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Table of Contents

Page

1 About this documentation ... 23
1.1 Validity of the documentation ... 23
1.2 Documentation structure ... 23
1.3 Using safety instructions ... 24
1.3.1 Safety instructions – Structure ... 24
1.3.2 Explaining signal words and safety alert symbol ... 24
1.3.3 Symbols used ... 26
1.4 Required and supplementing documentations ... 26
1.5 Names and abbreviations ... 32

2 XLC/MLC Parameter Description, General Information ... 35
2.1 Interaction between Parameters and Function Blocks ... 35
2.2 Document Structure ... 40
2.2.1 Parameter Types ... 40
2.2.2 Definitions ... 40

3 Overview table ... 45
3.1 Overview: User-Configurable Data Container, A-Parameters ... 45
3.2 Data Exchange between Control and Drives ... 46
3.2.1 General Information on Data Exchange ... 46
3.2.2 MLC-MDT Configuration, IndraDrive/HydraulicDrive, Interpolation in the drive ... 47
3.2.3 MLC-MDT Configuration, Interpolation in the Control ... 51
General structure ... 51
sercosDrive ... 51
IndraDrive/HydraulicDrive ... 51
Signal control word ... 52
sercosDrive ... 52
IndraDrive/HydraulicDrive ... 52
User-configurable 4-byte containers ... 52
3.2.4 MLC-AT Configuration, IndraDrive/HydraulicDrive, Interpolation in the drive ... 53
3.2.5 MLC-AT Configuration, Interpolation in the Control ... 55
General structure ... 55
Signal status word ... 56
sercosDrive ... 56
IndraDrive/HydraulicDrive ... 56
User-configurable 4-byte containers ... 57
3.3 Overview: XLC/MLC Diagnostic Parameters ... 57
3.4 Overview: XLC/MLC Command Parameters ... 59
3.5 Overview: XLC/MLC IP communication parameters ... 61
3.6 Overview: XLC/MLC MotionProfile, A-Parameters ... 64
3.7 Overview: XLC/MLC FlexProfile, A-Parameters ... 64
3.8 Overview: Kinematic parameters ... 66
3.9 Overview: Trace Parameters ... 70

Table of Contents

Page

3.10 Overview: Touch Probe Parameters ... 70
3.11 Overview: Programmable Limit Switches PLS (CFL01.1-N1), N-Parameters ... 71
3.12 Overview: XLC/MLC Oscilloscope Parameters ... 72

4 Describing individual parameters, arranged according to types ... 75
4.1 Axis parameters (A-parameters) ... 75
4.1.1 Axis Parameters, General Information ... 75
4.1.2 A-0-0000 - A-0-0499 ... 77
A-0-0000, Dummy, A-parameter ... 77
A-0-0001, Logic axis number ... 78
A-0-0002, Axis name ... 78
A-0-0004, Axis type ... 79
A-0-0005, Drive address ... 81
A-0-0006, Drive type ... 82
A-0-0007, Axis configuration ... 83
A-0-0008, Link axis, master axis selection ... 85
A-0-0009, Osci: list of all A-parameters that can be oscilloscoped ... 86
A-0-0010, List of all A-parameters ... 86
A-0-0011, List of all invalid A-parameters ... 87
A-0-0012, Checksum of all A-parameters ... 88
A-0-0013, IDN list of checksum A-parameters ... 89
A-0-0014, List of incorrect synchronized A-parameters ... 90
A-0-0016, Project identification number ... 91
A-0-0018, Control word of controller ... 91
A-0-0019, Status word of controller ... 93
A-0-0020, Axis diagnostic message ... 94
A-0-0021, Axis status ... 95
A-0-0022, Extended axis status ... 99
A-0-0023, Axis diagnostic number ... 100
A-0-0024, Axis state ... 101
A-0-0026, Telegram error counter of the drive ... 104
A-0-0027, Error counter of data loss ... 105
A-0-0028, Travel range limit switch ... 105
A-0-0029, Position polarities ... 106
A-0-0030, Position limit value, positive ... 108
A-0-0031, Position limit value, negative ... 109
A-0-0032, Velocity limit value, positive ... 110
A-0-0033, Velocity limit value, negative ... 111
A-0-0034, Acceleration limit value, bipolar ... 112
A-0-0036, Jerk limit value, bipolar ... 112
A-0-0038, Torque/force limit value, bipolar ... 113
A-0-0045, Modulo value ... 115
A-0-0046, Feed distance of the slave drive ... 115
A-0-0048, Velocity polarities ... 117
A-0-0049, Torque-/force polarities ... 118
A-0-0050, Scaling type for torque/force data ... 119

Table of Contents

Page

A-0-0051, Scaling factor for torque/force data ... 120
A-0-0052, Scaling exponent for torque/force data ... 121
A-0-0053, Scaling type for acceleration data ... 125
A-0-0054, Scaling factor for acceleration data ... 126
A-0-0055, Scaling exponent for acceleration data ... 127
A-0-0056, Scaling type for velocity data ... 128
A-0-0057, Scaling factor for velocity data ... 129
A-0-0058, Scaling exponent for velocity data ... 130
A-0-0059, Scaling type for position data ... 131
A-0-0060, Scaling factor for translatory position data ... 133
A-0-0061, Scaling exponent for translatory position data ... 134
A-0-0062, Position resolution, rotatory ... 135
A-0-0063, Scaling type for temperature data ... 136
A-0-0064, Torque/Force reference value ... 136
A-0-0066, Scaling type for valve control values ... 138
A-0-0080, Jogging, short distance ... 139
A-0-0081, Jogging, long distance ... 140
A-0-0082, Jogging, low velocity ... 141
A-0-0083, Jogging, high velocity ... 143
A-0-0084, Jogging, acceleration ... 144
A-0-0085, Jogging, deceleration ... 145
A-0-0086, Jogging, acceleration jerk ... 146
A-0-0087, Jogging, deceleration jerk ... 147
A-0-0100, Actual position value ... 148
A-0-0101, Actual position value, 8 bytes ... 149
A-0-0102, Actual velocity value ... 150
A-0-0103, Actual acceleration value ... 151
A-0-0108, Actual position value, incremental ... 152
A-0-0110, Actual torque/force value ... 153
A-0-0150, Interpolated position ... 153
A-0-0151, Interpolated position of the control ... 154
A-0-0152, Interpolated velocity ... 155
A-0-0153, Interpolated acceleration ... 155
A-0-0156, Interpolated force ... 156
A-0-0158, Interpolated analog control value ... 157
A-0-0170, Reaction to force limitation ... 157
A-0-0171, Position for interpolation effect ... 159
A-0-0172, Velocity for interpolation effect ... 160
A-0-0173, Acceleration for interpolation effect ... 161
A-0-0200, Default master axis ... 161
A-0-0201, Interpolator configuration ... 162
A-0-0203, Direction of motion ... 166
A-0-0204, Velocity threshold, positioning in modulo format ... 167
A-0-0216, Jerk ... 168
A-0-0219, Positioning window for shortest distance ... 169
A-0-0221, Torque/force window ... 170

Table of Contents

Page

A-0-0222, Standstill window ... 171
A-0-0223, Velocity window ... 171
A-0-0224, Rapid stop deceleration ... 172
A-0-0225, Rapid stop jerk ... 173
A-0-0230, Blending distance PTP ... 174
A-0-0240, Feedrate override ... 174
A-0-0241, Feedrate override control word ... 175
A-0-0242, Position control, synchronization acceleration ... 176
A-0-0243, Position control, synchronization velocity ... 178
A-0-0300, Master axis, actual position value ... 180
A-0-0302, Master axis, actual velocity value ... 180
4.1.3 A-0-0500 - A-0-0999 ... 181
A-0-0500, Configuration of user-defined command value A ... 181
A-0-0501, Container of user-defined command value A ... 182
A-0-0502, Configuration of user-defined command value B ... 183
A-0-0503, Container of user-defined command value B ... 183
A-0-0504, Configuration of user-defined command value C ... 184
A-0-0505, Container of user-defined command value C ... 185
A-0-0506, Configuration of user-defined command value D ... 186
A-0-0507, Container of user-defined command value D ... 186
A-0-0508, Configuration of user-defined command value E ... 187
A-0-0509, Container of user-defined command value E ... 188
A-0-0510, Reserved ... 189
A-0-0511, Reserved ... 189
A-0-0520, Configuration of actual user-defined value A ... 190
A-0-0521, Container of actual user-defined value A ... 191
A-0-0522, Configuration of actual user-defined value B ... 191
A-0-0523, Container of actual user-defined value B ... 192
A-0-0524, Configuration of actual user-defined value C ... 193
A-0-0525, Container of actual user-defined value C ... 194
A-0-0526, Configuration of actual user-defined value D ... 194
A-0-0527, Container of actual user-defined value D ... 195
A-0-0528, Configuration of actual user-defined value E ... 196
A-0-0529, Container of actual user-defined value E ... 197
A-0-0530, Configuration of actual user-defined value F ... 197
A-0-0531, Container of actual user-defined value F ... 198
A-0-0540, Configuration of user-defined command value, bit A ... 199
A-0-0541, Configuration of user-defined command value, bit number A ... 200
A-0-0542, User-defined command value, bit number A ... 200
A-0-0543, Configuration of user-defined command value, bit B ... 201
A-0-0544, Configuration of user-defined command value, bit number B ... 202
A-0-0545, User-defined command value, bit number B ... 203
A-0-0546, Configuration of user-defined command value, bit C ... 204
A-0-0547, Configuration of user-defined command value, bit number C ... 205
A-0-0548, User-defined command value, bit number C ... 206
A-0-0549, Configuration of user-defined command value, bit D ... 207

Table of Contents

Page

A-0-0550, Configuration of user-defined command value, bit number D..... 207
A-0-0551, User-defined command value, bit number D..... 208
A-0-0560, Configuration of actual user-defined value, bit A..... 209
A-0-0561, Configuration of actual user-defined value, bit number A..... 210
A-0-0562, Actual user-defined value, bit number A..... 211
A-0-0563, Configuration of actual user-defined value, bit B..... 212
A-0-0564, Configuration of actial user-defined value, bit number B..... 212
A-0-0565, Actual user-defined value, bit number B..... 213
A-0-0566, Configuration of actual user-defined value, bit C..... 214
A-0-0567, Configuration of actual user-defined value, bit number C..... 215
A-0-0568, Actual user-defined value, bit number C..... 216
A-0-0569, Configuration of actual user-defined value, bit D..... 217
A-0-0570, Configuration of actual user-defined value, bit number D..... 217
A-0-0571, Actual user-defined value, bit number D..... 218
A-0-0596, List of freely configurable parameters in the MDT..... 219
A-0-0597, List of freely configurable parameters in the AT..... 220
A-0-0598, List of configurable parameters in signal control word..... 221
A-0-0599, List of configurable parameters in signal status word..... 221
A-0-0606, Drive, Software revision..... 222
A-0-0622, Synchronization run window, position..... 223
A-0-0623, Synchronization run window, velocity..... 224
A-0-0627, Controller axis, diagnostic number..... 225
A-0-0630, Controller axis, controller name..... 225
A-0-0651, Diagnostics, control word..... 226
4.1.4 A-0-1000 - A-0-1999..... 227
A-0-1000, Command: Load basic axis parameters..... 227
A-0-1030, Command: Clear all axis errors..... 228
4.1.5 A-0-2000 - A-0-2499..... 229
A-0-2100, List of all backup operation A-parameters..... 229
A-0-2121, Axis status..... 230
A-0-2200, Command position..... 231
A-0-2201, Target position..... 233
A-0-2202, Command velocity..... 234
A-0-2203, Command acceleration..... 236
A-0-2204, Command deceleration..... 238
A-0-2205, Command jerk..... 239
A-0-2206, Target force..... 240
A-0-2207, Command direction of motion..... 241
A-0-2208, Cyclic command position..... 242
A-0-2209, Cyclic command torque..... 243
A-0-2210, Cyclic command velocity..... 243
A-0-2211, Cyclic analog value..... 244
A-0-2220, Additive position value, process controller..... 245
4.1.6 A-0-2500 - A-0-2999..... 246
A-0-2600, Additive master axis position, process controller..... 246
A-0-2601, ELS, filter constant, additive master axis position..... 247

Table of Contents

Page

A-0-2605, ELS, Gear ratio fine adjustment process controller... 248
A-0-2610, ELS, additive position command value, process controller... 248
A-0-2611, ELS, filter time constant, additive position command value... 249
A-0-2615, ELS, additive velocity command value, process controller... 250
A-0-2620, ELS, phase offset of table beginning, process controller... 250
A-0-2621, ELS, filter constant, phase offset of table... 251
A-0-2650, ELS, resulting master axis position... 252
A-0-2651, ELS, effective master axis position... 253
A-0-2652, ELS, effective master axis velocity... 253
A-0-2653, ELS, synchronous position command value... 254
A-0-2654, ELS, synchronous velocity... 255
A-0-2655, ELS, position command value... 255
A-0-2656, ELS, cam, access phase... 256
A-0-2657, ELS, effective velocity command value... 257
A-0-2658, ELS, master axis, velocity... 257
A-0-2700, ELS, master axis, control number... 258
A-0-2701, ELS, master axis, axis number... 259
A-0-2710, ELS, phasing, additive position command value... 260
A-0-2711, ELS, phasing, additive position command value, velocity... 260
A-0-2712, ELS, phasing, additive position command value, acceleration... 261
A-0-2720, ELS, master axis gear, input revolutions... 262
A-0-2721, ELS, master axis gear, output revolutions... 263
A-0-2722, ELS, gear ratio fine adjust... 264
A-0-2730, ELS, PhasingTableAngle, cam table beginning... 265
A-0-2731, ELS, PhasingTableAngle, change velocity... 265
A-0-2740, ELS, CamIn, cam table preselection... 266
A-0-2741, ELS, CamIn, cam distance... 267
A-0-2745, ELS, gear reduction... 268
A-0-2750, ELS, PhasingSlave, additive position command value... 269
A-0-2751, ELS, PhasingSlave, additive position command value, vel... 270
A-0-2752, ELS, PhasingSlave, additive position command value, acc... 270
A-0-2761, ELS, PhasingSlaveVel, additive command velocity... 271
A-0-2762, Slave axis, additive command velocity, acceleration... 272
A-0-2765, Slave axis, master axis revolutions per master axis cycle... 272
A-0-2790, ELS, synchronization velocity... 274
A-0-2791, ELS, synchronization acceleration... 275
A-0-2792, ELS, synchronization run window for modulo format... 276
A-0-2793, ELS, synchronization direction... 277
A-0-2794, ELS, synchronization mode... 278
A-0-2795, Positioning window... 280
A-0-2796, MotionProfile selection... 281
A-0-2797, Relative positioning of MotionProfile... 282
A-0-2798, Polarity of master axis position... 283
A-0-2800, Master axis encoder, configuration... 284
A-0-2801, Master axis encoder, status... 285
A-0-2802, Master axis encoder, input revolutions... 286

Table of Contents

Page

A-0-2803, Master axis encoder, output revolutions ... 287
A-0-2804, Master axis encoder, filter type ... 287
A-0-2805, Master axis encoder, filter cutoff frequency ... 288
A-0-2806, Master axis encoder, reference position ... 289
A-0-2807, Command: Set absolute position ... 290
A-0-2808, Master axis encoder, additive position command value ... 291
A-0-2900, MotionProfile, master axis switching position ... 291
A-0-2901, MotionProfile, motion step 1, initial slave axis position ... 292
A-0-2902, MotionProfile 0, diagnostics ... 293
A-0-2903, MotionProfile 1, diagnostics ... 294
A-0-2904, MotionProfile, basic configuration ... 295
A-0-2910, MotionProfile 0, number of motion steps ... 296
A-0-2911, MotionProfile 0, master axis velocity ... 296
A-0-2912, MotionProfile 0, list of initial master axis positions ... 297
A-0-2913, MotionProfile 0, list of motion laws ... 298
A-0-2914, MotionProfile 0, list of distances ... 300
A-0-2915, MotionProfile 0, list of slave axis velocities ... 301
A-0-2920, MotionProfile 1, number of motion steps ... 302
A-0-2921, MotionProfile 1, master axis velocity ... 302
A-0-2922, MotionProfile 1, list of initial master axis positions ... 303
A-0-2923, MotionProfile 1, list of motion laws ... 304
A-0-2924, MotionProfile 1, list of distances ... 306
A-0-2925, MotionProfile 1, list of slave axis velocities ... 307
A-0-2930, MotionProfile, control word ... 308
A-0-2931, MotionProfile, status word ... 309
4.1.7 A-0-3000 - A-0-3499 ... 311
A-0-3000, FlexProfile, current set ... 311
A-0-3001, FlexProfile, current step ... 312
A-0-3002, FlexProfile, master axis switching position ... 312
A-0-3003, FlexProfile, slave axis, additive command position value ... 313
A-0-3004, FlexProfile, master axis, additive command position value ... 314
A-0-3009, FlexProfile, control word ... 314
A-0-3010, FlexProfile, status word ... 316
A-0-3011, FlexProfile, conditions: control variables ... 318
A-0-3012, FlexProfile, conditions: status variables ... 319
A-0-3013, FlexProfile, value, current time-master ... 321
A-0-3020, FlexProfile 0, master axis velocity ... 321
A-0-3021, FlexProfile 0, list of master axis sources ... 322
A-0-3022, FlexProfile 0, list of slave axis distances ... 323
A-0-3023, FlexProfile 0, list of master axis ranges ... 324
A-0-3024, FlexProfile 0, list of master axis ranges, units ... 324
A-0-3025, FlexProfile 0, list of motion laws ... 325
A-0-3026, FlexProfile 0, list of motion step types ... 327
A-0-3027, FlexProfile 0, list of slave axis starting velocities ... 328
A-0-3028, FlexProfile 0, list of slave axis starting accelerations ... 330
A-0-3029, FlexProfile 0, list of slave axis starting jerks ... 331

Table of Contents

Page

A-0-3030, FlexProfile 0, list of slave axis end velocities... 333
A-0-3031, FlexProfile 0, list of slave axis end accelerations... 335
A-0-3032, FlexProfile 0, list of slave axis end jerks... 336
A-0-3033, FlexProfile 0, list of slave axis travel velocities... 338
A-0-3034, FlexProfile 0, list of slave axis travel accelerations... 339
A-0-3035, FlexProfile 0, list of slave axis travel jerks... 341
A-0-3036, FlexProfile 0, list of turning point displacements... 343
A-0-3040, FlexProfile 0, events, list of motion step assignments... 344
A-0-3041, FlexProfile 0, events, list of trigger modes... 344
A-0-3042, FlexProfile 0, events, list of action modes... 345
A-0-3043, FlexProfile 0, events, list of trigger values... 347
A-0-3044, FlexProfile 0, events, list of trigger values, units... 347
A-0-3046, FlexProfile 0, command: Check and apply event... 348
A-0-3047, FlexProfile 0, diagnostics... 349
A-0-3048, FlexProfile 0, command: Check and apply profile... 350
A-0-3049, FlexProfile 0, checksum... 351
A-0-3050, FlexProfile 1, master axis velocity... 352
A-0-3051, FlexProfile 1, list of master axis sources... 353
A-0-3052, FlexProfile 1, list of slave axis distances... 354
A-0-3053, FlexProfile 1, list of master axis ranges... 354
A-0-3054, FlexProfile 1, list of master axis ranges, units... 355
A-0-3055, FlexProfile 1, list of motion laws... 356
A-0-3056, FlexProfile 1, list of motion step types... 358
A-0-3057, FlexProfile 1, list of slave axis starting velocities... 359
A-0-3058, FlexProfile 1, list of slave axis starting accelerations... 361
A-0-3059, FlexProfile 1, list of slave axis starting jerks... 362
A-0-3060, FlexProfile 1, list of slave axis end velocities... 364
A-0-3061, FlexProfile 1, list of slave axis end accelerations... 366
A-0-3062, FlexProfile 1, list of slave axis end jerks... 367
A-0-3063, FlexProfile 1, list of slave axis travel velocities... 369
A-0-3064, FlexProfile 1, list of slave axis travel accelerations... 370
A-0-3065, FlexProfile 1, list of slave axis travel jerks... 372
A-0-3066, FlexProfile 1, list of turning point displacements... 374
A-0-3070, FlexProfile 1, events, list of motion step assignments... 375
A-0-3071, FlexProfile 1, events, list of trigger modes... 375
A-0-3072, FlexProfile 1, events, list of action modes... 376
A-0-3073, FlexProfile 1, events, list of trigger values... 378
A-0-3074, FlexProfile 1, events, list of trigger values, units... 378
A-0-3076, FlexProfile 1, command: Check and apply event... 379
A-0-3077, FlexProfile 1, diagnostics... 380
A-0-3078, FlexProfile 1, command: Check and apply profile... 381
A-0-3079, FlexProfile 1, checksum... 382
A-0-3080, FlexProfile 2, master axis velocity... 383
A-0-3081, FlexProfile 2, list of master axis sources... 384
A-0-3082, FlexProfile 2, list of slave axis distances... 385
A-0-3083, FlexProfile 2, list of master axis ranges... 385

Table of Contents

Page

A-0-3084, FlexProfile 2, list of master axis ranges, units... 386
A-0-3085, FlexProfile 2, list of motion laws... 387
A-0-3086, FlexProfile 2, list of motion step types... 389
A-0-3087, FlexProfile 2, list of slave axis starting velocities... 390
A-0-3088, FlexProfile 2, list of slave axis starting accelerations... 392
A-0-3089, FlexProfile 2, list of slave axis starting jerks... 393
A-0-3090, FlexProfile 2, list of slave axis end velocities... 395
A-0-3091, FlexProfile 2, list of slave axis end accelerations... 397
A-0-3092, FlexProfile 2, list of slave axis end jerks... 398
A-0-3093, FlexProfile 2, list of slave axis travel velocities... 400
A-0-3094, FlexProfile 2, list of slave axis travel accelerations... 401
A-0-3095, FlexProfile 2, list of slave axis travel jerks... 403
A-0-3096, FlexProfile 2, list of turning point displacements... 405
A-0-3100, FlexProfile 2, events, list of motion step assignments... 406
A-0-3101, FlexProfile 2, events, list of trigger modes... 406
A-0-3102, FlexProfile 2, events, list of action modes... 407
A-0-3103, FlexProfile 2, events, list of trigger values... 409
A-0-3104, FlexProfile 2, events, list of trigger values, units... 409
A-0-3106, FlexProfile 2, command: Check and apply event... 410
A-0-3107, FlexProfile 2, diagnostics... 411
A-0-3108, FlexProfile 2, command: Check and apply profile... 412
A-0-3109, FlexProfile 2, checksum... 413
A-0-3110, FlexProfile 3, master axis velocity... 414
A-0-3111, FlexProfile 3, list of master axis sources... 415
A-0-3112, FlexProfile 3, list of distances... 416
A-0-3113, FlexProfile 3, list of master axis ranges... 416
A-0-3114, FlexProfile 3, list of master axis ranges, units... 417
A-0-3115, FlexProfile 3, list of motion laws... 418
A-0-3116, FlexProfile 3, list of motion step types... 420
A-0-3117, FlexProfile 3, list of slave axis starting velocities... 421
A-0-3118, FlexProfile 3, list of slave axis starting accelerations... 423
A-0-3119, FlexProfile 3, list of slave axis starting jerks... 424
A-0-3120, FlexProfile 3, list of slave axis end velocities... 426
A-0-3121, FlexProfile 3, list of slave axis end accelerations... 428
A-0-3122, FlexProfile 3, list of slave axis end jerks... 429
A-0-3123, FlexProfile 3, list of slave axis travel velocities... 431
A-0-3124, FlexProfile 3, list of slave axis travel accelerations... 432
A-0-3125, FlexProfile 3, list of slave axis travel jerks... 434
A-0-3126, FlexProfile 3, list of turning point displacements... 436
A-0-3130, FlexProfile 3, events, list of motion step assignments... 437
A-0-3131, FlexProfile 3, events, list of trigger modes... 437
A-0-3132, FlexProfile 3, events, list of action modes... 438
A-0-3133, FlexProfile 3, events, list of trigger values... 440
A-0-3134, FlexProfile 3, events, list of trigger values, units... 440
A-0-3136, FlexProfile 3, command: Check and apply event... 441
A-0-3137, FlexProfile 3, diagnostics... 442

Table of Contents

Page

A-0-3138, FlexProfile 3, command: Check and apply profile ... 443
A-0-3139, FlexProfile 3, checksum ... 444
4.2 Control parameters (C-parameters) ... 445
4.2.1 Control Parameters, General Information ... 445
4.2.2 C-0-0000 - C-0-0499 ... 445
C-0-0000, Dummy, C-parameter ... 445
C-0-0001, Language selection ... 446
C-0-0002, Name of parameter file ... 446
C-0-0003, Name of diagnostic file ... 446
C-0-0004, Name of menu file ... 447
C-0-0009, Osci: list of all C-parameters that can be oscilloscoped ... 447
C-0-0010, Version number, hardware ... 447
C-0-0011, Version number, PLC firmware ... 447
C-0-0012, Version number, firmware ... 448
C-0-0013, Version number, BSP ... 448
C-0-0014, Version number, MLPI Server Core ... 448
C-0-0017, Reserved for internal use ... 449
C-0-0020, Hardware, configuration ... 449
C-0-0021, Hardware, details ... 449
C-0-0022, Local bus, configuration ... 450
C-0-0023, System status ... 450
C-0-0024, Internal system status ... 452
C-0-0025, Function module bus, configuration ... 453
C-0-0026, Hardware details of function module no. 1 ... 454
C-0-0027, Hardware details of function module no. 2 ... 454
C-0-0028, Hardware details of function module no. 3 ... 455
C-0-0029, Hardware details of function module no. 4 ... 455
C-0-0030, Control name ... 455
C-0-0031, Control address ... 456
C-0-0032, Serial number of control ... 457
C-0-0033, Project identification number ... 457
C-0-0034, Client, access locking number ... 457
C-0-0035, C2C, identification number ... 458
C-0-0036, Control configuration ... 458
C-0-0039, sercos local and function module bus, actual configuration ... 459
C-0-0040, sercos local and function module bus, command configuration ... 461
C-0-0041, Local and function module bus, actual configuration ... 463
C-0-0050, System time ... 465
C-0-0051, Operating hour counter ... 466
C-0-0052, Operating hour counter, fan ... 466
C-0-0060, Switch-on delay time ... 466
C-0-0063, Scaling type for temperature data of the control ... 466
C-0-0070, Control temperature ... 467
C-0-0071, Maximum control temperature ... 467
C-0-0080, User-defined decimal number ... 467
C-0-0081, User-defined text ... 468

Table of Contents

Page

C-0-0110, List of all C-parameters... 468
C-0-0111, List of all invalid C-parameters... 468
C-0-0112, Checksum of all C-parameters... 469
C-0-0113, IDN list of checksum C-parameters... 469
C-0-0114, IDN list of import errors... 470
C-0-0120, Maximum number of controls... 470
C-0-0121, Maximum number of axes... 470
C-0-0122, Maximum number of axes of a producer... 470
C-0-0123, Maximum number of kinematics... 471
C-0-0124, Maximum number of touch probes... 471
C-0-0125, Maximum number of programmable limit switches... 471
C-0-0126, Maximum number of oscilloscope channels... 471
C-0-0140, Minimum logic axis number... 472
C-0-0141, Maximum logic axis number... 472
C-0-0200, Engineering, IP address... 472
C-0-0201, Engineering, subnet mask... 472
C-0-0202, Engineering, standard gateway... 473
C-0-0203, Engineering, user name... 473
C-0-0205, Engineering, MAC address... 473
C-0-0206, TCP, time to live... 474
C-0-0207, UDP, ports... 474
C-0-0208, TCP, port for acyclic channels... 474
C-0-0209, Sender timeout... 474
C-0-0210, TCP, max. number of connection... 475
C-0-0211, Reserved... 475
C-0-0212, Drive server, configuration... 475
C-0-0216, Engineering, IP address, actual configuration... 476
C-0-0217, Engineering, subnet mask, actual configuration... 476
C-0-0218, List of existing network interfaces... 476
C-0-0219, Status of network configuration... 477
C-0-0220, sercos master, IP address, command configuration... 477
C-0-0221, sercos master, subnet mask, command configuration... 478
C-0-0222, sercos master, IP address, actual configuration... 478
C-0-0223, sercos master, subnet mask, actual configuration... 478
C-0-0224, sercos master, MAC address... 478
C-0-0225, C2C, IP address, command configuration... 479
C-0-0226, C2C, subnet mask, command configuration... 479
C-0-0227, C2C, IP address, actual configuration... 479
C-0-0228, C2C, subnet mask, actual configuration... 480
C-0-0229, C2C, MAC address... 480
C-0-0230, Bridge, IP address, command configuration... 480
C-0-0231, Bridge, subnet mask, command configuration... 481
C-0-0232, Bridge, command configuration of assigned interfaces... 481
C-0-0233, Bridge, actual configuration of assigned interfaces... 481
C-0-0234, Automatic IP address generation, actual configuration... 482
C-0-0235, Automatic IP address generation, command configuration... 483

Table of Contents

Page

C-0-0236, Bridge, IP address, actual configuration... 483
C-0-0237, Bridge, subnet mask, actual configuration... 484
C-0-0238, Bridge, MAC address... 484
C-0-0242, Onboard RT Ethernet, IP address, actual configuration... 484
C-0-0243, Onboard RT Ethernet, subnet mask, actual configuration... 485
C-0-0244, Onboard RT Ethernet, MAC address, actual configuration... 485
C-0-0250, Engineering, DHCP configuration... 485
C-0-0251, Engineering, DNS server IP... 485
C-0-0252, Engineering, DHCP initial address... 486
C-0-0253, Engineering, DHCP end address... 486
C-0-0254, Engineering, DHCP lease time... 486
C-0-0260, sercos master, DHCP configuration... 486
C-0-0261, sercos master, DNS server IP... 487
C-0-0262, sercos master, DHCP initial address... 487
C-0-0263, sercos master, DHCP end address... 487
C-0-0264, sercos master, DHCP lease time... 487
C-0-0270, Bridge, DHCP configuration... 487
C-0-0271, Bridge, DNS server IP... 488
C-0-0272, Bridge, DHCP initial address... 488
C-0-0273, Bridge, DHCP end address... 488
C-0-0274, Bridge, DHCP lease time... 488
C-0-0280, Onboard RT Ethernet, DHCP configuration... 489
C-0-0281, Onboard RT Ethernet, DNS server IP... 489
C-0-0282, Onboard RT Ethernet, DHCP initial address... 489
C-0-0283, Onboard RT Ethernet, DHCP end address... 489
C-0-0284, Onboard RT Ethernet, DHCP lease time... 489
C-0-0290, C2C, DHCP configuration... 490
C-0-0291, C2C, DNS server IP... 490
C-0-0292, C2C, DHCP initial address... 490
C-0-0293, C2C, DHCP end address... 490
C-0-0294, C2C, DHCP lease time... 491
C-0-0300, PLS No.1, control word... 491
C-0-0301, PLS No.1, status word... 492
C-0-0302, PLS No.1, signal selection... 492
C-0-0303, PLS No.1, control signal... 493
C-0-0304, PLS No.1, outputs... 494
C-0-0305, PLS No.1, internal registers... 494
C-0-0307, PLS No.1, reference axis configuration... 495
C-0-0308, PLS No.1, reference axis position, additive... 497
C-0-0309, PLS No.1, reference axis definition... 499
C-0-0310, PLS No.1, hysteresis... 500
C-0-0311, PLS No.1, lead time when switching on... 501
C-0-0312, PLS No.1, lead time when switching off... 502
C-0-0313, PLS No.1, switch track number... 503
C-0-0314, PLS No.1, switch-on position of switch track... 504
C-0-0315, PLS No.1, switch-off position of switch track... 505

Table of Contents

Page

C-0-0316, PLS No.1, command: Initialize switch track... 506
C-0-0317, PLS No.1, command: Activate switch track... 507
C-0-0318, PLS No.1, output mode... 507
C-0-0319, PLS No.1, switch-on duration... 508
C-0-0325, PLS No.2, control word... 509
C-0-0326, PLS No.2, status word... 510
C-0-0327, PLS No.2, signal selection... 511
C-0-0328, PLS No.2, control signal... 512
C-0-0329, PLS No.2, outputs... 512
C-0-0330, PLS No.2, internal registers... 513
C-0-0332, PLS No.2, reference axis configuration... 514
C-0-0333, PLS No.2, reference axis position, additive... 515
C-0-0334, PLS No.2, reference axis definition... 517
C-0-0335, PLS No.2, hysteresis... 518
C-0-0336, PLS No.2, lead time when switching on... 519
C-0-0337, PLS No.2, lead time when switching off... 520
C-0-0338, PLS No.2, switch track number... 521
C-0-0339, PLS No.2, switch-on position of switch track... 522
C-0-0340, PLS No.2, switch-off position of switch track... 523
C-0-0341, PLS No.2, command: Initialize switch track... 524
C-0-0342, PLS No.2, command: Activate switch track... 525
C-0-0343, PLS No.2, output mode... 525
C-0-0344, PLS No.2, switch-on duration... 526
C-0-0350, PLS No.3, control word... 527
C-0-0351, PLS No.3, status word... 528
C-0-0352, PLS No.3, signal selection... 529
C-0-0353, PLS No.3, control signal... 530
C-0-0354, PLS No.3, outputs... 530
C-0-0355, PLS No.3, internal registers... 531
C-0-0357, PLS No.3, reference axis configuration... 532
C-0-0358, PLS No.3, reference axis position, additive... 533
C-0-0359, PLS No.3, reference axis definition... 535
C-0-0360, PLS No.3, hysteresis... 536
C-0-0361, PLS No.3, lead time when switching on... 537
C-0-0362, PLS No.3, lead time when switching off... 538
C-0-0363, PLS No.3, switch track number... 539
C-0-0364, PLS No.3, switch-on position of switch track... 540
C-0-0365, PLS No.3, switch-off position of switch track... 541
C-0-0366, PLS No.3, command: Initialize switch track... 542
C-0-0367, PLS No.3, command: Activate switch track... 543
C-0-0368, PLS No.3, output mode... 543
C-0-0369, PLS No.3, switch-on duration... 544
C-0-0375, PLS No.4, control word... 545
C-0-0376, PLS No.4, status word... 546
C-0-0377, PLS No.4, signal selection... 547
C-0-0378, PLS No.4, control signal... 548

Table of Contents

Page

C-0-0379, PLS No.4, outputs ... 548
C-0-0380, PLS No.4, internal registers ... 549
C-0-0382, PLS No.4, reference axis configuration ... 550
C-0-0383, PLS No.4, reference axis position, additive ... 551
C-0-0384, PLS No.4, reference axis definition ... 553
C-0-0385, PLS No.4, hysteresis ... 554
C-0-0386, PLS No.4, lead time when switching on ... 555
C-0-0387, PLS No.4, lead time when switching off ... 556
C-0-0388, PLS No.4, switch track number ... 557
C-0-0389, PLS No.4, switch-on position of switch track ... 558
C-0-0390, PLS No.4, switch-off position of switch track ... 559
C-0-0391, PLS No.4, command: Initialize switch track ... 560
C-0-0392, PLS No.4, command: Activate switch track ... 561
C-0-0393, PLS No.4, output mode ... 561
C-0-0394, PLS No.4, switch-on duration ... 562
C-0-0400, Motion, cycle time, command value ... 563
C-0-0401, Time period of the integrated PLC of the MC cycle time ... 564
C-0-0402, Motion, startup of cycle time ... 564
C-0-0403, Motion, priority calculation ... 564
C-0-0404, Time slot control ... 565
C-0-0405, PLC, configuration ... 565
C-0-0406, Preset of operating state of all PLC applications ... 566
C-0-0407, Watchdog, communication ... 566
C-0-0408, Timeslot, communication ... 566
C-0-0410, Motion, cycle time (Tcyc), actual value ... 567
C-0-0412, List of current time slot measurements ... 567
C-0-0413, List of maximum time slot measurements ... 568
C-0-0414, List of minimum time slot measurements ... 569
C-0-0415, CPU load, current ... 569
C-0-0416, CPU load, maximum ... 570
C-0-0417, CPU load, minimum ... 570
C-0-0418, CPU load, threshold value for warning ... 570
C-0-0420, Motion, watchdog sensitivity ... 571
C-0-0421, Motion, absolute error counter ... 571
C-0-0422, Motion, number of successive errors ... 571
C-0-0423, Motion, cycle counter ... 572
C-0-0425, TaskViewer, buffer size ... 572
C-0-0440, Configuration PM/OM switching ... 572
C-0-0450, Motion, startup target mode ... 573
C-0-0451, Motion, target mode ... 574
C-0-0452, Motion, current mode ... 574
C-0-0476, Configured user tasks ... 575
C-0-0477, Command-actual comparison of the sercos devices ... 576
C-0-0478, sercos device configuration ... 578
C-0-0479, Extended sercos device information ... 580
C-0-0480, Configured axis number ... 581

Table of Contents

Page

C-0-0481, List of detected sercos devices... 582
C-0-0482, List of non-linked sercos devices... 582
C-0-0483, List of configured axes... 582
C-0-0484, Axis configuration list... 583
4.2.3 C-0-0500 - C-0-0999... 585
C-0-0500, sercos master, configuration... 585
C-0-0501, sercos master, baud rate... 585
C-0-0502, sercos master, OWG length... 586
C-0-0503, sercos master, cycle time... 586
C-0-0504, sercos master, SVC busy timeout... 586
C-0-0505, sercos master, consumer timeout... 587
C-0-0506, sercos Master, sercos III, configuration of function modes... 587
C-0-0507, sercos master, allowed telegram losses... 588
C-0-0510, sercos master, address configuration... 588
C-0-0511, sercos master, binary inputs, command values... 589
C-0-0514, sercos master, status... 589
C-0-0515, sercos master, sercos III, FPGA, image... 590
C-0-0516, sercos master, slave identification... 591
C-0-0517, sercos master, addresses ring break... 591
C-0-0518, sercos master, position ring break... 592
C-0-0519, sercos master, sercos III, internal connection configuration... 592
C-0-0520, sercos master, sercos III, external connection configuration... 592
C-0-0521, sercos master, sercos III, connection configuration active... 593
C-0-0535, sercos master, error counter for Port1 and Port2... 593
C-0-0620, Diagnostic memory index... 593
C-0-0621, Diagnostics, indexed message... 594
C-0-0622, Diagnostics, number of messages in the memory... 594
C-0-0623, Diagnostics, last reset message... 594
C-0-0624, Diagnostics, absolute indices... 595
C-0-0625, Diagnostics, display message... 595
C-0-0626, Diagnostics... 595
C-0-0627, Diagnostic number... 596
C-0-0650, Diagnostics, status word... 596
C-0-0660, Dispay, display period of messages... 597
C-0-0670, List of active trace modules... 597
C-0-0671, Trace, storage settings... 597
C-0-0672, Save trace after this DSH message... 598
C-0-0673, Save trace in DSH message mask... 598
C-0-0674, Save trace after specified time... 598
C-0-0675, Save trace under this file name... 599
C-0-0676, Percentage of trace data saved after trigger signal... 599
C-0-0700, C2C, cycle time (Tcyc), command value... 599
C-0-0701, C2C, configuration of function modes... 600
C-0-0702, C2C, OWG length... 601
C-0-0703, C2C, configuration of master axes... 601
C-0-0704, C2C, binary inputs, command values... 603

Table of Contents

Page

C-0-0705, C2C, calibration of dead time compensation... 604
C-0-0710, C2C, cycle time (Tcyc), actual value... 606
C-0-0711, C2C, error counter MDT... 606
C-0-0712, C2C, link data, status... 607
C-0-0713, C2C, binary inputs, status... 608
C-0-0714, C2C, function module, status... 608
C-0-0715, FM, sercos III, FPGA, image... 610
C-0-0716, C2C, sercos III, error counter for data loss... 610
C-0-0717, C2C, addresses ring break... 611
C-0-0735, C2C, error counter for Port1/Port2... 611
C-0-0750, C2C, startup target mode... 612
C-0-0751, C2C, target mode... 613
C-0-0752, C2C, current mode... 614
C-0-0778, C2C, command configuration... 615
C-0-0779, C2C, device information... 617
C-0-0800, Oscilloscope, status word... 618
C-0-0801, Oscilloscope, time resolution... 619
C-0-0802, Oscilloscope, memory depth... 620
C-0-0803, Oscilloscope, signal selection list... 620
C-0-0804, Oscilloscope, number of valid values... 621
C-0-0805, Oscilloscope, control word... 621
C-0-0806, Oscilloscope, number of channels... 621
C-0-0807, Oscilloscope, sample time stamp... 622
C-0-0820, Oscilloscope, sample task selection... 622
C-0-0821, Oscilloscope, sample task interval... 622
C-0-0822, Oscilloscope, sample task task ID... 623
C-0-0825, Oscilloscope, sample task status... 623
C-0-0830, Oscilloscope, IEC sample task 00... 623
C-0-0831, Oscilloscope, IEC sample task 01... 623
C-0-0832, Oscilloscope, IEC sample task 02... 624
C-0-0833, Oscilloscope, IEC sample task 03... 624
C-0-0834, Oscilloscope, IEC sample task 04... 624
C-0-0840, Oscilloscope, system sample task 00... 624
C-0-0841, Oscilloscope, system sample task 01... 624
C-0-0850, Oscilloscope, trigger mask... 625
C-0-0851, Oscilloscope, trigger signal... 625
C-0-0852, Oscilloscope, trigger threshold... 625
C-0-0853, Oscilloscope, trigger edge... 626
C-0-0854, Oscilloscope, number of measured values after trigger event... 626
C-0-0855, Oscilloscope, trigger time stamp... 627
C-0-0856, Oscilloscope, external trigger signal... 627
C-0-0857, Oscilloscope, internal trigger signal... 628
C-0-0858, Oscilloscope, AUX trigger path... 628
C-0-0859, Oscilloscope, AUX trigger... 628
C-0-0860, Oscilloscope, default trigger... 628
C-0-0900, Device operating state... 629

Table of Contents

Page

C-0-0915, Number of PLC applications ... 629
C-0-0916, PLC router address ... 629
C-0-0920, Operating states of PLC applications ... 630
4.2.4 C-0-1000 - C-0-1999 ... 630
C-0-1000, Command: Load basic parameters ... 630
C-0-1001, Command: Restore MC- and PLC-Retain-Data ... 631
C-0-1002, Command: Save MC- and PLC-Retain-Data ... 631
C-0-1003, Command: Restore PLC-Retain-Data ... 632
C-0-1004, Command: Save PLC-Retain-Data ... 632
C-0-1005, Command: Delete files on SYSTEM partition ... 633
C-0-1006, Command: Delete files on OEM partition ... 634
C-0-1007, Command: Delete files on USER partition ... 634
C-0-1008, Command: Get function modul bus information ... 635
C-0-1009, Command: Get extended sercos device information ... 635
C-0-1010, Command: Export parameter ... 636
C-0-1011, Command: Import parameter ... 636
C-0-1019, Command: Restart and reset to default ... 637
C-0-1020, Command: Restart after firmware update ... 638
C-0-1021, Command: Restart ... 638
C-0-1022, Command: Activate firmware update ... 639
C-0-1023, Command: Apply IP configuration ... 639
C-0-1024, Command: Load basic parameter of IP configuration ... 640
C-0-1030, Command: Clear all control errors ... 641
C-0-1041, Command: Start task record ... 641
C-0-1042, Command: Stop task record ... 642
C-0-1050, Command: Reset parameter C-0-0413 and C-0-0414 ... 643
C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417 ... 643
C-0-1052, Command: Reset parameter C-0-0421 and C-0-0422 ... 644
C-0-1060, Command: Save all trace recordings ... 644
C-0-1061, Command: Unlock all trace buffers ... 644
C-0-1070, Command: Switch PM/OM ... 645
4.2.5 C-0-2000 - C-0-2499 ... 646
C-0-2001 to C-0-2099, point tables on the control ... 646
C-0-2001, ELS, point table1 ... 646
C-0-2100, List of all backup operation C-parameters ... 646
C-0-2480, Configured kinematic number ... 647
C-0-2482, List of non-linked axes ... 647
C-0-2483, List of configured kinematics ... 648
C-0-2484, Kinematic configuration list ... 648
C-0-2499, Touch probe, IDN list signal selection ... 649
4.3 Kinematic parameters (K-parameters) ... 650
4.3.1 Kinematic Parameters, General Information ... 650
4.3.2 K-0-0000 - K-0-0999 ... 650
K-0-0000, Dummy, K-parameter ... 650
K-0-0001, Logic kinematic number ... 650
K-0-0002, Kinematic name ... 650

Table of Contents

Page

K-0-0003, Maximum path velocity... 651
K-0-0004, Reserved... 651
K-0-0005, Software limit switch, positive, MCS... 652
K-0-0006, Software limit switch, negative, MCS... 652
K-0-0007, Axis number of kinematics... 653
K-0-0008, Axis configuration list... 653
K-0-0009, Osci: list of all K-parameters that can be oscilloscoped... 655
K-0-0010, List of all K-parameters... 656
K-0-0011, List of all invalid K-parameters... 656
K-0-0012, Checksum of all K-parameters... 657
K-0-0013, IDN list of checksum K-parameters... 657
K-0-0014, Path acceleration, change time... 657
K-0-0015, Path deceleration, change time... 660
K-0-0016, Project identification number... 662
K-0-0019, Kinematic type... 663
K-0-0020, Kinematic diagnostic message... 663
K-0-0021, Kinematic status... 664
K-0-0022, Extended kinematic status... 667
K-0-0023, Kinematic diagnostic number... 670
K-0-0031, Transformation scheme... 671
K-0-0032, Referencing of axes, command configuration... 672
K-0-0033, IPOS, update at coordinate change... 673
K-0-0034, Maximum path acceleration (bipolar)... 673
K-0-0035, Maximum path jerk (bipolar)... 673
K-0-0036, MCS axis monitoring... 674
K-0-0040, Transformation, lengths of the mechanics... 674
K-0-0041, Transformation, factors... 675
K-0-0042, Offset of BCS system... 676
K-0-0043, Assignment list of workpiece coordinates... 676
K-0-0045, Tool selection... 678
K-0-0050, Distance units MCS... 678
K-0-0051, Velocity units MCS... 679
K-0-0052, Acceleration units MCS... 680
K-0-0053, Jerk units MCS... 681
K-0-0054, Measuring unit for kinematic data... 681
K-0-0070, Belt number of kinematics... 682
K-0-0071, Coupling factors, belt 1... 682
K-0-0072, Coupling factors, belt 2... 684
K-0-0073, Coupling factors, belt 3... 684
K-0-0074, Coupling factors, belt 4... 684
K-0-0080, Jogging, distance short in MCS... 685
K-0-0081, Jogging, distance long in MCS... 686
K-0-0082, Jogging, velocity low in MCS... 687
K-0-0083, Jogging, velocity high in MCS... 688
K-0-0084, Jogging, acceleration in MCS... 689
K-0-0085, Jogging, deceleration in MCS... 690

Table of Contents

Page

K-0-0086, Jogging, acceleration jerk in MCS ... 691
K-0-0087, Jogging, deceleration jerk in MCS ... 691
K-0-0096, Peak value of command buffer size ... 692
K-0-0097, Maximum command buffer size ... 693
K-0-0098, Current command buffer size ... 693
K-0-0099, Kinematic configuration ... 693
K-0-0100, Current position, Cartesian Machine Coordinate System ... 694
K-0-0102, Current path velocity ... 695
K-0-0103, Current path acceleration ... 695
K-0-0104, Current path jerk ... 695
K-0-0105, Actual position, Cartesian Workpiece Coordinates ... 696
K-0-0106, Coordinate values of tool ... 696
K-0-0107, Coordinate values of workpiece ... 696
K-0-0121 to K-0-0136, Coordinate Names ... 696
K-0-0121, Coordinate name C1 ... 697
K-0-0140, Tool name ... 697
K-0-0141, Workpiece name ... 697
K-0-0150, Interpolated command position ... 698
K-0-0152, Interpolated path velocity ... 698
K-0-0153, Interpolated path acceleration ... 698
K-0-0154, Interpolated path jerk ... 699
K-0-0155, Safe zones on/off ... 699
K-0-0156, Safe zone 1 min. point ... 699
K-0-0157, Safe zone 1 max. point ... 700
K-0-0156/K-0-0157 Zone of protection1 Min./Max. Point up to K-0-0218/K-0-0219 Zone of protection32 Min./Max. Point ... 700
K-0-0220, File transfer name ... 702
K-0-0221, File name to be compiled ... 703
K-0-0223, Selection of error reaction ... 703
K-0-0224, Emergency halt deceleration ... 704
K-0-0225, Emergency halt jerk ... 704
K-0-0240, Feedrate override ... 705
K-0-0241, Feedrate override control word ... 705
K-0-0242, Acceleration override ... 706
K-0-0243, Deceleration override ... 706
K-0-0250, Continuous slope lead time ... 707
4.3.3 K-0-1000 - K-0-1999 ... 708
K-0-1000, Command: Load basic kinematic parameters ... 708
K-0-1060, Command: Load file from CF ... 708
K-0-1061, Command: Save file to CF ... 709
K-0-1062, Command: Compile file to MLC ... 709
4.3.4 K-0-2000 - K-0-2499 ... 709
K-0-2100, List of all backup operation K-parameters ... 709
K-0-2200, Programmed position 1 (active) ... 710
K-0-2201, Programmed position 2 (active) ... 710
K-0-2202, Type of actively programmed position ... 711

Table of Contents

Page

K-0-2203, Interpolation type ... 711
K-0-2204, Currently active QLL file name ... 711
K-0-2205, Currently active line number ... 711
K-0-2300, PLC bit input (RCL) ... 712
K-0-2301, PLC integer input (RCL) ... 712
K-0-2302, PLC floating point input (RCL) ... 712
4.4 Touch probe parameters (M-parameters) ... 712
4.4.1 Touch Probe Parameters, General Information ... 712
4.4.2 M-0-0000, Dummy, M-parameter ... 713
4.4.3 M-0-0001, Logic touch probe number ... 713
4.4.4 M-0-0002, Touch probe name ... 713
4.4.5 M-0-0005, Input selection ... 713
4.4.6 M-0-0006, Signal selection ... 714
4.4.7 M-0-0007, Control word ... 715
4.4.8 M-0-0009, Osci: list of all M-parameters that can be oscilloscoped ... 717
4.4.9 M-0-0010, List of all M-parameters ... 717
4.4.10 M-0-0016, Project identification number ... 717
4.4.11 M-0-0021, Status word ... 718
4.4.12 M-0-0024, Command: Activation ... 719
4.4.13 M-0-0130, Measured value, positive edge ... 719
4.4.14 M-0-0131, Measured value, negative edge ... 720
4.4.15 M-0-0132, Difference value ... 720
4.4.16 M-0-0133, Time difference ... 721
4.4.17 M-0-0140, Time stamp, positive edge ... 721
4.4.18 M-0-0141, Time stamp, negative edge ... 722
4.4.19 M-0-0200, Dead-time compensation, positive edge ... 722
4.4.20 M-0-0201, Dead-time compensation, negative edge ... 723
4.4.21 M-0-0202, Starting position of the expectation window, positive edge ... 723
4.4.22 M-0-0203, End position of the expectation window, positive edge ... 723
4.4.23 M-0-0204, Starting position of the expectation window, negative edge ... 724
4.4.24 M-0-0205, End position of the expectation window, negative edge ... 724
4.4.25 M-0-0206, Maximum number of marker failures ... 725
4.4.26 M-0-0224, Number of marker failures, positive edge ... 725
4.4.27 M-0-0225, Number of marker failures, negative edge ... 726
4.4.28 M-0-0401, Input status ... 726
4.4.29 M-0-0405, Enabling ... 727
4.4.30 M-0-0409, Counter of measured values, positive edge ... 727
4.4.31 M-0-0410, Counter of measured values, negative edge ... 728
4.4.32 M-0-0411, Counter of difference values ... 728
4.4.33 M-0-1000, Command: Load basic touch probe parameters ... 729
4.4.34 M-0-2100, List of all backup operation M-parameters ... 729
4.5 Programmable limit switch parameters (N-parameters) ... 730
4.5.1 Overview: Programmable limit switches PLS (CFL01.1-N1), N-parameters ... 730
4.5.2 N-0-0000, Dummy, N-parameter ... 731
4.5.3 N-0-0001, Logical switch track number ... 731
4.5.4 N-0-0002, Switch track name ... 731

Table of Contents

Page

4.5.5 N-0-0009, Osci: list of all N-parameters that can be oscilloscoped ... 731
4.5.6 N-0-0010, List of all N-parameters ... 732
4.5.7 N-0-0016, Project identification number ... 732
4.5.8 N-0-0300, Control word ... 732
4.5.9 N-0-0302, Signal selection ... 733
4.5.10 N-0-0303, Control signals ... 734
4.5.11 N-0-0304, Outputs ... 735
4.5.12 N-0-0305, Internal registers ... 735
4.5.13 N-0-0307, Reference axis configuration ... 736
4.5.14 N-0-0308, Reference axis position, additive ... 737
4.5.15 N-0-0309, Reference axis definition ... 739
4.5.16 N-0-0310, Hysteresis ... 739
4.5.17 N-0-0311, Lead time when switching on ... 741
4.5.18 N-0-0312, Lead time when switching off ... 742
4.5.19 N-0-0313, Switch track number ... 743
4.5.20 N-0-0314, Switch-on position of switch track ... 744
4.5.21 N-0-0315, Switch-off position of switch track ... 745
4.5.22 N-0-0316, Command: Initialize switch track ... 746
4.5.23 N-0-0317, Command: Activate switch track ... 747
4.5.24 N-0-0318, Output mode ... 747
4.5.25 N-0-0319, Switch-on duration ... 748
4.5.26 N-0-1000, Command: Load basic PLS parameters ... 749
4.5.27 N-0-2100, List of all backup operation N-parameters ... 750
4.6 Oscilloscope parameters (O-parameters) ... 750
4.6.1 Oscilloscope Parameters, General Information ... 750
4.6.2 O-0-0000, Dummy, O-parameter ... 750
4.6.3 O-0-0001, Logical channel number ... 751
4.6.4 O-0-0002, Channel name ... 751
4.6.5 O-0-0003, Signal selection ... 751
4.6.6 O-0-0004, Measured value list ... 752
4.6.7 O-0-0005, AUX signal path ... 752
4.6.8 O-0-0006, AUX signal ... 752
4.6.9 O-0-0007, List index ... 753
4.6.10 O-0-0009, Osci: list of all O-parameters that can be oscilloscoped ... 753
4.6.11 O-0-0010, List of all O-parameters ... 753
4.6.12 O-0-0016, Project identification number ... 754
4.6.13 O-0-0021, Channel status ... 754
4.6.14 O-0-1000, Command: Load basic oscilloscope parameters ... 754
4.6.15 O-0-2100, List of all backup operation O-parameters ... 755

5 A-/C-parameters cover S-/P-parameters ... 757
5.1 IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Control) ... 757
5.1.1 General Information ... 757
5.1.2 IndraDrive, Calculation in the Control, A-0-0000 - A-0-0499 ... 757
5.1.3 IndraDrive, Calculation in the Control, A-0-0500 - A-0-2999 ... 759
5.1.4 IndraDrive, Calculation in the Control, C-0-0000 - End ... 760

Table of Contents

Page

5.2 IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Drive) ... 760
5.2.1 General Information ... 760
5.2.2 IndraDrive, Calculation in the Drive, A-0-0000 - A-0-0499 ... 761
5.2.3 IndraDrive, Calculation in the Drive, A-0-0500 - A-0-0999 ... 762
5.2.4 IndraDrive, Calculation in the Drive, A-0-1000 - A-0-2999 ... 764
5.2.5 IndraDrive, Calculation in the Drive, C-0-0000 - End ... 766
5.3 SercosDrive: A/C ==> S-/P-Parameters ... 766
5.3.1 General Information ... 766
5.3.2 SercosDrive, A-0-0000 - A-0-2999 ... 766
5.3.3 SercosDrive, C-0-0000 - End ... 769
5.4 HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Control) ... 769
5.4.1 General Information ... 769
5.4.2 HydraulicDrive, Calculation in the Control, A-0-0000 - A-0-0499 ... 769
5.4.3 HydraulicDrive, Calculation in the Control, A-0-0500 - A-0-2999 ... 771
5.4.4 HydraulicDrive, Calculation in the Control, C-0-0000 - End ... 772
5.5 HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Drive) ... 772
5.5.1 General Information ... 772
5.5.2 HydraulicDrive, Calculation in the Drive, A-0-0000 - A-0-0499 ... 773
5.5.3 HydraulicDrive, Calculation in the Drive, A-0-0500 - A-0-0999 ... 774
5.5.4 HydraulicDrive, Calculation in the Drive, A-0-1000 - A-0-2999 ... 775
5.5.5 HydraulicDrive, Calculation in the Drive, C-0-0000 - End ... 776

6 Service and support ... 777

Index ... 779

1 About this documentation

1.1 Validity of the documentation

This documentation describes the parameter system of the controls IndraLogic XLC L25, L45, L65 and IndraMotion MLC L25, L45, L65 in version 13.

Target group

This documentation is intended for

- System programmer and commissioner
- Technologist and process specialists

Required qualification: Individual who is able to assess the tasks assigned and identify possible safety risks owing to qualification in the subject, knowledge and experience. The individual should also be familiar with the standards and regulations.

Application phases

This documentation supports the user during the following phases:

- Engineering
- Commissioning
- operating,

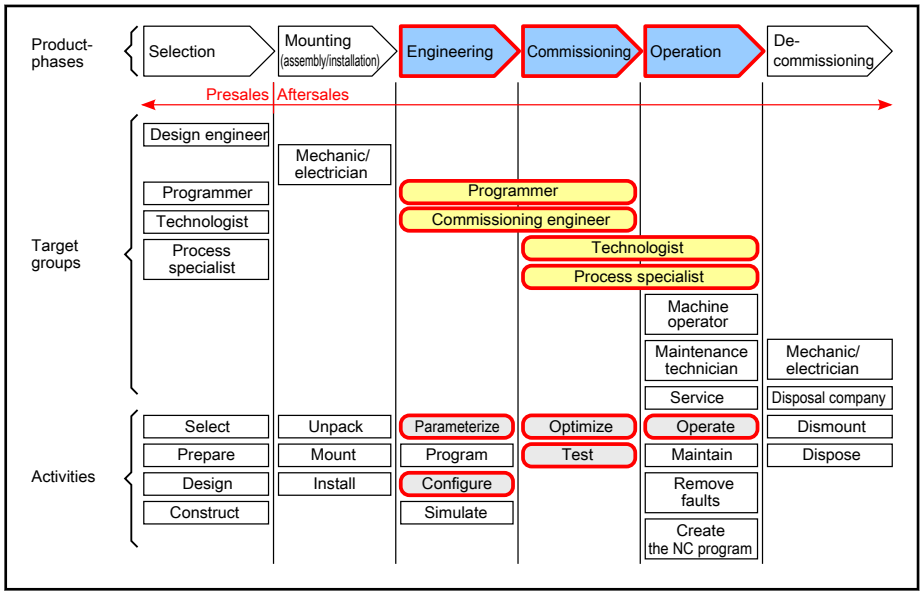


Fig. 1-1: Application phases

1.2 Documentation structure

The first part of the document describes the basics of the IndraLogic XLC / IndraMotion MLC parameter system.

The parameter use is described (Using parameters by means of PLC functions blocks on page 36).

Additionally, the PLC access to the parameter values is included:

- PLC access to parameter values with function block on page 37
- PLC access to parameter values via Shared Memory on page 37
- PLC access to parameter values function variable access on page 38 and
- PLC access to the parameter values with function variable access synchronously in the C2C link, page 39.

An overview on the parameters is given sorted according to their purpose of usage.

Subsequently, the individual parameters are described arranged according to types.

- Axis parameters (A-parameters) on page 75 classified according to axis types
- Control parameters (C-parameters) on page 445
- Kinematic parameters (K-parameters) on page 650, classified according to their use in Robot-Control V1 and Robot-Control V2
- Touch probe parameters (M-parameters) on page 712
- Programmable limit switch parameters (N-parameters) on page 730
- Oscilloscope parameters (O-parameters) on page 750

A-/C-parameters cover S-/P-parameters follows on page 757. Data is exchanged among them. The data exchange differs according to axis types and whether the respective motion calculation in the drive is performed in the drive or control.

For information on the Bosch Rexroth customer service help desk, refer to Service and support on page 777,.

1.3 Using safety instructions

1.3.1 Safety instructions – Structure

The safety instructions are structured as follows:

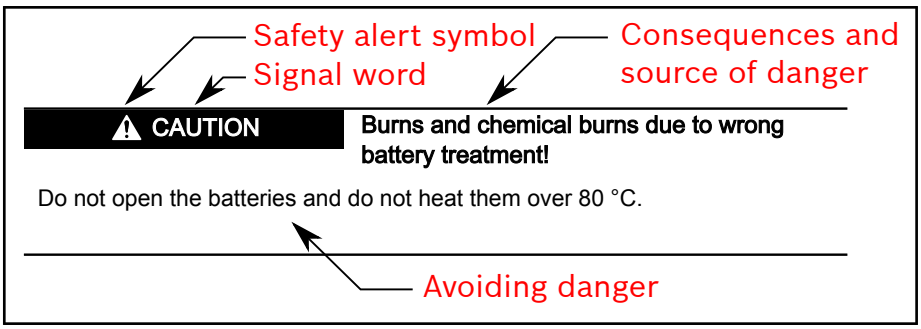


Fig. 1-2: Safety instructions – structure

1.3.2 Explaining signal words and safety alert symbol

The safety instructions in this documentation contain specific signal words (danger, warning, caution, notice) and, if necessary, a safety alert symbol (according to ANSI Z535.6-2006).

The signal word is used to draw attention to the safety instruction and also provides information on the severity of the hazard.

The safety alert symbol (a triangle with an exclamation point), which precedes the signal words danger,warning and caution is used to alert the reader to personal injury hazards.

⚠ DANGER

In the event of non-compliance with this safety instruction, death or serious injury **will** occur.

⚠ WARNING

In the event of non-compliance with this safety instruction, death or serious injury **will** occur.

⚠ CAUTION

In the event of non-compliance with this safety instruction, minor or moderate injury can occur.

NOTICE

In the event of non-compliance with this safety instruction, material damage can occur.

About this documentation

1.3.3 Symbols used

Pointers are displayed as follows:



This is a note.

Tips are displayed as follows:



This is a tip.

1.4 Required and supplementing documentations

Documentation titles with type codes and parts numbers

IndraWorks		MLC	XLC
/36/	**Rexroth IndraWorks 13VRS Software Installation** DOK-IWORKS-SOFTINS*V13-CORS-EN-P, R911336880 This documentation describes the IndraWorks installation.	X	X
/5/	**Rexroth IndraWorks 13VRS Engineering** DOK-IWORKS-ENGINEE*V13-APRS-EN-P, R911336870 This documentation describes the application of IndraWorks in which the Rexroth Engineering tools are integrated. It includes instructions on how to work with IndraWorks and how to operate the oscilloscope function.	X	X
/20/	**Rexroth IndraMotion MLC 13VRS Functional Description** DOK-MLC***-FUNC****V13-APRS-EN-P, R911336295 This documentation describes wizards, context menus, dialogs, control commissioning, device configuration and functionalities of the IndraMotion MLC.	X	
/20/	**Rexroth IndraLogic XLC 13VRS Functional Description** DOK-XLC***-FUNC****V13-APRS-EN-P, R911336352 This documentation describes wizards, context menus, dialogs, control commissioning, device configuration and functionalities of the IndraLogic XLC.		X
/7/	**Rexroth IndraWorks 13VRS CamBuilder** DOK-IWORKS-CAMBUIL*V13-APRS-EN-P, R911336291 This documentation describes the basic principles and operation of the CamBuilder, the cam editing tool.	X	X
/37/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Automation Interface** DOK-XLCMLC-AUT*INT*V13-APRS-EN-P, R911336356 This documentation describes the script-based access to IndraWorks project data via the interface of the Automation Interface.	X	X
/38/	**Rexroth IndraWorks 12VRS FDT Container** DOK-IWORKS-FDT*CON*V12-APRS-EN-P, R911334398 This documentation describes the IndraWorks FDT Container functionality. It includes the activation of the functionality in the project and working with DTMs.	X	X

IndraWorks		MLC	XLC
/29/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Project Conversion** DOK-XLCMLC-PROCONV*V13-APRS-EN-P, R911336366 This documentation describes the project conversion of IndraLogic 04VRS and IndraMotion MLC04VRS on IndraWorks version 12 with IndraLogic 2G. Changes with regard to Motion and PLC are described in detail.	X	X
/28/	**Rexroth IndraMotion MLC 13VRS Commissioning** DOK-MLC***-STARTUP*V13-CORS-EN-P, R911336308 This documentation describes the steps to commission and service the IndraMotion MLC system. It includes checklists for frequent tasks and a detailed description of the steps.	X	

Tab. 1-1: XCL/MLC documentation overview

About this documentation

Motion		MLC	XLC
/23/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS PLCopen Libraries** DOK-XLCMLC-FUNLIB**V13-LIRS-EN-P, R911336360 This documentation describes the function blocks, functions and data types of the RIL_Common-Types, ML_Base and ML_PLCopen libraries for the IndraLogic XLC/IndraMotion MLC. It also includes the error reactions of function blocks.	X	X
/27/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Generic Application Template** DOK-XLCMLC-TF*GAT**V13-APRS-EN-P, R911336370 This documentation provides a structured template to the IndraLogic PLC programmer. This template can be used to add and edit the PLC programming code. It includes the template, the template wizard and example applications.	X	X
/31/	**Rexroth IndraMotion MLC 13VRS RCL Programming Instruction** DOK-MLC***-RCL*PRO*V13-APRS-EN-P, R911336297 This documentation provides information on the RobotControl. The programming language RCL (RobotControl Language) is focused. The program structure, variables, functions, motion statements and the required system parameters are described.	X	
/32/	**Rexroth IndraMotion MLC 13VRS Robot Control V2** DOK-MLC***-ROCO***V13-RERS-EN-P, R911341035 The documentation provides information about the Robot Control V2. The focus of this documentation is on PLCopen programming. The program structure, variables, functions and motion commands as well as the required system parameters are described. Furthermore, the documentation contains the description of the ML_Robot library.	X	
/21/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Parameters** DOK-XLCMLC-PARAM***V13-RERS-EN-P, R911336364 This documentation describes the parameters of the XLC/MLC systems as well as the interaction between parameterization and programming. It includes the axis parameters, control parameters, kinematic parameters, touch probe parameters and programmable limit switch parameters.	X	X
/10/	**Rexroth IndraDrive Firmware for Drive Controllers MPH-, MPB-, MPD-, MPC-07** DOK-INDRV*-MP*-07VRS**-FKRS-EN-P, R911328670 This documentation describes all functional properties of the IndraDrive firmware in the variants MPH-07, MPB-07, MPD-07 and MPC-07.		
/11/	**Rexroth IndraDrive MPx-17 Functions** DOK-INDRV*-MP*-17VRS**-APRS-EN-P, R911331236 This documentation describes all functional properties of the IndraDrive firmware in the variants MPB-17, MPM-17, MPC-17 and MPE-17.		

Tab. 1-2: XCL/MLC documentation overview

Field Buses		MLC	XLC
/4/	**Rexroth IndraWorks 13VRS Field Buses** DOK-IWORKS-FB******V13-APRS-EN-P, R911336872 This documentation describes the supported field buses and their diagnostic function blocks.	X	X
/4a/	**Rexroth IndraWorks 13VRS Field Buses Libraries** DOK-IWORKS-FB*LIB**V13-LIRS-EN-P, R911337857 This manual describes the field bus libraries: RIL_ProfibusDP_02, RIL_ProfibusDPSlave, RIL_ProfinetIO, RIL_ProfinetIODevice, RIL_EtherNetIPAdapter, RIL_MappingList, RIL_SERCOSIII, RIL_Inline including their diagnostics and error reactions of the function blocks.	X	X
/63/	**SERCOS System Manual for I/O Devices** DOK-CONTRL-ILS3*******-APRS-EN-P, R911333512 This documentation describes the configuration, parameterization, commissioning and diagnostics of I/O devices with a SERCOS interface.	X	X

Tab. 1-3: XCL/MLC documentation overview

HMI		MLC	XLC
/8/	**Rexroth IndraWorks 13VRS HMI** DOK-IWORKS-HMI*****V13-APRS-EN-P, R911336874 This documentation describes the functions, configuration and operation of the user interfaces IndraWorks HMI Engineering and IndraWorks HMI Operation.	X	X
/6/	**Rexroth IndraWorks 13VRS WinStudio** DOK-IWORKS-WINSTUD*V13-APRS-EN-P, R911336882 This documentation describes the installation of the software, working with WinStudio and the creation and operation of applications.	X	X
/50/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS HMI Connection** DOK-XLCMLC-HMI*****V13-APRS-EN-P, R911336362 This documentation describes the visualization systems supported by the IndraLogic XLC and IndraMotion MLC and their connection.	X	X

Tab. 1-4: XCL/MLC documentation overview

PLC		MLC	XLC
/3/	**Rexroth IndraWorks 13VRS IndraLogic 2G Programming Instruction** DOK-IWORKS-IL2GPRO*V13-APRS-EN-P, R911336876 This documentation describes the PLC programming tool IndraLogic 2G and its use. It includes the basic use, first steps, visualization, menu items and editors.	X	X
/33/	**Rexroth IndraWorks 13VRS Basic Libraries IndraLogic 2G** DOK-IL*2G*-BASLIB**V13-LIRS-EN-P, R911336285 This documentation describes the system-comprehensive PLC libraries.	X	X

Tab. 1-5: XCL/MLC documentation overview

About this documentation

Technology		MLC	XLC
/30/	**Rexroth IndraMotion MLC 13VRS Technology Libraries** DOK-MLC***-TF*LIB**V13-LIRS-EN-P, R911336324 This documentation describes the function blocks, functions and data types of the "ML_TechInterface.library", "ML_TechMotion.library", "RMB_TechCam.library" and "ML_TechBase.library". It also includes libraries for the winder functionality, register controller functionality and CrossCutter functionality.	X	
/60/	**Rexroth IndraMotion MLC 13VRS RegisterControl (Library)** DOK-MLC***-REGI*CO*V13-LIRS-EN-P, R911336306 This documentation describes the inputs and outputs of the individual function blocks and provides notes on their use.	X	
/62/	**Rexroth IndraMotion MLC 13VRS RegisterControl (Application Manual)** DOK-MLC***-REGI*CO*V13-APRS-EN-P, R911336304 This documentation describes the application of the integrated register control for a rotogravure printing machine. The components of the mark stream sensor, the HMI application and the error recovery options are described. This instruction provides information on how to operate the register control, react to errors and query diagnostics. This documentation is written for machine setters and machine operators.	X	
/49/	**Rexroth IndraMotion MLC 13VRS Winder Function Application** DOK-MLC***-TF*WIND*V13-APRS-EN-P, R911336326 This application-related system documentation describes the application of the winder technology functions.	X	

Tab. 1-6: XCL/MLC documentation overview

Hydraulics		MLC	XLC
/40/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Sequential Programming** DOK-XLCMLC-SEQPROG*V13-LIRS-EN-P, R911336368 This documentation includes the library for the sequential programming.	X	X
/41/	**Rexroth IndraMotion MLC 13VRS MH_TechHydrBase** DOK-MLC***-TF*HBASEV13-LIRS-EN-P, R911336312 No purpose defined.	X	
/42/	**Rexroth IndraMotion MLC 13VRS MH_TechHydrMotion** DOK-MLC***-TF*HMOT*V13-LIRS-EN-P, R911336316 No purpose defined.	X	
/43/	**Rexroth IndraMotion MLC 13VRS MH_HydrControl** DOK-MLC***-TFHCLIB*V13-LIRS-EN-P, R911336328 No purpose defined.	X	
/44/	**Rexroth IndraMotion MLC 13VRS MH_SynchControl** DOK-MLC***-TFHSLIB*V13-LIRS-EN-P, R911336330 No purpose defined.	X	

Tab. 1-7: XCL/MLC documentation overview

Hardware		MLC	XLC
/1/	**Rexroth IndraControl L45/L65/L85 Control** DOK-CONTRL-ICL45L65L85-PRRS-EN-P, R911332116 This documentation describes the IndraControl L45/L65/L85 controls.	X	X
/2/	**Rexroth IndraControl L25** DOK-CONTRL-IC*L25*****-PRRS-EN-P, R911328474 This documentation describes the IndraControl L25 controls.	X	X
/24/	**Rexroth IndraControl Lxx 13VRS Function Modules** DOK-CONTRL-FM*LXX**V13-APRS-EN-P, R911336283 This documentation describes all function modules of the Lxx controls including engineering and diagnostics.	X	X
/12/	**Rexroth IndraDrive Drive Controllers MPx-02 to MPx-07** DOK-INDRV*-GEN-**VRS**-PARS-EN-P, R911297317 This documentation describes all parameters implemented in the firmware for drive controllers of the IndraDrive family. It supports the parameterization of the drive controllers.		
/13/	**Rexroth IndraDrive MPx-02 to MPx-07 and HMV** DOK-INDRV*-GEN-**VRS**-WARS-EN-P, R911297319 This documentation describes all diagnostics implemented in the following firmwares: • Drive controller firmwares from MPx-02 to MPx-08 and • firmwares of the supply devices of the type "HMV". It supports the operating crew as well as the programmer at troubleshooting.		
/35/	**Rexroth IndraDrive Drive Controller Control Sections CSB01, CSH01, CDB01** DOK-INDRV*-CSH********-PRRS-EN-P, R911295012 This documentation is a project planning manual to select and use the control sections CSB01, CDB01 and CSH01 for drive controllers of the product families Rexroth IndraDrive M and Rexroth IndraDrive C.		

Tab. 1-8: XCL/MLC documentation overview

Diagnostics and service		MLC	XLC
/26/	**Rexroth IndraWorks 13VRS IndraMotion Service Tool** DOK-IWORKS-IMST****V13-RERS-EN-P, R911337707 This documentation describes the IndraMotion Service Tool (IMST). It is a web-based diagnostic tool to access the control systems IndraMotion MLC L25, L45 or 65 as well as the MLP via an Ethernet high-speed connection. The IMST allows OEMs, end users and service engineers to access and remotely diagnose a system. A PC with Internet Explorer version 6 or 7 is required.	X	X
/22/	**Rexroth IndraLogic XLC IndraMotion MLC 13VRS Diagnostics** DOK-XLCMLC-DIAG****V13-RERS-EN-P, R911336358 This documentation includes all control diagnostics implemented in the control systems IndraLogic XLC and IndraMotion MLC.	X	X

Tab. 1-9: XCL/MLC documentation overview

About this documentation

System Overview		MLC	XLC
/48/	**Rexroth IndraMotion for Printing 13VRS System Overview** DOK-IM*PR*-SYSTEM**V13-PRRS-EN-P, R911336289 This documentation describes the product IndraMotion for Printing. It introduces the control systems, drive systems and I/O systems as well as the commissioning and programming.	X	
/48/	**Rexroth IndraMotion for Packaging 13VRS System Overview** DOK-IM*PA*-SYSTEM**V13-PRRS-EN-P, R911336287 This documentation describes the product IndraMotion for Packaging. It introduces the control systems, drive systems and I/O systems as well as the commissioning and programming.	X	
/9/	**Rexroth IndraMotion MLC 13VRS System Overview** DOK-MLC***-SYSTEM**V13-PRRS-EN-P, R911336310 This documentation provides an overview on the hardware/software components of the automation system IndraMotion MLC in the mentioned version. It helps assembling a system.	X	
/9/	**Rexroth IndraLogic XLC 13VRS System Overview** DOK-XLC***-SYSTEM**V13-PRRS-EN-P, R911336354 This documentation provides an overview on hardware/software components of the automation system IndraLogic XLC in the respective version. It helps assembling a system.		X

Tab. 1-10: XCL/MLC documentation overview

First Steps		MLC	XLC
/25/	**Rexroth IndraMotion MLC 13VRS, First Steps** DOK-MLC***-F*STEP**V13-CORS-EN-P, R911336293 This documentation describes the first steps of the IndraMotion MLC and the RobotControl. It includes the hardware and software prerequisites as well as the creation of a project.	X	
/25/	**Rexroth IndraLogic XLC 13VRS, First Steps** DOK-XLC***-F*STEP**V13-CORS-EN-P, R911336350 This documentation describes the first steps of the IndraLogic XLC. It includes the hardware and software prerequisites as well as the creation of a project.		X

Tab. 1-11: XCL/MLC documentation overview

1.5 Names and abbreviations

Term	Explanation
IndraLogic XLC	Compact PLC system with integrated Motion functionality
IndraMotion MLC	Compact Motion Logic systems with Motion, Robot and Logic Control functionalities
IndraWorks Engineering Framework	Configuration and commissioning tool by Bosch Rexroth
IndraDrive	Drive control device
HydraulicDrive	Hydraulic drive control section
SercosDrive	Drive control section with parameter block according to the Pack Profile
Wizard	Wizard guiding the user through several dialogs for an ergonomic data input
IEC	International Electrotechnical Commission
OEM	Original Equipment Manufacturer

OM	Operating mode
PM	Parameterization mode
Sercos	Sercos (SErial Realtime COmmunication System) interface is a world-wide standardized interface for the communication between controls and drives
XML	Extensible Markup Language (XML). It is a markup language to represent hierarchical structured data as text data

Tab. 1-12: Names and abbreviations used

2 XLC/MLC Parameter Description, General Information

2.1 Interaction between Parameters and Function Blocks

The basic idea of the PLCopen is to facilitate the PLC access to the controlled drives to control motion processes for the user **according to the PLC possibilities and its programming philosophy**.

Seen from the **drive technology point of view** (Motion) , the data assigned to a drive/an axis such as actual values, limit values, command values, controller parameters is named as **parameters** and provided according to the parameter application (read-only and/or write access). The data type of the respective parameter is specified by the sercos standard for example.

Also refer to

- Axis parameters (A-parameters) on page 75
- Control parameters (C-parameters) on page 445
- Kinematic parameters (K-parameters) on page 650
- Touch probe parameters (M-parameters) on page 712
- Programmable limit switch parameters (N-parameters) on page 730
- Oscilloscope parameters (O-parameters) on page 750

Seen from the **PLC technology point of view**, it is about the **variables** representing the content of the parameters based on a data type allowed in EN 6 1131-3.

Typical PLC equivalents of the Motion data formats

	1ByteVar	2Byte	2ByteVar	4Byte	4ByteVar	8Byte	8ByteVar
BINARY		WORD	ARRAY of WORD	DWORD	ARRAY of DWORD	LWORD	ARRAY of LWORD
UINT_HEX		UINT	ARRAY of UINT	UDINT	ARRAY of UDINT	ULINT	ARRAY of ULINT
UINT_DEC		UINT	ARRAY of UINT	UDINT	ARRAY of UDINT	ULINT	ARRAY of ULINT
INT_DEC		INT	ARRAY of INT	DINT	ARRAY of DINT	LINT	ARRAY of LINT
TEXT	STRING						
UINT_IDN		WORD	ARRAY of WORD				
MLC_IDN						MB_IDN	ARRAY of MB_IDN
FLOAT				REAL	ARRAY of REAL		
DOUBLE						LREAL	ARRAY of LREAL

Tab. 2-1: PLC use of the MLC data formats

With the upgrade from MLC 04VRS to MLC/XLC 09VRS, the data length of the parameter ID "MLC_IDN" increased from 32 bits to 64 bits.

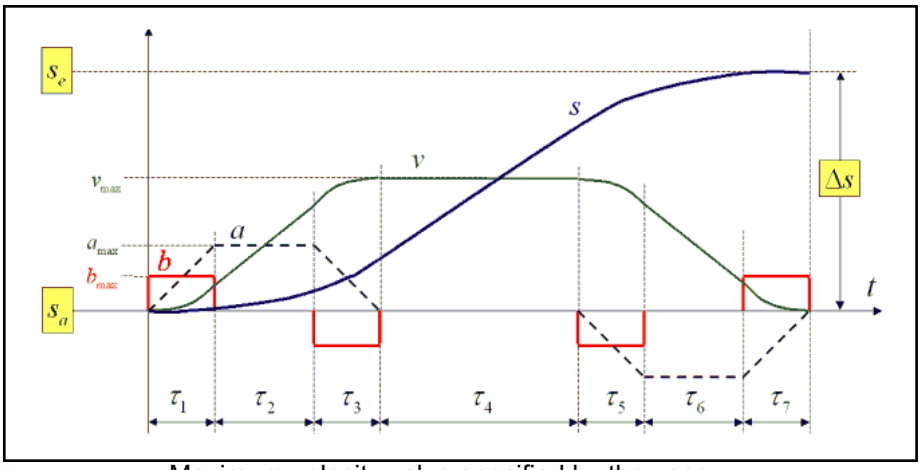
With FLOAT(REAL) variables, the "double precision" calculation options are used for L45/L65 controls.

Due to the processor, this approach is not possible for L25 controls. Therefore, it is calculated with the "single precision" method.

XLC/MLC Parameter Description, General Information

Using parameters by means of PLC functions blocks

The value transfer from the PLC to the axis/drive and from the axis/drive to the PLC is now described in detail:



v_{max} Maximum velocity value specified by the user
a_{max} Maximum acceleration value specified by the user
b_{max} Maximum jerk value specified by the user

Fig. 2-1: Motion from point Sa to point Se

The PLC is to control the motion from point S_a to point S_e.

The maximum values for velocity, jerk, acceleration and deceleration are required as additional information. They have to be lower than the maximum values allowed for the drive.

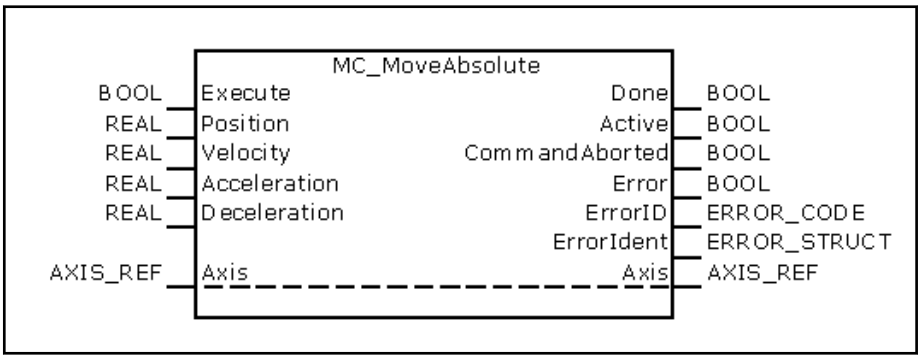


Fig. 2-2: PLCopen function block "MC_MoveAbsolute"

At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

- Position: A-0-2200, Command position
- Velocity: A-0-2202, Command velocity
- Acceleration: A-0-2203, Command acceleration
- Deceleration: A-0-2204, Command deceleration

The "A-0-2200, Command position" is copied to "A-0-2201, Target position" at **MC_MoveAbsolute** .

"A-0-2205, Command jerk" belongs to this parameter. As an alternative, this parameter value is applied by the parameter "A-0-0216, Jerk" (standard jerk).

The complete motion process is calculated

- after copying the values from the inputs of the function block instance to the A-parameters of the axis and then to the S- and P-parameters of the drive at IndraDrive or HydraulicDrive at sercos interfaces on the drive.

  - or -

- after copying the values from the inputs of the function block instances to the A-parameters of the axis on the control. Subsequently, the command values are transferred to the drives.

PLC access to parameter values with function block

The PLC function blocks M*_Read...parameters and M*_Write...parameters permit reading parameter values or - under certain conditions - writing to parameters (parameter attribute "Editable").

The variable name derives from the name of the respective parameter:

Example: parameter A-0-0100 has the parameter number **FP_A_0_0100**,

Editable: READ_ONLY.

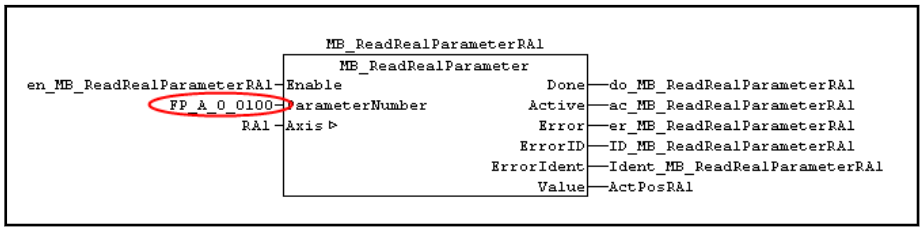


Fig. 2-3: Parameter access via function block (FBD editor)

The function blocks read via the service channel and require several PLC cycles.

PLC access to parameter values via Shared Memory

The reading access on the data in the shared memory can be carried out via the following equivalent instructions (ST).

Reading Access on the Data in the Shared Memory

```
MyVar:= AxisData[MyAxisName.AxisNo].FlexProfil_Active;
MyVar:= AxisData[Index].FlexProfil_Active;
MyVar:= AxisData[1].FlexProfil_Active;
```

The writing access on the data in the shared memory can be carried out via the following equivalent instructions (ST).

Writing Access on the Data in the Shared Memory

```
AxisData[MyAxisName.AxisNo].dwFlexProfileEventControlBits_q:= MyVar;
AxisData[Index].dwFlexProfileEventControlBits_q:= MyVar;
AxisData[1].dwFlexProfileEventControlBits_q:= MyVar;
```

The IntelliSense of a variable in the shared memory contains the parameter ident number and if necessary the bit, the access possibilities (RD or RW), the parameter names and the meaning of the bit.

XLC/MLC Parameter Description, General Information

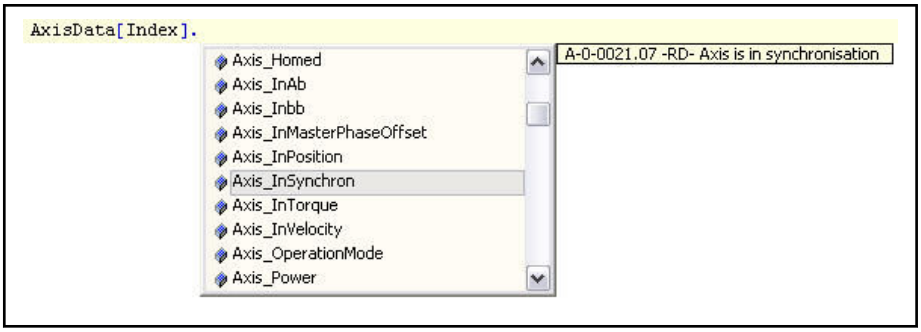


Fig. 2-4: IntelliSense of a variable in the shared memory

Variables of an axis in the shared memory can also be accessed via an user-defined designation by using references.

User-defined Designation by Using References

```
VAR
 MyAxisName: REFERENCE TO ML_AXISDATA_SM:= AxisData[MyAxisName.AxisNo];
END_VAR

MyVar:= MyAxisName.FlexProfil_Active;
MyAxisName.dwFlexProfileEventControlBits_q:= MyVar;
```

PLC access to parameter values function variable access

The read-only access to a function variable can be executed via the following equivalent instructions (ST) if the respective method is equipped with a GET property (READ).

Read-only access to a function variable

```
MyVar:= DV_Axis[MyAxisName.AxisNo].A_0_0004;
MyVar:= DV_Axis[Index].A_0_0004;
MyVar:= DV_Axis[1].A_0_0004;
```

The write-access to a function variable can be executed via the following equivalent instructions (ST) if the respective method is equipped with a SET property (WRITE).

Write access to a function variable

```
DV_Axis[MyAxisName.AxisNo].A_0_0216:= MyVar;
DV_Axis[Index].A_0_0216:= MyVar;
DV_Axis[1].A_0_0216:= MyVar;
```

The IntelliSense of a function variable contains the parameter ident number, the access possibilities (READ or READ/WRITE), the parameter names as well as the method to determine the current access state.

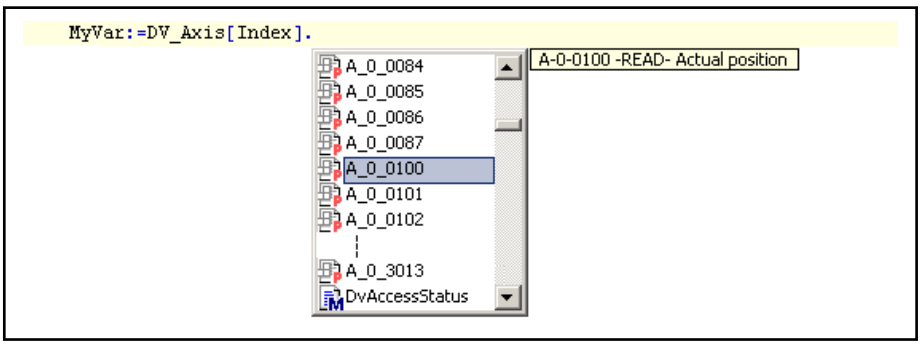


Fig. 2-5: Function variable access using the IntelliSense functionality

Function variables of an axis can also be accessed via an user-defined designation by using references.

Access via REFERENCE_TO

```
VAR
  MyAxisName: REFERENCE TO ML_DirectVarAxis:= DV_Axis[MyAxisName.AxisNo];
END_VAR

 MyVar:= MyAxisName.A_0_0004;
 MyAxisName.A_0_0216:= MyVar;
```

PLC access to the parameter values with function variable access synchronously in the C2C link

The read-only access to a function variable synchronously in the C2C link can be executed via the following equivalent instructions (ST) if the respective method is equipped with a GET property (READ).

Program:

```
MyVar:= GV_LinkAxis[CtrlNo, AxisNo].A_0_0021;
MyVar:= GV_LinkAxis[0, 1].A_0_0021;
```

The indexed, blocked access with CtrlNo equal to LOCAL_CTRL accesses the synchronized operating data of the local control located in the C2C link. This access is equivalent to the indexed, blocked access with CtrlNo equal to C-0-0031.

The write access to a function variable synchronous in the C2C link is not supported.

The IntelliSense of a function variable synchronous in the C2C variable contains the parameter ident number, the access possibilities (READ or READ/WRITE), the parameter names as well as the method to determine the current access state.

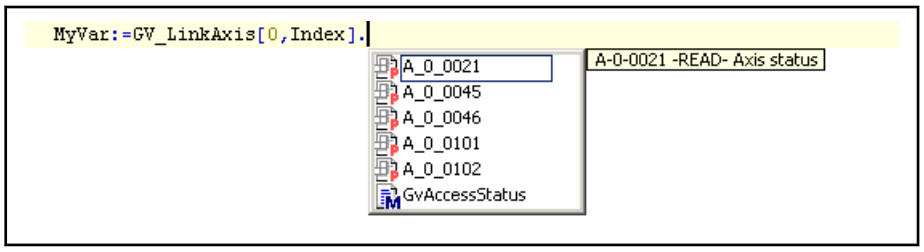


Fig. 2-6: Function variable access synchronous in the C2C link using the IntelliSense functionality

Function variables of an axis can also be accessed via an user-defined designation by using references.

Access via REFERENCE_TO

```
VAR
  MyAxisName: REFERENCE TO ML_GlobalVarAxis:= GV_LinkAxis[CtrlNo, AxisNo];
END_VAR

 MyVar:= MyAxisName.A_0_0021;
```

XLC/MLC Parameter Description, General Information

2.2 Document Structure

2.2.1 Parameter Types

Different parameter types are available for the controls IndraLogic XLC L25, L45, L65 with onboard sercos III bus and IndraMotion MLC L25, L45, L65. The parameters as a whole are named system parameters.

C-parameters The C-parameters describe the control function. Currently, one C-parameter is available in the IndraMotion system.

A-parameters The A-parameters describe the behavior of the individual axes running at the sercos bus.

Thus, there is one such parameter set for each axis. Since all parameters are not supported by each axis type, the range of validity is specified in the parameter descriptions.

K-parameters K-parameters describe the kinematic functions. One K-parameter is provided in each kinematics.

M-parameters M-parameters describe the touch probe functions. One M-parameter is provided in each touch probe function.

N-parameters N-parameters describe the programmable limit switch functions. One N-parameter is provided in each programmable limit switch.

O-parameters O-parameters describe the oscilloscope functions. One O-parameter is provided in each oscilloscope function.

S-Parameters The S-parameters correspond to the parameters specified in the sercos interface standard.

P-Parameters The P-parameters are manufacturer-specific and product-specific parameters defined according to the sercos interface standard.

Each system parameter is identified by its unique ID number.

The description of the parameters is divided into two sections:

General Description

This section contains important information on individual parameters, their amount of values as well as presetting notes.

Attribute Description

The characteristic values and properties of the parameters are listed in a table. They are required to provide a complete description, but the detailed information is often not required.

2.2.2 Definitions

The following abbreviations are used:

Data length:

2BYTE	The data length is 2 bytes.
4BYTE	The data length is 4 bytes.
8BYTE	The data length is 8 bytes.
1BYTE_VAR	List of data elements. One date has a length of 1 byte
2BYTE_VAR	List of data elements. One date has a length of 2 bytes
4BYTE_VAR	List of data elements. One date has a length of 4 bytes
8BYTE_VAR	List of data elements. One date has a length of 8 bytes

Format:

BINARY	Binary display format
UINT_HEX	Hexadecimal display format
UINT_DEC	Unsigned decimal display format
INT_DEC	Signed decimal display format
TEXT	The date is a text (8 bit - ANSI characters)
UINT_IDN	The date is a sercos ID number (IDN) of 2 bytes
MLC_IDN	The date is an ID number (IDN) of 8 bytes It contains the coded parameter name (e.g. A-0-0100) and its reference (e.g. axis A001). The information is encapsulated. Read the information or the corresponding content and change it, if necessary. Use the parameter editor or the IndraWorks interface dialog.
MB_IDN	The date is an ID number (IDN) of 8 bytes It contains the coded parameter name (e.g. A-0-0100 ==> FP_A_0_0100) as a low-order 32-bit value. The higher-order 32-bit values are not used. The data is used as a parameter address on the PLCopen function blocks. The reference (e.g. axis A001 of the local control) is transferred via the AXIS_REF input (similar to AXIS_GROUP_REF for K-parameters or other object or device references).
FLOAT	The date is a floating point number (4 bytes)
DOUBLE	The date is a floating point number (8 bytes)

Editable?

READ_ONLY	The date cannot be edited
PM	The date can be changed in the respective device in parameterization mode
P0	The date can be changed in the "P0" operation mode of the Motion component
P2	The date can be changed in the "P2" parameterization mode of the Motion component
(P2+Stop)	The date can be changed in the "P2" parameterization mode of the Motion component The PLC component has to be in "Stop" state as well
BB	The date can be changed in the "BB" operating mode of the Motion component
P0, P2, BB	The date can always be changed

Where is it saved?

RAM	The date is located in the RAM; it is not saved when the power is switched off
NVRAM	The date is saved automatically in the NVRAM
FLASH	The date is retained in the FLASH of the control

XLC/MLC Parameter Description, General Information

MinMax test:

-	No check
+	The date is checked on its minimum and maximum values allowed during writing

Type editable:

-	No
+	Type can be edited online by the firmware

MinMax editable:

-	No
+	MinMax values can be edited online by firmware

Touch probe:

-	No
+	Parameter is contained in "C-0-2499, Touch probe, IDN list signal selection"

Oscilloscope:

-	No
+	Parameter is contained in "C-0-0803, Oscilloscope, signal selection list"

Direct access:

Access the **operating date of this parameter** via the simplified, blocking instruction "function variable access" (alias "direct variable").

A function variable call is executed as blocking and can require different periods according to its characteristics, for example, its axis type.

The indexed, blocking access is executed with the instruction:

```
UserVariable:= DV_Axis[AxisNo].A_0_0000;
```

or

```
DV_Axis[AxisNo].A_0_00000:= UserVariable;
```

RO	Read access
RW	Read and write access
--	No access

C2C access:

Access the **operating date synchronized in the C2C link** via the simplified, blocking instruction "function variable access" (alias "direct variable").

A function variable call is executed as blocking and can require different periods according to its characteristics, for example, its axis type.

The indexed, blocking access is executed with the instruction:

```
UserVariable:= GV_LinkAxis[CtrlNo, AxisNo].A_0_0021;
```

The indexed, blocking access with CtrlNo equal to LOCAL_CTRL accesses the synchronized operating data of the local control in the C2C link.

This access is equivalent to the indexed, blocking access with CtrlNo equal to C-0-0031.

RO	Read access
RW	Read and write access
--	No access

Initial value:

The initial value is loaded to the respective parameter by the firmware before modifications are made by the running program or the following commands.

Initial value HydraulicDrive: The initial value for the HydraulicDrive is loaded to the respective parameter by the firmware before modifications are made by the running program or the following commands.

3 Overview table

3.1 Overview: User-Configurable Data Container, A-Parameters

Organize the transfer of command values and actual values between the control and the individual drives (IndraDrive/HydraulicDrive/SercosDrive) via the following A-parameters.

User-defined command values

A-0-0500, Configuration of user-defined command value A
A-0-0501, Container of user-defined command value A
A-0-0502, Configuration of user-defined command value B
A-0-0503, Container of user-defined command value B
A-0-0504, Configuration of user-defined command value C
A-0-0505, Container of user-defined command value C
A-0-0506, Configuration of user-defined command value D
A-0-0507, Container of user-defined command value D
A-0-0508, Configuration of user-defined command value E
A-0-0509, Container of user-defined command value E
A-0-0510, Reserved
A-0-0511, Reserved

User-defined actual values

A-0-0520, Configuration of actual user-defined value A
A-0-0521, Container of actual user-defined value A
A-0-0522, Configuration of actual user-defined value B
A-0-0523, Container of actual user-defined value B
A-0-0524, Configuration of actual user-defined value C
A-0-0525, Container of actual user-defined value C
A-0-0526, Configuration of actual user-defined value D
A-0-0527, Container of actual user-defined value D
A-0-0528, Configuration of actual user-defined value E
A-0-0529, Container of actual user-defined value E
A-0-0530, Configuration of actual user-defined value F
A-0-0531, Container of actual user-defined value F

User-defined bit command values

A-0-0540, Configuration of user-defined command value, bit A
A-0-0541, Configuration of user-defined command value, bit number A
A-0-0542, User-defined command value, bit number A
A-0-0543, Configuration of user-defined command value, bit B

Overview table

A-0-0544, Configuration of user-defined command value, bit number B
A-0-0545, User-defined command value, bit number B
A-0-0546, Configuration of user-defined command value, bit C
A-0-0547, Configuration of user-defined command value, bit number C
A-0-0548, User-defined command value, bit number C
A-0-0549, Configuration of user-defined command value, bit D
A-0-0550, Configuration of user-defined command value, bit number D
A-0-0551, User-defined command value, bit number D

User-defined actual bit values

A-0-0560, Configuration of actual user-defined value, bit A
A-0-0561, Configuration of actual user-defined value, bit number A
A-0-0562, Actual user-defined value, bit number A
A-0-0563, Configuration of actual user-defined value, bit B
A-0-0564, Configuration of actial user-defined value, bit number B
A-0-0565, Actual user-defined value, bit number B
A-0-0566, Configuration of actual user-defined value, bit C
A-0-0567, Configuration of actual user-defined value, bit number C
A-0-0568, Actual user-defined value, bit number C
A-0-0569, Configuration of actual user-defined value, bit D
A-0-0570, Configuration of actual user-defined value, bit number D
A-0-0571, Actual user-defined value, bit number D

Listen

A-0-0596, List of freely configurable parameters in the MDT
A-0-0597, List of freely configurable parameters in the AT
A-0-0598, List of configurable parameters in signal control word
A-0-0599, List of configurable parameters in signal status word

3.2 Data Exchange between Control and Drives

3.2.1 General Information on Data Exchange

The control and the drives exchange data via the sercos bus using

- the master data telegram (control ⇒ drives) and the
- drive telegrams (drive ⇒ control)

Find an overview on the information available in the individual parameters in the following.

It is distinguished between a

- Interpolation in the drive (functions are calculated in the drive; available for IndraDrive MPx03/ HydraulicDrive and higher) and

- Interpolation in the control (functions are calculated in the control; IndraDrive/HydraulicDrive with interpolation in the control, SercosDrive acc. to PackProfile).

☞ Every parameter may be transferred only **once** within one telegram.

It is not allowed to transfer a parameter and a bit from that parameter.

3.2.2 MLC-MDT Configuration, IndraDrive/HydraulicDrive, Interpolation in the drive

The interface is provided with a total of 50-byte data containers. The first four containers have already been assigned (2 bytes/2 bytes/2 bytes/4 bytes):

- S-0-0134, Master control word
- S-0-0368, Data container addressing
- S-0-0145, Signal control word
- P-0-0053, Master axis position

The five containers, each of 4 bytes, whose content depends on the function (depending on the function block or operation mode) operating - according to the address stored in S-0-0368, Data container addressing - in multiplex operation.

The telegram is completed by five 4-byte containers freely configurable by the user (A-0-0500 / A-0-0501 ... A-0-0508 /A-0-0509; List of possible parameters: A-0-0596). The parameters A-0-0510 /A-0-0511 are reserved due to compatibility reasons.

Overview table

MUX-Container										S-0-0360	S-0-0450	S-0-0451	S-0-0452	S-0-0453
MUX-Config Liste										S-0-0370	S-0-0490	S-0-0491	S-0-0492	S-0-0493
Layer	Commands (Actual FB)	Command Channel	Drive Mode	Layer dependency	2 Byte	2 Byte	2 Byte	4 Byte		Internal 4 Byte	4 Byte	4 Byte	4 Byte	4 Byte
Layer 1	all, after transmitting the data to the drive	No		Fix	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 2	MC_TorqueControl	Main	0x0001 Torque control	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0080 Torque/force command value	S-0822 Torque/Force ramp	S-0823 Torque/Force ramp time	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 3	MC_MoveAbsolute MC_MoveRelative MC_MoveAdditive	Main	0x0215 Drive-controlled positioning (via axis control word)	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0346 Positioning control word	S-00282 Position	S-0-0259 Velocity	S-0-0260 acceleration	S-0-0359 deceleration
Layer 4	MC_MoveVelocity MC_CamOut MC_GearOut	Main	0x0002 Velocity control	Fix	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0036 Velocity	P-0-1203 acceleration ramp	P-0-1213 deceleration ramp	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 5	MC_Stop	Main		Fix	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0036 Velocity	P-0-1203 acceleration ramp	P-0-1213 deceleration ramp	S-0-0372 acceleration ramp	S-0-0000 Dummy-Parameter
Layer 6	MC_GearInPos MB_MotionProfile MC_CamIn	Main	0x0245 Position synchronization	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		P-0-0088 Control word synchronization modes	P-0-0157 Gear output	P-0-0156 Gear input	P-0-0083 Fine adjustment	P-0-0093 H-factor
Layer 7	MB_Phasing	First Secondary	0x0245 Position synchronization	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		P-0-0054 Additive Master Position	P-0-0688 Additive master position velocity	P-0-0689 Additive master position acceleration	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 8	MB_PhasingSlave	Third Secondary	0x0245 Position synchronization	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0048 Additive Slave Position	P-0-0686 Additive slave position velocity	P-0-0687 Additive slave position acceleration	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 9	MC_GearIn	Main	0x0042 Velocity synchronization	Fix	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		P-0-0088 Control word synchronization modes	P-0-0157 Gear output	P-0-0156 Gear input	P-0-0083 Fine adjustment	S-0-0000 Dummy-Parameter
Layer 10	ML_WriteCyclicPosition MC_AddAxisToGroup	Main	0x0305 Position control drive-controlled (via axis control word)	Closed Loop only	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0047 Position command value	P-0-0100 Position command extension value	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter
Layer 11	MC_Power	Main	0x0215 Drive-controlled positioning (via axis control word)	Fix	S-0-0134 master control word	S-0-0368 MUX layer address	S-0-0145 signal control word	P-0-0053 master position		S-0-0346 Positioning control word	S-00282 Position	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter	S-0-0000 Dummy-Parameter

Fig. 3-1: MLC-MDT configuration, IndraDrive, Interpolation in the drive (13V10)

Overview table

| MUX-Container | | |

Overview table

Fixed	Only with synchronization
Only with Closed Loop	Parameter-dependent

Tab. 3-1: Color coding to use the parameters

S-0-0145, Signal control word

Due to its use, the signal control word is split into twelve specified bits and four bits that can be preselected using the parameter editor or the IndraWorks interface (e.g. **Real axis (IndraDrive) ▸ Popup menu ▸ Communication ▸ Signal control word**). They remain constant up to the next reconfiguration.

The parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

Bit 0:	Closed-Loop	S-0-0520.0	Axis controller control word; selection of actual position value
Bit 1	Closed-Loop	S-0-0520.1	Axis controller control word; selection of actual position value
Bit 2	Closed-Loop	S-0-0520.3	Axis controller control word; selection of actual position value
Bit 3	Sync	P-0-0155.1	Synchronization mode: 0 - absolute, 1 - relative
Bit 4	Sync	P-0-0154.0	Direction of synchronization: 00 - shortest distance; 01 - pos.;10 - neg. direction
Bit 5	Sync	P-0-0154.1	Direction of synchronization: 00 - shortest distance; 01 - pos.;10 - neg. direction
Bit 6	Sync	S-0-0393.0	Command value mode: 00 - pos.; 01 - neg. direction; 10 - shortest distance
Bit 7	Sync	S-0-0393.1	Command value mode: 00 - pos.; 01 - neg. direction; 10 - shortest distance
Bit 8	Reserved	S-0-0000.0	Dummy parameters
Bit 9	Reserved	S-0-0000.0	Dummy parameters
Bit 10	Reserved	S-0-0000.0	Dummy parameters
Bit 11	Reserved	S-0-0000.0	Dummy parameters
Bit 12	User	A-0-0540	Configuration of user-defined command value, bit A
Bit 13	User	A-0-0543	Configuration of user-defined command value, bit B
Bit 14	User	A-0-0546	Configuration of user-defined command value, bit C
Bit 15	User	A-0-0549	Configuration of user-defined command value, bit D

Tab. 3-2: Bit assignment in S-0-0145, Signal control word (IndraWorks)

Task	Container A	Container B	Container C	Container D
Defines the drive parameter	A-0-0540	A-0-0543	A-0-0546	A-0-0549
Defines the bit in the drive parameter	A-0-0541	A-0-0544	A-0-0547	A-0-0550
Contains the value to be written to the parameter bit	A-0-0542	A-0-0545	A-0-0548	A-0-0551

Tab. 3-3: Used parameters of a signal control word

User-configurable 4-byte containers

This becomes complete by five containers, each of four bytes, that can either be preselected via the parameter editor or the IndraWorks interface (e.g.**Real axis (IndraDrive) ▸ PopUp menu ▸ Communication ▸ Cyclic sercos data channel**). They remain constant up to the next reconfiguration.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values can be transferred.

Overview table

Container for data transport

- A-0-0500, Configuration of user-defined command value A
  - A-0-0501, Container of user-defined command value A
- A-0-0502, Configuration of user-defined command value B
  - A-0-0503, Container of user-defined command value B
- A-0-0504, Configuration of user-defined command value C
  - A-0-0505, Container of user-defined command value C
- A-0-0506, Configuration of user-defined command value D
  - A-0-0507, Container of user-defined command value D
- A-0-0508, Configuration of user-defined command value E
  - A-0-0509, Container of user-defined command value E

3.2.3 MLC-MDT Configuration, Interpolation in the Control

General structure

sercosDrive

The transfer mechanism described in MLC-MDT Configuration, IndraDrive/ HydraulicDrive, Interpolation in the drive, page 47 can be analogously used.

However, the mechanism is simplified, since the calculation is already executed on the control and not in the drive.

The following parameters are transferred as default (multiplexing is not required):

- S-0-0134, Master control word
- S-0-0047, Position command value
- S-0-0145, Signal control word

The telegram is completed by five 4-byte containers freely configurable by the user (A-0-0500 / A-0-0501 ... A-0-0508 /A-0-0509; List of possible parameters: A-0-0596).

Actual FB	1	2	3	4	5	6	7	8
	4 Byte	4 Byte	2 Byte					
all	S-0-0134 master control word	S-0-0047 position command value	S-0-0145 signal control word	Free configurable container A	Free configurable container B	Free configurable container C	Free configurable container D	Free configurable container E

Fig. 3-3: MLC-MDT configuration, SercosDrive, Interpolation on the Control

IndraDrive/HydraulicDrive

Additional command values are transferred for IndraDrives and HydraulicDrives.

The telegram is completed by five 4-byte containers freely configurable by the user (A-0-0500 / A-0-0501 ... A-0-0508 /A-0-0509; List of possible parameters: A-0-0596).

Overview table

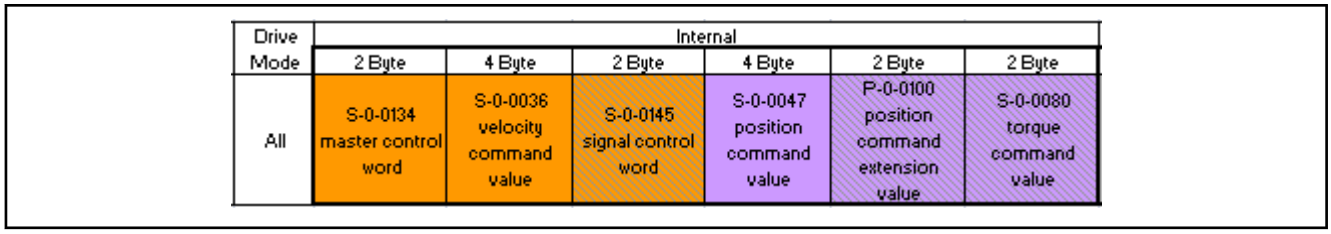


Fig. 3-4: MLC-MDT configuration, IndraDrive, Interpolation on the control

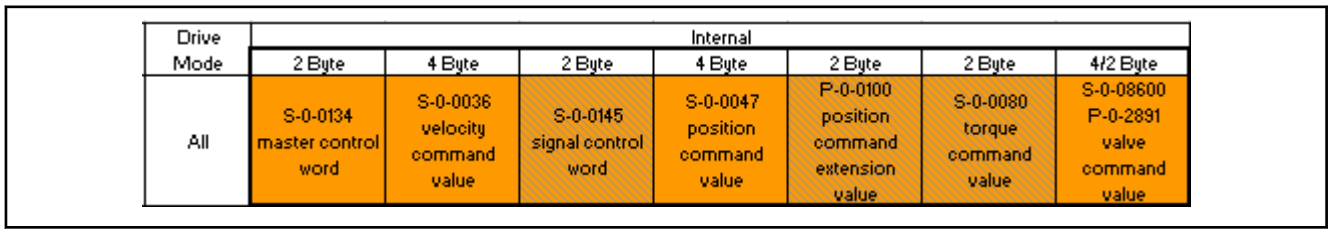


Fig. 3-5: MLC-MDT configuration, HydraulicDrive, Interpolation on the control

Fixed

Only with synchronization

Only with Closed Loop

Parameter-dependent

Tab. 3-4: Color coding to use the parameters

Signal control word

sercosDrive

No signal control word is supported for the SercosDrive.

IndraDrive/HydraulicDrive

If S-0-0145 is supported and the user configured at least one bit, the parameter S-0-0145 is transferred to the MDT.

Due to its use, the signal control word is split into twelve bits reserved for the communication between firmware and drive and four bits that can be preselected using the parameter editor or the IndraWorks interface (e.g. **Real axis (SercosDrive) ▸ PopUp menu ▸ Communication ▸ Signal control word**). They remain constant up to the next reconfiguration.

Task	Container A	Container B	Container C	Container D
Defines the drive parameter	A-0-0540	A-0-0543	A-0-0546	A-0-0549
Defines the bit in the drive parameter	A-0-0541	A-0-0544	A-0-0547	A-0-0550
Contains the value to be written to the parameter bit	A-0-0542	A-0-0545	A-0-0548	A-0-0551

Tab. 3-5: Used parameters of a signal control word

User-configurable 4-byte containers

If this is valid for the drive, it is completed by five containers, each of four bytes which can either be preselected via the parameter editor or the IndraWorks interface (e.g. **Real axis (SercosDrive) ▸ Popup menu ▸ Communication ▸ Cyclic sercos data channel**). They remain constant up to the next reconfiguration.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

Overview table

Container for data transport

- A-0-0500, Configuration of user-defined command value A
  - A-0-0501, Container of user-defined command value A
- A-0-0502, Configuration of user-defined command value B
  - A-0-0503, Container of user-defined command value B
- A-0-0504, Configuration of user-defined command value C
  - A-0-0505, Container of user-defined command value C
- A-0-0506, Configuration of user-defined command value D
  - A-0-0507, Container of user-defined command value D
- A-0-0508, Configuration of user-defined command value E
  - A-0-0509, Container of user-defined command value E

The containers follow the master data telegram.

3.2.4 MLC-AT Configuration, IndraDrive/HydraulicDrive, Interpolation in the drive

The interface is provided with a total of 50-byte data containers. The first four containers have already been assigned (2 bytes/2 bytes/2 bytes/4 bytes):

- S-0-0135, Drive status
- S-0-0368, Data container addressing
- S-0-0144, Signal status word
- P-0-0052, Actual position value of measuring encoder.

The four containers, each of 4 bytes, whose content depends on the function (depending on the function block or operation mode) operating - according to the address stored in the first container - in multiplex operation.

The telegram is completed by six 4-byte containers freely configurable by the user (A-0-0520 / A-0-0521 ... A-0-0530 /A-0-0531; List of possible parameters: A-0-0597).

MUX-Container									S-0-0364	S-0-0480	S-0-0481	S-0-0482
MUX-Config Liste									S-0-0371	S-0-0500	S-0-0501	S-0-0502
Layer	Commands (Actual FB)	Command Channel	Drive Mode	Layer dependency	Internal							
					2 Byte	2 Byte	2 Byte	4 Byte	4 Byte	4 Byte	4 Byte	4 Byte
Layer 1	none	Main	all operation modes	Fix	S-0-0135 Drive-Status	S-0-0368 MUX layer address	S-0-0144 signal status word	P-0-0052 encoder position	S-0-0386 Active position value	S-0-0040 Actual velocity	S-0-0084 Torque/Force feedback value	S-0-0390 Diagnostic message number
Layer 2	Default	Main	all operation modes	Fix	S-0-0135 Drive-Status	S-0-0368 MUX layer address	S-0-0144 signal status word	P-0-0052 encoder position	S-0-0386 Active position value	S-0-0040 Actual velocity	S-0-0084 Torque/Force feedback value	S-0-0390 Diagnostic message number

Fig. 3-6: MLC-AT configuration, IndraDrive/HydraulicDrive

Fixed
Only with synchronization
Only with Closed Loop
Parameter-dependent

Tab. 3-6: Color coding to use the parameters

S-0-0144, Signal status word

Due to its use, the signal status word is split into twelve specified bits and four bits that can be preselected using the parameter editor or the IndraWorks interface (e.g. **Real axis (IndraDrive) ▸ Popup menu ▸ Communication ▸ Signal status word**). They remain constant up to the next reconfiguration.

Overview table

The parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

Bit 0:	Fixed	S-0-0330.0	Message n_act = n_comm
Bit 1	Fixed	S-0-0331.0	Message n_act = 0
Bit 2	Closed-Loop	S-0-0437.2	Positioning status
Bit 3	Closed-Loop	S-0-0403.0	Status of the reference encoder "actual position value" (encoder 1 or 2): 0 - relative 1- referenced
Bit 4	Fixed	S-0-0419.0	Acknowledgement of the positioning command value
Bit 5	Sync	P-0-0089.0	Feedback of the active cam: Active cam table selection (1-4)
Bit 6	Sync	P-0-0089.1	Feedback of the active cam: Active cam table selection (1-4)
Bit 7	Sync	P-0-0089.8	Synchronous operation mode in synchronization: 0 - Slave axis is not synchronized, 1 - Slave axis is synchronized
Bit 8	Fixed	S-0-0824.0	Message "Torque/force command value reached" (S-0-0080 = P-0-0049) S-0-0080 + S-0-0081 - S-0-0084 < S-0-0826 0 - command value is ramped, 1 - command value reached
Bit 9	Sync	P-0-0089.5	Status word "synchronous modes": Status "distance switching 0 - Current distance value not active 1 - Current distance active
Bit 10	Closed-Loop	S-0-0336.0	Message "In-position"
Bit 11	Sync	P-0-0089.6	Status of positioning P-0-0054: 0 - Positioning active 1- Positioning completed
Bit 12	User	A-0-0560	Configuration of actual user-defined value, bit A
Bit 13	User	A-0-0563	Configuration of actual user-defined value, bit B
Bit 14	User	A-0-0566	Configuration of actual user-defined value, bit C
Bit 15	User	A-0-0569	Configuration of actual user-defined value, bit D

Tab. 3-7: Bit assignment in S-0-0144, Signal status word (IndraWorks)

Task	Container A	Container B	Container C	Container D
Defines the drive parameter	A-0-0560	A-0-0563	A-0-0566	A-0-0569
Defines the bit in the drive parameter	A-0-0561	A-0-0564	A-0-0567	A-0-0570
Contains the value read from the parameter bit	A-0-0562	A-0-0565	A-0-0568	A-0-0571

Tab. 3-8: Parameters for the signal status word

User-configurable 4-byte containers

This becomes complete by six containers, each of four bytes, that can either be preselected via the parameter editor or the IndraWorks interface (e.g.**Real axis (IndraDrive) ▸ Popup menu ▸ Communication ▸ Cyclic sercos data channel**). They remain constant up to the next reconfiguration.

The parameter "A-0-0597, List of freely configurable parameters in the AT" contains the possible parameters whose values can be transferred.

Container for data transport

- A-0-0520, Configuration of actual user-defined value A
  - A-0-0521, Container of actual user-defined value A
- A-0-0522, Configuration of actual user-defined value B

Overview table

  - A-0-0523, Container of actual user-defined value B
- A-0-0524, Configuration of actual user-defined value C
  - A-0-0525, Container of actual user-defined value C
- A-0-0526, Configuration of actual user-defined value D
  - A-0-0527, Container of actual user-defined value D
- A-0-0528, Configuration of actual user-defined value E
  - A-0-0529, Container of actual user-defined value E
- A-0-0530, Configuration of actual user-defined value F
  - A-0-0531, Container of actual user-defined value F

3.2.5 MLC-AT Configuration, Interpolation in the Control

General structure

The transfer mechanism described in MLC-AT Configuration, IndraDrive/ HydraulicDrive, Interpolation in the drive, page 53 can be analogously used.

Since the calculation is not executed on the drive but already in the control, the corresponding actual values have to be provided for the control.

The following parameters are transferred as default (multiplexing is not required):

- S-0-0135, Drive status
- *Position*
  - S-0-0051, Actual position value encoder 1 or S-0-0053, Actual position value encoder 2 for sercosDrive depending on A-0-0007, Axis configuration, selection of the active encoder,
  - S-0-0386 active position feedback value for IndraDrive and HydraulicDrive.
- S-0-0144, Signal status word
- S-0-0040, Actual velocity value and
- S-0-0084, Actual torque/force value
- S-0-0390, Diagnostic number
- P-0-0052, Actual position value, measuring encoder (IndraDrive with function package: Synchronization (ELS)] to implement an encoder axis.

The telegram is completed by six 4-byte containers freely configurable by the user (A-0-0520 / A-0-0521 ... A-0-0530 /A-0-0531; List of possible parameters: A-0-0597).

Commands (Actual FB)	Command Channel	Drive Mode	Internal					
			2 Byte	4 Byte	4 Byte	4 Byte	4 Byte	2 Byte
All	All	All	S-0-0135 master status word	S-0-0051 Actual Position	S-0-0040 Velocity feedback value	S-0-0084 Torque feedback value	S-0-0052 Encoder Position	S-0-0144 signal status word

Fig. 3-7: MLC-AT configuration, SercosDrive

Commands (Actual FB)	Command Channel	Drive Mode	Internal						
			2 Byte	4 Byte	2 Byte	4 Byte	2 Byte	4 Byte	4 Byte
All	All	All	S-0-0135 Drive-Status	S-0-0386 active position feedback value	S-0-0144 signal status word	S-0-0040 velocity feedback value	S-0-0084 torque feedback value	S-0-0390 diagnosis number	P-0-0052 encoder position

Fig. 3-8: MLC-AT configuration, IndraDrive

Overview table

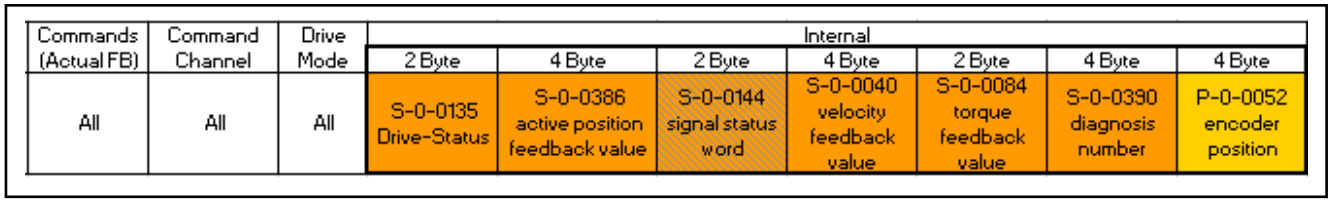


Fig. 3-9: MLC-AT configuration, HydraulicDrive

Fixed
Only with synchronization
Only with Closed Loop
Parameter-dependent

Tab. 3-9: Color coding to use the parameters

Signal status word

sercosDrive

No signal status word is supported for the SercosDrive.

IndraDrive/HydraulicDrive

A prerequisite is the support of the S-0-0144 and signal status word by the drive.

If S-0-0144 is supported and the user configured at least one bit, the parameters S-0-0144, Status control word and the actual values mentioned above are transferred.

Due to its use, the signal status word is split into twelve specified bits reserved for the firmware and four bits that can be preselected using the parameter editor or the IndraWorks interface (e.g. **Real axis (IndraDrive) ▸ Pop-Up menu ▸ Communication ▸ Signal status word**). They remain constant up to the next reconfiguration.

The parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

Bit 0:	Reserved	S-0-0000.0	Dummy parameters
Bit 1	Reserved	S-0-0000.0	Dummy parameters
Bit 2	Reserved	S-0-0000.0	Dummy parameters
Bit 3	Closed-Loop	S-0-0403.0	Status of the reference encoder "actual position value" (encoder 1 or 2): 0 - relative 1- referenced
Bit 4	Reserved	S-0-0000.0	Dummy parameters
Bit 5	Reserved	S-0-0000.0	Dummy parameters
Bit 6	Reserved	S-0-0000.0	Dummy parameters
Bit 7	Reserved	S-0-0000.0	Dummy parameters
Bit 8	Reserved	S-0-0000.0	Dummy parameters
Bit 9	Reserved	S-0-0000.0	Dummy parameters
Bit 10	Reserved	S-0-0000.0	Dummy parameters
Bit 11	Reserved	S-0-0000.0	Dummy parameters
Bit 12	User	A-0-0560	Configuration of actual user-defined value, bit A
Bit 13	User	A-0-0563	Configuration of actual user-defined value, bit B

Overview table

Bit 14	User	A-0-0566	Configuration of actual user-defined value, bit C
Bit 15	User	A-0-0569	Configuration of actual user-defined value, bit D

Tab. 3-10: Bit assignment in S-0-0144, Signal status word (IndraWorks)

Task	Container A	Container B	Container C	Container D
Defines the drive parameter	A-0-0560	A-0-0563	A-0-0566	A-0-0569
Defines the bit in the drive parameter	A-0-0561	A-0-0564	A-0-0567	A-0-0570
Contains the value read from the parameter bit	A-0-0562	A-0-0565	A-0-0568	A-0-0571

Tab. 3-11: Parameters for the signal status word

Bit 0 is assigned in the reserved area of the signal status word by the parameter **S-0-0403**, Status of actual position values.

User-configurable 4-byte containers

If this is valid for the drive, it is completed by six containers, each of four bytes which can either be preselected via the parameter editor or the IndraWorks interface (e.g. **Real Axis (IndraDrive)** ▸ **Popup menu** ▸ **Communication** ▸ **Cyclic sercos Data Channel**). They remain constant up to the next reconfiguration.

The parameter "A-0-0597, List of freely configurable parameters in the AT" contains the possible parameters whose values can be transferred.

Container for data transport

- A-0-0520, Configuration of actual user-defined value A
  - A-0-0521, Container of actual user-defined value A
- A-0-0522, Configuration of actual user-defined value B
  - A-0-0523, Container of actual user-defined value B
- A-0-0524, Configuration of actual user-defined value C
  - A-0-0525, Container of actual user-defined value C
- A-0-0526, Configuration of actual user-defined value D
  - A-0-0527, Container of actual user-defined value D
- A-0-0528, Configuration of actual user-defined value E
  - A-0-0529, Container of actual user-defined value E
- A-0-0530, Configuration of actual user-defined value F
  - A-0-0531, Container of actual user-defined value F

The containers follow the drive telegram.

3.3 Overview: XLC/MLC Diagnostic Parameters

The following parameters are used for diagnostic purposes:

Device status

C-0-0010, Version number, hardware
C-0-0012, Version number, firmware
C-0-0023, System status
C-0-0030, Control name
C-0-0031, Control address

Overview table

C-0-0050, System time
C-0-0203, Engineering, user name
C-0-0626, Diagnostics

Extended device status

C-0-0010, Version number, hardware
C-0-0011, Version number, PLC firmware
C-0-0012, Version number, firmware
C-0-0013, Version number, BSP
C-0-0021, Hardware, details
C-0-0022, Local bus, configuration
C-0-0023, System status
C-0-0032, Serial number of control

Axis status

A-0-0002, Axis name
A-0-0020, Axis diagnostic message
A-0-0021, Axis status
A-0-0022, Extended axis status
A-0-0023, Axis diagnostic number
A-0-0100, Actual position value
S-0-0095, Diagnostics
S-0-0390, Diagnostic number

Clearing an Error

A-0-1030, Command: Clear all axis errors
C-0-1030, Command: Clear all control errors

Error/diagnostic memory

C-0-0620, Diagnostic memory index
C-0-0621, Diagnostics, indexed message
C-0-0622, Diagnostics, number of messages in the memory
C-0-0623, Diagnostics, last reset message
C-0-0624, Diagnostics, absolute indices
C-0-0625, Diagnostics, display message
C-0-0626, Diagnostics
C-0-0627, Diagnostic number

Overview table

C-0-0650, Diagnostics, status word
C-0-0660, Dispay, display period of messages

Invalid Parameters

C-0-0111, List of all invalid C-parameters
C-0-0626, Diagnostics
and the parameters required for each axis
A-0-0011, List of all invalid A-parameters
A-0-0014, List of incorrect synchronized A-parameters
and the parameters required for each real axis and for each encoder axis
S-0-0021, IDN list of invalid operating data for phase 2
S-0-0022, IDN list of invalid operating data for phase 3
S-0-0390, Diagnostic number

Cycle times

C-0-0400, Motion, cycle time, command value
C-0-0503, sercos master, cycle time
C-0-0410, Motion, cycle time (Tcyc), actual value
C-0-0412, List of current time slot measurements
C-0-0413, List of maximum time slot measurements
C-0-0414, List of minimum time slot measurements
C-0-0420, Motion, watchdog sensitivity
C-0-0421, Motion, absolute error counter
C-0-0422, Motion, number of successive errors
C-0-1050, Command: Reset parameter C-0-0413 and C-0-0414
C-0-1052, Command: Reset parameter C-0-0421 and C-0-0422

3.4 Overview: XLC/MLC Command Parameters

The following lists provide an overview on parameters triggering a command.

Load basic parameters

A-0-1000, Command: Load basic axis parameters
C-0-1000, Command: Load basic parameters
K-0-1000, Command: Load basic kinematic parameters
M-0-1000, Command: Load basic touch probe parameters

Overview table

N-0-1000, Command: Load basic PLS parameters
O-0-1000, Command: Load basic oscilloscope parameters

More command parameters

A-0-1030, Command: Clear all axis errors
A-0-2807, Command: Set absolute position
A-0-3046, FlexProfile 0, command: Check and apply event
A-0-3048, FlexProfile 0, command: Check and apply profile
A-0-3076, FlexProfile 1, command: Check and apply event
A-0-3078, FlexProfile 1, command: Check and apply profile
A-0-3106, FlexProfile 2, command: Check and apply event
A-0-3108, FlexProfile 2, command: Check and apply profile
A-0-3136, FlexProfile 3, command: Check and apply event
A-0-3138, FlexProfile 3, command: Check and apply profile
C-0-0316, PLS No.1, command: Initialize switch track
C-0-0317, PLS No.1, command: Activate switch track
C-0-0341, PLS No.2, command: Initialize switch track
C-0-0342, PLS No.2, command: Activate switch track
C-0-0366, PLS No.3, command: Initialize switch track
C-0-0367, PLS No.3, command: Activate switch track
C-0-0391, PLS No.4, command: Initialize switch track
C-0-0392, PLS No.4, command: Activate switch track
C-0-0001, Language selection
C-0-1001, Command: Restore MC- and PLC-Retain-Data
C-0-1002, Command: Save MC- and PLC-Retain-Data
C-0-1003, Command: Restore PLC-Retain-Data
C-0-1004, Command: Save PLC-Retain-Data
C-0-1005, Command: Delete files on SYSTEM partition
C-0-1006, Command: Delete files on OEM partition
C-0-1007, Command: Delete files on USER partition
C-0-1008, Command: Get function modul bus information
C-0-1009, Command: Get extended drive information
C-0-1010, Command: Export parameter
C-0-1011, Command: Import parameter
C-0-1019, Command: Restart and reset to default
C-0-1020, Command: Restart after firmware update
C-0-1021, Command: Restart

Overview table

C-0-1022, Command: Activate firmware update
C-0-1023, Command: Apply IP configuration
C-0-1024, Command: Load basic parameter of IP configuration
C-0-1030, Command: Clear all control errors
C-0-1041, Command: Start task record
C-0-1042, Command: Stop task record
C-0-1050, Command: Reset parameter C-0-0413 and C-0-0414
C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417
C-0-1052, Command: Reset parameter C-0-0421 and C-0-0422
C-0-1060, Command: Save all trace recordings
C-0-1061, Command: Unlock all trace buffers
C-0-1070, Command: Switch PM/OM
K-0-1060, Command: Load file from CF
K-0-1061, Command: Save file to CF
K-0-1062, Command: Compile file to MLC
M-0-0024, Command: Activation
N-0-0316, Command: Initialize switch track
N-0-0317, Command: Activate switch track

3.5 Overview: XLC/MLC IP communication parameters

- The IP settings of the Engineering interface, the Sercos III interfaces and the bridge are applied with the command "C-0-1023, Command: Apply IP configuration". The command specification is defined for the onboard Sercos III interface via the parameter C-0-0220 for example. It is applied to the parameter C-0-0222 when the command "Apply IP settings" is started.
- In preparation: The IP settings of the Onboard Realtime Ethernet are specified in the IndraWorks dialogs (e.g. PROFINET_IO_Controller node). They are applied after a control restart. The command specifications are not explicitly available via parameters
- The default values for the Sercos III interfaces (onboard and function module) and the bridge are copied to the command configuration parameters and then automatically applied via the command "C-0-1024, Command: Load basic parameter of IP configuration". Furthermore, the default value of the IP address generation is written to the command value parameter (C-0-0235) and then automatically applied.
- The parameter "C-0-0219, Status of network configuration" indicates bit by bit for the individual interfaces whether changes are entered but not yet applied in the IP settings.
- The parameter "C-0-0234, Automatic IP address generation, actual configuration" indicates the current setting of the automatic IP address generation (actual configuration) bit by bit.
- The parameter "C-0-0235, Automatic IP address generation, command configuration" controls the automatic IP address generation bit by bit for all optional network interfaces on the control (command configuration).

Overview table

- The parameter "C-0-0218, List of existing network interfaces" indicates the network interfaces on hardware-side.

Interface		IP address	Subnet mask	MAC address	Corresponding bit in C-0-0219 C-0-0235 C-0-0234
Engineering	Command configuration	C-0-0200	C-0-0201	C-0-0205	
Onboard Sercos III	Actual configuration	C-0-0222	C-0-0223	C-0-0224	Bit 0
	Command configuration	C-0-0220	C-0-0221		
Sercos III function module	Actual configuration	C-0-0227	C-0-0228	C-0-0229	Bit 1
	Command configuration	C-0-0225	C-0-0226		
Onboard Realtime Ethernet	Actual configuration	C-0-0242	C-0-0243	C-0-0244	Bit 2
	Command configuration	IW dialogs	IW dialogs		
Bridge	Actual configuration	C-0-0236	C-0-0237	C-0-0238	Bit 3
	Command configuration	C-0-0230	C-0-0231		

Tab. 3-12: Overview on the most important IP communication settings

Parameters for the IP communication

C-0-0031, Control address
C-0-0200, Engineering, IP address
C-0-0201, Engineering, subnet mask
C-0-0202, Engineering, standard gateway
C-0-0203, Engineering, user name
C-0-0205, Engineering, MAC address
C-0-0206, TCP, time to live
C-0-0207, UDP, ports
C-0-0208, TCP, port for acyclic channels
C-0-0209, Sender timeout
C-0-0210, TCP, max. number of connection
C-0-0211, Reserved
C-0-0212, Drive server, configuration
C-0-0216, Engineering, IP address, actual configuration

Overview table

C-0-0217, Engineering, subnet mask, actual configuration
C-0-0218, List of existing network interfaces
C-0-0219, Status of network configuration
C-0-0220, sercos master, IP address, command configuration
C-0-0221, sercos master, subnet mask, command configuration
C-0-0222, sercos master, IP address, actual configuration
C-0-0223, sercos master, subnet mask, actual configuration
C-0-0224, sercos master, MAC address
C-0-0225, C2C, IP address, command configuration
C-0-0226, C2C, subnet mask, command configuration
C-0-0227, C2C, IP address, actual configuration
C-0-0228, C2C, subnet mask, actual configuration
C-0-0229, C2C, MAC address
C-0-0230, Bridge, IP address, command configuration
C-0-0231, Bridge, subnet mask, command configuration
C-0-0232, Bridge, command configuration of assigned interfaces
C-0-0233, Bridge, actual configuration of assigned interfaces
C-0-0234, Automatic IP address generation, actual configuration
C-0-0235, Automatic IP address generation, command configuration
C-0-0236, Bridge, IP address, actual configuration
C-0-0237, Bridge, subnet mask, actual configuration
C-0-0238, Bridge, MAC address
C-0-0242, Onboard RT Ethernet, IP address, actual configuration
C-0-0243, Onboard RT Ethernet, subnet mask, actual configuration
C-0-0244, Onboard RT Ethernet, MAC address, actual configuration
C-0-0250, Engineering, DHCP configuration
C-0-0251, Engineering, DNS server IP
C-0-0252, Engineering, DHCP initial address
C-0-0253, Engineering, DHCP end address
C-0-0254, Engineering, DHCP lease time
C-0-0260, sercos master, DHCP configuration
C-0-0261, sercos master, DNS server IP
C-0-0262, sercos master, DHCP initial address
C-0-0263, sercos master, DHCP end address
C-0-0264, sercos master, DHCP lease time
C-0-0270, Bridge, DHCP configuration
C-0-0271, Bridge, DNS server IP

Overview table

C-0-0272, Bridge, DHCP initial address
C-0-0273, Bridge, DHCP end address
C-0-0274, Bridge, DHCP lease time
C-0-0280, Onboard RT Ethernet, DHCP configuration
C-0-0281, Onboard RT Ethernet, DNS server IP
C-0-0282, Onboard RT Ethernet, DHCP initial address
C-0-0283, Onboard RT Ethernet, DHCP end address
C-0-0284, Onboard RT Ethernet, DHCP lease time
C-0-0290, C2C, DHCP configuration
C-0-0291, C2C, DNS server IP
C-0-0292, C2C, DHCP initial address
C-0-0293, C2C, DHCP end address
C-0-0294, C2C, DHCP lease time
C-0-1023, Command: Apply IP configuration
C-0-1024, Command: Load basic parameter of IP configuration

3.6 Overview: XLC/MLC MotionProfile, A-Parameters

The following table provides an overview on the A-parameters used for MotionProfiles.

Common parameters for both sets

- A-0-2900, MotionProfile, master axis switching position
- A-0-2901, MotionProfile, motion step 1, initial slave axis position
- A-0-2904, MotionProfile, basic configuration
- A-0-2930, MotionProfile, control word
- A-0-2931, MotionProfile, status word

MotionProfile 0-parameters with parameter names	MotionProfile 1
A-0-2902, MotionProfile 0, diagnostics	A-0-2903
A-0-2910, MotionProfile 0, number of motion steps	A-0-2920
A-0-2911, MotionProfile 0, master axis velocity	A-0-2921
A-0-2912, MotionProfile 0, list of initial master axis positions	A-0-2922
A-0-2913, MotionProfile 0, list of motion laws	A-0-2923
A-0-2914, MotionProfile 0, list of distances	A-0-2924
A-0-2915, MotionProfile 0, list of slave axis velocities	A-0-2925

3.7 Overview: XLC/MLC FlexProfile, A-Parameters

The following table provides an overview on the A-parameters used for the FlexProfile control.

Overview table

Common parameters for all the four sets

- A-0-3000, FlexProfile, current set
- A-0-3001, FlexProfile, current step
- A-0-3002, FlexProfile, master axis switching position
- A-0-3003, FlexProfile, slave axis, additive command position value
- A-0-3004, FlexProfile, master axis, additive command position value
- A-0-3009, FlexProfile, control word
- A-0-3010, FlexProfile, status word
- A-0-3011, FlexProfile, conditions: control variables
- A-0-3012, FlexProfile, conditions: status variables
- A-0-3013, FlexProfile, value, current time-master.

FlexProfile 0-parameters with parameter names	FlexProfile 1	FlexProfile 2	FlexProfile 3
A-0-3020, FlexProfile 0, master axis velocity	A-0-3050	A-0-3080	A-0-3110
A-0-3021, FlexProfile 0, list of master axis sources	A-0-3051	A-0-3081	A-0-3111
A-0-3022, FlexProfile 0, list of slave axis distances	A-0-3052	A-0-3082	A-0-3112
A-0-3023, FlexProfile 0, list of master axis ranges	A-0-3053	A-0-3083	A-0-3113
A-0-3024, FlexProfile 0, list of master axis ranges, units	A-0-3054	A-0-3084	A-0-3114
A-0-3025, FlexProfile 0, list of motion laws	A-0-3055	A-0-3085	A-0-3115
A-0-3026, FlexProfile 0, list of motion step types	A-0-3056	A-0-3086	A-0-3116
A-0-3027, FlexProfile 0, list of slave axis starting velocities	A-0-3057	A-0-3087	A-0-3117
A-0-3028, FlexProfile 0, list of slave axis starting accelerations	A-0-3058	A-0-3088	A-0-3118
A-0-3029, FlexProfile 0, list of slave axis starting jerks	A-0-3059	A-0-3089	A-0-3119
A-0-3030, FlexProfile 0, list of slave axis end velocities	A-0-3060	A-0-3090	A-0-3120
A-0-3031, FlexProfile 0, list of slave axis end accelerations	A-0-3061	A-0-3091	A-0-3121
A-0-3032, FlexProfile 0, list of slave axis end jerks	A-0-3062	A-0-3092	A-0-3122
A-0-3033, FlexProfile 0, list of slave axis travel velocities	A-0-3063	A-0-3093	A-0-3123
A-0-3034, FlexProfile 0, list of slave axis travel accelerations	A-0-3064	A-0-3094	A-0-3124
A-0-3035, FlexProfile 0, list of slave axis travel jerks	A-0-3065	A-0-3095	A-0-3125
A-0-3036, FlexProfile 0, list of turning point displacements	A-0-3066	A-0-3096	A-0-3126
A-0-3040, FlexProfile 0, events, list of motion step assignments	A-0-3070	A-0-3100	A-0-3130
A-0-3041, FlexProfile 0, events, list of trigger modes	A-0-3071	A-0-3101	A-0-3131
A-0-3042, FlexProfile 0, events, list of action modes	A-0-3072	A-0-3102	A-0-3132
A-0-3043, FlexProfile 0, events, list of trigger values	A-0-3073	A-0-3103	A-0-3133
A-0-3044, FlexProfile 0, events, list of trigger values, units	A-0-3074	A-0-3104	A-0-3134
A-0-3046, FlexProfile 0, command: Check and apply event	A-0-3076	A-0-3106	A-0-3136
A-0-3047, FlexProfile 0, diagnostics	A-0-3077	A-0-3107	A-0-3137
A-0-3048, FlexProfile 0, command: Check and apply profile	A-0-3078	A-0-3108	A-0-3138
A-0-3049, FlexProfile 0, checksum	A-0-3079	A-0-3109	A-0-3139

Overview table

3.8 Overview: Kinematic parameters

1. Only an IndraMotion MLC supports kinematic functions.
2. "+" indicates that Robot Control V1 and/or V2 supports these parameters; "-" indicates that Robot Control V1 and/or V2 does not support them.

Axis-specific parameters

Limit values and axis-specific data are stored in the A-parameters of the respective axis.

Ident. No.	Parameter name	V1	V2
A-0-0028	Travel range limit switch	+	+
A-0-0030	Position limit value, positive	+	+
A-0-0031	Position limit value, negative	+	+
A-0-0032	Velocity limit value, positive	+	+
A-0-0033	Velocity limit value, negative	+	+
A-0-0034	Acceleration limit value, bipolar	+	+
A-0-0036	Jerk limit value, bipolar	+	+
A-0-0038	Torque/force limit value, bipolar	+	+
A-0-0080	Jogging, short distance	+	-
A-0-0081	Jogging, long distance	+	-
A-0-0082	Jogging, low velocity	+	-
A-0-0083	Jogging, high velocity	+	-
A-0-0084	Jogging, acceleration	+	-
A-0-0085	Jogging, deceleration	+	-
A-0-0086	Jogging, acceleration jerk	+	-
A-0-0087	Jogging, deceleration jerk	+	-
A-0-0224	Rapid stop deceleration	+	+
A-0-0225	Rapid stop jerk	+	+
A-0-0230	Blending distance PTP	+	-
A-0-0240	Feedrate override	+	+
A-0-0241	Feedrate override control word	+	+

V1 Robot Control V1
V2 Robot Control V2

Tab. 3-13: Overview of available A-parameters

Control-specific parameters

The following C-parameters are created to manage **all** kinematic data of one control.

Ident. No.	Parameter name	V1	V2
C-0-0123	Maximum number of kinematics	+	+
C-0-2480	Configured kinematic number	+	+
C-0-2482	List of non-linked axes	+	+

Overview table

Ident. No.	Parameter name	V1	V2
C-0-2483	List of configured kinematics	+	+
C-0-2484	Kinematic configuration list	+	+

V1 Robot Control V1
V2 Robot Control V2

Tab. 3-14: Overview of available C-parameters

Parameters of one kinematics

The following K-parameters are created to manage the data of **one** kinematics in the control. Each parameter exists once in each kinematics.

Ident. No.	Parameter name	V1	V2
K-0-0000	Dummy, K-parameter	+	+
K-0-0001	Logic kinematic number	+	+
K-0-0002	Kinematic name	+	+
K-0-0003	Maximum path velocity	+	+
K-0-0004	Reserved	+	-
K-0-0005	Software limit switch, positive, MCS	+	+
K-0-0006	Software limit switch, negative, MCS	+	+
K-0-0007	Axis number of kinematics	+	+
K-0-0008	Axis configuration list	+	+
K-0-0009	Osci: list of all K-parameters that can be oscilloscoped	+	+
K-0-0010	List of all K-parameters	+	+
K-0-0011	List of all invalid K-parameters	+	+
K-0-0012	Checksum of all K-parameters	+	+
K-0-0013	IDN list of checksum K-parameters	+	+
K-0-0014	Path acceleration, change time	+	-
K-0-0015	Path deceleration, change time	+	-
K-0-0016	Project identification number	+	+
K-0-0019	Kinematic type	+	+
K-0-0020	Kinematic diagnostic message	+	+
K-0-0021	Kinematic status	+	+
K-0-0022	Extended kinematic status	+	+
K-0-0023	Kinematic diagnostic number	+	+
K-0-0031	Transformation scheme	+	+
K-0-0032	Referencing of axes, command configuration	+	-
K-0-0033	IPOS, update at coordinate change	+	-
K-0-0034	Maximum path acceleration (bipolar)	-	+
K-0-0035	Maximum path jerk (bipolar)	-	+
K-0-0036	MCS axis monitoring	+	-
K-0-0040	Transformation, lengths of the mechanics	+	+

Overview table

Ident. No.	Parameter name	V1	V2
K-0-0041	Transformation, factors	+	+
K-0-0042	Offset of BCS system	+	+
K-0-0043	Assignment list of workpiece coordinates	+	-
K-0-0045	Tool selection	+	-
K-0-0050	Distance units MCS	+	+
K-0-0051	Velocity units MCS	+	+
K-0-0052	Acceleration units MCS	+	+
K-0-0053	Jerk units MCS	+	+
K-0-0054	Measuring unit for kinematic data	+	+
K-0-0070	Belt number of kinematics	+	+
K-0-0071	Coupling factors, belt 1	+	-
K-0-0072	Coupling factors, belt 2	+	-
K-0-0073	Coupling factors, belt 3	+	-
K-0-0074	Coupling factors, belt 4	+	-
K-0-0080	Jogging, distance short in MCS	+	-
K-0-0081	Jogging, distance long in MCS	+	-
K-0-0082	Jogging, velocity low in MCS	+	-
K-0-0083	Jogging, velocity high in MCS	+	-
K-0-0084	Jogging, acceleration in MCS	+	-
K-0-0085	Jogging, deceleration in MCS	+	-
K-0-0086	Jogging, acceleration jerk in MCS	+	-
K-0-0087	Jogging, deceleration jerk in MCS	+	-
K-0-0096	Peak value of command buffer size	-	+
K-0-0097	Maximum command buffer size	-	+
K-0-0098	Current command buffer size	-	+
K-0-0099	Kinematic configuration	+	+
K-0-0100	Current position, Cartesian Machine Coordinate System	+	+
K-0-0102	Current path velocity	+	+
K-0-0103	Current path acceleration	+	+
K-0-0104	Current path jerk	+	+
K-0-0105	Actual position, Cartesian Workpiece Coordinates	+	-
K-0-0106	Coordinate values of tool	+	-
K-0-0107	Coordinate values of workpiece	+	-
K-0-0121 ...	Coordinate name C1 ...	+	-
K-0-0136	Coordinate name C16	+	-
K-0-0140	Tool name	+	-

Overview table

Ident. No.	Parameter name	V1	V2
K-0-0141	Workpiece name	+	-
K-0-0150	Interpolated command position	+	+
K-0-0152	Interpolated path velocity	+	+
K-0-0153	Interpolated path acceleration	+	+
K-0-0154	Interpolated path jerk	+	+
K-0-0155	Safe zones on/off	+	-
K-0-0156	Safe zone 1 min. point	+	-
K-0-0157 ...	Safe zone 1 max. point ...	+	-
K-0-0218	Safe zone 32 min. point	+	-
K-0-0219	Safe zone 32 max. point	+	-
K-0-0220	File transfer name	+	-
K-0-0221	File name to be compiled	+	-
K-0-0223	Selection of error reaction	-	+
K-0-0224	Emergency halt deceleration	-	+
K-0-0225	Emergency halt jerk	-	+
K-0-0240	Feedrate override	+	+
K-0-0241	Feedrate override control word	+	+
K-0-0242	Acceleration override	+	+
K-0-0243	Deceleration override	+	+
K-0-0250	Continuous slope lead time	+	+
K-0-0815	Odometer	-	+
K-0-1000	Command: Load basic kinematic parameters	+	+
K-0-1060	Command: Load file from CF	+	-
K-0-1061	Command: Save file to CF	+	-
K-0-1062	Command: Compile file to MLC	+	-
K-0-2100	List of all backup operation K-parameters	+	+
K-0-2200	Programmed position 1 (active)	+	-
K-0-2201	Programmed position 2 (active)	+	-
K-0-2202	Type of actively programmed position	+	-
K-0-2203	Interpolation type	+	-
K-0-2204	Currently active QLL file name	+	-
K-0-2205	Currently active line number	+	-
K-0-2300	PLC bit input (RCL)	+	-
K-0-2301	PLC integer input (RCL)	+	-
K-0-2302	PLC floating point input (RCL)	+	-

V1 Robot Control V1

Overview table

V2	Robot Control V2

Tab. 3-15: Overview of available K-parameters

3.9 Overview: Trace Parameters

The following parameters support the "Trace" function of the IndraLogic XLC/ IndraMotion MLC.

C-0-0670, List of active trace modules
C-0-0671, Trace, storage settings
C-0-0672, Save trace after this DSH message
C-0-0673, Save trace in DSH message mask
C-0-0674, Save trace after specified time
C-0-0675, Save trace under this file name
C-0-0676, Percentage of trace data saved after trigger signal
C-0-1060, Command: Save all trace recordings
C-0-1061, Command: Unlock all trace buffers

3.10 Overview: Touch Probe Parameters

The M-parameters represent the data set for one touch probe function.

Addressing takes place as for axes and controls:

M001...M100 for the respective touch probe function and the desired parameter, that is

M002: M-0-0021: Touch probe 2, status.

Suitable control inputs:

- 8 onboard inputs,
- 64 fast I/O inputs.

Since one input can be used for several touch probe functions, 100 touch probe functions is an arbitrary limitation.

Common C-parameters for all touch probes

- C-0-2499, Touch probe, IDN list signal selection



The parameter attribute "Touch probe" indicates whether a parameter is intended for the signal selection.

M parameter dataset for each touch probe

M-0-0001, Logic touch probe number
M-0-0002, Touch probe name
M-0-0005, Input selection
M-0-0006, Signal selection
M-0-0007, Control word

Overview table

M-0-0009, Osci: list of all M-parameters that can be oscilloscoped
M-0-0010, List of all M-parameters
M-0-0016, Project identification number
M-0-0021, Status word
M-0-0024, Command: Activation
M-0-0130, Measured value, positive edge
M-0-0131, Measured value, negative edge
M-0-0132, Difference value
M-0-0133, Time difference
M-0-0140, Time stamp, positive edge
M-0-0141, Time stamp, negative edge
M-0-0200, Dead-time compensation, positive edge
M-0-0201, Dead-time compensation, negative edge
M-0-0202, Starting position of the expectation window, positive edge
M-0-0203, End position of the expectation window, positive edge
M-0-0204, Starting position of the expectation window, negative edge
M-0-0205, End position of the expectation window, negative edge
M-0-0206, Maximum number of marker failures
M-0-0224, Number of marker failures, positive edge
M-0-0225, Number of marker failures, negative edge
M-0-0401, Input status
M-0-0405, Enabling
M-0-0409, Counter of measured values, positive edge
M-0-0410, Counter of measured values, negative edge
M-0-0411, Counter of difference values
M-0-1000, Command: Load basic touch probe parameters
M-0-2100, List of all backup operation M-parameters

☞ The parameter numbers are selected following the IndraDrive parameter numbers.

3.11 Overview: Programmable Limit Switches PLS (CFL01.1-N1), N-Parameters

☞ This programmable limit switch can only be used for IndraMotion MLC L25, L45, L65.

The following table shows the substitution of the C-parameters for the four possible programmable limit switches PLS (CFL01.1-N1) by N-parameters.

Overview table

The N-parameters display the data set for one programmable limit switch each.

Addressing takes place as for axes and controls:

N001...N004 for the respective programmable limit switch and the desired parameter, instead of

C-0-0325 now **N002: N-0-0300**.

N-parameters	Previous parameterization using C-parameters			
	PLS01	PLS02	PLS03	PLS04
N-0-0001, Logical switch track number	-	-	-	-
N-0-0002, Switch track name	-	-	-	-
N-0-0009, Osci: list of all N-parameters that can be oscilloscoped	-	-	-	-
N-0-0010, List of all N-parameters	-	-	-	-
N-0-0016, Project identification number	-	-	-	-
N-0-0300, Control word	C-0-0300	**C-0-0325**	C-0-0350	C-0-0375
N-0-0302, Signal selection	C-0-0302	C-0-0327	C-0-0352	C-0-0377
N-0-0303, Control signals	C-0-0303	C-0-0328	C-0-0353	C-0-0378
N-0-0304, Outputs	C-0-0304	C-0-0329	C-0-0354	C-0-0379
N-0-0305, Internal registers	C-0-0305	C-0-0330	C-0-0355	C-0-0380
N-0-0307, Reference axis configuration	C-0-0307	C-0-0332	C-0-0357	C-0-0382
N-0-0308, Reference axis position, additive	C-0-0308	C-0-0333	C-0-0358	C-0-0383
N-0-0309, Reference axis definition	C-0-0309	C-0-0334	C-0-0359	C-0-0384
N-0-0310, Hysteresis	C-0-0310	C-0-0335	C-0-0360	C-0-0385
N-0-0311, Lead time when switching on	C-0-0311	C-0-0336	C-0-0361	C-0-0386
N-0-0312, Lead time when switching off	C-0-0312	C-0-0337	C-0-0362	C-0-0387
N-0-0313, Switch track number	C-0-0313	C-0-0338	C-0-0363	C-0-0388
N-0-0314, Switch-on position of switch track	C-0-0314	C-0-0339	C-0-0364	C-0-0389
N-0-0315, Switch-off position of switch track	C-0-0315	C-0-0340	C-0-0365	C-0-0390
N-0-0316, Command: Initialize switch track	C-0-0316	C-0-0341	C-0-0366	C-0-0391
N-0-0317, Command: Activate switch track	C-0-0317	C-0-0342	C-0-0367	C-0-0392
N-0-0318, Output mode	C-0-0318	C-0-0343	C-0-0368	C-0-0393
N-0-0319, Switch-on duration	C-0-0319	C-0-0344	C-0-0369	C-0-0394
N-0-1000, Command: Load basic PLS parameters				
N-0-2100, list of all backup operation N-parameters				

Tab. 3-16: Parameter comparison

3.12 Overview: XLC/MLC Oscilloscope Parameters

The O-parameters represent the data set for one oscilloscope function each.

Addressing takes place as for axes and controls:

Overview table

O001...O128 for the corresponding oscilloscope function and the desired parameter, that is

O002: O-0-0010, List of all O-parameters, Oscilloscope function 2.

Common C-parameters for all oscilloscope functions

C-0-0800, Oscilloscope, status word
C-0-0801, Oscilloscope, time resolution
C-0-0802, Oscilloscope, memory depth
C-0-0803, Oscilloscope, signal selection list
C-0-0804, Oscilloscope, number of valid values
C-0-0805, Oscilloscope, control word
C-0-0806, Oscilloscope, number of channels
C-0-0807, Oscilloscope, sample time stamp
C-0-0820, Oscilloscope, sample task selection
C-0-0821, Oscilloscope, sample task interval
C-0-0822, Oscilloscope, sample task task ID
C-0-0825, Oscilloscope, sample task status
C-0-0830, Oscilloscope, IEC sample task 00
C-0-0831, Oscilloscope, IEC sample task 01
C-0-0832, Oscilloscope, IEC sample task 02
C-0-0833, Oscilloscope, IEC sample task 03
C-0-0834, Oscilloscope, IEC sample task 04
C-0-0840, Oscilloscope, system sample task 00
C-0-0841, Oscilloscope, system sample task 01
C-0-0850, Oscilloscope, trigger mask
C-0-0851, Oscilloscope, trigger signal
C-0-0852, Oscilloscope, trigger threshold
C-0-0853, Oscilloscope, trigger edge
C-0-0854, Oscilloscope, number of measured values after trigger event
C-0-0855, Oscilloscope, trigger time stamp
C-0-0856, Oscilloscope, external trigger signal
C-0-0857, Oscilloscope, internal trigger signal
C-0-0858, Oscilloscope, AUX trigger path
C-0-0859, Oscilloscope, AUX trigger
C-0-0860, Oscilloscope, default trigger

O parameter data set for every oscilloscope function

O-0-0001, Logical channel number
O-0-0002, Channel name

Overview table

O-0-0003, Signal selection
O-0-0004, Measured value list
O-0-0005, AUX signal path
O-0-0006, AUX signal
O-0-0009, Osci: list of all O-parameters that can be oscilloscoped
O-0-0010, List of all O-parameters
O-0-0016, Project identification number
O-0-0021, Channel status
O-0-1000, Command: Load basic oscilloscope parameters
O-0-2100, list of all backup operation O-parameters

Lists of parameters that can be oscilloscoped

A-0-0009, Osci: list of all A-parameters that can be oscilloscoped
C-0-0009, Osci: list of all C-parameters that can be oscilloscoped
K-0-0009, Osci: list of all K-parameters that can be oscilloscoped
M-0-0009, Osci: list of all M-parameters that can be oscilloscoped
N-0-0009, Osci: list of all N-parameters that can be oscilloscoped
O-0-0009, Osci: list of all O-parameters that can be oscilloscoped

4 Describing individual parameters, arranged according to types

4.1 Axis parameters (A-parameters)

4.1.1 Axis Parameters, General Information

The systems

- IndraLogic XLC L25, L45, L65 with onboard sercos III bus,
- IndraMotion MLC L25, L45, L65

support various sercos-based drive and axis types.

For the drive types of the IndraDrive and HydraulicDrive family 12VRS or higher, it can be calculated in the drive and in the control. This provides the following options for the real axis:

- **IndraDrive/Control:** IndraDrive, calculation in the control,
- **IndraDrive/Drive:** IndraDrive, calculation in the drive,
- **SercosDrive:** (Third-party) drive meeting the requirements of the PackProfile specification; calculation in the control,
- **HydraulicDrive/Control:** HydraulicDrive, calculation in the control,
- **HydraulicDrive/Drive:** HydraulicDrive, calculation in the drive,

Example:

Use cases

The user wants to

1. use the options of the cams saved in the drive on an IndraDrive ⇒ IndraDrive, calculation in the drive, PLCopen: MC_CamIn.
2. use the option of the FlexProfile with the point tables saved in the control on an IndraDrive ⇒ IndraDrive, calculation in the control, PLCopen: ML_FlexProfile.
3. use the options of the FlexProfile with point tables saved in the control on a (third-party) drive, which meets the requirement of the PackProfile specification, ⇒ SercosDrive, calculation on the control, PLCopen: ML_FlexProfile, the limited PackProfile parameter set is used for transfer.

☞ When using an IndraDrive (irrespective of where the calculation takes place), the complete diagnostic system of the IndraMotion MLC is provided to the user.

When using a SercosDrive, only the error collection message is available. This applies as well if an IndraDrive is used as SercosDrive!

One part of the following axis parameters is required for these drive or axis types:

Supports:

+	axis parameter is available for the drive type/axis type/calculation location
-	axis parameter is not available

Describing individual parameters, arranged according to types

A part of the A-parameters is not used by kinematics. These parameters are marked with "+" supproted or "-" not supported for Robot Control V1 or Robot Control V2.

See also "Axis-specific parameters" on page 66.

Access the **operating date of this parameter** via the simplified, blocking instruction "function variable access" (alias "direct variable").

A function variable call is executed as blocking and can require different periods according to its characteristics, for example, its axis type.

The indexed, blocking access is executed with the instruction:

```
UserVariable:= DV_Axis[AxisNo].A_0_0000;
```

or

```
DV_Axis[AxisNo].A_0_00000:= UserVariable;
```

Direct access:

RO	Read access
RW	Read and write access
--	No access

Access the **operating date synchronized in the C2C link** via the simplified, blocking instruction "function variable access" (alias "direct variable").

A function variable call is executed as blocking and can require different periods according to its characteristics, for example, its axis type.

The indexed, blocking access is executed with the instruction:

```
UserVariable:= GV_LinkAxis[CtrlNo, AxisNo].A_0_0021;
```

The indexed, blocking access with CtrlNo equal to LOCAL_CTRL accesses the synchronized operating data of the local control in the C2C link.

This access is equivalent to the indexed, blocking access with CtrlNo equal to C-0-0031.

C2C access:

RO	Read access
RW	Read and write access
--	No access

Oscilloscope:

+	Parameter can be oscilloscoped for the concrete axis type
-	Parameter cannot be oscilloscoped for the concrete axis type

Touch probe:

+	Parameter can be used as signal source for a concrete touch probe
-	Parameter cannot be used as signal source for a concrete touch probe

The minimum, maximum and initial values can also vary for the axis types.

Describing individual parameters, arranged according to types

The line "General" usually shows the common data and the line "HydraulicDrive" shows the exception.

The A-parameters to be processed further in the drive have to be transferred to the corresponding S- or P-parameters or distributed to several S- and/or P-parameters. Since this is different for the various drive types, these specifications complete the parameter attributes.

Transferring A-/C-parameters to S-/P-Parameters for

- IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Drive) on page 760
- IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Control) on page 757
- SercosDrive: A/C ==> S-/P-Parameters, page 766
- HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Drive) on page 772
- HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Control) on page 769

4.1.2 A-0-0000 - A-0-0499

A-0-0000, Dummy, A-parameter

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RW	RW	RW	RW	RW	RW	RW	RW	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function A parameter serves as a placeholder; it does not have a function. A parameter can be described and read cyclically.

Use Measure down time for writing and reading.

A-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0001, Logic axis number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter shows the actual logical axis number.

A-0-0001 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0002, Axis name

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function A descriptive name text for the axis can be stored in this parameter (e.g., swivel axis). It has no functional significance.

Describing individual parameters, arranged according to types

A-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Axis_name"
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0142
IndraDrive/ Control:	S-0-0142
HydraulicDrive/ Drive:	S-0-0142
HydraulicDrive/ Control:	S-0-0142
SercosDrive:	S-0-0142

A-0-0004, Axis type

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter contains information about the type of axis and its configuration.

Structure

Bit	Name/function
0	**Interpolation method** 0: Interpolation in the drive 1: Interpolation in the control
1	**Telegram configuration** 0: Device-specific 1: PackProfile-compliant
2	**Drive type (only valid for real axes)** 0: Electric 1: Hydraulic
7..3	**Axis types** 00001: IndraDrive / HNC axis / SercosDrive 00010: Virtual axis 00100: Encoder axis 01000: Link axis 10000: Controller axis

Describing individual parameters, arranged according to types

Bit	Name/function
4..9	Reserved
10	Reserved
11	**Operation mode Velocity control** 0: Not available / not configured 1: Available
12	**Operating mode position control** 0: Not available / not configured 1: Available
13	**Operation mode Torque/force control** 0: Not available / not configured 1: Available
14	**Synchronization modes** 0: Not available / not configured 1: Available
15	**Parameterization level support** 0: Parameterization level is not supported 1: Parameterization level is supported

Use

Representing the axis type (Bit 7...3)

- 16#08 IndraDrive / HydraulicDrive / SercosDrive
- 16#10 Virtual axis
- 16#20 encoder axis
- 16#40 link axis
- 16#80 controller axis.

Parameterization level support

Irrespective of the control and communication phase, devices can be configured via the parameterization level.

Thus, axes can be moved further, the I/Os can continue to exchange cyclic data and the PLC program keeps running.

Thus, these devices support two modes:

Parameterization mode

- In the parameterization mode, all device parameters - that are not write-protected - can be changed. This does not apply to communication partners such as configuration, timing or user-defined data containers.
- If a device is in the parameterization mode, it remains irrespective of the communication phase.

Operating mode

- Only parameters without write protection in this mode can be changed in the operating mode.
- The parameter crosscheck is performed when switching from parameterization to operating mode.
- The adjustment of A- to S-/P-parameter is executed.

Switching the modes

- For **one** device, switching between the two modes is controlled using the parameter "A-0-0024, Axis state".
- To switch **multiple** devices, the parameter "C-0-1070, Command: PM/OM switching" executed.

  The devices are selected using "A-0-0004 Axis type, bit 15".
- To switch an axis, it has to be in the "Standstill“ state.

  The real axis has to be in the "Power off“ state.

  An axis in the parameterization mode cannot be traversed.

A-0-0004 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0005, Drive address

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	+	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the drive address configured for the axis. The drive is assigned via this axis address.

Use

IndraDrive/HydraulicDrive/SercosDrive

0: Invalid drive address,

1..99: Drive addresses.

Encoder axis

0: Invalid drive address,

1..99: Encoder drive addresses.

Describing individual parameters, arranged according to types

A-0-0005 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0006, Drive type

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	+	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter shows the detected drive type.

Use Possible entries are:

- "SercosDrive"
- "IndraDrive, Interpolation Drive"
- "IndraDrive, Interpolation Control"
- "HydraulicDrive, Interpolation Drive"
- "HydraulicDrive, Interpolation Control"
- "IndraDrive, Encoder"
- "SercosDrive, Encoder"

A-0-0006 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Drive not in ring"
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0007, Axis configuration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Structure

The axis configuration is set in this parameter.

Bit	Name/function
0	**Lag error** 0: Position control with lag error is specified for the axis 1: Position control without lag error is specified for the axis
1	**Position control via encoder 1 or 2 (refer to bit 13)** 0: Position control via encoder 1 (motor encoder) 1: Position control via encoder 2 (external encoder)
2	**Disabling Torque (only IndraDrive and HydraulicDrive)** 0: Torque is enabled, the function block MC_TorqueControl can be used 1: Torque is disabled, the function block MC_TorqueControl cannot be used
3	**Extending the position command value interface (only IndraDrive and HydraulicDrive)** 0: Disabled (transmitting S-0-0047 to MDT) 1: Enabled (transmitting S-0-0047 and P-0-0100 to MDT)
4	**Synchronization settings for A-0-0242 / A-0-0243 (only IndraDrive and HydraulicDrive with interpolation in the control)** 0: A-0-0242/A-0-0243 are overwritten with A-0-0034 and A-0-0032/A-0-0033. 1: A-0-0242/A-0-0243 can be set individually by the user. No synchronization with A-0-0034 and A-0-0032/A-0-0033.
5	**Mode "selection of drive modes" (only IndraDrive and HydraulicDrive with interpolation on the control)** 0: Automatic selection of the drive mode for the PLCopen function block "MC_Stop" by the control firmware 1: Manual selection of the drive mode for the PLCopen function block "MC_Stop" via bit 6

Describing individual parameters, arranged according to types

Bit	Name/function
6	**Selection of the drive mode for the PLCopen function block "MC_Stop"** 0: Drive ramps in velocity control 1: Drive ramps in position control
7	Reserved
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Reserved
13	**Hybrid position control** 0: Position control via encoder 1 or 2 (see A-0-0007 bit 1) 1: Position control via encoder 1 and 2 (hybrid)
14	Reserved
15	Reserved
31..16	Reserved

☞ In case of HydraulicDrives, bit 1 (position control via encoder 1 or 2) cannot be configured on position control via encoder 2 (external encoder).

A second encoder is not supported.

A-0-0007 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x01
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0032, S-0-0033, S-0-0034, S-0-0035, S-0-0284, S-0-0285, S-0-0286, S-0-0287
IndraDrive/ Control:	S-0-0032, S-0-0033, S-0-0034
HydraulicDrive/ Drive:	S-0-0032, S-0-0033, S-0-0034, S-0-0035, S-0-0284, S-0-0285, S-0-0286, S-0-0287
HydraulicDrive/ Control:	S-0-0032, S-0-0033, S-0-0034
SercosDrive:	S-0-0032

Describing individual parameters, arranged according to types

A-0-0008, Link axis, master axis selection

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	-	+	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The link participant's control address is defined and the master axis - of the two master axes available - required by the link participant is set in this parameter.

The parameter is a list parameter with the following structure:

- Element 1: control address selection
- Element 2: master axis selection

Structure

Control address selection:

1...64: a link participant's control address

The following maximum values are permitted for the control address, depending on the link cycle time (C-0-0700, C2C, cycle time (Tcyc), command value). This maximum value is checked when switching into operating mode:

Link cycle time	Maximum control address
2000 µs	16
4000 µs	32
8000 µs	64

Tab. 4-1: Maximum control address

Master axis selection:

Master axis A (element 2=1): corresponds to the first axis in the link data of the selected link participant.

Master axis B (element 2=2): corresponds to the second axis in the link data of the selected link participant.



The axis addresses of the master axis in the link do not generally correspond to the local addresses of the master axis in the selected link participant. In this case, master axis A and B and are explicitly specified for this purpose.

A-0-0008 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0009, Osci: list of all A-parameters that can be oscilloscoped

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter contains the list of all A-parameters which can be oscilloscoped.

A-0-0009 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0010, List of all A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function This list includes all A parameters of the axis. The entries are in ID number format.

The entries are sorted according to definition and how they belong together, but not according to ID number or alphabetically.

The A parameters of the axis are stored in the order of these entries.

Structure

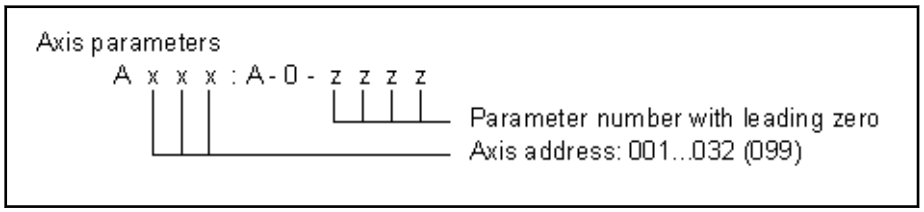


Fig. 4-1: ID number format of an A parameter

Use A001: A-0-0004 - axis 1; parameter A-0-0004.

A-0-0010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0011, List of all invalid A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list shows the all A parameters which are detected as illegal

- during the MLC checksum test, e.g., following a firmware update, or
- during the MLC plausibility test, e.g., as a result of an illegal operating mode.

The entries are in ID number format.

Describing individual parameters, arranged according to types

Structure

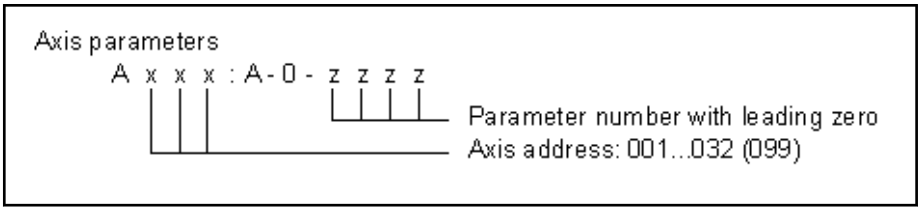


Fig. 4-2: ID number format of an A parameter

Use A001: A-0-0004 - axis 1; parameter A-0-0004.

A-0-0011 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x0	0x100000FFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0012, Checksum of all A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function When reading this parameter the checksum is generated by all A parameter values the IDNs of which are listed in parameter "A-0-0013, IDN list of checksum A parameter".

A-0-0012 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0013, IDN list of checksum A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The IDNs of those A parameters the checksum of which is to be generated are entered in this parameter.

The checksum generation is triggered with the reading of the "A-0-0012, Checksum of A parameters ". In the condition as supplied this does not yet contain any IDNs.

Structure

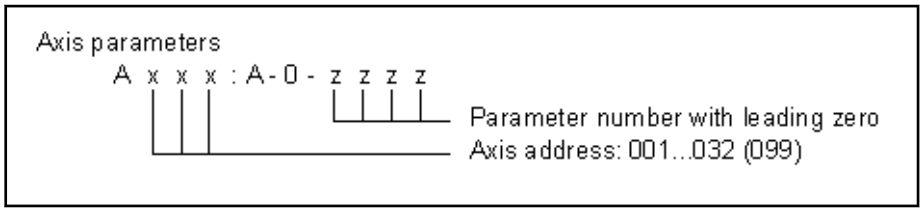


Fig. 4-3: ID number format of an A parameter

Use

A001: A-0-0004 - axis 1; parameter A-0-0004.

A-0-0013 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4095	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0014, List of incorrect synchronized A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list displays all A-parameters that cannot be transferred to the desired S-parameters.

Example:

The scaling was changed and therefore, the value range also changed. The A-parameters no longer match the new range.

Structure The entry is made in ID number format.

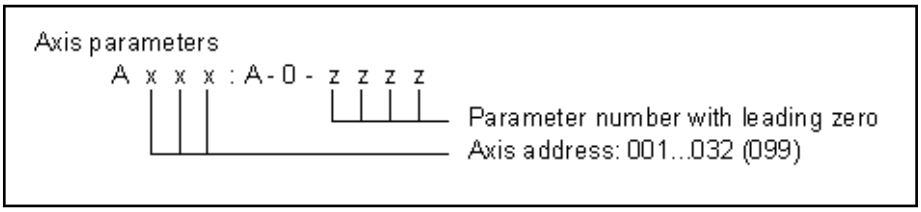


Fig. 4-4: ID number format

Use A001: A-0-0004 - axis 1; parameter A-0-0004.

A-0-0014 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0016, Project identification number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

IndraWorks generates a unique character string in this parameter for the global identification of the project. The character string is unique for each project.

The parameter does not affect the control's function.



This parameter is only intended for internal use.

A-0-0016 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Project ID number"
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0018, Control word of controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter defines the material control information of the controller of a controller axis, like e.g.:

- controller release
- drive halt

Describing individual parameters, arranged according to types

Structure

- selection of the target operating mode.

Bit	Designation/ function
7..0	reserved
9..8	**Target operating mode:** 00 - Position control, follows "A-0-0150, interpolated position" 01 - Force control, follows "A-0-0156, interpolated force" 10 - Velocity control, follows "A-0-0152, interpolated velocity" 11 - Direct valve control, follows "A-0-0158, interpolated analog direct value"
12..10	reserved
13	**Drive halt:** 1-0 change, stopping the drive, only possible if bit 14 = 1 and bit 15 = 1.
14	**Drive release:** 1-0 change, instantaneous torque shut-down, irrespective of bit 15 or bit 13.
15	**Drive On:** 1-0 change, best shut-down possible, only possible if bit 14 = 1
32..16	reserved

Use

The parameter will be generated by the control in each cycle. The value can be accessed via direct variable in "ML_AXISDATA".

A-0-0018 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0019, Status word of controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter defines the relevant status information of a controller axis.

Structure

Bit	Name/function
2..0	Reserved
3	**Status of command value processing:** 0 - Command values are not processed, 1 - Command values are processed,
7..4	Reserved
10..8	**Actual operation mode:** 000 - HBA, position control 001 - NBA1, force control 010 - NBA2, velocity control 011 - NBA3, direct valve control 100 - NBA4, reserved 101 - NBA5, reserved 110 - NBA6, reserved 111 - NBA7, reserved
11	Reserved
12	State bit of state class 2, warning
13	State bit of state class 1, error
15..14	**Readiness:** 00 - Not ready for power on 01 - Ready for power on ("bb") 10 - Controller system ready ("Ab") 11 - In operation (e.g. "AF")
18..16	Reserved
19	Actual position value is relative/referenced
32..20	Reserved

Use

The controller status word can be written from a PLC program via the function block ML_ControlWriteActualData.

Describing individual parameters, arranged according to types

A-0-0019 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0020, Axis diagnostic message

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter contains the current diagnostics message of the axis (message, warning or error).

If bit 8 or bit 9 of the "A-0-0021, Axis status " parameter is set to 1, this parameter contains either the warnig text (bit 8) or the error text (bit 9).

A-0-0020 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"No messages now available"
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0021, Axis status

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter describes the current value of the axis status.

Structure

Bit	Name/function
0	Active CAM table, bit 0
1	Active CAM table, bit 1
2	Active CAM table, bit 2
3	Cam, distance enabled/applied
4	Commanded axis command velocity = current axis command velocity (interpolation in the control) Commanded axis command velocity = current actual axis velocity (interpolation in the drive)
5	Axis velocity lower than/equal to A-0-0222 (standstill)
6	Commanded axis command position = current axis command position (interpolation in the control) Commanded axis command position = current actual axis position (interpolation in the drive)
7	Axis is synchronized
8	Axis indicates warning
9	Axis indicates error
10	Actual position value is relative/referenced
11	Axis torque/force command value = actual value
12	Axis is in operating mode (P4)
13	bb - Ready for power on
14	Ab - Control and power element ready
15	AH_AF - "Drive Halt", "Drive enabled"
16	Reserved
17	Error reaction enabled
18	Cyclic position command value channel open
19	Master phase offset reached
20	Cyclic force command value channel open
21	Cyclic velocity command value channel open

Describing individual parameters, arranged according to types

Bit	Name/function
22	Cyclic analog value channel open
23	Communication via Sercos III NRT
24	Command value processing interrupted
25	PLC parameter system active
26	Reserved
27	Command value specification affected by PLC program
28	Position data in modulo format
29	Position data is rotarily scaled
30	Position data of the (external) master axis is valid
31	Command value decoupling active

☞ Only bit 5 and bit 10 are supported for encoder axes and link axes.

Use

Bit 2...0:

The drive uses the bits 0/1 of this parameter to report from which cam table the table values are used.

- 000 - Cam 1 active, (P-0-0072)
- 001 - Cam 2, active, (P-0-0092),
- 010 - Cam 3, active, (P-0-0080),
- 011 - Cam 4, active, (P-0-0081),
- 100 - Cam 5, active, (P-0-0782),
- 101 - Cam 6 , active, (P-0-0783),
- 110 - Cam 7 , active, (P-0-0784),
- 111 - Cam 8 , active, (P-0-0785).

☞ Currently, only the cams 1-4 are supported by the control firmware.

Bit 3:

Distance enabled/applied, copy of bit "P-0-0089, Status word for synchronous operation modes, bit 5" from the drive

Bit 4:

Axis command velocity = actual axis velocity

For any velocity command value, " "A-0-0102, Actual velocity value" is in the range specified by " "A-0-0223, Velocity window".

Bit 5:

"A-0-0102, Actual velocity value" less than/equal to " "A-0-0222, Standstill window".

For the velocity command value 0, " "A-0-0102, Actual velocity value" is in the range specified by " "A-0-0222, standstill window".

Bit 6:

Commanded axis command position = current axis command position (interpolation in the control)

"A-0-0150, Interpolated position" reached the commanded value.

Commanded axis command position = current actual axis position (interpolation in the drive)

For any commanded command position, " "A-0-0100, Actual position value" is in position in the range specified by " "A-0-2795, Positioning window".

Bit 7:

Axis is synchronized.

The axis follows the master (master axis) in the closed-loop velocity control (MC_GearIn) or in the position control (MB_GearInPos).

Bit 8:

Axis indicates warning

During operation, the drive controller performs monitoring tasks. Some monitoring tasks depend on the operation mode and/or the parameter settings. If it detects a state in which proper operation is still possible, but which remains and leads to an error as the operation progresses, a warning is output.



Some warnings do not lead to an error if ignored.

Bit 9:

Axis indicates error

Depending on the operation mode and several parameter settings, the drive controller monitors. If it detects a state in which proper operation is no longer possible, the drive controller outputs an error message.

Bit 10:

0 - Actual position value is relative

1 - Actual position value is referenced

Bit 11:

Torque/force command value = Actual torque/force value

The actual torque/force value of a (hydraulic) drive is equivalent to the specified torque/force command value.

Bit 12:

Axis is the operating mode (P4)

Bit 13:

"bb" - Axis is ready for power on

The diagnostics "A0000013, Ready to connect power" signals that control voltage is present at the drive.

The drive is ready for power on.



This state is indicated on the drive control panel with "bb" (ready for operation).

If an error (bit 9) or a warning (bit 8) is present, this message is displayed with priority.

Bit 14:

"Ab" - Control and power element ready

The diagnostics "A0000012, Control and power element ready" indicates that the drive is supplied with control voltage and that the power is connected. The drive is ready for power output.

Describing individual parameters, arranged according to types



This state is indicated on the drive control panel with "Ab" (drive ready).

If an error (bit 9) or a warning (bit 8) is present, this message is displayed with priority. The error or warning can impede the requested power output.

Bit 15:

"AH_AF" - Drive Halt, Drive Enabled

The drive outputs power. That means that it is under torque.

The "Drive Halt" function sets an axis with a defined acceleration and jerk to standstill.

"Drive enabled" means that the drive is enabled in the desired operation mode. Diagnostics (A0000100...A0000211)

Bit 17:

Error reaction active

The axes are stopped with the set deceleration according to the parameter " "A-0-0224, Rapid stop deceleration". While ramping down, the bit is active, the axes are set to standstill and it is set to zero.

Bit 18:

Cyclic position command value channel open

A cyclic position command value channel was opened for the axis with the "ML_OpenCyclicPositionChannel" function block.

Bit 19:

Master phase offset reached

The phase offset entered at the MB_Phasing function block was reached.

Bit 20:

Cyclic force command value channel open

A cyclic force command value channel was opened for the axis with the "ML_OpenCyclicTorqueChannel" function block.

Bit 21:

Cyclic velocity command value channel open

A cyclic velocity command value channel was opened for the axis with the "ML_OpenCyclicVelocityChannel" function block.

Bit 22:

Cyclic analog command value channel open

A cyclic position command value channel was opened for the axis with the "ML_OpenCyclicAnalogChannel" function block. This channel is only available for HNC100-3x.

Bit 23:

Communication via Sercos III NRT

Parameter queries to the drive via sercos III NRT.

Bit 24:

Command value processing interrupted. There can be superordinate drive functions in the drive interrupting a Motion command by a superordinate PLC, but usually not canceling the commanding. This bit indicates whether such a drive function (e.g. drive-controlled referencing) is enabled.

Bit 25:

PLC parameter system active

Bit 27:

The command values are affected or specified by the PLC program.

Bit 28:

0 - Absolute position data

1 - Position data in modulo format

Bit 29:

0 - Position data is translatorily scaled

1 - Position data is rotarily scaled

Bit 30:

Position data of the (external) master axis is valid

The external master axis produces parameter data into the C2C link according to the link command configuration (C-0-0778). This data is marked as valid if bit 30 is set. This status bit is handled analogously for local master axes.

Bit 31:

Command value decoupling active

For the axis, the command value decoupling was enabled using the axis state (A-0-0024). For real axes with interpolation in the control, the traversing commands are executed without the subsequent motion in the drive.

A-0-0021 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	AT Configuration
IndraDrive/ Control:	AT Configuration
HydraulicDrive/ Drive:	AT Configuration
HydraulicDrive/ Control:	AT Configuration
SercosDrive:	AT Configuration

A-0-0022, Extended axis status

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function This parameter describes the actual state of the axis based on the PLCopen state diagram. The single bits show the states of the state diagram.

Structure

Bit	Designation/function
0	Axis is in "Errorstop"
1	Axis is in "Stopping"
2	Axis is in "Homing"
3	Axis got power
4	Axis is in "Discrete Motion"
5	Axis is in "Continuous Motion"
6	Axis is in "Synchronized Motion"
7	Axis is in "StandStill"
8	Axis is in "Coordinated Motion"
9	Axis is in "Controlled Motion"
31..10	reserved

A-0-0022 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	AT Configuration
IndraDrive/ Control:	AT Configuration
HydraulicDrive/ Drive:	AT Configuration
HydraulicDrive/ Control:	AT Configuration
SercosDrive:	AT Configuration

A-0-0023, Axis diagnostic number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function If the bit 8 or the bit 9 of the parameter “A-0-0021, Axis status” is set to 1, this parameter shows the actual axis diagnostic number.

Describing individual parameters, arranged according to types

A-0-0023 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0390
IndraDrive/ Control:	S-0-0390
HydraulicDrive/ Drive:	S-0-0390
HydraulicDrive/ Control:	S-0-0390
SercosDrive:	---

A-0-0024, Axis state

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Use this parameter to change the axis states.

Possible axis states are:

- Active
- Parked
- Deactivated
- Command values processing switched on/off in the drive
- Parameterization mode

The following values result for the parameter due to the possible combinations of these states:

Value	Name/function
0	Axis is active (command value calculation in the control + command value processing in the drive)
1	Axis is parked
2	Axis is disabled
3	Not supported
4	Axis is enabled without command value processing in the drive
5	Axis is active with command value calculation in the control + drive is parked
6	Axis is active with command value calculation in the control + drive is disabled

Describing individual parameters, arranged according to types

Value	Name/function
7	Not supported
8	Axis in active in parameterization mode
9	Axis in parked in parameterization mode
10	Axis in disabled in parameterization mode
11	Not supported
12	Axis is enabled in parameterization mode without command value processing in the drive
13	Axis is active in parameterization mode with command value calculation in the control + drive is parked
14	Axis is active in parameterization mode with command value calculation in the control + drive is disabled

Setting the parameter affects the state of the connected drive. If the drive is connected to another axis at the same time, parameter A-0-0024 is adjusted in the second axis.

Use

Axis disabled:

If an axis is disabled, S- and P-parameters cannot be accessed. A-parameters can continue to be read or written. For a parked axis, all parameters remain accessible.

Axis parked:

If an axis is parked, the command "Parking axis" is triggered in the drive. For the functional description, refer to the drive help.

Command value decoupling:

The command value decoupling allows the execution of traversing commands for a (real) axis with interpolation in the control (command value calculation) but without a motion in the drive (without command value processing in the drive).

The calculated command value of the axis can be read out using the interpolated position of the control (A-0-0151).

In the axis states with command value decoupling, the actual position value of the axis (A-0-0100) does not follow.

Parameterization mode:

In the parameterization mode, the axis can be parameterized irrespective of the control phase (see below).

Restrictions:

Parked, disabled axes or axes in parameterization mode cannot be moved by the PLC.

The data in the AxisData structure is not updated.

If the parked or disabled axis in the parameter "C-0-0703, C2C, configuration of master axes" is configured, their data is marked as invalid in the network.

Special feature of the encoder axis

Axis 1: Real axis connected to drive 1

Axis 2: Encoder axis connected to drive 1

If parameter A00024 is changed in axis 1, the parameter in axis 2 is set at the same time.



If the command value decoupling is deactivated, the interpolated position of the control (A-0-0151) is set to the current actual value of the drive. This causes a position jump.

Describing individual parameters, arranged according to types



If a slave axis is following a master axis that is operating in a parked or disabled state when the command value decoupling is disabled, the error F2220231, "Invalid master axis data", is generated. Thus, all slave axes are to be decoupled before deactivating the command value decoupling.

Parameterization level support

Irrespective of the control and communication phase, devices can be configured via the parameterization level.

Thus, axes can be moved further, the I/Os can continue to exchange cyclic data and the PLC program keeps running.

Thus, these devices support two modes:

Parameterization mode

- In the parameterization mode, all device parameters - that are not write-protected - can be changed. This does not apply to communication partners such as configuration, timing or user-defined data containers.
- If a device is in the parameterization mode, it remains irrespective of the communication phase.

Operating mode

- Only parameters without write protection in this mode can be changed in the operating mode.
- The parameter crosscheck is performed when switching from parameterization to operating mode.
- The adjustment of A- to S-/P-parameter is executed.

Switching the modes

- For **one** device, switching between the two modes is controlled using the parameter "A-0-0024, Axis state".
- To switch **multiple** devices, the parameter "C-0-1070, Command: PM/OM switching" executed.

  The devices are selected using "A-0-0004 Axis type, bit 15".
- To switch an axis, it has to be in the "Standstill“ state.

  The real axis has to be in the "Power off“ state.

  An axis in the parameterization mode cannot be traversed.

A-0-0024 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	6	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0139
IndraDrive/ Control:	S-0-0139
HydraulicDrive/ Drive:	S-0-0139
HydraulicDrive/ Control:	S-0-0139
SercosDrive:	---

A-0-0026, Telegram error counter of the drive

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	+	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter counts all invalid drive bus slave telegrams (AT) in operation mode. If two ATs fail in direct succession, then error "F80B0004, Double AT missing" is generated.

The "AT error counter" only counts up to 65535 and then stands. It takes a while to reach this value, if a transmission has a great deal of interference.

Writing into it, resets the counter.

A-0-0026 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0027, Error counter of data loss

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	+	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter is only valid for sercos III. It indicates the number of data losses from a sercos III device to the master detected in the sercos III connection.

The counter stops at a maximum of 65535 and has no overflow.

Writing in this parameter does not influence the subordinate sercos III connection state machine.

A-0-0027 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0028, Travel range limit switch

Robot-Control V1: +, Robot-Control V2: +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter defines the signal behavior of the travel range limit switch inputs and the behavior of the drive with regard to exceeded travel ranges.

Describing individual parameters, arranged according to types

Structure

Bit	Function
0	**Signal behavior travel range limit switch inputs (real axes, only)** 0: not inverted, 24 V ⇒ travel range is exceeded, 1: inverted, 0 V ⇒ travel range is exceeded.
1	**Activation of travel range limit switch (real axes, only)** 0: no, 1: yes.
2	**Handling when travel range exceeded** 0: as error (acc. to error reaction), 1: as fatal warning (shutdown).
15..3	reserved

A-0-0028 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x07	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0090
IndraDrive/ Control:	P-0-0090
HydraulicDrive/ Drive:	P-0-0090
HydraulicDrive/ Control:	P-0-0090
SercosDrive:	---

A-0-0029, Position polarities

Robot-Control V1: -, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The following only applies to real axes:

The first four bits of this parameter can invert the polarities of the specified position data.

The polarities are switched outside the controlled system. That is at the input and output of the controlled system.

The parameter acts on the parameter S-0-0055 of the drive device.

Describing individual parameters, arranged according to types



The position polarity has to be specified at first commissioning of an axis before creating the machine zero point reference for measuring systems, since other actual position values result when changing the polarity.

For rotary (rotating) motors applies:

- Rotation of the motor output shaft in clockwise direction at positive position command value difference and positive polarity.

For linear motors apply:

- Motion of the primary component towards the cable connection side at positive position command difference and positive polarity.

See also: A-0-0048 and A-0-0049

Function

The software position limit value, "A-0-0030, Position limit value, positive" or "A-0-0031, Position limit value, negative" are activated or deactivated using bit 4 of this parameter.

Structure

Bit	Name/function
0	**Position command value** 0: Positive polarity 1: Negative polarity
1	**Position command value, additive** 0: Positive polarity 1: Negative polarity
2	**Actual position value 1** 0: Positive polarity 1: Negative polarity
3	**Actual position value 2** 0: Positive polarity 1: Negative polarity
4	**Position limit value** 0: Not active, 1: Active.
15..5	Reserved

A-0-0029 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0055
IndraDrive/ Control:	S-0-0055
HydraulicDrive/ Drive:	S-0-0055
HydraulicDrive/ Control:	S-0-0055
SercosDrive:	---

A-0-0030, Position limit value, positive

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

An axis's permitted travel range can be defined by the position limit values. The maximum allowed positive actual position value (positive traveling direction) in entered in this parameter.

The positive limit value is only active if all position data refers to the axis zero point, i.e. the axis is referenced"A-0-0021, Axis status, bit 10".

Use

If the "A-0-2200, Command position" of the axis is set outside the positive position limit value, the error bit in "A-0-0021, Axis status, bit 9" is TRUE and generates the error "F2112053, Command target position outside of travel range".

If the "A-0-0100, Actual position value" exceeds the "A-0-0030, Position limit value, positive" or the "A-0-0031, Position limit value, negative", the axis sets the error bit in the "A-0-0021, Axis status, bit 9" and generates the error "F2116029, Positive position limit value exceeded" or "F2116030, Negative position limit value exceeded".

See also Functional Description: "Position Limit Values".

A-0-0030 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	36000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0049
IndraDrive/ Control:	S-0-0049
HydraulicDrive/ Drive:	S-0-0049
HydraulicDrive/ Control:	S-0-0049
SercosDrive:	---

A-0-0031, Position limit value, negative

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

An axis's permitted travel range can be defined by the position limit values. The maximum allowed negative actual position value (negative travel direction) in entered in this parameter.

The negative limit value is only active if all position data refers to the axis zero point, i.e. the axis is referenced"A-0-0021, Axis status, bit 10".

Use

If the "A-0-2200, Command position" of the axis is set outside the negative position limit value, the error bit in "A-0-0021, Axis status, bit 9" is TRUE and generates the error "F2112053, Command target position outside of travel range".

If the "A-0-0100, Position value" exceeds the "A-0-0030, Position limit value, positive" or the "A-0-0031, Position limit value, negative", the axis sets the error bit in the "A-0-0021, Axis status, bit 9" and generates the error "F2116029, Positive position limit value exceeded" or "F2116030, Negative position limit value exceeded".

See also Functional Description: "Position Limit Values".

A-0-0031 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	-36000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0050
IndraDrive/ Control:	S-0-0050
HydraulicDrive/ Drive:	S-0-0050
HydraulicDrive/ Control:	S-0-0050
SercosDrive:	---

A-0-0032, Velocity limit value, positive

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter describes the maximum admissible velocity in the positive direction.

Use If the "A-0-0102, actual velocity value" exceeds the amount of the limit values "A-0-0032, velocity limit values, positive" or "A-0-0033, velocity limit value, negative", the axis sets the warning bit "A-0-0021, axis status, bit 8" and generates the warning "E0112063, velocity greater than limit value A-0-0032 / A-0-0033".

The entered value is used as the maximum value for velocity variables in the positive direction.

See also Functional DescriptionVelocity Limitation.



For an axis in state "Synchronized Motion", there is not limitation to the limit values. In this case, the warning "E0112064 slave axis, velocity greater than limit value (A-0-0032/ A-0-0033)" is generated.

A-0-0032 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0038
IndraDrive/ Control:	S-0-0038
HydraulicDrive/ Drive:	S-0-0038
HydraulicDrive/ Control:	S-0-0038
SercosDrive:	---

A-0-0033, Velocity limit value, negative

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter describes the maximum admissible velocity in the negative direction.

Use If the "A-0-0102, actual velocity value" exceeds the amount of the limit values "A-0-0032, velocity limit values, positive" or "A-0-0033, velocity limit value, negative", the axis sets the warning bit "A-0-0021, axis status, bit 8" and generates the warning "E0112063, velocity greater than limit value A-0-0032 / A-0-0033".

The entered value is used as the maximum value for velocity variables in the negative direction.

See also Functional DescriptionVelocity Limitation.

For an axis in state "Synchronized Motion", there is not limitation to the limit values. In this case, the warning "E0112064 slave axis, velocity greater than limit value (A-0-0032/ A-0-0033)" is generated.

A-0-0033 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	0.0	-1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0039, S-0-0091
IndraDrive/ Control:	S-0-0039, S-0-0091
HydraulicDrive/ Drive:	S-0-0039, S-0-0091
HydraulicDrive/ Control:	S-0-0039, S-0-0091
SercosDrive:	---

A-0-0034, Acceleration limit value, bipolar

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter describes the maximum admissible symmetric acceleration in both directions (acceleration and deceleration).

Use If the parameter"A-0-0103, Actual acceleration value" exceeds the parameter "A-0-0034, Acceleration limit value, bipolar", the axis sets the warning bit "A-0-0021, Axis status, bit 8" and generates the warning "E0112039, Maximum acceleration exceeded".

A-0-0034 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0138
IndraDrive/ Control:	S-0-0138, P-0-1203, P-0-1213
HydraulicDrive/ Drive:	S-0-0138
HydraulicDrive/ Control:	S-0-0138
SercosDrive:	---

A-0-0036, Jerk limit value, bipolar

Robot-Control V1: +, **Robot-Control V2:** +

Describing individual parameters, arranged according to types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter describes the maximum admissible acceleration change for each time interval (jerk) symmetrical in both directions (acceleration and deceleration).

This limit value counteracts the commanded jerk in the parameter "A-0-0216, Jerk".



The parameter limits the acceleration change for each time interval during "Drive hold" and for commands automatically generating position command values for themselves.

A value of "0" switches off the jerk limit value.

It is influenced by the parameter "A-0-0053, Scaling type for acceleration data".

A-0-0036 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0349
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0349
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0038, Torque/force limit value, bipolar

Robot-Control V1: +, **Robot-Control V2:** +

Describing individual parameters, arranged according to types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	+
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter can be used to limit the torque/force command value to maximum admissible values to protect mechanical components in the drive train.

The parameter acts in a bipolar way. That means that positive and negative command values are limited to the entered value. The limit affects the total of all torque command values. That is the total of the command value parts of the velocity controller output and the command value parts from the acceleration-dependent feedforwards ("S-0-0348, Acceleration feedforward gain"; velocity control loop: "P-0-1126, Acceleration feedforward").

The unit of "A-0-0038" depends on the scaling set.

See also Parameter Description "A-0-0050, Scaling type for torque/force data"



The effective limit value is displayed in "P-0-0049, Effective torque/force command value". This value can be limited via "A-0-0038" due to a smaller value in "P-0-0109, Peak torque/force limitation" or due to a current limitation by a respective amplifier or motor load.

If the drive should be provided with a lower torque during stationary mode (constant speed) than during accelerations, this can be achieved with the respective values of "S-0-0082, Torque/force limit value, positive" and "S-0-0083, Torque/force limit value, negative" in connection with the acceleration feedforward (S-0-0348 or P-0-1126).

The torque/force limit value, bipolar also affects the "C1300 command: Travel to fixed stop".

The value of "A-0-0038" is a criterion for acknowledging "C1300".

See also Functional Description"Torque/Force Control".

A-0-0038 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	100.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0092
IndraDrive/ Control:	S-0-0092
HydraulicDrive/ Drive:	S-0-0092
HydraulicDrive/ Control:	S-0-0092
SercosDrive:	---

A-0-0045, Modulo value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	-	+	+	+	+	+
Direct access:	RO	RO	--	--	RO	RO	RO	RO	RO
C2C access:	RO	RO	--	--	RO	RO	RO	RO	RO
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

If the modulo format is set (parameter "A-0-0059, Scaling type for position data, bit 7"), the modulo value specifies the number value when the position data overflows on "0".

See also Functional Description: "Modulo Processing".

A-0-0045 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0001	2147483647.0	360.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0103
IndraDrive/ Control:	S-0-0103
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	S-0-0103
SercosDrive:	S-0-0103

A-0-0046, Feed distance of the slave drive

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	+	+	+
Direct access:	RO	RO	--	RO	RO	RO	RO	RO	RO
C2C access:	RO	RO	--	RO	RO	RO	RO	RO	RO
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function

☞ For the interpolation in the control (IPO_CONTROL), this parameter is NOT used to calculate the slave axis motion (slave axis).

☞ The function and meaning of this parameter depends on the operation mode!

Velocity synchronization

The parameter is used in the operation mode of the velocity synchronization with translatory velocity scaling to convert the rotary master axis velocity to the translatory slave axis velocities.

Slave axis velocity = A-0-2652 * A-0-0046

A-0-2652 - Effective master axis velocity (rpm)

A-0-0046 - Feed distance of the slave drive (mm/rev.)

Slave axis velocity (mm/min)

Synchronous mode with subordinate closed-loop position control (phase synchronization, cam...)

For translatory absolute scaling, it is traversed from the slave axis of the feed distance parameterized in parameter A-0-0046 per output revolution of the electronic gear (including fine adjustment).

An output revolution of the electronic device corresponds to a change of 2^20 after division by "A-0-2720, ELS, master axis gear, input revolutions ", multiplication with "A-0-2721, ELS, master axis gear, output revolutions " and multiplication by the factor (1 + "A-0-2722, ELS, gear ratio fine adjustment").

The following restrictions must be observed:

- In the "Cam" operation mode, A-0-0046 is only effective in the linear reduction branch.
- For modulo scaling in synchronous modes with subordinate closed-loop position control, the parameter "A-0-0045, Modulo value" performs the task of A-0-0046 in translatory scaling.

A-0-0046 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.01	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0159
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0159
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0048, Velocity polarities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

In this parameter, the polarity of the velocity data is switched with regard to the application.

The polarity is not switched within, but outside (at input and output) a controlled system.

Structure

Bit	Name/function
0	**Velocity command value** 0: Positive polarity 1: Negative polarity
1	**Position command value, additive** 0: Positive polarity 1: Negative polarity
2	**Actual velocity value** 0: Positive polarity 1: Negative polarity
15..3	Reserved

☞ Bit 1 and bit 2 are copies of bit 0.

Changes only become effective in bit 0. Different settings of the individual bits are not permitted!

For **rotary (rotating) motors** applies: Rotation of the motor output shaft in clockwise direction causes a positive actual velocity value (positive polarity).

For **linear motors** applies: Motion of the primary component towards the cable connection side causes a positive actual velocity value and (positive polarity).

A-0-0048 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	7	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0043
IndraDrive/ Control:	S-0-0043
HydraulicDrive/ Drive:	S-0-0043
HydraulicDrive/ Control:	S-0-0043
SercosDrive:	---

A-0-0049, Torque-/force polarities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

In this parameter, the polarity of the specified torque/force data is inverted with regard to the application.

The polarity is switched outside the controlled system. That means at the input and the output of the controlled system.

Structure

Bit	Name/function
0	**Torque command value** 0: Positive polarity 1: Negative polarity
1	**Torque command value, additive** 0: Positive polarity 1: Negative polarity
2	**Actual torque value** 0: Positive polarity 1: Negative polarity
15..3	Reserved



Bit 1 and bit 2 are copies of bit 0.

Changes only become effective in bit 0. Different settings of the individual bits are not permitted!

For **rotary (rotating) motors** applies: Rotation of the motor output shaft in clockwise direction at positive torque and positive polarity.

For **linear motors** applies: Motion of the primary component towards the cable connection side at positive force and positive polarity.

Describing individual parameters, arranged according to types

A-0-0049 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0085
IndraDrive/ Control:	S-0-0085
HydraulicDrive/ Drive:	S-0-0085
HydraulicDrive/ Control:	S-0-0085
SercosDrive:	---

A-0-0050, Scaling type for torque/force data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	+
Direct access:	RO	RO	RO	RO	RO	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The unit and the reference of the torque/force data of a drive are set using this parameter:

- Scaling in percent (% from the reference value, see below)
- Rotary scaling (Nm, inlbf)
- Translatory scaling (N, lbf)

Structure

Bit	Name/function
2-0	**Scaling type** 0 0 0: Scaling in percent (force) 0 0 1: Translatory scaling 0 1 0: Rotary scaling (torque)
3	**Scaling type** 0: Preference scaling 1: Parameter scaling

Describing individual parameters, arranged according to types

Bit	Name/function
4	**Measuring unit for force** 0: Newton [N] 1: Pound-force [lbf] **Measuring unit for torque** 0: Newton meter [Nm] 1: Inch pound-force [inlbf]
6	**Data reference** 0: At the motor shaft 1: At the load
15-7	Bit 15 - 7: Reserved

Tab. 4-2: Scaling type for torque/force data

The data reference is on load side (bit 6= TRUE).



The parameter scaling is available for the drive firmware versions MPx08/17 and higher.

A-0-0050 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x40
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0086
IndraDrive/ Control:	S-0-0086
HydraulicDrive/ Drive:	S-0-0086
HydraulicDrive/ Control:	S-0-0086
SercosDrive:	S-0-0086

A-0-0051, Scaling factor for torque/force data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter and "A-0-0052, scaling exponent for torque/force data " are used when scaling the parameter (A-0-0050, bit 3 = 1) of the scaling factor and the decimal format (decimal digit) of the torque/force data parameter.

If the preference scaling is selected in "A-0-0050, Scaling type for torque/force data, bit 3 = 0", the drive automatically sets the values in A-0-0051 and A-0-0052.

See also Functional Description Scaling of Physical Data.



This parameter does not affect the scaling factor. Currently, the value of the scaling factor (irrespective of the set scaling type) is always set to 1.

A-0-0051 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0093
IndraDrive/ Control:	S-0-0093
HydraulicDrive/ Drive:	S-0-0093
HydraulicDrive/ Control:	S-0-0093
SercosDrive:	---

A-0-0052, Scaling exponent for torque/force data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter and "A-0-0051, scaling factor for torque/force data " are used when scaling the parameter (A-0-0050, bit 3 = 1) of the scaling factor and the decimal format (decimal digit) and the unit prefix of the torque/force data parameter.

See also Functional Description Scaling of Physical Data.



The preceding unit prefix depends only from the set scaling exponent.



The scaling exponent can only be changed in parameter scaling (A-0-0050, bit 3 = 1). In the preferred scaling (A-0-0050, bit 3 = 0), the scaling exponent is always specified.

Describing individual parameters, arranged according to types

Possible scaling exponents

Exponent	Decimal format	Prefix
-15 ... 0	1 ... 10^{-15}	- -
1	0,01	Kilogram [k]
2	0,1	Kilogram [k]
3	1	Kilogram [k]
4	0,01	Mega [M]
5	0,1	Mega [M]
6	1	Mega [M]

Tab. 4-3: Unit prefix and decimal format for torque/force data parameter

Use **MPx und HDx, interpolation in the drive and on the control:**

Parameter scaling (A-0-0050, bit 3 = 1) and scaling in percent (A-0-0050, bit 0 - 2 = 000)

- scaling exponent is fixedly set to -1, since no unit prefix is used
- all force-scaled parameters get the unit [%] and are displayed in decimal format with one decimal place (exception: A-0-0064, Torque/force reference value
- of A-0-0064, torque/force reference value, does not get a unit prefix

parameter scaling (A-0-0050, bit 3 = 1) and translatory scaling (A-0-0050, bit 0 - 2 = 001)

- Scaling exponent can be freely set from -15 ... 6. The unit prefix is oriented at the set scaling exponent.
- all force-scaled parameters get the unit [N] or [lbf]
- of A-0-0064, torque/force reference value, does not get a unit prefix
- the decimal format of the forced-scaled parameters orients at the set scaling exponent

Parameter scaling (A-0-0050, bit 3 = 1) and rotary scaling (A-0-0050, bit 0 - 2 = 010)

- Scaling exponent can be freely set from -15 ... 6. The unit prefix is oriented at the set scaling exponent.
- all force-scaled parameters get the unit [Nm] or [inlbf]
- the decimal format of the forced-scaled parameters orients at the set scaling exponent
- of A-0-0064, torque/force reference value, does not get a unit prefix

Example:

Parameter scaling, translatory

Output situation:

A-0-0052 = 0; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 N

Adapt scaling exponent:

A-0-0052 = 3; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 kN

Adapt scaling exponent:

A-0-0052 = 2; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.1 ⇒ output: A-0-0038 = 0.1 kN

Adapt scaling exponent:

A-0-0052 = 1; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.01 ⇒ output: A-0-0038 = 0.01 kN

Example:

Parameter scaling, in percent

Output situation:

A-0-0052 = 1; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1.2 ⇒ output: A-0-0038 = 1.2 %

The scaling exponent cannot be changed! Thus, an adaption to the decimal format is not possible.

Controller axis:

Parameter scaling (A-0-0050, bit 3 = 1) and scaling in percent (A-0-0050, bit 0 - 2 = 000)

- Scaling exponent can be freely set from -15 ... 6.
- All force-scaled parameters contain the unit [%] (exception: A-0-0064, Torque/force reference value
- the decimal format of the forced-scaled parameters orients at the set scaling exponent
- Only the parameter A-0-0064 gets a unit prefix with regard to the scaling exponent

parameter scaling (A-0-0050, bit 3 = 1) and translatory scaling (A-0-0050, bit 0 - 2 = 001)

- Scaling exponent can be freely set from -15 ... 6. The unit prefix is oriented at the set scaling exponent.
- all force-scaled parameters get the unit [N] or [lbf]
- the decimal format of the forced-scaled parameters orients at the set scaling exponent

Parameter scaling (A-0-0050, bit 3 = 1) and rotary scaling (A-0-0050, bit 0 - 2 = 010)

- Scaling exponent can be freely set from -15 ... 6. The unit prefix is oriented at the set scaling exponent.
- all force-scaled parameters get the unit [Nm] or [inlbf]
- the decimal format of the forced-scaled parameters orients at the set scaling exponent

Example:

Parameter scaling, translatory

Output situation:

A-0-0052 = 0; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 N

Adapt scaling exponent:

A-0-0052 = 3; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 kN

Adapt scaling exponent:

Describing individual parameters, arranged according to types

A-0-0052 = 2; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.1 ⇒ output: A-0-0038 = 0.1 kN

Adapt scaling exponent:

A-0-0052 = 1; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.01 ⇒ output: A-0-0038 = 0.01 kN

In case of the controller axis, the parameter "A-0-0064, torque/force reference value" is equally adapted.

Example:

Parameter scaling, in percent

Output situation:

A-0-0052 = 0; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 %

A-0-0052 = 0; A-0-0051 = 1 (cannot be changed); A-0-0064 = 1 ⇒ output: A-0-0038 = 1 N

Adapt scaling exponent:

A-0-0052 = 3; A-0-0051 = 1 (cannot be changed); A-0-0038 = 1 ⇒ output: A-0-0038 = 1 %

A-0-0052 = 3; A-0-0051 = 1 (cannot be changed); A-0-0064 = 1 ⇒ output: A-0-0038 = 1 kN

Adapt scaling exponent:

A-0-0052 = 2; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.1 ⇒ output: A-0-0038 = 0.1 %

A-0-0052 = 2; A-0-0051 = 1 (cannot be changed); A-0-0064 = 0.1 ⇒ output: A-0-0038 = 0.1 kN

Adapt scaling exponent:

A-0-0052 = 1; A-0-0051 = 1 (cannot be changed); A-0-0038 = 0.01 ⇒ output: A-0-0038 = 0.01 %

A-0-0052 = 1; A-0-0051 = 1 (cannot be changed); A-0-0064 = 0.01 ⇒ output: A-0-0038 = 0.01 kN

A-0-0052 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE	**PLC data type:**	INT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-15	6	-1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0094
IndraDrive/ Control:	S-0-0094
HydraulicDrive/ Drive:	S-0-0094
HydraulicDrive/ Control:	S-0-0094
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0053, Scaling type for acceleration data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The scaling type of the acceleration data determines the format and the relation in which the acceleration data and the jerk data is exchanged between the drive and the control or the interface.

When acceleration parameters (e.g. "A-0-0034, Acceleration limit value, bipolar") are read, the control indicates them in the selected scaling.

The setting of the scaling is normally specified by the control.

☞ This parameter specifies the jerk data scaling in addition to the acceleration scaling.

Structure

The following settings can be made

Bit	Designation/function
2..0	**Scaling types** 0 0 1: translatory scaling 0 1 0: rotatory scaling 0 1 1: ramp time (only in case of interpolation in the drive)
3	**Selecting the scaling** 0: Preference scaling 1: Parameter scaling (only in case of interpolation in the drive)
4	**Measuring unit for translatory scaling** 0: millimeter [mm] 1: inch [in] **Measuring unit for rotatory scaling** 0: Radiant [rad] 1: reserved
5	**Unit of time** 0: Seconds * seconds [s^2] for acceleration 0: Seconds * seconds * seconds [s^3] for jerk 1: reserved
6	**Data reference** 0: at the motor shaft 1: at the load
15..7	**reserved**

Describing individual parameters, arranged according to types

Use

When selecting the **scaling type**, note that the **ramp time** can only be selected if the interpolation is carried out in the drive and if it supports this scaling type.

In bit 3, it can be chosen between the **preference scaling** and the **parameter scaling**

For **preference scaling**, the following parameters are predefined and cannot be changed:

- "A-0-0054, Scaling factor for acceleration data",
- "A-0-0055, Scaling exponent for acceleration data",

Parameter scaling means that these parameters have to be set.

A-0-0053 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x42
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0160
IndraDrive/ Control:	S-0-0160
HydraulicDrive/ Drive:	S-0-0160
HydraulicDrive/ Control:	S-0-0160
SercosDrive:	S-0-0160

A-0-0054, Scaling factor for acceleration data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	-
Direct access:	RO	RO	RO	RO	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter scaling (A-0-0053, bit 3 = 1) of the scaling factor and the decimal format (decimal digit) of the acceleration data parameter are defined with this parameter and "A-0-0055, Scaling exponent for acceleration data".

If preference scaling is selected in "A-0-0053, Scaling type for acceleration data, bit 3 = 0", the drive automatically sets the values in A-0-0054 and A-0-0055.

See also Functional Description "Scaling of Physical Data".

Describing individual parameters, arranged according to types

A-0-0054 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0161
IndraDrive/ Control:	S-0-0161
HydraulicDrive/ Drive:	S-0-0161
HydraulicDrive/ Control:	S-0-0161
SercosDrive:	---

A-0-0055, Scaling exponent for acceleration data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	-
Direct access:	RO	RO	RO	RO	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter scaling (A-0-0053, bit 3 = 1) of the scaling factor and the decimal format (decimal digit) of the acceleration data parameter are defined with this parameter and "A-0-0054, Scaling factor for acceleration data".

If preference scaling is selected in "A-0-0053, Scaling type for acceleration data, bit 3 = 0", the drive automatically sets the values in A-0-0054 and A-0-0055.

See also Functional Description "Scaling of Physical Data".

A-0-0055 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE	**PLC data type:**	INT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-15	0	-4
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0162
IndraDrive/ Control:	S-0-0162
HydraulicDrive/ Drive:	S-0-0162
HydraulicDrive/ Control:	S-0-0162
SercosDrive:	---

A-0-0056, Scaling type for velocity data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The scaling type of the velocity data determine the format and the relation in which the velocity data is exchanged between the drive and the control or user interface.

When velocity parameters (e.g. "A-0-0102, Actual velocity value") are read, the control indicates them in the selected scaling.

The setting of the scaling is normally specified by the control.

Structure

The following settings can be made:

Bit	Designation/function
2..0	**Scaling types** 0 0 1: translatory scaling, 0 1 0: rotatory scaling.
3	**Selecting the scaling** 0: preference scaling, 1: parameter scaling. (Only in case of interpolation in the drive)
4	**Measuring unit for translatory scaling** 0: millimeter [mm], 1: inch [in]. **Measuring unit for rotatory scaling** 0: revolution, 1: reserved.
5	**Unit of time** 0: minutes [min], 1: seconds [s].

Describing individual parameters, arranged according to types

Bit	Designation/function
6	**Data reference** 0: at the motor shaft, 1: at the load.
15..7	**reserved**

Use

In bit 3, it can be chosen between the **preference scaling** and the **parameter scaling**

Preference scaling:

For the preference scaling, the following parameters are predefined and cannot be changed:

- A-0-0057, Scaling factor for velocity data,
- A-0-0058, Scaling exponent for velocity data.

Parameter scaling means that these parameters have to be set.

See also Functional Description "Scaling of Physical Data".

A-0-0056 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x42
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0044
IndraDrive/ Control:	S-0-0044
HydraulicDrive/ Drive:	S-0-0044
HydraulicDrive/ Control:	S-0-0044
SercosDrive:	S-0-0044

A-0-0057, Scaling factor for velocity data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter scaling (A-0-0056, Bit 3 = 1) of the scaling factor and the decimal format (decimal digit) of the acceleration data parameter are defined with this parameter and "A-0-0057, Scaling factor for velocity data".

If preference scaling is selected in "A-0-0056, Scaling type for velocity data, bit 3 = 0", the drive automatically sets the values in A-0-0057 and A-0-0058.

See also Functional Description "Scaling of Physical Data".

Describing individual parameters, arranged according to types

A-0-0057 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0045
IndraDrive/ Control:	S-0-0045
HydraulicDrive/ Drive:	S-0-0045
HydraulicDrive/ Control:	S-0-0045
SercosDrive:	S-0-0045

A-0-0058, Scaling exponent for velocity data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter scaling (A-0-0056, Bit 3 = 1) of the scaling factor and the decimal format (decimal digit) of the acceleration data parameter are defined with this parameter and "A-0-0057, Scaling factor for velocity data".

If preference scaling is selected in "A-0-0056, Scaling type for velocity data, bit 3 = 0", the drive automatically sets the values in A-0-0057 and A-0-0058.

See also Functional Description "Scaling of Physical Data".

A-0-0058 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE	**PLC data type:**	INT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-15	0	-4
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0046
IndraDrive/ Control:	S-0-0046
HydraulicDrive/ Drive:	S-0-0046
HydraulicDrive/ Control:	S-0-0046
SercosDrive:	S-0-0046

A-0-0059, Scaling type for position data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The scaling type of the position data determines the format and the relation in which the position data is exchanged between the drive and the control or user interface.

When position parameters (e.g. "A-0-0100, Actual position value") are read, the control indicates them in the selected scaling.

The scaling is normally preset in the control.

Structure

The following settings can be made:

Bit	Designation/function
2..0	**Scaling types** 0 0 1: translatory scaling, 0 1 0: rotatory scaling.
3	**Selecting the scaling** 0: preference scaling, 1: parameter scaling. (Only in case of interpolation in the drive)
4	**Measuring unit for translatory scaling** 0: millimeter [mm], 1: inch [in]. **Measuring unit for rotatory scaling** 0: angular degree, 1: reserved.
5	reserved
6	**Data reference** 0: at the motor shaft, 1: at the load.

Describing individual parameters, arranged according to types

Bit	Designation/function
7	**Processing format** 0: absolute format, 1: Modulo format.
15..8	**reserved**

Use

In bit 3, it can be chosen between the **preference scaling** and the **parameter scaling**

Preference scaling:

For the preference scaling, the following parameters are predefined and cannot be changed:

- A-0-0060, Scaling factor for translatory position data,
- A-0-006, Scaling exponent for translatory position data,
- A-0-0062, Position resolution, rotatory.

Parameter scaling means that these parameters have to be set.

See also Functional Description "Scaling of Physical Data".

☞ Also refer to the example in the Parameter Description A-0-0060.

☞ In A-0-0059, there is no synchronization performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

A-0-0059 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0xC2
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0076
IndraDrive/ Control:	S-0-0076
HydraulicDrive/ Drive:	S-0-0076
HydraulicDrive/ Control:	S-0-0076
SercosDrive:	S-0-0076

A-0-0060, Scaling factor for translatory position data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

If translatory scaling (A-0-0059, bits 2..0 = 001) has been selected, the parameter "A-0-0061, Scaling exponent for translatory position data " determines together with "A-0-0060, Scaling factor for translatory position data" and the selected unit meter or inch in "A-0-0059, Scaling type for position data, bit 4" the display of the axis's position data.

Use

If **preference scaling** is selected in "A-0-0059, Scaling type for position data, bit 3 = 0", the axis automatically sets the values in "A-0-0060, Scaling factor for translatory position data" and "A-0-0061, Scaling exponent for translatory position data".

If **parameter scaling** is selected in "A-0-0059, Scaling type for position data, bit 3 = 1", the values in "A-0-0060, Scaling factor for translatory position data" and "A-0-0061, Scaling exponent for translatory position data" are used.

Examples for displaying translatory position data:

The physical position of the axis position is 0.12 m (meter).

Example 1:

Selected scaling = translatory preference scaling

(A-0-0060 = 1, A-0-0061 = -7).

The value 1200000 (mm as the unit, 4 decimal places) is derived for the actual position value (A-0-0100).

Example 2:

Selected scaling = translatory parameter scaling

(A-0-0060 = 3, A-0-0061 = -7).

The value 400000 (mm as the unit, 4 decimal places) is derived for the actual position value (A-0-0100).

See also Functional Description "Scaling of Physical Data".

A-0-0060 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0077
IndraDrive/ Control:	S-0-0077
HydraulicDrive/ Drive:	S-0-0077
HydraulicDrive/ Control:	S-0-0077
SercosDrive:	S-0-0077

A-0-0061, Scaling exponent for translatory position data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

If translatory scaling (A-0-0059, bits 2..0 = 001) has been selected, the parameter "A-0-0061, Scaling exponent for translatory position data " determines together with "A-0-0060, Scaling factor for translatory position data" and the selected unit meter or inch in "A-0-0059, Scaling type for position data, bit 4" the display of the axis's position data.

Use

If **preference scaling** is selected in "A-0-0059, Scaling type for position data, bit 3 = 0", the axis automatically sets the values in "A-0-0060, Scaling factor for translatory position data" and "A-0-0061, Scaling exponent for translatory position data".

If **parameter scaling** is selected in "A-0-0059, Scaling type for position data, bit 3 = 1", the values in "A-0-0060, Scaling factor for translatory position data" and "A-0-0061, Scaling exponent for translatory position data" are used.



See parameter (A-0-0060) for an example of calculating the position data.

See also Functional Description "Scaling of Physical Data".

A-0-0061 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE	**PLC data type:**	INT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-15	0	-7
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0078
IndraDrive/ Control:	S-0-0078
HydraulicDrive/ Drive:	S-0-0078
HydraulicDrive/ Control:	S-0-0078
SercosDrive:	S-0-0078

A-0-0062, Position resolution, rotatory

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The smallest phase value for the rotary position data parameter is defined for the rotary parameter scaling (see A-0-0059, bit 2..0 = 010) with this parameter.

Smallest phase = 360 degrees / rotary position resolution

The smallest phase value may refer to the motor or the load (A-0-0059, bit 6).

If the rotary preference scaling is set (A-0-0059), the value in "A-0-0062, Position resolution, rotatory" is fixed to 3,600,000.

The smallest phase value is therefore set to a phase value of 0.0001 for all rotary position data.

See also Functional Description "Scaling of Physical Data".

A-0-0062 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	4294967295	3600000
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0079
IndraDrive/ Control:	S-0-0079
HydraulicDrive/ Drive:	S-0-0079
HydraulicDrive/ Control:	S-0-0079
SercosDrive:	S-0-0079

Describing individual parameters, arranged according to types

A-0-0063, Scaling type for temperature data

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter is used to set the unit of the drive's temperature data in °C (Celsius) or in °F (Fahrenheit).

The values are displayed with the first decimal place.

Structure

Bit	Designation/function
0	**Temperature data in** 0: degrees Celsius (°C), 1: Fahrenheit (F).
15..1	**reserved**

A-0-0063 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0208
IndraDrive/ Control:	S-0-0208
HydraulicDrive/ Drive:	S-0-0208
HydraulicDrive/ Control:	S-0-0208
SercosDrive:	---

A-0-0064, Torque/Force reference value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function

When the torque/force data scaling (A-0-0050) is set in percentage, this value can be used to convert to absolute scaling. The parameter value corresponds to 100%.

$$F_{abs} = F_{ref} * \frac{F_{\%}}{100\%}$$

F_{abs} Absolute value
F_{ref} Torque/force reference value (A-0-0064)
$F_{\%}$ Torque/force value in percentage scaling

Fig. 4-5: Conversion from a percentaged to an absolute torque / force.

Derivation

The torque/force reference value results as follows:

- **HydraulicDrive:** Value from "S-0-0825, Nominal force".
- **IndraDrive:**

$$F_{ref} = I_{still} * K_{MF} * K_{kühlart}$$

F_{ref} Torque/force reference value (A-0-0064)
I_{still} Motor current at standstill (S-0-0111)
K_{MF} Torque/force constant (P-0-0051)
$K_{cooling\ type}$ Cooling type factor

Fig. 4-6: Derivation of torque / force reference value for IndraDrive

- **Controller axis:** freely writable.
- **Other axis types:** not yet supported.

A-0-0064 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.001	2147483647.0	1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0111,P-0-0051
IndraDrive/ Control:	S-0-0111,P-0-0051
HydraulicDrive/ Drive:	S-0-0825
HydraulicDrive/ Control:	S-0-0825
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0066, Scaling type for valve control values

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	+	+	-	-	-	-	+
Direct access:	--	--	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The scaling type for the valve adjustment value determines in which format the control values for the hydraulic valve must be entered.

When analog value parameters (e.g. "A-0-2211, Cyclic analog value") are read, the control indicates them in the selected scaling.

Structure The following settings can be made:

Bit	Designation/function	Comment
0	**Unit** 0: voltage in V 1: current in mA	10V or 20mA
1	**Type** 0: bipolar 1: unipolar	-10V to 10V / -20mA to 20mA or 0V to 10V 0mA to 20mA
2	**Cable break monitoring** 0: No 1: Yes	1: 4mA to 20mA
15..3	**reserved**	

Use The option of monitoring cable break is only possible with current as a unit, unipolar.

A-0-0066 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-2882
HydraulicDrive/ Control:	P-0-2882
SercosDrive:	---

A-0-0080, Jogging, short distance

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The short distance for the incremental axis jogging is stored in this parameter.

☞ It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- Unit:
  Millimeters [mm] or inches [in] for axes with translatory scaling
  Degrees for axes with rotary scaling
- Value range: >0.0 (floating point number)
- Default: 1.0 mm or inch or degree.

Use This parameter is used by the robot control for the incremental axis jogging.

If an axis is coupled with another axis (e.g. lifting and rotating spindle), the other axis is controlled without its logic position being changed.

With the jog bits (KinData[1].stJogCmd_q), the PLC program can activate incremental jogging with short distance:

E.g. incremental jogging with short distance of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_JOINT_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_SMALL;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

- The maximum velocity is listed in A-0-0083 (always fast for incremental jogging).
- The maximum acceleration is listed in A-0-0084 and
- the maximum deceleration is listed in A-0-0085.
- The maximum jerk for the acceleration is listed in A-0-0086 and
- the maximum deceleration jerk is written in A-0-0087.

Describing individual parameters, arranged according to types

The jog motion can be prematurely completed by setting enJogMode = KIN_JOG_STOP.

Program:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

A-0-0080 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	1.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0081, Jogging, long distance

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The long distance for the incremental axis jogging is stored in this parameter.

☞ It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- Unit:
  Millimeters [mm] or inches [in] for axes with translatory scaling
  Degrees for axes with rotary scaling
- Value range: >0.0 (floating point number)
- Default: 10.0 mm or inch or degree.

Use This parameter is used by the robot control for the incremental axis jogging.

If an axis is coupled with another axis (e.g. lifting and rotating spindle), the other axis is controlled without its logic position being changed.

With the jog bits (KinData[1].stJogCmd_q), the PLC program can activate incremental jogging with long distance:

E.g. incremental jogging with long distance of the 4th axis in negative direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_JOINT_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_LARGE;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*4. bit for 4. axis of kinematics or group*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*no axis in pos.*)
```

- The distance to the jog the axis with long distance is listed in A-0-0081.
- The maximum velocity is listed in A-0-0083 (always fast for incremental jogging).
- The maximum acceleration is listed in A-0-0084 and
- the maximum deceleration is listed in A-0-0085.
- The maximum jerk for the acceleration is listed in A-0-0086 and
- the maximum deceleration jerk is written in A-0-0087.

The jog motion can be prematurely completed by setting enJogMode = KIN_JOG_STOP.

Program:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

A-0-0081 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.001	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0082, Jogging, low velocity

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function The low velocity for the continuous axis jogging is stored in this parameter.



It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s or in/s for axes with translatory scaling,
  degree/s for axes with rotary scaling.
- Value range: >0.0 (floating point number)
- Default: 10.0 mm/s or in/s or degree/s.

Use This parameter is used by the robot control for the continuous axis jogging.

If an axis is coupled with another axis (e.g. lifting and rotating spindle), the other axis is controlled without its logic position being changed.

With the jog bits (KinData[1].stJogCmd_q) the PLC program can activate continuous jogging at low velocity:

E.g. continuous jogging with low velocity of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_JOINT_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_SLOW;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

- The maximum acceleration is listed in A-0-0084
- The maximum deceleration is listed in A-0-0085
- The maximum jerk for the acceleration is listed in A-0-0086
- The maximum deceleration jerk is written in A-0-0087

The continuous jogging can be completed by 2 different methods:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

and/or

```
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 0; (*no axis in pos.*)
```

A-0-0082 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0083, Jogging, high velocity

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The high velocity for the continuous axis jogging is stored in this parameter.

☞ It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s or in/s for axes with translatory scaling,
  degree/s for axes with rotary scaling.
- Value range: >0.0 (floating point number)
- Default: 25.0 mm/s or in/s or degree/s.

Use This parameter is used by the robot control for continuous **and incremental** axis jogging.

If an axis is coupled with another axis (e.g. lifting and rotating spindle), the other axis is controlled without its logic position being changed.

With the jog bits (KinData[1].stJogCmd_q), the PLC program can activate continuous jogging at high velocity:

E.g. continuous jogging at higher fast velocity of the 4th. axis in negative direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_JOINT_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_FAST;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*4. bit for 4. axis of kinematics or group*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*no axis in pos.*)
```

- The maximum acceleration is listed in A-0-0084
- The maximum deceleration is listed in A-0-0085
- The maximum jerk for the acceleration is listed in A-0-0086
- The maximum deceleration jerk is written in A-0-0087

The continuous jogging can be completed with two different methods:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

and/or

```
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 0; (*no axis in pos.*)
```

Describing individual parameters, arranged according to types

A-0-0083 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	25.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0084, Jogging, acceleration

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The maximum acceleration to jog the axis (incremental and continuous) is stored in this parameter.



It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s^2 or in/s^2 for axes with translatory scaling,
  degree/s^2 for axes with rotary scaling.
- Value range: > 0.0 (floating point number, has to be ≤ A-0-0034)
- Default: 370 mm/s^2 or in/s^2 or degree/s^2.

Use

This parameter is used by the robot control to jog the axis. The jog acceleration is valid for all jog motions (incremental and continuous). The jog deceleration is listed in A-0-0085.

To jog in the machine coordinate system (MCS), the deceleration and acceleration values are determined in K-0-0084 and K-0-0085.

Describing individual parameters, arranged according to types

A-0-0084 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	370.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0085, Jogging, deceleration

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The maximum deceleration to jog the axis (incremental and continuous) is stored in this parameter.

It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s^2 or in/s^2 for axes with translatory scaling,
  degree/s^2 for axes with rotary scaling.
- Value range: > 0.0 (floating point number, has to be ≤ A-0-0034)
- Default: 100 mm/s^2 or in/s^2 or degree/s^2.

Use This parameter is used by the robot control to jog the axis.

The jog deceleration is valid for all jog motions (incremental and continuous).

The jog acceleration is listed in A-0-0084.

To jog in the machine coordinate system (MCS), the deceleration and acceleration values are determined in K-0-0084 and K-0-0085.

Describing individual parameters, arranged according to types

A-0-0085 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	370.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0086, Jogging, acceleration jerk

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The maximum acceleration jerk to jog the axis (incremental and continuous) is stored in this parameter (indirect definition of the acceleration change time).

☞ It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s³ or in/s³ for axes with translatory scaling,
  degree/s³ for axes with rotary scaling.
- Value range: ≥ 0.0 (floating point number, ≤ A-0-0036)
- Default: 0.0 (no jerk limitation).

Use This parameter is used by the robot control to jog the axis. The jog acceleration jerk is valid for all jog motions (incremental and continuous).

Off $\Delta a = j * t$ The acceleration change time can be calculated from $t = \frac{\Delta a}{j}$ or $t = \frac{A-0-0084}{A-0-0086}$.

Describing individual parameters, arranged according to types

The maximum jerk j for the deceleration is listed in A-0-0087.

The maximum jerk values to jog in machine coordinates (MCS) are applied with K-0-0086 and K-0-0087.

A-0-0086 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0087, Jogging, deceleration jerk

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The maximum deceleration jerk to jog the axis (incremental and continuous) is stored in this parameter (indirect definition of the deceleration change time).



It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Structure

- Unit:
  mm/s^3 or in/s^3 for axes with translatory scaling,
  degree/s^3 for axes with rotary scaling.
- Value range: ≥ 0.0 (floating point number, ≤ A-0-0036)
- Default: 0.0 (no jerk limitation).

Use

This parameter is used by the robot control to jog the axis. The jog deceleration jerk is valid for all jog motions (incremental and continuous).

Describing individual parameters, arranged according to types

Off $\Delta a = j * t$ The deceleration change time can be calculated from $t = \frac{\Delta a}{j}$ or $t = \frac{A-0-0085}{A-0-0087}$.

The maximum jerk for the acceleration is specified in A-0-0086.

The maximum jerk values to jog in machine coordinates (MCS) are applied with K-0-0086 and K-0-0087.

A-0-0087 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0100, Actual position value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	+	+	+	+	+	+	+	+	+

Function The parameter indicates the actual position value of the axis. It is valid in all operation modes.

Use It is displayed depending on the axis type:

- **Virtual axis:** The value comes from the position output of the virtual axis.
- **IndraDrive/HydraulicDrive/SercosDrive:** The value comes from the connected drive. It indicates the actual position value of the active encoder ("A-0-0007, Axis configuration, bit 1").
- **Encoder axis:** The value comes from the position output of the encoder axis.
- **Link axis:** The value comes from the position output of the axis addressed in "A-0-0008, Link axis, master axis selection".
  - A-0-0008: Contains the control address of the axis requested and information on whether master axis A or B of this control.

  - The parameter "C-0-0703, C2C, configuration of master axes" is to be evaluated in the control specified in A-0-0008: the first axis number corresponds to master axis A and the second axis number corresponds to master axis B.

- **Controller axis:** The value comes from the position output of the controller axis.

A-0-0100 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0386
IndraDrive/ Control:	S-0-0051
HydraulicDrive/ Drive:	S-0-0386
HydraulicDrive/ Control:	S-0-0051
SercosDrive:	S-0-0051

A-0-0101, Actual position value, 8 bytes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the actual position value of the axis. It is valid in all operation modes.

Use *It is displayed depending on the axis type:*

- **Virtual axis:** The value comes from the position output of the virtual axis.
- **IndraDrive/HydraulicDrive/SercosDrive:** The value comes from the connected drive. It indicates the actual position value of the active encoder ("A-0-0007, Axis configuration, bit 1").
- **Encoder axis:** The value comes from the position output of the encoder axis.
- **Link axis:** The value comes from the position output of the axis addressed in "A-0-0008, Link axis, master axis selection".
  - A-0-0008: Contains the control address of the axis requested and information on whether master axis A or B of this control.
  - The parameter "C-0-0703, C2C, configuration of master axes" is to be evaluated in the control specified in A-0-0008:

Describing individual parameters, arranged according to types

the first axis number corresponds to master axis A and the second axis number corresponds to master axis B.

A-0-0101 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0386
IndraDrive/ Control:	S-0-0051
HydraulicDrive/ Drive:	S-0-0386
HydraulicDrive/ Control:	S-0-0051
SercosDrive:	S-0-0051

A-0-0102, Actual velocity value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the actual velocity value of the axis. It is valid for all operation modes of the axis.

Use

- **Virtual axis:** the value comes from the velocity output of the virtual axis.
- **IndraDrive/HydraulicDrive/SercosDrive:** The value comes from the connected drive. It indicates the actual velocity value for the active encoder ("A-0-0007, Axis configuration, bit 1").
- **Encoder axis:** The value comes from the velocity output of the encoder axis.
- **Link axis:** The value comes from the velocity calculation for the axis addressed in "A-0-0008, Link axis, master axis selection" based on the data transmitted for the actual position value.
  - A-0-0008: Contains the control address of the axis requested and information on whether master axis A or B of this control.
  - The parameter "C-0-0703, C2C, configuration master axes" is to be evaluated in the control specified in A-0-0008: the first axis number corresponds to master axis A and the second axis number corresponds to master axis B.
- **Controller axis:** The value comes from the velocity output of the controller axis.

A-0-0102 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0040
IndraDrive/ Control:	S-0-0040
HydraulicDrive/ Drive:	S-0-0040
HydraulicDrive/ Control:	S-0-0040
SercosDrive:	S-0-0040

A-0-0103, Actual acceleration value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter contains the actual acceleration value of the axis.

Use

- **Virtual axis:** The value results from the acceleration output of the virtual axis.
- **IndraDrive/SercosDrive/HydraulicDrive:** The value results from the connected drive. It indicates the actual acceleration value of the active drive encoder.

  This parameter is a differentiated actual velocity value of the motor encoder filtered for 4 ms.



By default, the value for real axis is not cyclically available. For a direct access (direct variable) or to oscilloscope the value, the linked drive parameter has to be previously configured in one of the user-defined actual value channels (see A-0-0520 - A-0-0530).

- **Controller axis:** The value results from the acceleration output of the controller axis.

(Also refer to the dialog box "Motor Encoder - Application Type", "Optional Encoder").

Describing individual parameters, arranged according to types

A-0-0103 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0164
IndraDrive/ Control:	S-0-0164
HydraulicDrive/ Drive:	S-0-0164
HydraulicDrive/ Control:	S-0-0164
SercosDrive:	---

A-0-0108, Actual position value, incremental

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the axis's increments converted in "A-0-0100, Actual position value".

Use This parameter is transmitted via the MLC link once an axis is configured as a master axis in the parameter "C-0-0703, C2C, configuration of master axes".

A-0-0108 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0110, Actual torque/force value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	+
Direct access:	RO	RO	RO	RO	RO	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the actual torque/force value of the drive. It is valid for all operation modes.

Use **IndraDrive/HydraulicDrive:** The value comes from the connected drive and indicates the actual torque/force value of the drive.

A-0-0110 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0084
IndraDrive/ Control:	S-0-0084
HydraulicDrive/ Drive:	S-0-0084
HydraulicDrive/ Control:	S-0-0084
SercosDrive:	S-0-0084

A-0-0150, Interpolated position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The position command values are precisely interpolated for a jerk-free motion.

This parameter indicates the value of the interpolated position. It is valid for all operation modes of the axis.

Describing individual parameters, arranged according to types

A-0-0150 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0434
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0434
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0151, Interpolated position of the control

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter displays the value of the interpolated position of the control. It is valid in all operating modes of the axis.

This parameter only exists for axes, in which the interpolation of the control takes place.

A-0-0151 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0434
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0434
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0152, Interpolated velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The velocity command values are precisely interpolated for a jerk-free motion.

This parameter indicates the value of the interpolated velocity. It is valid for all operation modes of the axis - except for homing.

A-0-0152 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0048
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0048
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0153, Interpolated acceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the value of the interpolated acceleration.

Describing individual parameters, arranged according to types

A-0-0153 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0156, Interpolated force

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	-	-	-	-	+
Direct access:	--	RO	--	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function For a jerk-free movement, the force target values are fine-interpolated.
The parameter shows the "Interpolated force".

A-0-0156 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0158, Interpolated analog control value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	+	+	-	-	-	-	+
Direct access:	--	--	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	+	+	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the interpolated analog control value.

The parameter can be influenced with the function blocks ML_OpenCyclicAnalogChannel and ML_WriteCyclicAnalog.

A-0-0158 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0066
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0170, Reaction to force limitation

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter defines the scope of influence on the interpolation's command value specification.

Only the following motion commands can be influenced:

- MC_MoveAbsolute
- MC_MoveAdditive
- MC_MoveRelative
- MC_MoveVelocity

Describing individual parameters, arranged according to types



This parameter is generally administered by a PLC program using the ML_IPOImpactControl library. For this reason, the override control's concept (see Introduction ML_IPOImpactControl) must be implemented in the PLC program.

This parameter is not intended to be directly manipulated.

Structure

Bit	Designation/function
0	Type of influence, bit 0
1	Type of influence, bit 1
2	reserved
3	Direction of influence, bit 0
4	Direction of influence, bit 1
5	Type of the transition after break, bit 0
6	Type of the transition after break, bit 1
7	reserved
8	Applying individual position and velocity values, bit 0
9	Applying individual position and velocity values, bit 1
10... 31	reserved

Use

Bit 1...0:

This bit is used to select the influencing type of the interpolation.

- 00 - Neutral: No influence or the existing influence is canceled (movement resumes with the command parameters).
- 01 - Break: The interpolation is stopped, the current position value is kept and the velocity is set to 0.
- 10 - Jump: The interpolation is set to the final value of the active command. (Not possible for MC_MoveVelocity).

Bit 4..0.3:

This bit is used to select the direction of the influence.

- 00 - None: The influence is not taken into account.
- 01 - Forward: The influence is only effective in the forward direction.
- 10 - Backward: The influence is only effective in the backward direction.
- 11 - Both: The influence is effective in the forward and backward direction.

Bit 6..0.5:

This bits is used to set the type of transition in/from the "break" state.

- 00 - Transition with maximum axis-dependent acceleration.
- 01 - Transition with the acceleration of the active command.
- 10 - Transition with individual acceleration (A-0-0173).

Bit 9...8:

This bit allows individual position or velocity values to be applied in the "break" state or at the end of motion command.

Describing individual parameters, arranged according to types

- 00 - No individual values are applied.
- 01 - The individual position values from A-0-0171 are applied.
- 10 - The individual velocity values from A-0-0172 are applied.
- 11 - The individual position and velocity values are applied.

A-0-0170 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0171, Position for interpolation effect

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The individual position value that can be applied during the interpolation influence (see A-0-0170).



This parameter is generally administered by a PLC program using the ML_IPOImpactControl library. For this reason, the override control's concept (see A-0-0170) must be implemented in the PLC program.

This parameter is not intended to be directly manipulated.

Use This value is used during the interpolation influence in the "break" state to overwrite the current interpolated position command value (A-0-0150).

Describing individual parameters, arranged according to types

A-0-0171 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0172, Velocity for interpolation effect

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The individual velocity value that can be applied during the interpolation influence (see A-0-0170).



This parameter is generally administered by a PLC program using the ML_IPOImpactControl library. For this reason, the override control's concept (see A-0-0170) must be implemented in the PLC program.

This parameter is not intended to be directly manipulated.

Use This value is used during the interpolation influence in the "break" state to overwrite the current interpolated velocity position value (A-0-0152).

A-0-0172 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0173, Acceleration for interpolation effect

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The individual velocity value that is effective during the interpolation influence for the transition in the "break" state (see A-0-0170).

Use This value is used for the transition to/from the "break" state during the interpolation influence.

A-0-0173 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0200, Default master axis

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function This parameter contains the control address and the logical address of the master axis that is transmitted in the master axis position of the real axis outside the "Synchronized motion" state (A-0-0022, Extended axis status, bit 6 = 0).

- Example: The content "1 6" means control address 1 and logical address of master axis 6.
- The content "0 0" disables the function. No master axis is addressed.

The parameter influences the units of the parameters

- A-0-0300, Master axis, actual position value,
- A-0-0302, Master axis, actual velocity value.

If the parameter "0 0" is not set, the units are set to "not activated".



The parameter "Default master axis" can only be changed if the axes are in the "AF" state.

A-0-0200 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	64	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0201, Interpolator configuration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RW	RW	RW	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Make the optional configuration of the interpolator in this parameter.

Structure The following bits are available

Bit	Functionality
0	**Velocity ramps at interpolation without jerk limitations (only interpolation in the control)** 0: Trapezoidal ramps for velocity 1: Sine² ramps for velocity
1	**Dynamic jerk adaptation at velocity overshoot (only interpolation in the control)** 0: Dynamic jerk adjustment enabled. 1: Dynamic jerk adjustment disabled.
2	**Reference point for the positioning command values (only interpolation in the drive)** 0: Current actual value 1: Last effective target position
3...31	Reserved

Use **Bit 0:**

Velocity ramps at interpolation without jerk limitation

The shape of the velocity ramps at interpolation without jerk limitation (A-0-0216 = 0) can be selected. By setting the bit, the velocity is no longer linear, but based on a sine² progression.

Even without jerk limitation, the use of sine² ramps causes a dynamic motion with significantly less vibration than with trapezoidal ramps.

Describing individual parameters, arranged according to types

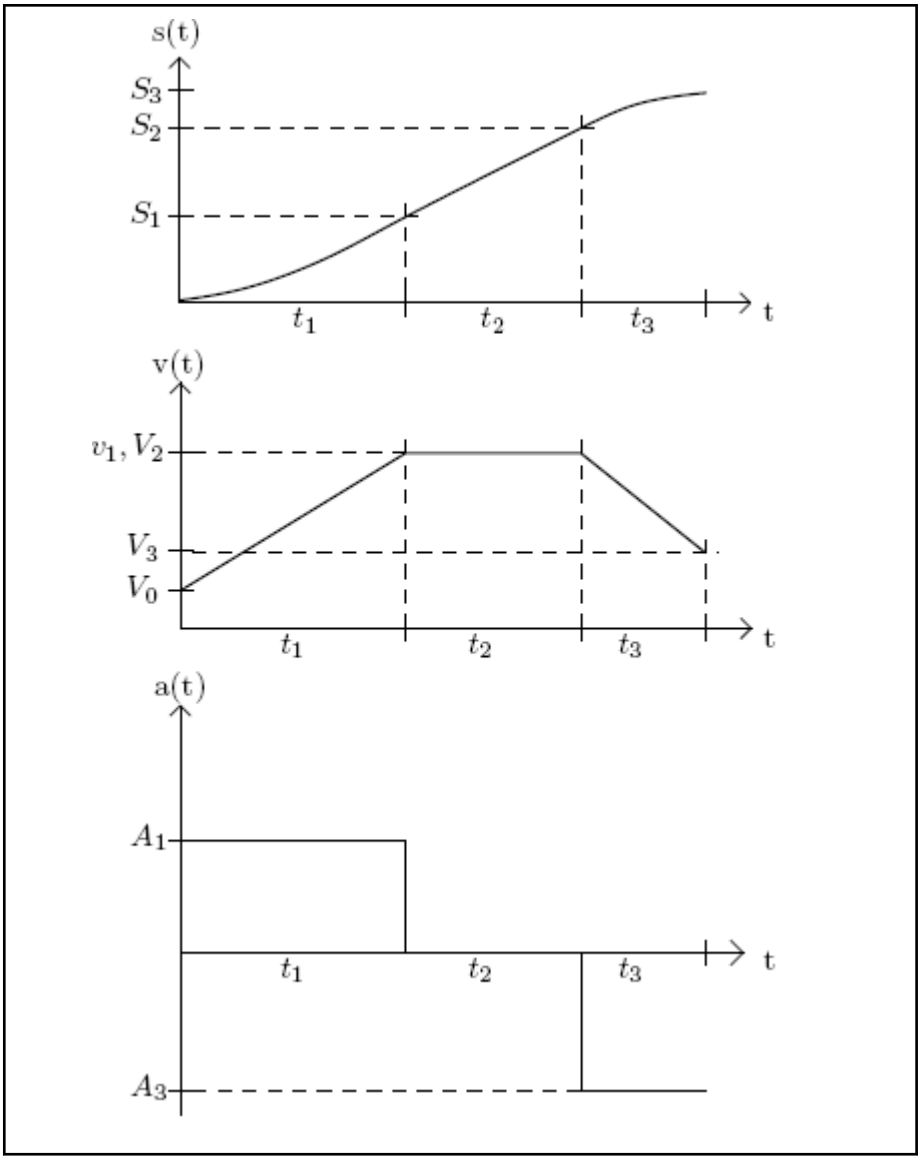


Fig. 4-7: Interpolation with trapezoidal ramps

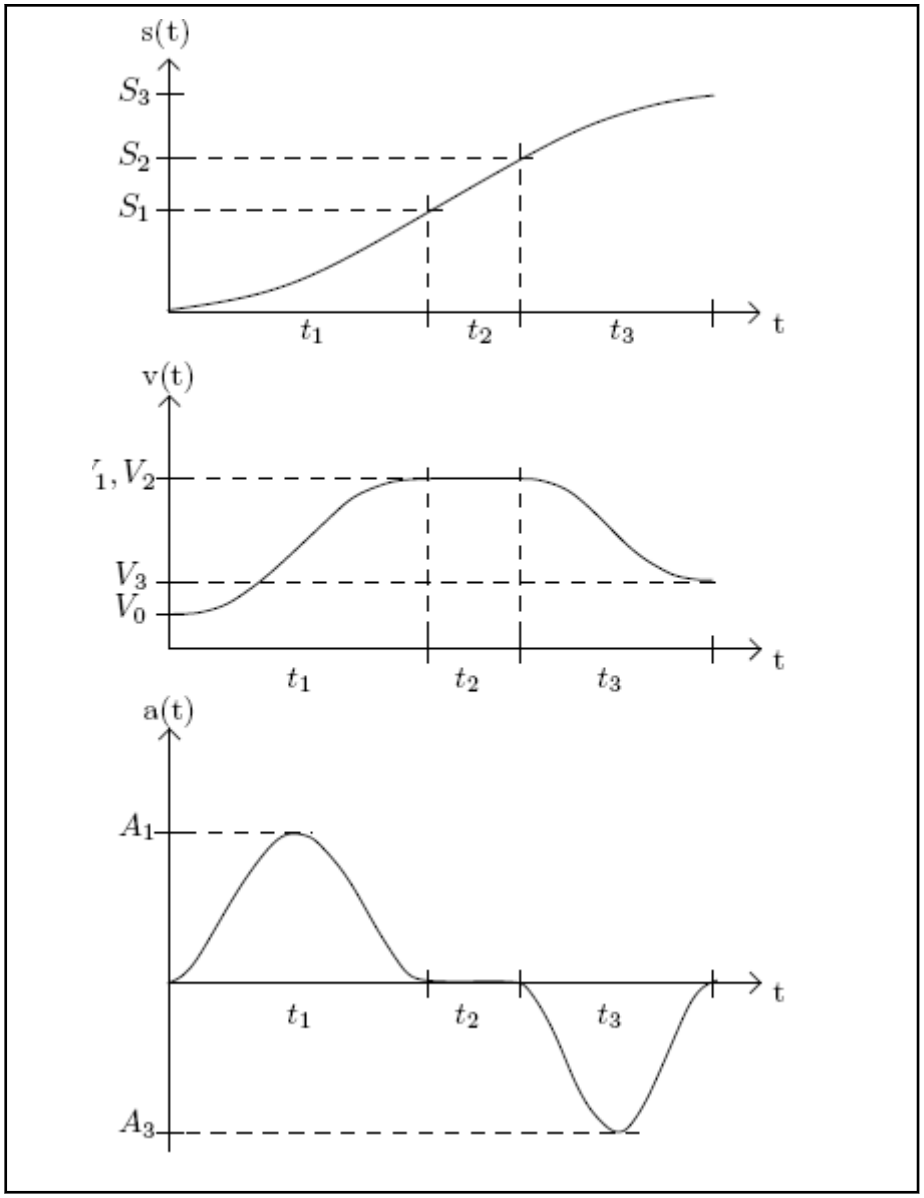


Fig. 4-8: Interpolation with sine² ramps

Bit 1:

Dynamic jerk adjustment at velocity overshoots

With an active jerk limitation (A-0-0216 = 0), an unfortunate commanding can cause high velocity overshoots. This is for example the case if the running motion command is prematurely interrupted by another motion command and the new commanded jerk is significantly lower than the previously commanded jerk. Since using the new, lower commanded jerk to reduce the acceleration already built up requires much longer, it can lead to the velocity being exceeded. During deceleration, such an undesired change in direction can also occur.

The "dynamic jerk adjustment" is intended to prevent exactly this behavior. To do this, the commanded jerk is adjusted (increased) so that the velocity overshoot is limited between two boundaries.

The lower limit is set to 0 (standstill, i.e. no change in direction). The upper limit is set by the velocity limit value in the parameter A-0-0032.

Describing individual parameters, arranged according to types

If the jerk is adjusted, the warning "E113003; Dynamic jerk adjustment active" is displayed.

Bit 2:

This setting determines the reference point of the drive considered during positioning. This can either be the current actual value (bit 2=0, default setting) or the previous target position. It is indirectly specified via bit 4 of the parameter S-0-0346. When enabling the function block MC_MoveAbsolute, bit 4 in S-0-0346 is set with regard to the setting of bit 2 in A-0-0201 by the control (inverted logic).

- Bit 2=0: S-0-0346.4 is set to 1
- Bit 2=1: S-0-0346.4 is set to 0

For more information on the meaning and mode of operation of the S-0-0346 bit 4, refer to the drive help.

A-0-0201 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0203, Direction of motion

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	-	+	+	-	-	+
Direct access:	RW	RW	--	--	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	-	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter defines the default jerk value for the axis if the respective function blocks do not support the jerk.

In this case, it is the template for the parameter "A-0-2207, Commanded direction" and provides the value at a positive edge at the "Execute" input of a PLCopen FB instance.

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
1..0	**direction of motion** 0 0: shortest distance, 0 1: positive direction, 1 0: negative direction.

Use

- **Shortest distance** - The axis is moved to the commanded target position at the shortest distance.
- **Positive direction** - The target is reached by turning the axis in the positive direction relative to the main direction.
- **Negative direction** - The target is reached by turning the axis in the negative direction relative to the main direction.

If the shortest distance to the positioning is smaller than "A-0-0219 Positioning window for shortest way", the shortest distance is automatically selected and the preset direction is ignored.

A-0-0203 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x02	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0145, Bit 4+ 5, after MoveAbs
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0204, Velocity threshold, positioning in modulo format

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	-	+	+	-	-	+
Direct access:	RO	RW	--	--	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	-	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

These parameters can be used to set a threshold value for the actual velocity.

When a position command is given, if the current velocity of the axis is greater than the threshold value, then the axis is positioned without changing the direction of rotation even if the specification in parameter A-0-0203, Direction, indicates that the change is required.

Describing individual parameters, arranged according to types

Prerequisite: The position data format must be "modulo". (A-0-0059, Scaling type for position data)



Entering the value "0" deactivates the velocity threshold, i.e. the target position remains as determined in A-0-0203.

A-0-0204 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	20.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0417
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0216, Jerk

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RW	RO	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter influences all PLCopen function block with positioning and velocity interpolation (MC_Stop, MC_MoveAbsolute, MC_MoveVelocity..).

The parameter does not have any effect on the following PLCopen function blocks:

- Function blocks with master axis coupling (MC_GearIn, MB_GearInPos, MB_MotionProfile, ML_FlexProfile...)
- MC_TorqueControl

The function block defines the commanded jerk of the executed motion.



When changing from a PLCopen function block the parameter does not have any effect on to a PLCopen function block the parameter has an effect on, in particular when enabling the stop functionality (PLCopen function block MC_Stop or using the operation mode "ModeStopping" in the AxisInterface) it has to be ensured that a value is selected in parameter "A-0-0216, Jerk" to set the axis to standstill with the required deceleration distance (also in case of an interrupted acceleration).

Describing individual parameters, arranged according to types

The jerk value "A-0-0216, Jerk" is limited with the parameter "A-0-0036, Jerk limit value, bipolar".



Using a value greater zero, the jerk-limited interpolation is enabled. The jerk-limited interpolation is disabled using the default value zero.

The jerk value "A-0-0216, Jerk" is limited with the parameter "A-0-0053, Scaling type for acceleration data".

With a positive Execute edge at the PLCopen function block, the "A-0-0216, Jerk" is copied to parameter "A-0-2205, Command jerk".

A-0-0216 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0193
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0193
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0219, Positioning window for shortest distance

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	-	+	+	-	-	+
Direct access:	RO	RW	--	--	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	-	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter defines the positioning window for the shortest way in case the respective function blocks do not support the positioning window for the shortest way.

The target positions are reached on the "shortest way" or in the direction specified by the parameterized value in the "A-0-2207, Command direction".

The effective preferred direction within the limited angle range is deactivated with the positioning window.

If the difference from the current axis position and the new target position is less than the positioning window, the axis is always positioned on the shortest way.

The parameter is influenced by the parameter "A-0-0059, Scaling type for position data".

Describing individual parameters, arranged according to types

A-0-0219 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	1.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0418
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0221, Torque/force window

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The force window refers to the force command value of the axis with regard to the amount.

It the actual force value is in the calculated force window, the axis sets "A-0-0021, Axis status, bit 11" (axis torque value/force command value = actual value).

A-0-0221 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0826
IndraDrive/ Control:	S-0-0826
HydraulicDrive/ Drive:	S-0-0826
HydraulicDrive/ Control:	S-0-0826
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0222, Standstill window

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

To detect the axis standstill, a threshold value for the velocity is entered into this parameter.

If the velocity value falls below this threshold, the axis detects the standstill.

The following applies:

- For axes with interpolation in the drive, the actual velocity value is considered.
- For axes with interpolation in the control, the current velocity command value is considered.

At standstill, bit 5 of the parameter "A-0-0021, Axis status", "Axis velocity within the standstill window" is set.

A-0-0222 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0124
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0124
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0223, Velocity window

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	+	+
Direct access:	RO	RO	RO	RO	RO	RO	--	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function The velocity window refers to the velocity command value of the axis (A-0-2202) with regard to the amount.

If the actual velocity value is in the calculated velocity window, the axis sets bit 4 of the parameter "A-0-0021, Axis status" (command velocity = actual velocity).

☞ Due to compatibility reasons (parameter import/export), this parameter also exists for virtual axes. It does not affect the axis behavior.

A-0-0223 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0157
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0157
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0224, Rapid stop deceleration

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RW	RO	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function In this parameter, the maximum deceleration value at which the axis is set to standstill at

- Emergency stop with ramp

is set.

The parameter unit is specified by "A-0-0053, Scaling type for acceleration data".

See also Functional Description: "Error Reaction"

Describing individual parameters, arranged according to types

A-0-0224 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	500.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0372 after E Stop
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0372 after E Stop
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0225, Rapid stop jerk

Robot-Control V1: +, **Robot-Control V2:** +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

In this parameter, the maximum jerk value at which the axis

- Emergency stop with ramp

is set.

The parameter unit is specified by "A-0-0053, Scaling type for acceleration data".

See also Functional Description: "Error Reaction".



This parameter is only in effect if "Interpolation in the control" was selected for the axis.

A-0-0225 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0230, Blending distance PTP

Robot-Control V1: +, **Robot-Control V2:** -

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter is relevant only for axes which are proceeded within a kinematics with the command " MOVE PTP ".

With these axis movements the strength of the passing can be programmed with movement block transitions by the factor R_PTP.

The value of this parameter indicates the distance to which the factor R_PTP refers.

If the value is 0, no passing of the axis can take place.

A-0-0230 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0240, Feedrate override

Robot-Control V1: +, **Robot-Control V2:** +

Describing individual parameters, arranged according to types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RW	RO	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The factor used to modify the axis velocity is set in this parameter.

A value of 100% means no modification.

If the factor is 0%, the warning "E0112055, Feedrate override A-0-0240 = 0" is output.

A-0-0240 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	600.0	100.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0108, S-0-0036
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0108, S-0-0036
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0241, Feedrate override control word

Robot-Control V1: +, Robot-Control V2: +

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RW	RO	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter influences the feedrate override without modifying the Feedrate override parameter A-0-0240.

Describing individual parameters, arranged according to types

Structure

Bit	Designation / Function
0	Reserved
1	Feedrate override = 0
15-2	Reserved

Use

Bit 1:

When bit 1 is set, a feedrate override of 0 becomes effective without modifying the actual A-0-0240 parameter value.

☞ Feedrate override = 0 means "Halt", but in this case without the warning "E0112055, Feedrate override A-0-0240 = 0"

A-0-0241 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0242, Position control, synchronization acceleration

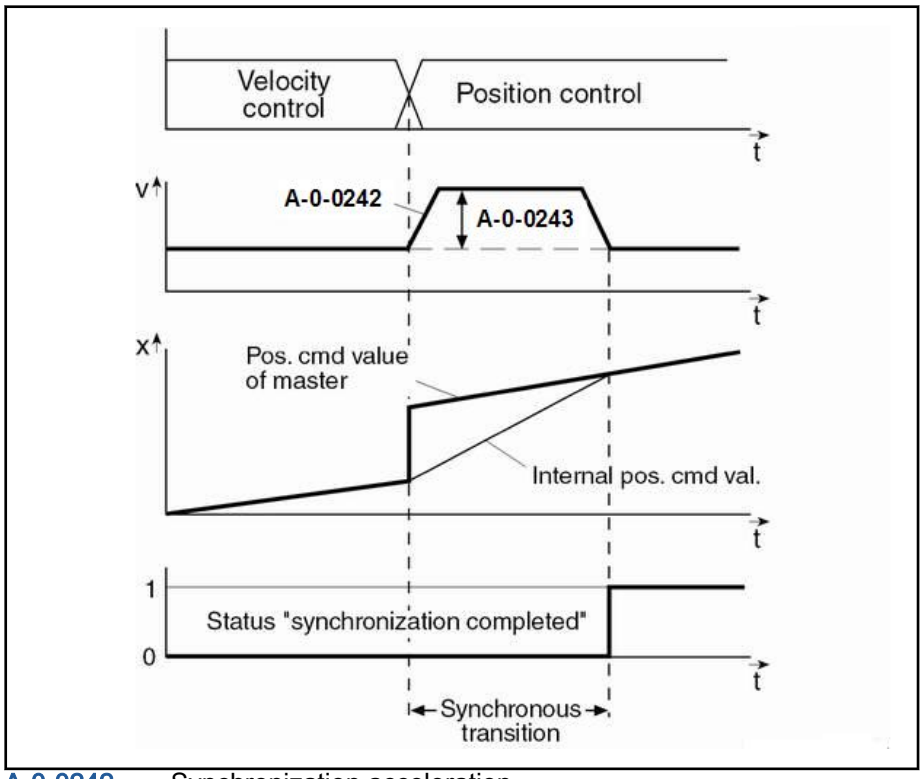
	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	-	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter contains the acceleration value considered as drive-controlled when switching the operation mode from velocity control to position control during synchronization.

The drive synchronizes when changing the operation mode to the cyclic position control. That means that it creates a smooth transition of the internal position command value from the actual position to the new command value characteristic specified by the control. This creation is based on internal synchronization parameters (A-0-0242, A-0-0243) After the synchronization, the drive follows the position command values specified by the master in the Motion cycle

It is ensured drive-internally, that the operation mode switching is also switched in case of command value changes in jumps.



A-0-0242 Synchronization acceleration
A-0-0243 Synchronization velocity
Fig. 4-9: Time diagram"Drive-controlled operation mode switching"

The value of this parameter corresponds in its default state to the value of the parameter A-0-0034, Acceleration limit value, bipolar.

Individual values can be configured if bit 4 is set in the parameter A-0-0007, Axis configuration.

Use This value is synchronized to the drive when switching from P2 to BB.

A-0-0242 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	P-0-0142
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	P-0-0142
SercosDrive:	---

A-0-0243, Position control, synchronization velocity

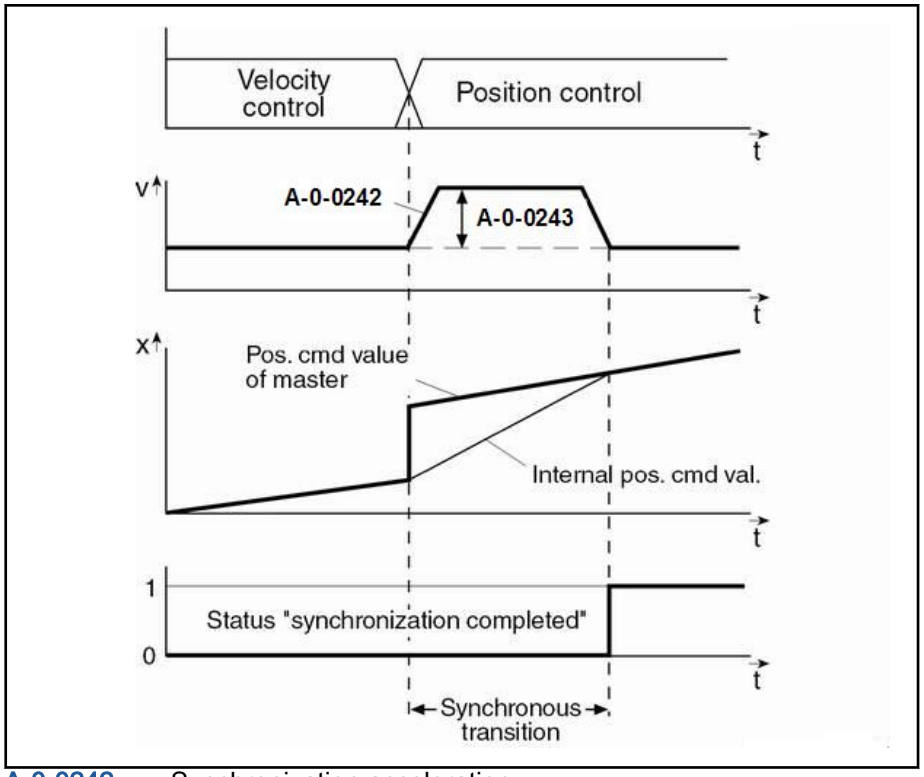
	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	-	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter contains the velocity value considered as drive-controlled when switching the operation mode from velocity control to position control during synchronization.

The drive synchronizes when changing the operation mode to the cyclic position control. That means that it creates a smooth transition of the internal position command value from the actual position to the new command value characteristic specified by the control. This creation is based on internal synchronization parameters (A-0-0242, A-0-0243) After the synchronization, the drive follows the position command values specified by the master in the Motion cycle

It is ensured drive-internally, that the operation mode switching is also switched in case of command value changes in jumps.



A-0-0242 Synchronization acceleration
A-0-0243 Synchronization velocity

Fig. 4-10: Time diagram"Drive-controlled operation mode switching"

☞ This parameter value corresponds by default to the maximum absolute value of the parameters A-0-0032/A-0-0033, Velocity limit value, positive/negative.

Individual values can be configured if bit 4 is set in the parameter A-0-0007, Axis configuration.

Use

This value is synchronized to the drive when switching from P2 to BB.

A-0-0243 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	1000.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	P-0-0143
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	P-0-0143
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0300, Master axis, actual position value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The actual position value of the master axis to the current slave axis is displayed in this parameter.

The master axis is defined by "A-0-2700, ELS, master axis, control number" and "A-0-2701, ELS, master axis, axis number".

The unit is transferred to the axis specified by the parameter "A-0-0200, default master axis".

A-0-0300 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0302, Master axis, actual velocity value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The actual velocity value of the master axis to the current slave axis is displayed in this parameter.

The master axis is defined by "A-0-2700, ELS, master axis, control number" and "A-0-2701, ELS, master axis, axis number".

The unit is transferred to the axis specified by the parameter "A-0-0200, default master axis".

A-0-0302 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

4.1.3 A-0-0500 - A-0-0999

A-0-0500, Configuration of user-defined command value A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter configures a parameter that is cyclically transmitted in container "A" from the control to the drive.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

A-0-0500 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0501, Container of user-defined command value A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter indicates the value of the parameter configured in the parameter "A-0-0500, Configuration of user-defined command value A".

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

If the value of the parameter is modified, the related value is also modified in the AxisData structure

`AxisData[].dwUserCmdDataA_q` and vice versa.

If the control is in phase 4, the value is transferred cyclically to the drive.

A-0-0501 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0502, Configuration of user-defined command value B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis. This parameter configures a parameter that is cyclically transmitted in container "B" from the control to the drive.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

A-0-0502 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0503, Container of user-defined command value B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter indicates the value of the parameter configured in the parameter "A-0-0502, Configuration of user-defined command value B".

Describing individual parameters, arranged according to types

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

If the value of the parameter is modified, the related value is also modified in the AxisData structure

`AxisData[].dwUserCmdDataB_q` and vice versa.

If the control is in phase 4, the value is transferred cyclically to the drive.

A-0-0503 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0504, Configuration of user-defined command value C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis. This parameter configures a parameter that is cyclically transmitted in container "C" from the control to the drive.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

A-0-0504 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0505, Container of user-defined command value C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter indicates the value of the parameter configured in the parameter "A-0-0504, Configuration of user-defined command value C".

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

If the value of the parameter is modified, the related value is also modified in the AxisData structure

`AxisData[].dwUserCmdDataC_q` and vice versa.

If the control is in phase 4, the value is transferred cyclically to the drive.

A-0-0505 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0506, Configuration of user-defined command value D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis. This parameter configures a parameter that is cyclically transmitted in container "D" from the control to the drive.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

A-0-0506 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0507, Container of user-defined command value D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter indicates the value of the parameter configured in the parameter "A-0-0506, Configuration of user-defined command value D".

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

If the value of the parameter is modified, the related value is also modified in the AxisData structure

`AxisData[].dwUserCmdDataD_q` and vice versa.

If the control is in phase 4, the value is transferred cyclically to the drive.

A-0-0507 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0508, Configuration of user-defined command value E

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis. This parameter configures a parameter that is cyclically transmitted in container "E" from the control to the drive.

The parameter "A-0-0596, List of freely configurable parameters in the MDT" contains the possible parameters whose values may be transferred.

A-0-0508 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0509, Container of user-defined command value E

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Five containers (A/B/C/D/E) with four bytes each are reserved in the master data telegram to transmit command values to the corresponding axis.

This parameter indicates the value of the parameter configured in the parameter "A-0-0508, Configuration of user-defined command value E".

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

If the value of the parameter is modified, the related value is also modified in the AxisData structure

`AxisData[].dwUserCmdDataE_q` and vice versa.

If the control is in phase 4, the value is transferred cyclically to the drive.

A-0-0509 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-0510, Reserved

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is not available anymore in the current firmware version. However, the parameter remains due to compatibility reasons.

The control can only be switched to phase 4, if this parameter contains the value S-0-0000.

A-0-0510 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0024
IndraDrive/ Control:	S-0-0024
HydraulicDrive/ Drive:	S-0-0024
HydraulicDrive/ Control:	S-0-0024
SercosDrive:	S-0-0024

A-0-0511, Reserved

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RW	RW	RW	RW	RW	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is not available anymore in the current firmware version. However, the parameter remains due to compatibility reasons.

Describing individual parameters, arranged according to types

A-0-0511 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0520, Configuration of actual user-defined value A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to the control. This parameter is used to configure a parameter that is cyclically transmitted in container "A" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0520 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

Describing individual parameters, arranged according to types

A-0-0521, Container of actual user-defined value A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0520, Configuration of actual user-defined value A".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataA_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0521 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0522, Configuration of actual user-defined value B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to

Describing individual parameters, arranged according to types

the control. This parameter is used to configure a parameter that is cyclically transmitted in container "B" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0522 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

A-0-0523, Container of actual user-defined value B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function

Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0522, Configuration of actual user-defined value B".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataB_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0523 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0524, Configuration of actual user-defined value C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to the control. This parameter is used to configure a parameter that is cyclically transmitted in container "C" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0524 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

Describing individual parameters, arranged according to types

A-0-0525, Container of actual user-defined value C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0524, Configuration of actual user-defined value C".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataC_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0525 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0526, Configuration of actual user-defined value D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to

the control. This parameter is used to configure a parameter that is cyclically transmitted in container "D" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0526 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

A-0-0527, Container of actual user-defined value D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function

Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0526, Configuration of actual user-defined value D".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataD_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0527 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	---

A-0-0528, Configuration of actual user-defined value E

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to the control. This parameter is used to configure a parameter that is cyclically transmitted in container "E" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0528 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

Describing individual parameters, arranged according to types

A-0-0529, Container of actual user-defined value E

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0528, Configuration of actual user-defined value E".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataE_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0529 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	---

A-0-0530, Configuration of actual user-defined value F

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Six containers (A/ B/ C/ D/ E /F) with four bytes each are reserved within the drive telegram for transmitting the actual values from the respective axis to

Describing individual parameters, arranged according to types

the control. This parameter is used to configure a parameter that is cyclically transmitted in container "F" from the axis to the control.

The parameter "A-0-0597, List of freely configurable parameter in the AT" contains the possible parameters whose values can be transmitted.

A-0-0530 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	S-0-0016

A-0-0531, Container of actual user-defined value F

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	+	+	+	+	+	-	-	-	-

Function

Six containers (A/B/C/D/E/F) with four bytes each are reserved in the drive telegram to transmit the actual values from the respective axis to the control.

This parameter indicates the value of the parameter configured in the parameter "A-0-0530, Configuration of actual user-defined value F".

The value is provided to the PLC in the AxisData structure

`AxisData[].dwUserActualDataF_i`.

The parameter applies the sercos attribute and the unit of the configured S-/P-parameter.

A-0-0531 - Attributes:

Function:	PARAMETER	**Unit:**	MasterUnit
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	+	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0016
IndraDrive/ Control:	S-0-0016
HydraulicDrive/ Drive:	S-0-0016
HydraulicDrive/ Control:	S-0-0016
SercosDrive:	---

A-0-0540, Configuration of user-defined command value, bit A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0540" defines the parameter of the drive,
- "A-0-0541" defines the bit in the parameter of the drive and
- "A-0-0542" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0540 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0027
IndraDrive/ Control:	S-0-0027
HydraulicDrive/ Drive:	S-0-0027
HydraulicDrive/ Control:	S-0-0027
SercosDrive:	S-0-0027

Describing individual parameters, arranged according to types

A-0-0541, Configuration of user-defined command value, bit number A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0540" defines the parameter of the drive,
- "A-0-0541" defines the bit in the parameter of the drive and
- "A-0-0542" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0541 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0329
IndraDrive/ Control:	S-0-0329
HydraulicDrive/ Drive:	S-0-0329
HydraulicDrive/ Control:	S-0-0329
SercosDrive:	Not in PackProfile S-0-0329

A-0-0542, User-defined command value, bit number A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function

Four containers (A/B/C/D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" to transmit the command values to the respective axis.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0540" defines the parameter of the drive,
- "A-0-0541" defines the bit in the parameter of the drive and
- "A-0-0542" contains the value that should be written in the parameter bit.

If the bit value is changed in the parameter, the related value is also modified in the AxisData structure

`AxisData[].wUserCmdDataBitA_q` and vice versa.

The parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0542 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x01	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0145
IndraDrive/ Control:	S-0-0145
HydraulicDrive/ Drive:	S-0-0145
HydraulicDrive/ Control:	S-0-0145
SercosDrive:	Not in PackProfile S-0-0145

A-0-0543, Configuration of user-defined command value, bit B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0543" defines the parameter of the drive,
- "A-0-0544" defines the bit in the parameter of the drive and

Describing individual parameters, arranged according to types

- "A-0-0545" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0543 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0027
IndraDrive/ Control:	S-0-0027
HydraulicDrive/ Drive:	S-0-0027
HydraulicDrive/ Control:	S-0-0027
SercosDrive:	S-0-0027

A-0-0544, Configuration of user-defined command value, bit number B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0543" defines the parameter of the drive,
- "A-0-0544" defines the bit in the parameter of the drive and
- "A-0-0545" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

Describing individual parameters, arranged according to types

A-0-0544 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0329
IndraDrive/ Control:	S-0-0329
HydraulicDrive/ Drive:	S-0-0329
HydraulicDrive/ Control:	S-0-0329
SercosDrive:	Not in PackProfile S-0-0329

A-0-0545, User-defined command value, bit number B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/B/C/D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" to transmit the command values to the respective axis.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0543" defines the parameter of the drive,
- "A-0-0544" defines the parameter bit of the drive,
- "A-0-0545" contains the value which should be written in the parameter bit.

If the bit value is changed in the parameter, the related value is also modified in the AxisData structure

`AxisData[].wUserCmdDataBitB_q` and vice versa.

The parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

Describing individual parameters, arranged according to types

A-0-0545 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x01	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0145
IndraDrive/ Control:	S-0-0145
HydraulicDrive/ Drive:	S-0-0145
HydraulicDrive/ Control:	S-0-0145
SercosDrive:	Not in PackProfile S-0-0145

A-0-0546, Configuration of user-defined command value, bit C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0546" defines the parameter of the drive,
- "A-0-0547" defines the bit in the parameter of the drive and
- "A-0-0548" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0546 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0027
IndraDrive/ Control:	S-0-0027
HydraulicDrive/ Drive:	S-0-0027
HydraulicDrive/ Control:	S-0-0027
SercosDrive:	S-0-0027

A-0-0547, Configuration of user-defined command value, bit number C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0546" defines the parameter of the drive,
- "A-0-0547" defines the bit in the parameter of the drive and
- "A-0-0548" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0547 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0329
IndraDrive/ Control:	S-0-0329
HydraulicDrive/ Drive:	S-0-0329
HydraulicDrive/ Control:	S-0-0329
SercosDrive:	Not in PackProfile S-0-0329

Describing individual parameters, arranged according to types

A-0-0548, User-defined command value, bit number C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/B/C/D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" to transmit the command values to the respective axis.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0546" defines the parameter of the drive,
- "A-0-0547" defines the parameter bit of the drive,
- "A-0-0548" contains the value which should be written in the parameter bit.

If the bit value is changed in the parameter, the related value is also modified in the AxisData structure

`AxisData[].wUserCmdDataBitC_q` and vice versa.

The parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0548 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0145
IndraDrive/ Control:	S-0-0145
HydraulicDrive/ Drive:	S-0-0145
HydraulicDrive/ Control:	S-0-0145
SercosDrive:	Not in PackProfile S-0-0145

Describing individual parameters, arranged according to types

A-0-0549, Configuration of user-defined command value, bit D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0549" defines the parameter of the drive,
- "A-0-0550" defines the bit in the parameter of the drive and
- "A-0-0551" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0549 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0027
IndraDrive/ Control:	S-0-0027
HydraulicDrive/ Drive:	S-0-0027
HydraulicDrive/ Control:	S-0-0027
SercosDrive:	S-0-0027

A-0-0550, Configuration of user-defined command value, bit number D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function Four containers (A/ B/ C/ D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" for transmitting the command values to the respective axis .

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0549" defines the parameter of the drive,
- "A-0-0550" defines the bit in the parameter of the drive and
- "A-0-0551" contains the value which is to be written in the bit of the parameter.

Parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0550 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0329
IndraDrive/ Control:	S-0-0329
HydraulicDrive/ Drive:	S-0-0329
HydraulicDrive/ Control:	S-0-0329
SercosDrive:	Not in PackProfile S-0-0329

A-0-0551, User-defined command value, bit number D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Four containers (A/B/C/D) with one bit each are reserved in the master data telegram in "S-0-0145, Signal control word" to transmit the command values to the respective axis.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0549" defines the parameter of the drive,
- "A-0-0550" defines the parameter bit of the drive,
- "A-0-0551" contains the value which should be written in the parameter bit.

If the bit value is changed in the parameter, the related value is also modified in the AxisData structure

`AxisData[].wUserCmdDataBitD_q` and vice versa.

The parameter "A-0-0598, List of configurable parameters in signal control word" contains the possible parameters whose values can be transferred.

A-0-0551 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0145
IndraDrive/ Control:	S-0-0145
HydraulicDrive/ Drive:	S-0-0145
HydraulicDrive/ Control:	S-0-0145
SercosDrive:	Not in PackProfile S-0-0145

A-0-0560, Configuration of actual user-defined value, bit A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

In the drive telegram in "S-0-0144, Signal status word", four containers (A/ B/ C/ D) with one bit each are reserved for the transmission of the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0560" defines the parameter of the drive,
- "A-0-0561" defines the bit in the parameter of the drive and
- "A-0-0562" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

Describing individual parameters, arranged according to types

A-0-0560 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0026
IndraDrive/ Control:	S-0-0026
HydraulicDrive/ Drive:	S-0-0026
HydraulicDrive/ Control:	S-0-0026
SercosDrive:	S-0-0026

A-0-0561, Configuration of actual user-defined value, bit number A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0560" defines the parameter of the drive,
- "A-0-0561" defines the bit in the parameter of the drive and
- "A-0-0562" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0561 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0328
IndraDrive/ Control:	S-0-0328
HydraulicDrive/ Drive:	S-0-0328
HydraulicDrive/ Control:	S-0-0328
SercosDrive:	Not in PackProfile S-0-0328

A-0-0562, Actual user-defined value, bit number A

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/B/C/D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" to transmit the actual values from the respective axis to the control.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0560" defines the parameter of the drive,
- "A-0-0561" defines the parameter bit of the drive.
- "A-0-0562" contains the value read from the parameter bit.

The value of the parameter bit is provided to the PLC in the AxisData structure

`AxisData[].wUserActualDataBitA_i`.

The Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values may be transferred.

A-0-0562 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0144
IndraDrive/ Control:	S-0-0144
HydraulicDrive/ Drive:	S-0-0144
HydraulicDrive/ Control:	S-0-0144
SercosDrive:	Not in PackProfile S-0-0144

Describing individual parameters, arranged according to types

A-0-0563, Configuration of actual user-defined value, bit B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0563" defines the parameter of the drive,
- "A-0-0564" defines the bit in the parameter of the drive and
- "A-0-0565" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0563 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0026
IndraDrive/ Control:	S-0-0026
HydraulicDrive/ Drive:	S-0-0026
HydraulicDrive/ Control:	S-0-0026
SercosDrive:	S-0-0026

A-0-0564, Configuration of actial user-defined value, bit number B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0563" defines the parameter of the drive,
- "A-0-0564" defines the bit in the parameter of the drive and
- "A-0-0565" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0564 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0328
IndraDrive/ Control:	S-0-0328
HydraulicDrive/ Drive:	S-0-0328
HydraulicDrive/ Control:	S-0-0328
SercosDrive:	Not in PackProfile S-0-0328

A-0-0565, Actual user-defined value, bit number B

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/B/C/D) with one bit each are reserved in the drive telegram in "S-00144, Signal status word" to transmit the actual values from the respective axis to the control.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0563" defines the parameter of the drive,
- "A-0-0564" defines the parameter bit of the drive,
- "A-0-0565" contains the value read from the parameter bit.

The value of the parameter bit is provided to the PLC in the AxisData structure

Describing individual parameters, arranged according to types

`AxisData[].wUserActualDataBitB_i`.

The Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values may be transferred.

A-0-0565 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0144
IndraDrive/ Control:	S-0-0144
HydraulicDrive/ Drive:	S-0-0144
HydraulicDrive/ Control:	S-0-0144
SercosDrive:	Not in PackProfile S-0-0144

A-0-0566, Configuration of actual user-defined value, bit C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0566" defines the parameter of the drive,
- "A-0-0567" defines the bit in the parameter of the drive and
- "A-0-0568" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

Describing individual parameters, arranged according to types

A-0-0566 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0026
IndraDrive/ Control:	S-0-0026
HydraulicDrive/ Drive:	S-0-0026
HydraulicDrive/ Control:	S-0-0026
SercosDrive:	S-0-0026

A-0-0567, Configuration of actual user-defined value, bit number C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0566" defines the parameter of the drive,
- "A-0-0567" defines the bit in the parameter of the drive and
- "A-0-0568" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0567 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0328
IndraDrive/ Control:	S-0-0328
HydraulicDrive/ Drive:	S-0-0328
HydraulicDrive/ Control:	S-0-0328
SercosDrive:	Not in PackProfile S-0-0328

A-0-0568, Actual user-defined value, bit number C

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/B/C/D) with one bit each are reserved in the drive telegram in "S-00144, Signal status word" to transmit the actual values from the respective axis to the control.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0566" defines the parameter of the drive,
- "A-0-0567" defines the parameter bit of the drive,
- "A-0-0568" contains the value read from the parameter bit.

The value of the parameter bit is provided to the PLC in the AxisData structure

`AxisData[].wUserActualDataBitC_i`.

The Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values may be transferred.

A-0-0568 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0144
IndraDrive/ Control:	S-0-0144
HydraulicDrive/ Drive:	S-0-0144
HydraulicDrive/ Control:	S-0-0144
SercosDrive:	Not in PackProfile S-0-0144

Describing individual parameters, arranged according to types

A-0-0569, Configuration of actual user-defined value, bit D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0569" defines the parameter of the drive,
- "A-0-0570" defines the bit in the parameter of the drive and
- "A-0-0571" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0569 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x0	0x100000FFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0026
IndraDrive/ Control:	S-0-0026
HydraulicDrive/ Drive:	S-0-0026
HydraulicDrive/ Control:	S-0-0026
SercosDrive:	S-0-0026

A-0-0570, Configuration of actual user-defined value, bit number D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function Four containers (A/ B/ C/ D) with one bit each are reserved in the drive telegram in "S-0-0144, Signal status word" for transmitting the actual values from the respective axis to the control.

A total of three parameters per container are required or addressing and value transmission.

- "A-0-0569" defines the parameter of the drive,
- "A-0-0570" defines the bit in the parameter of the drive and
- "A-0-0571" contains the value which was read from the bit of the parameter.

Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values can be transferred.

A-0-0570 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	31	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0328
IndraDrive/ Control:	S-0-0328
HydraulicDrive/ Drive:	S-0-0328
HydraulicDrive/ Control:	S-0-0328
SercosDrive:	Not in PackProfile S-0-0328

A-0-0571, Actual user-defined value, bit number D

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	RO	RO	RO	RO	RO	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Four containers (A/B/C/D) with one bit each are reserved in the drive telegram in the parameter "S-00144, Signal status word" to transmit the actual values from the respective axis to the control.

A total of three parameters are required per container for addressing and value transmission.

- "A-0-0569" defines the parameter of the drive,
- "A-0-0570" defines the parameter bit of the drive,
- "A-0-0571" contains the value read from the parameter bit.

The value of the parameter bit is provided to the PLC in the AxisData structure

`AxisData[].wUserActualDataBitD_i`.

The Parameter "A-0-0599, List of configurable parameters in signal status word" contains the possible parameters whose values may be transferred.

A-0-0571 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0144
IndraDrive/ Control:	S-0-0144
HydraulicDrive/ Drive:	S-0-0144
HydraulicDrive/ Control:	S-0-0144
SercosDrive:	Not in PackProfile S-0-0144

A-0-0596, List of freely configurable parameters in the MDT

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list contains the parameter ID numbers that can be configured in the master data telegram for one of the six 4-byte containers.

Container A	Container B	Container C	Container D	Container E	Container F
A-0-0500	A-0-0502	A-0-0504	A-0-0506	A-0-0508	A-0-0510

Tab. 4-4: Parameters that configure the respective containers

See also Functional Description: "MDT/ AT Configuration".

A-0-0596 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0188
IndraDrive/ Control:	S-0-0188
HydraulicDrive/ Drive:	S-0-0188
HydraulicDrive/ Control:	S-0-0188
SercosDrive:	S-0-0188

A-0-0597, List of freely configurable parameters in the AT

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list contains the parameter ID numbers that can be configured in the drive telegram for one of the six 4-byte containers.

Container A	Container B	Container C	Container D	Container E	Container F
A-0-0520	A-0-0522	A-0-0524	A-0-0526	A-0-0528	A-0-0530

Tab. 4-5: Parameters that configure the respective containers

See also Functional Description: "MDT/ AT Configuration".

A-0-0597 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0187
IndraDrive/ Control:	S-0-0187
HydraulicDrive/ Drive:	S-0-0187
HydraulicDrive/ Control:	S-0-0187
SercosDrive:	S-0-0187

A-0-0598, List of configurable parameters in signal control word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list contains the parameter ID numbers that can be configured in the master data telegram for one of the four single-bit containers.

	Container A	Container B	Container C	Container D
Parameter	A-0-0540	A-0-0543	A-0-0546	A-0-0549
Bit position	A-0-0541	A-0-0544	A-0-0547	A-0-0550
Value	A-0-0542	A-0-0545	A-0-0548	A-0-0551

Tab. 4-6: Parameters that configure the respective containers

See also Functional Description: "MDT/ AT Configuration".

A-0-0598 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0399
IndraDrive/ Control:	S-0-0399
HydraulicDrive/ Drive:	S-0-0399
HydraulicDrive/ Control:	S-0-0399
SercosDrive:	Not in PackProfile S-0-0399

A-0-0599, List of configurable parameters in signal status word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function This list contains the parameter ID numbers that can be configured in the drive telegram for one of the four single-bit containers.

	Container A	Container B	Container C	Container D
Parameter	A-0-0560	A-0-0563	A-0-0566	A-0-0569
Bit position	A-0-0561	A-0-0564	A-0-0567	A-0-0570
Value	A-0-0562	A-0-0565	A-0-0568	A-0-0571

Tab. 4-7: Parameters that configure the respective containers

See also Functional Description: "MDT/ AT Configuration".

A-0-0599 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0398
IndraDrive/ Control:	S-0-0398
HydraulicDrive/ Drive:	S-0-0398
HydraulicDrive/ Control:	S-0-0398
SercosDrive:	Not in PackProfile S-0-0398

A-0-0606, Drive, Software revision

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	-	+	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the software version of the connected drive.



The software version is read out from the drive during runtime. No buffering by the control. One or more communication cycles can sporadically elapse until the value is available on the control.

An empty character string is displayed if the software version of the drive cannot be determined.

Describing individual parameters, arranged according to types

A-0-0606 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0622, Synchronization run window, position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

If, for the "Synchronized Motion" function blocks with subordinate position control (MC_GearInPos, MC_CamIn, MB_MotionProfile, FlexProfile), the difference between the position command value and the actual position value is smaller than the "A-0-0622, Synchronization window, position", bit 7 in parameter "A-0-0021, Axis status" is set.

The following applies:

Bit 7 = 1 if | X synch - X actual | < (A-0-0622)

with

- X synch: "A-0-2653, ELS, synchronous position command value",
- X actual: "A-0-0100, Actual position value".



For axes with interpolation in the control, the status is exclusively created based on the interpolated values.

For these axes, the parameters are only available due to reasons of compatibility and have thus no effect.

Describing individual parameters, arranged according to types

A-0-0622 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	5.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0228
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0623, Synchronization run window, velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

With the "Synchronized Motion" function blocks (MC_GearIn), if the difference between the velocity command value and actual velocity value is smaller than "A-0-0623, Synchronization window, velocity, bit 7 in the parameter "A-0-0021, Axis status" is set.

The following applies:

Bit 7 = 1, if | dX synch - dX Actual | < (A-0-0623)

with

- dX actual: "A-0-0102, Actual velocity value",
- dX synch: "A-0-2654, ELS, synchronous velocity", created from the current master axis speed.

A-0-0623 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	1.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0183
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0627, Controller axis, diagnostic number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function If bit 12 or 13 of the parameter "A-0-0019, Controller status word" is set to 1, this parameter contains the current diagnostic message for the controller axis.

A-0-0627 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0630, Controller axis, controller name

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function A description text for the PLC controller of the controller axis can be saved in this parameter (e.g. synchronous controller). The text does not provide any functional meaning.

A-0-0630 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Controller_name"
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-0651, Diagnostics, control word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RW	RW	RW	RW	RW	RW	RW	RW	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function The error reaction on the control side can be set axis-specifically via this parameter.

Structure

Bit	Designation/function
0	0: Reaction from the control on the F2/F3 drive errors
1..31	reserved

Describing individual parameters, arranged according to types

Use **Bit 0:**

Interpolation	Behavior
In the control	0: F2/F3 drive errors cause the control error F20B0005. There is an error reaction from the control. 1: All drive errors of state class 1 (F2...F8) cause a control error F00B0165. There is **no** error reaction from the control.
In the drive	0: Fxxxx drive errors become F200xxxx errors on the control. There is an error reaction from the control. 1: F2xxx/F3xxx drive errors become F0002xxx/F0003xxx errors on the control side. Thus, there is **no** error reaction from the control for these errors.

Tab. 4-8: Using A-0-0651, bit 0

NOTICE

If the error reaction on the control is switched off, the error handling must be programmed in the PLC program.

A-0-0651 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x0000
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

4.1.4 A-0-1000 - A-0-1999

A-0-1000, Command: Load basic axis parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is used as a command for loading the basic axis parameters.

Describing individual parameters, arranged according to types



Before executing the command, back up the parameters

- A-0-0002 and
- A-0-0016.

Both parameters have to be restored manually after loading the axis basic parameters. This is the only way to be able to continue to use the IndraWorks diagnostic function online.

Use

From IndraWorks MLC:

- Click on the menu item "Load Basis Parameters" in the **context menu of the axis ▸ Parameter Handling ▸ Load Basic Parameters**.

From the field bus:

- Enter the binary value "0000000000000011" (=0x0003) in the parameter (A-0-1000).

  This activates the loading procedure of the axis's basic parameters.
- After the loading procedure, the control automatically resets the parameter to "0x00" again.

A-0-1000 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-1030, Command: Clear all axis errors

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter acts as a command to clear all axis errors on the control or in the drive.

Use

Starting from IndraWorks:

- Use "Clear Error" in the **axis context menu ▸ Diagnostics ▸ Clear Error**.

Describing individual parameters, arranged according to types

From the field bus:

- Enter the binary value "0000000000000011" (=16#0003) in the parameter.

  This triggers the error deletion process.
- After the error is deleted, the control automatically resets the parameter value back to "0000000000000000".

PLC program:

- Use the MB_Command function block.

A-0-1030 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0099
IndraDrive/ Control:	S-0-0099
HydraulicDrive/ Drive:	S-0-0099
HydraulicDrive/ Control:	S-0-0099
SercosDrive:	S-0-0099

4.1.5 A-0-2000 - A-0-2499

A-0-2100, List of all backup operation A-parameters

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list includes all A-parameters to be considered when backing up parameters. It is entered in the ID number format.

The entries are sorted by description and their relation and not by ID number or alphabetically.

A-parameters are stored in the order of these entries.

Structure The ID number format is as follows:

Describing individual parameters, arranged according to types

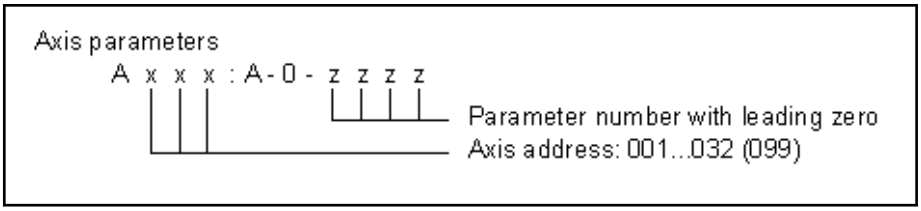


Fig. 4-11: ID number format

Use A001: A-0-0004 - axis 1; parameter A-0-0004.

A-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x1 0000 0000	0x1 0000 0FFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2121, Axis status

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	+	+	+
Direct access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
C2C access:	RO	RO	RO	RO	RO	RO	RO	RO	RO
Oscilloscope:	+	+	+	+	+	+	+	+	+
Probe:	-	-	-	-	-	-	-	-	-

Function

Structure This parameter describes the current value of the axis status.

Bit	Name/function
0..31	Refer to the parameter description A-0-0021
32	Status SIS protocol
33	Status SIP protocol
34..63	Reserved



Only bit 5 and bit 10 are supported for encoder axes and link axes.

Describing individual parameters, arranged according to types

Use

Bit 32:

0 - Corresponding drive is not linked via SIS protocol

1 - Corresponding drive is linked via SIS protocol

Bit 33:

0 - Corresponding drive is not linked via S/IP protocol

1 - Corresponding drive is linked via S/IP protocol

A-0-2121 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 8BYTE	**PLC data type:**	LWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2200, Command position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter displays the "command position". It is used for the PLCopen FBs supporting the "Discrete Motion" state:

- MC_MoveAbsolute (figure below)
- MC_MoveAdditive
- MC_MoveRelative.

Describing individual parameters, arranged according to types

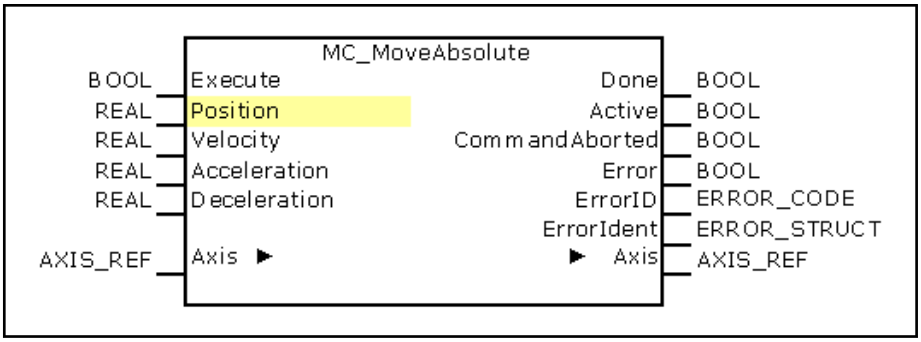


Fig. 4-12: MC_MoveAbsolute with "Position" input

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Command variable	Parameters	Used in
Position	A-0-2200, Command position	MC_MoveAbsolute
Distance	A-0-2200, Command position	MC_MoveAdditive, MC_MoveRelative
Velocity	A-0-2202, Command velocity	
Acceleration	A-0-2203, Command acceleration	
Deceleration	A-0-2204, Command deceleration	
Jerk	A-0-2205, Command jerk	

Tab. 4-9: Command values of "Discrete Motion" function blocks

For "Discrete Motion" function blocks, "A-0-2201, target position" is computed from "command" parameters.

Subsequently, the respective motion of the axis with the specified parameters is running.

☞ Since A-0-22o5, command jerk, is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, jerk" (standard jerk) at a positive edge at the "Execute" input of the respective function block.

A-0-2200 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0282, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0282, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2201, Target position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the "target position". This position contains the value at which the change in position is completed ["A-0-0021, Axis status" (bit 6 = TRUE)].

The parameter is used for the PLCopen FBs supporting the "Discrete Motion" state:

- MC_MoveAbsolute (figure below)
- MC_MoveAdditive
- MC_MoveRelative.

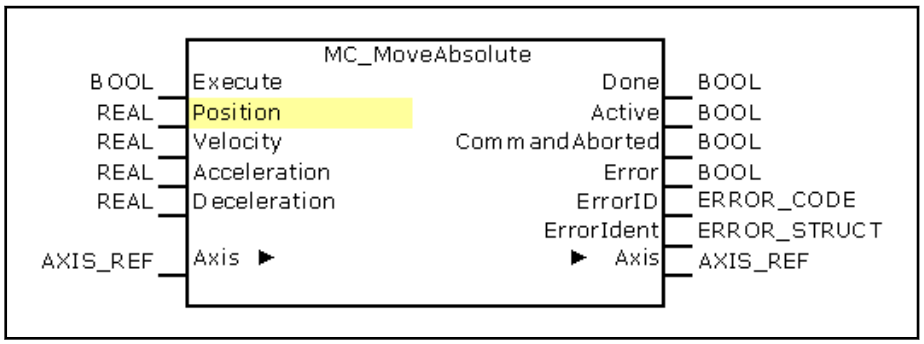


Fig. 4-13: MC_MoveAbsolute with "Position" input

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Command variable	Parameters	Used in
Position	A-0-2200, Command position	MC_MoveAbsolute
Distance	A-0-2200, Command position	MC_MoveAdditive, MC_MoveRelative
Velocity	A-0-2202, Command velocity	
Acceleration	A-0-2203, Command acceleration	
Deceleration	A-0-2204, Command deceleration	
Jerk	A-0-2205, Command jerk	

Tab. 4-10: Command values of "Discrete Motion" function blocks

Afterwards, "A-0-2201, Target position" is immediately calculated:

- **MC_MoveAbsolute**: "A-0-2200, Command position" is copied to "A-0-2201, Target position".
- **MC_MoveAdditive**: "A-0-2200, Command position" is added to "A-0-2201, Target position".

Describing individual parameters, arranged according to types

- **MC_MoveRelative**: "A-0-2200, Command position" and "A-0-0100, Actual position value" are summed up and saved as "A-0-2201, Target position".

The motion runs until the target position "Done" is reached (or up to the command abort "CommandAborted").

☞ Since A-0-22o5, command jerk, is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, jerk" (standard jerk) at a positive edge at the "Execute" input of the respective function block.

A-0-2201 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-4294967296.0	4294967296.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0430, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0430, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2202, Command velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter displays the "command velocity". It is used for the PLCopen FBs supporting the states "Discrete Motion" and "Continuous Motion":

- MC_MoveAbsolute (figure below), MC_MoveAdditive, MC_MoveRelative
- MC_MoveVelocity (figure below).

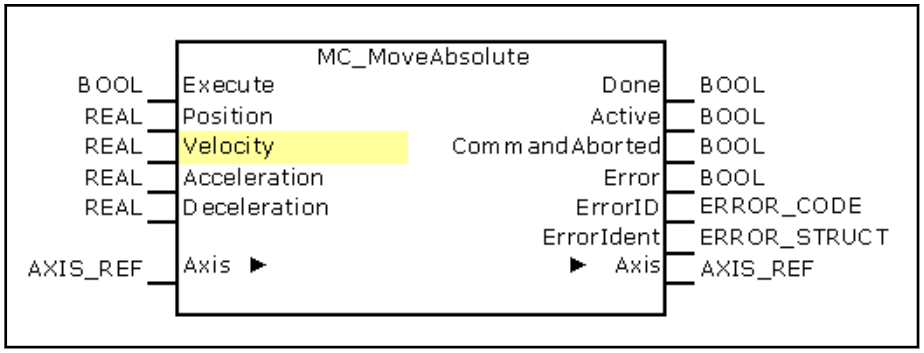


Fig. 4-14: MC_MoveAbsolute with "Velocity" input

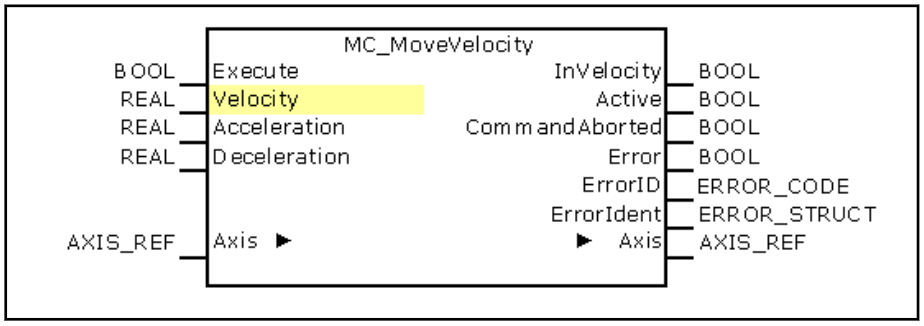


Fig. 4-15: MC_MoveVelocity with "Velocity" input

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Command variable	Parameters	Used in
Position	A-0-2200, Command position	MC_MoveAbsolute
Distance	A-0-2200, Command position	MC_MoveAdditive, MC_MoveRelative
Velocity	A-0-2202, Command velocity	
Acceleration	A-0-2203, Command acceleration	
Deceleration	A-0-2204, Command deceleration	
Jerk	A-0-2205, Command jerk	

Tab. 4-11: Command values of "Discrete Motion" function blocks

For "Discrete Motion" function blocks, "A-0-2201, target position" is computed from "command" parameters.

Subsequently, the respective motion of the axis with the specified parameters is running.



Since A-0-22o5, command jerk, is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, jerk" (standard jerk) at a positive edge at the "Execute" input of the respective function block.

Describing individual parameters, arranged according to types

A-0-2202 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0259, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0259, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2203, Command acceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter displays the "command acceleration". It is used for the PLCopen FBs supporting the states "Discrete Motion" and "Continuous Motion":

- MC_MoveAbsolute (figure below), MC_MoveAdditive, MC_MoveRelative
- MC_MoveVelocity (figure below).

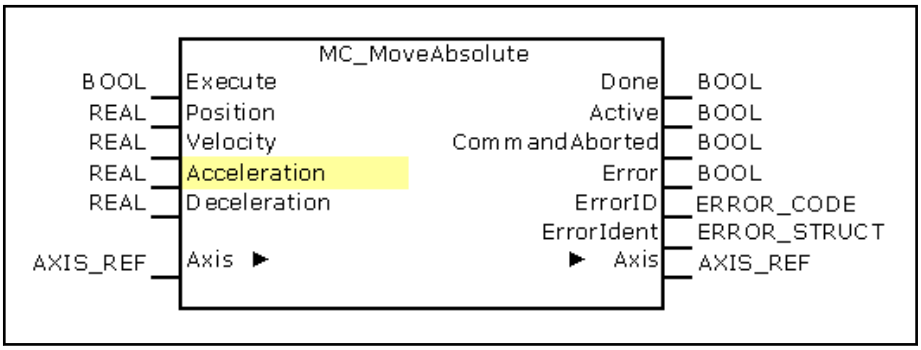


Fig. 4-16: MC_MoveAbsolute with "Acceleration" input

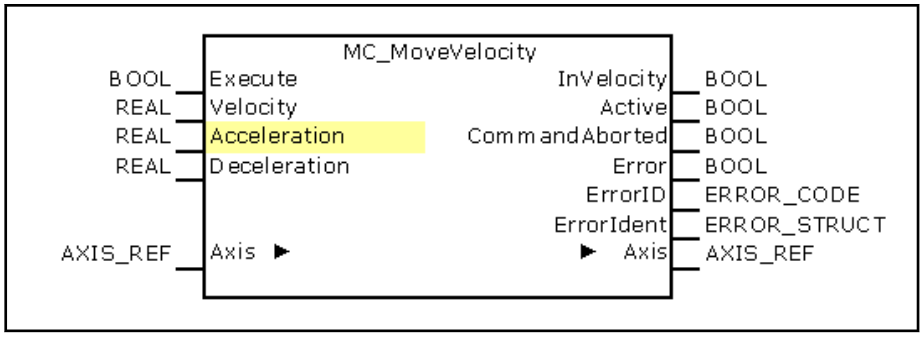


Fig. 4-17: MC_MoveVelocity with "Acceleration" input

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Command variable	Parameters	Used in
Position	A-0-2200, Command position	MC_MoveAbsolute
Distance	A-0-2200, Command position	MC_MoveAdditive, MC_MoveRelative
Velocity	A-0-2202, Command velocity	
Acceleration	A-0-2203, Command acceleration	
Deceleration	A-0-2204, Command deceleration	
Jerk	A-0-2205, Command jerk	

Tab. 4-12: Command values of "Discrete Motion" function blocks

For "Discrete Motion" function blocks, "A-0-2201, target position" is computed from "command" parameters.

Subsequently, the respective motion of the axis with the specified parameters is running.

Since A-0-22o5, command jerk, is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, jerk" (standard jerk) at a positive edge at the "Execute" input of the respective function block.

A-0-2203 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	2147483647.0	MinPositiveLong
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0260, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0260, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2204, Command deceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter displays the "command deceleration". It is used for the PLCopen FBs supporting the states "Discrete Motion" and "Continuous Motion":

- MC_MoveAbsolute (figure below), MC_MoveAdditive, MC_MoveRelative
- MC_MoveVelocity (figure below).

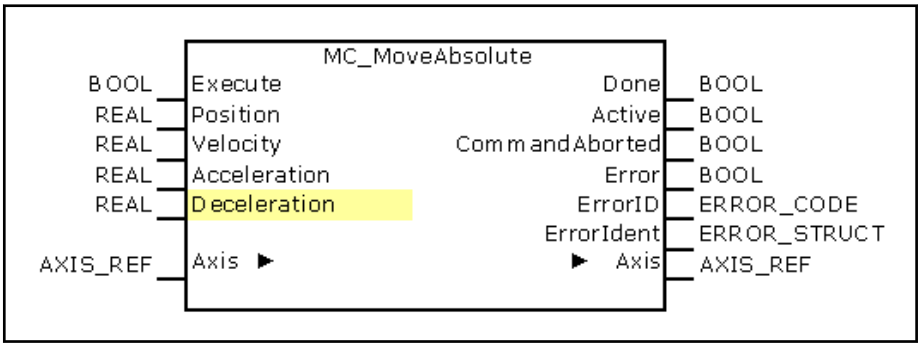


Fig. 4-18: MC_MoveAbsolute with "Deceleration" input

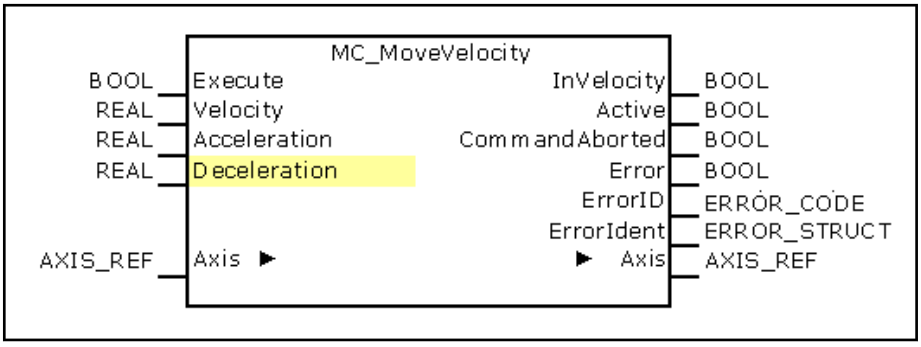


Fig. 4-19: MC_MoveVelocity with "Deceleration" input

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Describing individual parameters, arranged according to types

Command variable	Parameters	Used in
Position	A-0-2200, Command position	MC_MoveAbsolute
Distance	A-0-2200, Command position	MC_MoveAdditive, MC_MoveRelative
Velocity	A-0-2202, Command velocity	
Acceleration	A-0-2203, Command acceleration	
Deceleration	A-0-2204, Command deceleration	
Jerk	A-0-2205, Command jerk	

Tab. 4-13: Command values of "Discrete Motion" function blocks

For "Discrete Motion" function blocks, "A-0-2201, target position" is computed from "command" parameters.

Subsequently, the respective motion of the axis with the specified parameters is running.



Since A-0-22o5, command jerk, is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, jerk" (standard jerk) at a positive edge at the "Execute" input of the respective function block.

A-0-2204 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	2147483647.0	MinPositiveLong
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0359, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0359, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2205, Command jerk

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the command jerk for the axis.

Describing individual parameters, arranged according to types

Since this parameter is not supplied by one FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0216, Jerk" (default jerk) at a positive edge at the "Execute" input of the respective function block.

A-0-2205 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0000001	2147483647.0	MinPositiveLong
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0193, after FB invocation
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0193, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2206, Target force

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the target force for the axis.

Use At a rising edge at the "Execute" input, the input values at the function block instance are applied to the "command" parameters:

Command variable	Parameter	Used in
Torque/force	A-0-2206, Target force	MC_TorqueControl

A-0-2206 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0000001	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0080
IndraDrive/ Control:	S-0-0080
HydraulicDrive/ Drive:	S-0-0080
HydraulicDrive/ Control:	S-0-0080
SercosDrive:	---

A-0-2207, Command direction of motion

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	-	+	+	-	-	+
Direct access:	RO	RO	--	--	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	-	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the command direction for the axis.

Since this parameter is not supplied by a FB input at the PLCopen FBs, such as "A-0-2202, Command velocity", its value is applied by the parameter "A-0-0203, Direction" (default direction) at a positive edge at the "Execute" input of the respective function block.

Structure

Bit	Designation/function
1..0	**direction of motion** 0 0: shortest distance, 0 1: positive direction, catch up, 1 0: negative direction, slow down.

Use **Shortest distance** - The axis is moved to the command target position at the shortest distance.

Positive direction, catch up - The target is reached by turning the axis in the positive direction with regard to the main direction.

Negative direction, slow down - The target is reached by turning the axis in the negative direction with regard to the main direction.

A-0-2207 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0145, Bit 4 + 5, after FB_MoveAbs
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2208, Cyclic command position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This Parameter displays the "commanded position" written with FB ML_Write-CyclicPosition.

This commanded position only gets active on axis if cyclic position channel is opened.

Cyclic position Channel can be opened with FB ML_OpenCyclicPossition-Channel.

A-0-2208 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0047, after FB invocation
IndraDrive/ Control:	S-0-0047, after FB invocation
HydraulicDrive/ Drive:	S-0-0047, after FB invocation
HydraulicDrive/ Control:	S-0-0047, after FB invocation
SercosDrive:	S-0-0047, after FB invocation

Describing individual parameters, arranged according to types

A-0-2209, Cyclic command torque

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	-	-	-	-	+
Direct access:	RO	RO	RO	RO	--	--	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	-	-	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter displays the "Cyclic target force" that has been written using the function module ML_WriteCyclicTorque.

This "Cyclic target value" will only become active on the axis if the cyclic target value channel is open.

The cyclic target value channel can be opened using the function module ML_OpenCyclicTorqueChannel.

A-0-2209 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0050
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2210, Cyclic command velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter displays the "Cyclic target velocity" that has been written using the function module ML_WriteCyclicVelocity.

This "Cyclic target value" will only become active on the axis if the cyclic target value channel is open.

Describing individual parameters, arranged according to types

The cyclic target value channel can be opened using the function module ML_OpenCyclicVelocityChannel.

A-0-2210 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2211, Cyclic analog value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	+	+	-	-	-	-	-
Direct access:	--	--	RO	RO	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter indicates the "cyclic analog value" written with the ML_WriteCyclicAnalog function block.

This “cyclic command value” becomes only active on the axis if the cyclic command value channel is open. This channel can only be opened for HydraulicDrive.

The cyclic command value channel can be opened using the function block ML_OpenCyclicAnalogChannel.

A-0-2211 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0066
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-2891, after FB invocation
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2220, Additive position value, process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RW	RW	RW	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	+	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

Use this parameter to add an additional (additive) position command value to the position command value generated by the command value preparation.

This additional command value is neither limited nor changed. Thus, ensure that the amount, characteristics and derived variables are located in the permitted value range!

The parameter applies to all individual axis commands (e.g. MC_MoveAbsolute).

☞ At interpolation in the drive, this parameter is applied to P-0-0059. More information on this causal loop of the parameter can be found in the documentation of the respective drive.

☞ At interpolation in the drive, P-0-0059 is not in the command value telegram by default. A-0-2220 is transferred first via the asynchronous service channel. If the value is to be cyclically transferred, it is recommended to include P-0-0059 in the user-defined command values (see e.g. A-0-0500).

☞ When the power (MC_Power) is switched on and off, the parameter is reset to "0". This is performed to prevent undesired command value jumps.

☞ The parameter is volatile and not backed up in the remanent data of the control.

Describing individual parameters, arranged according to types

A-0-2220 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0059
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0059
HydraulicDrive/ Control:	---
SercosDrive:	---

4.1.6 A-0-2500 - A-0-2999

A-0-2600, Additive master axis position, process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The specified parameter value is smoothed by means of a 1st order filter and is subsequently added to the sum of "A-0-2710, ELS, phasing, additive position command value, velocity" and of "A-0-0300, Master axis, actual position value".

The time constant of the filter is determined by the parameter A-0-2601, ELS, filter constant, additive master axis position".

A-0-2600 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	P-0-0692
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2601, ELS, filter constant, additive master axis position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The time constant of a 1st order filter is determined with the parameter. This filter is used for smoothing the "A-0-2600, Additive master axis position, process controller".

Use A filter time constant of 0 deactivates the filter.



The filter time constant must comply with the sampling theorem according to Shannon, i.e. the entered filter time constant must not be smaller than double the MC cycle time ("C-0-0400, motion, cycle time, command value"). An automatic check is carried out when the respective operation mode is activated. If it fails, a diagnostic message is output.

A-0-2601 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	655.35	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0693
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2605, ELS, Gear ratio fine adjustment process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function By means of the percentage value of this parameter, a factor is created that acts in the electronic drive.

A-0-2605 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-800.0	800.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0694
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2610, ELS, additive position command value, process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function In addition to "A-0-2750 ELS, PhasingSlave, additive position command value", the parameter is used to add an additive position command value.

The parameterization of the filter effect for the additive position command value is carried out via "A-0-2611, ELS, filter time constant, additive position command value".

Describing individual parameters, arranged according to types

A-0-2610 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0691
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2611, ELS, filter time constant, additive position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter is used to parameterize the filter effect for the additive position command value (cf. A-0-2610, ELS, additive position command value, process controller) filtered by a VZ1 filter (PT1).

Use A filter time constant of 0 deactivates the filter.



The filter time constant must comply with the sampling theorem according to Shannon, i.e. the entered filter time constant must not be smaller than double the MC cycle time ("C-0-0400, motion, cycle time, command value"). An automatic check is carried out when the respective operation mode is activated. If it fails, a diagnostic message is output.

A-0-2611 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	655.35	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	P-0-0060
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2615, ELS, additive velocity command value, process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function In addition to "A-0-2761 ELS, ELS, PhasingSlaveVel, additive command velocity", the parameter is used to add an additive velocity command value

A-0-2615 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0690
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2620, ELS, phase offset of table beginning, process controller

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function Using this parameter, a phase offset can be carried out cyclically in relation to the beginning of the table in the synchronization modes "Cam" and "Motion-Profile".

As a result, the master axis position behind the electronic gear is reduced by the phase parameterized in this parameter.

A-0-2620 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0695
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2621, ELS, filter constant, phase offset of table

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The time constant of a 1st order filter is determined with this parameter. This filter is used to smooth the parameter "A-0-2620, ELS, phase offset of table beginning, process controller".

Use A filter time constant of 0 deactivates the filter.

☞ The filter time constant must comply with the sampling theorem according to Shannon, i.e. the entered filter time constant must not be smaller than double the MC cycle time ("C-0-0400, motion, cycle time, command value"). An automatic check is carried out when the respective operation mode is activated. If it fails, a diagnostic message is output.

Describing individual parameters, arranged according to types

A-0-2621 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	655.35	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0696
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2650, ELS, resulting master axis position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	+	-	+	+	+	-	-	+

Function The master axis position results from the values of the parameters "A-0-0300, Master axis, actual position value" and "A-0-2710, ELS, phasing, additive position command value".

A-0-2650 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0775
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2651, ELS, effective master axis position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	+	-	+	+	+	-	-	+

Function The effective master axis position is the "A-0-2650 ELS, resulting master axis position" behind the electronic gear "A-0-2721"/"A-0-2720" and the "A-0-2722, ELS, gear ratio fine adjust".

A-0-2651 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0776
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2652, ELS, effective master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The effective master axis velocity is the "A-0-0302, Master axis velocity" after the electronic gear "A-0-2721/A-0-2720" and the ELS, gear ratio fine adjust "A-0-2722".

Describing individual parameters, arranged according to types

A-0-2652 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0777
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2653, ELS, synchronous position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	+	-	+	+	+	-	-	+

Function The synchronous position command value is the synchronous position command value of the slave axis derived from "A-0-0300, Master axis, actual position value" and the additive master axis positions.

A-0-2653 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0778
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2654, ELS, synchronous velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The synchronous velocity is the differentiated "A-0-2653, ELS, synchronous position command value" per motion cycle.

A-0-2654 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0779
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2655, ELS, position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	+	-	+	+	+	-	-	+

Function The synchronous position command value is the synchronous position command value of the slave axis resulting from "A-0-0300, Master axis, actual position value" and all additive master axis positions.

Describing individual parameters, arranged according to types

A-0-2655 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0434
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2656, ELS, cam, access phase

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	+	-	+	+	+	-	-	+

Function In the "Cam" operating mode, this parameter can display the calculated value of the access phase for the current cam table.

The calculation of the table access phase is synchronized with "A-0-2650, ELS, resulting master axis position".

A-0-2656 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0227
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2657, ELS, effective velocity command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter can indicate the velocity command value before the summing point of the velocity controller (cf. P-0-0048).



The actual effective velocity value is subtracted from the command velocity value at the summing point. The result (control deviation) is added to the speed controller.

A-0-2657 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0048
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2658, ELS, master axis, velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The master axis speed is the sum modification of "A-0-0300, Master axis, actual position value" and "A-0-2710, ELS, phasing, additive position command value".

Describing individual parameters, arranged according to types

A-0-2658 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0764
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2700, ELS, master axis, control number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the control number of the master axis. The current axis should follow the master axis as slave axis.

Use The parameter is supplemented by "A-0-2701, ELS, master axis, axis number".

Both parameters contain the AXIS_REF information of the master axis related to the FBs

- MC_GearIn
- MB_GearInPos and
- MC_CamIn
- MB_MotionProfile
- ML_FlexProfile

A-0-2700 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2701, ELS, master axis, axis number

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the axis number of the master axis. The current axis should follow the master axis as slave axis.

The parameter is supplemented by "A-0-2700, ELS, master axis, control number".

Use Both parameters contain the AXIS_REF information of the master axis related to the FBs

- MC_GearIn
- MB_GearInPos
- MC_CamIn
- MB_MotionProfile and
- ML_FlexProfile

A-0-2701 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2710, ELS, phasing, additive position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function Using this parameter, an additive master axis position can be added to the parameter "A-0-0300, Master axis, actual position value" for "Synchronized Motion" function blocks (MC_GearIn, MB_GearInPos, MC_CamIn, MB_MotionProfile and ML_FlexProfile).

A parameter change is traversed in one MC cycle for a real axis.

The parameter is influenced by "A-0-0059, Scaling type for position data".

A-0-2710 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0054
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2711, ELS, phasing, additive position command value, velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the maximum position change (= velocity) used to add "A-0-2710, ELS, phasing, additive position command value" to the master axis phase.

Describing individual parameters, arranged according to types

A-0-2711 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0688
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2712, ELS, phasing, additive position command value, acceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the maximum velocity change (= acceleration) used to add "A-0-2710, phasing, additive position command value" to the master axis phase.

A-0-2712 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-2701
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0689
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2720, ELS, master axis gear, input revolutions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the number of input revolutions of the electronic gear.

It determines the gear ratio together with parameter "A-0-2721, ELS, master axis gear, output revolutions" and parameter "A-0-2722, ELS, gear ratio fine adjust".

The gear ratio is:

Gr = ((A-0-2721) / (A-0-2720)) * (1 + A-0-2722)

with "A-0-2721, ELS, master axis gear, output revolutions" and

"A-0-2722, ELS, gear ratio fine adjust".

Use If the axis - coupled via a "Synchronized Motion" FB (MC_GearIn, MB_GearInPos, MC_CamIn, MB_MotionProfile or ML_FlexProfile) - follows its master axis, a master axis position (A-0-0300) sent to the axis is multiplied before further processing with the electronic gear ratio takes place.

A-0-2720 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0156
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2721, ELS, master axis gear, output revolutions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the number of output revolutions of the electronic gear.

It determines the gear ratio together with parameter "A-0-2720, ELS, master axis gear, input revolutions" and parameter "A-0-2722, ELS, gear ratio fine adjust".

The gear ratio is:

Gr = ((A-0-2721) / (A-0-2720)) * (1 + A-0-2722)

with "A-0-2720, ELS, master axis gear, input revolutions" and

"A-0-2722, ELS, gear ratio fine adjust".

Use If the axis - coupled via a "Synchronized Motion" FB (MC_GearIn, MB_GearInPos, MC_CamIn, MB_MotionProfile, ML_FlexProfile) - follows its master axis, a master axis position (A-0-0300) sent to the axis is multiplied before further processing with the electronic gear ratio takes place.

A-0-2721 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0157
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2722, ELS, gear ratio fine adjust

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter indicates the fine adjustment of the gear ratio.

This is the percentage the gear ratio of the electronic device changed.

The values can range between - 799.9999% and 799.9999%.

The gear ratio is:

Gr = ((A-0-2721) / (A-0-2720)) * (1 + A-0-2722)

with "A-0-2721, ELS, master axis gear, output revolutions" and

"A-0-2720, ELS, master axis gear, input revolutions".

Use

If the axis - coupled via a "Synchronized Motion" FB (MC_GearIn, MB_GearInPos, MC_CamIn, MB_MotionProfile, ML_FlexProfile) - follows its master axis, a master axis position (A-0-0300) sent to the axis is multiplied before further processing with the electronic gear ratio takes place.

A-0-2722 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0083
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2730, ELS, PhasingTableAngle, cam table beginning

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the phase at which the access on the cam is negatively displaced compared to "A-0-0300, Master axis, actual position value".

Use The displacement is only used together with the "Synchronized Motion" FB "MC_CamIn", even if there is always one parameter available.

A-0-2730 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0061
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2731, ELS, PhasingTableAngle, change velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the change in velocity of the phase offset for the table access phase parameter "A-0-2730, ELS, PhasingTableAngle, cam table beginning".

If this alteration of the phase offset is to be high, the new value has to be approached slowly if there is an existing gradient in the active table, since each change means a jump in the position command value.

Describing individual parameters, arranged according to types

A new value for the parameter "A-0-2730" does not become effectively immediately. Coming from the current value, the new value is approached in ramp shape. The approach is carried out at the shortest distance.

The gradient of the ramp is determined with this parameter.

If a value of 0 is specified for the parameter, the phase offset is immediately carried out in one step.

Use The parameter is used together with the "Synchronized Motion" FBs MC_CamIn.

A-0-2731 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	655.35	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0158
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2740, ELS, CamIn, cam table preselection

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	-	-	-	-	-	-	-	-
Direct access:	RO	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The "cam table" defined by the MC_CamIn function block is displayed in this parameter.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
2..0	**Enabled cam table** 000 - Cam table 1, active, (P-0-0072), 001 - Cam table 2, active, (P-0-0092), 010 - Cam table 3, active, (P-0-0080), 011 - Cam table 4, active, (P-0-0781), 100 - Cam table 5, active, (P-0-0782), 101 - Cam table 6, active, (P-0-0783), 110 - Cam table 7, active, (P-0-0784), 111 - Cam table 8, active, (P-0-0785).
15...3	Reserved

Currently, only the cams 1-4 are supported by the control firmware.

A-0-2740 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0088
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2741, ELS, CamIn, cam distance

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	-	-	-	-	-	-	-	-
Direct access:	RW	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter indicates the distance, a factor, by which the cam profile is multiplied.

Use The hub is used together with the "Synchronized Motion" FB MC_CamIn.

Describing individual parameters, arranged according to types

A-0-2741 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	360.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0093
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2745, ELS, gear reduction

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter is used to set a phase-synchronous motion to the master axis for the operation modes "Cam", "MotionProfile" and "FlexProfile".

For an endless rotating axis, the forward motion takes place via the linear part, the compensation motion via the cam.



The linear part is switched off with a value of 0.

A-0-2745 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	32767	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	P-0-0755
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2750, ELS, PhasingSlave, additive position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function If a synchronization mode with subordinated closed-loop position control is selected, the position command value is additively added.

This is used to create a position offset between the master axis encoder and slave axis.

Use Only effective in the synchronization modes:

- Phase synchronization (MB_GearInPos),
- Cam table (MC_CamIn),
- MotionProfile (MB_MotionProfile),
- FlexProfile (ML_FlexProfile).

A-0-2750 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0048
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2751, ELS, PhasingSlave, additive position command value, vel.

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the velocity value used to travel the distance (parameter offset) to the absolute synchronization (position adaptation) during the dynamic synchronization.

Use Only effective in the synchronization modes:

- Phase synchronization (MB_GearInPos),
- Cam table (MC_CamIn),
- MotionProfile (MB_MotionProfile),
- FlexProfile (ML_FlexProfile).

A-0-2751 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0686
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2752, ELS, PhasingSlave, additive position command value, acc.

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the value of acceleration or deceleration used to apply the synchronized velocity during the dynamic synchronization (velocity adjustment).

Describing individual parameters, arranged according to types

A-0-2752 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0687
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2761, ELS, PhasingSlaveVel, additive command velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The control can cyclically enter an additive command value in this parameter in velocity and position-controlled operating modes if the control provides a respective value.



The actual effective velocity command value (addition of all parts forming the velocity command value) at the input of the velocity controller is displayed in parameter "A-0-0152".

Also refer to the IndraDrive Functional Descriptions "Operating Modes - Velocity Control".

A-0-2761 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	S-0-0037
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2762, Slave axis, additive command velocity, acceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the maximum change in position (= acceleration) used to add "A-0-2761, ELS, PhasingSlaveVel, additive command velocity" to the master axis phase.

A-0-2762 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2765, Slave axis, master axis revolutions per master axis cycle

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	-	-	-	-	-	-	-	-
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Describing individual parameters, arranged according to types

Function

This parameter can affect the master axis format transferred in the parameter P-0-0053 to the drive.

The value transferred in the parameter P-0-0053 results in:

$$P-0-0053 = \frac{A-0-0101_{MasterAxis}}{A-0-0045_{MasterAxis}} \cdot 2^{20} \cdot A-0-2765$$

☞ If the parameter A-0-2765 "Slave axis, master axis revolutions per master axis cycle" is set to value higher than 1, the following relation has to be ensured:

$$A-0-0045 = \frac{A-0-0045_{MasterAxis}}{A-0-2765}$$

⚠ WARNING **If the ratio of the modulo values (A-0-0045) described is changed, an (implicit) gear is caused.**

☞ The parameter is only available for real axes of type IndraDrive with interpolation in the drive.

Special case: Modulo scaling of the slave axis

If 0 is written to the parameter, write A-0-0045 in such a way that 2^{32} - $2^{\text{P-0-0084, Number of bits per master axis revolution}}$ master axis revolutions correspond to the modulo range after the master axis gear. Use case: FlyingShear.

Special case: Absolute scaling of the slave axis

For the absolute scaling, write 0 to the parameter. Note that it is not fallen below the master axis range or that the master axis range is not exceeded and that the derived slave axis position is in the maximum traversing range. Otherwise, undesired axis motions are caused.

Example:

Implementing synchronizations in the drive with a synchronization range higher than the modulo range:

Using the parameter "P-0-0155, synchronization mode", a synchronization range (bit 2/3) higher than the modulo range of the salve axis can be set. This synchronization range corresponds to the value range of the parameter P-0-0053 specified using the parameter A-0-2765.

The following table shows an exemplary implementation of the synchronization across double the modulo range (defined by A-0-2765). In this case, it corresponds to 720 degrees. That are two load revolutions.

Element	Value
A-0-0045 of the master axis	720 degrees
A-0-2765 of the slave axis	2
Value range of P-0-0053	0 to $2 \cdot 2^{20}$
A-0-0045 of the slave axis	$\frac{720\,\text{deg}}{2} = 360\,\text{deg}$

Describing individual parameters, arranged according to types

Element	Value
P-0-0155 bit 2 of the slave axis	1
P-0-0155 bit 3 of the slave axis	0

Tab. 4-14: Relation of the involved parameters

A-0-2765 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	2047	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0750
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2790, ELS, synchronization velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the positioning velocity used to travel the distance (parameter offset) to the absolute synchronization during the dynamic synchronization.

Use The following figure shows possible transitions of such a synchronization:

Describing individual parameters, arranged according to types

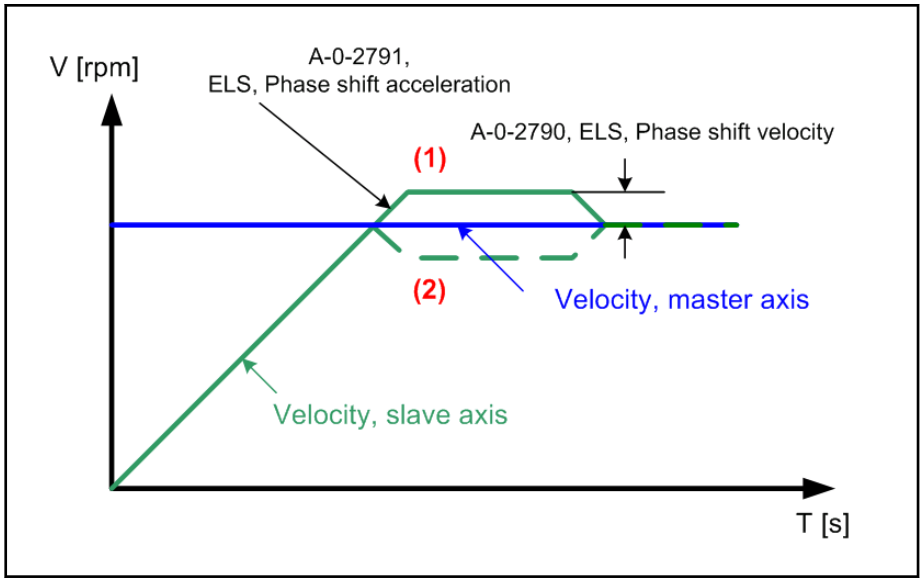


Fig. 4-20: Parameters used for synchronization

A-0-2790 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	214748.3647	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0143
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2791, ELS, synchronization acceleration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RW	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter contains the value of acceleration or deceleration used to apply the synchronized velocity during the dynamic synchronization (velocity adjustment).

Use The following figure shows possible transitions of such a synchronization:

Describing individual parameters, arranged according to types

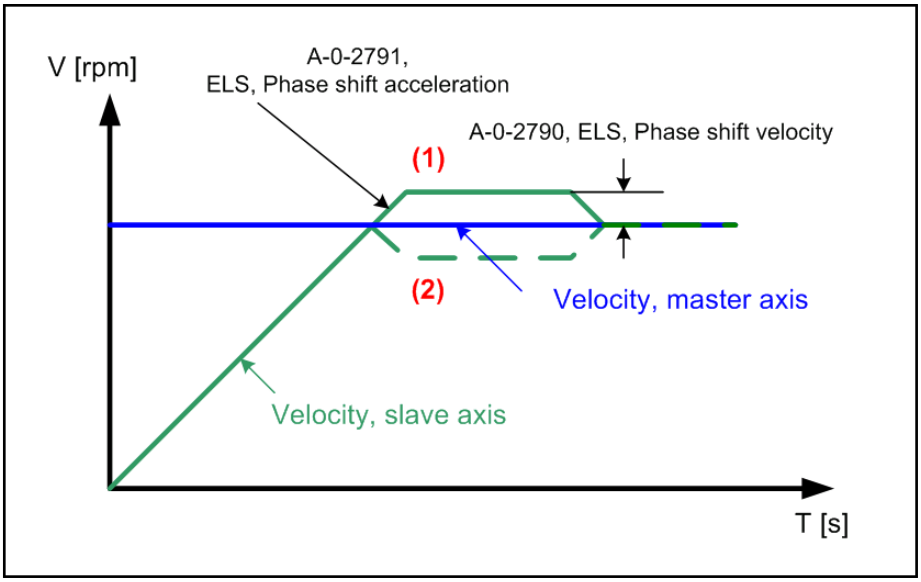


Fig. 4-21: Parameters used for synchronization

A-0-2791 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0000001	4294967.295	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0142
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2792, ELS, synchronization run window for modulo format

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function A distance to be traveled for transition to the absolute synchronization is determined in the second step of the dynamic synchronization (position adaptation).

If the position difference is greater than "A-0-2792, ELS, synchronization window for modulo format", the direction of synchronization is determined by the parameter "A-0-2793, Synchronization direction".

If the position difference is less than the value of the parameter A-0-2792, the synchronization takes place at the shortest distance.

See also Functional Description: "Synchronization modes".

A-0-2792 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0151
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2793, ELS, synchronization direction

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

A distance to be traveled for transition to the absolute synchronization is determined in the second step of the dynamic synchronization (position adaptation).

For modulo axes, the motion of the drive can be in the positive or negative direction. The direction of synchronization defines the direction of the drive motion.

Structure

Bit	Designation/function
1..0	**direction of motion** 0 0: shortest distance, 0 1: positive direction, catch up, 1 0: negative direction, slow down.

Use

Shortest distance - The axis is moved to the command target position at the shortest distance.

Positive direction, catch up - The target is reached by turning the axis in the positive direction with regard to the main direction.

Describing individual parameters, arranged according to types

Negative direction, slow down - The target is reached by turning the axis in the negative direction with regard to the main direction.

If the shortest distance to the absolute synchronization is less than "A-0-2792, Synchronization window for modulo format", the shortest distance is traveled and the preset direction of synchronization is ignored.

See also Functional Description: "Synchronization Operation Modes".

A-0-2793 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x02	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0154
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2794, ELS, synchronization mode

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

After one of the operating modes "Phase synchronization" or "Cam table" has been activated, the dynamic synchronization is automatically executed by the drive. The drive generates command values (P-0-0434) considering "P-0-0142, Acceleration of synchronization" and "P-0-0143, Velocity of synchronization" until an absolute or relative synchronization is reached.

Structure

Bit	Designation/function
0	**Processes the slave axis, A-0-2750, ELS, PhasingSlave, additive position command value)** 0: trapezoidal velocity profile, 1: P-0-0060, Filter time constant active.
1	**Synchronization** 0: absolute synchronization, 1: relative synchronization.

Bit	Designation/function
3..2	**Synchronization range** 0 0: modulo range of the slave axis (load revolutions), 0 1: command value cycle of the slave axis, 1 0: partial range of the command value cycle.
4	**Formation of the actual value cycle** 0: actual value cycle depends on P-0-0752, 1: actual value cycle = command value cycle.
5	**Synchronization in velocity synchronization** 0: only when activating the operating mode, 1: always active,

Usage

Bit 0:

Bit 0 = 0 means that a distance is determined for each change in "S-0-0048, Slave axis, position command value, additive" considering the acceleration and velocity of synchronization.

For bit 0 = 1, when reaching the absolute or relative synchronization, the parameters P-0-0143 and P-0-0142 become ineffective.

The following changes in "S-0-0048, Slave axis, position command value, additive" are smoothed by a 1st degree filter. The filter time constant is set via parameter "P-0-0060, Filter time constant, position command value, additive".

Bit 1:

For bit 1 = 0, an absolute position is always established to the master axis.

See also Functional Description: "Dynamic Synchronization" in the operating modes "Phase Synchronization" or "Cam Table".

For bit 1 = 1, only the velocity is adapted.

After activating the operating mode, only step 1 of the synchronization (velocity adjustment) is carried out.

Bit 3..2:

Synchronization can be set in the modulo range, in the command value cycle or in the partial range of the command value cycle. The distance to be traveled is limited to this range. The actual position value used when calculating the distance has to be unambiguous in the range in which the synchronization is to take place. Therefore, the actual value cycle must be determined so that it is a multiple of the synchronization range.

Bit 4:

For bit 4 = 0, the actual value cycle in which the parameter "P-0-0753, Actual position value in actual value cycle" is located, is formed with regard to parameter "P-0-0752, Load revolutions per actual value cycle of the slave axis".

The actual value cycle is set equal to the command value cycle if bit 4 = 1.

Explanation:

If a synchronization is set in the command value cycle, the command value cycle has to be a complete part of the actual value cycle to unambiguously derive the actual position value. To fulfill this constraint by a parameterization of the actual value cycle (P-0-0752), the parameter "A-0-2720, Electronic gear, input revolutions" should be considered when determining the master axis cycle (P-0-0750). If the constraint cannot be fulfilled by the parameterization of the actual value cycle (P-0-0752), bit 4 can be set in the synchroniza-

Describing individual parameters, arranged according to types

tion mode, A-0-2794, to obtain the range of the actual value cycle calculated by the drive. The calculation is carried out as for the command value cycle (P-0-0754). In this case, the actual value cycle parameterized in parameter P-0-0752 is ignored.

The actual value cycle is calculated when switching from phase 3 to phase 4. If a parameter that is used for the calculation of the actual value cycle is changed in phase 4, the command "P-0-0071, Recalculate actual value cycle" can be used to calculate the actual value cycle again in phase 4. Subsequently, the command P12 "Set absolute measuring" has to be executed to reference the actual position values.

Bit 5:

If the velocity is only to be adapted once in the operating mode "Velocity synchronization", bit 5 has to be set to 0. All the following changes in velocity are executed with maximum acceleration.

If bit 5 is set to 1, each change in velocity is limited to "P-0-0142, Acceleration of synchronization" in the operating mode "Velocity synchronization".

The change in velocity can be caused by a change in the master axis velocity (A-0-0302), the electronic gear (A-0-2720, A-0-2721) or the fine adjustment (A-0-2722).

See also Functional Description: "Synchronization Operation Modes".

A-0-2794 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x01	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0155
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2795, Positioning window

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	+	+	+	+	-	-	+
Direct access:	RO	RO	RO	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	+	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function If an axis is positioned, multiple status messages (A-0-0021) on the positioning behavior of the drive are generated.

Describing individual parameters, arranged according to types

Due to compatibility reasons (parameter import/export), this parameter also exists for virtual axes. It does not affect the axis behavior.

Use

The parameter is used for the following status messages and functionalities:

- "In Position" (A-0-0021, bit 6 = 1),
- while executing the MB_Home function block, the "DONE" output is affected,
- as hysteresis window for the position limit value monitoring. If the drive traveled across the position limit value, the positioning window also limits the travel range.
- It is always traveled at the shortest distance to the target positions in the positioning window. This is irrespective of the setting in "A-0-2207, Commanded direction".

A-0-2795 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0057
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	S-0-0057
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2796, MotionProfile selection

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The MotionProfile is based on the implementation of the segmented cam table in the IndraDrive.

The master axis position is determined by a real or a virtual master axis source.

The parameter determines which of the slave axis's MotionProfile is to be enabled (MotionProfile 0 or MotionProfile 1).

Structure

Among other things, the parameter is used by the "MB_MotionProfile" FB and "SetSelection" input.

Describing individual parameters, arranged according to types

A-0-2796 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	2	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2797, Relative positioning of MotionProfile

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The MotionProfile (control-based) is based on the implementation of the segmented cam table in the IndraDrive.

The master axis position is determined by a real or a virtual master axis source.

The parameter determines whether the profile's parameterized initial position is to be enabled. In this case, after synchronization, the slave axis is located at the initial position of the master axis when it crosses zero.

Use Among other things, the parameter is used by the "MB_MotionProfile" FB and "RelativePositioning" input.

A-0-2797 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x01	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2798, Polarity of master axis position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	+	+	-	+	+	+	-	-	+
Direct access:	RO	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter can invert the polarity of the master axis position to realize an electronic gear.

Structure The following settings can be made:

Bit	Functions
0	**master axis position** 0: positive polarity, 1: negative polarity.
15...1	not assigned

A-0-2798 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x01	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-0108
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2800, Master axis encoder, configuration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RW	RW	--
C2C access:	--	--	--	--	--	--	RW	RW	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter has a dual function:

- It indicates the current configuration of the master axis encoder for link and encoder axes.
- For consumer axes, a dead time compensation ranging from 0..192 cycles can be set in the parameter.

Structure

The current configuration of the master axis encoder for link and encoder axes

Bit	Name/function
1..0	**Used encoders** 0 1: Reserved, 1 0: Reserved, 1 1: Measurement encoder.
11..2	Reserved
15..12	**Dead time compensation** 0 0 0 0: No dead time compensation, 0 0 0 1: 1 cycle, 0 0 1 0: 2 cycles, 0 0 1 1: 3 cycles, 0 1 0 0: 4 cycles.

Dead time compensation setting for consumer axes

The parameter can only be written using the PLC:

```
GV_LinkAxis[control address, logical axis address].A_0_2800 := value.
```

With the value = 0...192.

Write-protected:

The consumer axis parameter can only be written if

- the master communication of the control is in phase 0 or 2, or
- the bit "Position data of the (external) master axis is valid" = 0 in A-0-0021 of the consumer axis, or
- the bit "Position data of the (external) master axis is valid" = 1 and the bit "Axis velocity less/equal to A-0-0222 (standstill)" = 1 in A-0-0021 of the consumer axis.

Describing individual parameters, arranged according to types

A-0-2800 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x03	0x4003	0x3003
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2801, Master axis encoder, status

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	+	+	-
Probe:	-	-	-	-	-	-	-	-	-

Function Structure

The parameter indicates the status of the aster axis encoder:

Bit	Designation/function
0	**In reference** 0: no, 1: yes.
15..1	**reserved**

A-0-2801 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2802, Master axis encoder, input revolutions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter operates together with the parameter "A-0-2803, Master axis encoder, output revolutions" as a drive.

The gear ratio Tr is:

Tr = (A-0-2803) / (A-0-2802).

A-0-2802 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2803, Master axis encoder, output revolutions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter operates together with the parameter "A-0-2802, Master axis encoder, input revolutions" as a drive.

The gear ratio Tr is:

Tr = (A-0-2803) / (A-0-2802).

A-0-2803 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2804, Master axis encoder, filter type

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter specifies the filter type for the master axis encoder. It must be completed in terms of the "A-0-2805, Master axis encoder, filter cutoff frequency".

Structure The following assignments are possible:

Describing individual parameters, arranged according to types

Value	Filter type
0	Filter deactivated
1	40 ms average value filter
2	1st order low-pass filter
3	2nd order low-pass filter
4	2nd order Butterworth
5	2nd order low-pass filter with velocity pilot control (dead time compensation)
6	3rd order low-pass filter
7	3rd order low-pass filter with velocity and acceleration pilot control (dead time compensation)
8	3rd order Butterworth

A-0-2804 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	8	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2805, Master axis encoder, filter cutoff frequency

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter specifies the filter cutoff frequency of the "A-0-2804, Master axis encoder, filter type" used by the encoder.

Use When a filter is selected, the filter cutoff frequency of the filter must be preset.

The filter cutoff frequency is the frequency by which the signal has been reduced by 3db.

If the filter cutoff frequency is set to zero, the filter is switched off.

In order to obtain a stable system, the following calculation rule must be complied with:

filter cutoff frequency < 1 / (2 * sampling rate [s]).

Example:

The filter cutoff frequency for a 2ms-Sercos cycle is calculated as follows:

filter cutoff frequency < 1 / (2 * 0.002) = 250 Hz.

A-0-2805 - Attributes:

Function:	PARAMETER	**Unit:**	Hz
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	1.0	100.0	25.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2806, Master axis encoder, reference position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter includes the reference position of the master axis encoder.

A-0-2806 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	+

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2807, Command: Set absolute position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	+	+	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter is used as command to set the absolute measuring of the master axis encoder of the encoder axis.

When activating this command, the value set in parameter "A-0-2806, Master axis encoder, reference position" is applied as the starting position of the encoder axis.

Use

When using this feature from IndraWorks MLC:

- Use the menu item "Establish dimensional reference" in the dialog window **Motion ▸ Real axes ▸ Drives ▸ Establish dimensional reference**.

and from the fieldbus:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. That triggers the "Set absolute measuring".
- After the "Set absolute measuring" is complete, the MLC automatically resets this parameter to "0000000000000000".



The command can only be executed if the control is in "BB" or if the encoder used in the drive is referenced.

A-0-2807 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2808, Master axis encoder, additive position command value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	-	-	-	-	-	+	+	-
Direct access:	--	--	--	--	--	--	RO	RO	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter includes the position offset of the master axis encoder.

A-0-2808 **- Attributes:**

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	+

	Minimum value	Maximum value	Default value
Common:	0.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2900, MotionProfile, master axis switching position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function When the operation mode "MotionProfile" (electronic MotionProfile) is active, the motion sequence can be changed in the second, inactive data set. The parameter defines the position at which the selected, inactive set is switched.

Describing individual parameters, arranged according to types

See also Functional Description: "MotionProfile with real/virtual master axis".

Use If all changes are parameterized and the "profile check" for the inactive set is successfully completed, this set can be switched.

Switching takes place when the "A-0-2656, ELS, cam, access phase" matches the switching phase specified in this parameter.

The switching is acknowledged with bit 3 of "A-0-2931, MotionProfile, status word".

A-0-2900 - Attributes:

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2901, MotionProfile, motion step 1, initial slave axis position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is effective if the input parameter "RelativePositioning" on the "MB_MotionProfile" FB is set to FALSE.

The absolute position processing of the MotionProfile is then set.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use After synchronization, the position command value generated in the operation mode "MotionProfile, synchronization operation modes" corresponds to the position determined with this parameter, if the "A-0-2656, ELS, cam, access phase," is 0. In other words, at the beginning of the first motion step.

Describing individual parameters, arranged according to types

A-0-2901 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-360.0	360.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2902, MotionProfile 0, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The motion sequence parameterized in set 0 for the operation mode "MotionProfile" is checked for plausibility.

If a check finds an inconsistency, a number is displayed in this parameter. The cause of the inconsistency can be derived from this number.

See Diagnostics Description: "F2229235, Error in MotionProfile".

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

A-0-2902 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2903, MotionProfile 1, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

The motion sequence parameterized in set 1 for the operation mode "MotionProfile" is checked for plausibility.

If a check finds an inconsistency, a number is displayed in this parameter. The cause of the inconsistency can be derived from this number.

See Diagnostics Description: "F2229235, Error in MotionProfile".

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

A-0-2903 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	65535	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2904, MotionProfile, basic configuration

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Using this parameter, various general basic settings can be made for the operation mode "MotionProfile".

Currently, only one selected linear, phase synchronous motion (gear reduction) can be activated as a basic setting.

Structure

The following settings can be made:

Bit	Functions
3..0	not assigned
4	**Gear reduction path for MotionProfile:** 0: the linear, phase synchronous path is inactive, 1: the linear, phase synchronous path is activated.
15..5	not assigned

Use

Bit 4:

If the gear reduction is activated, the master axis position at the output of the electronic gear is also divided by "A-0-2745, ELS, gear reduction" and multiplied by a scaling-dependent factor. The result is differentiated and added to the position command value.

A-0-2904 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2910, MotionProfile 0, number of motion steps

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the number of motion steps in the motion sequence, which are processed for each master revolution, for the set 0 in the operation mode "MotionProfile"

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use If a relative actual position value reference is set (the input parameter "RelativePositioning" at the "MB_MotionProfile" FB is FALSE), the motion sequence must comprise at least two steps.

A-0-2910 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	1	16	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2911, MotionProfile 0, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates with which constant velocity the master axis moves if MotionProfile 0 is active.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which a slave axis velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest).

The specified value must refer to the electronic gear's output.

A-0-2911 - **Attributes:**

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.1	2147483647.0	0.1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2912, MotionProfile 0, list of initial master axis positions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function The master axis positions (or table access phases) at the which the motion steps begin are determined for MotionProfile with this parameter.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use It is determined that motion step 1 begins with the master axis's initial position "0". The 1st element of this list must therefore be "0".

This list must have at least as many elements as MotionProfile 0 has motion steps (A-0-2910).

Describing individual parameters, arranged according to types

A-0-2912 - Attributes:

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2913, MotionProfile 0, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is used to determine which properties the individual motion steps have for MotionProfile 0.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
7…0	**Profile BS** 0000 0000: Analytical profile 0000 0001: C-0-2001, ELS, point table 1, 0000 0010: C-0-2002, ELS, point table 2, 0000 0011: C-0-2003, ELS, point table 3, . 0110 0011: C-0-2099, ELS, point table 99.
10…8	**Profile type** 000: Rest-in-rest, with inclined sine curve, 001: Rest-in-rest, with 5th order polynomial, 010: Rest-in-velocity, 100: Velocity-in-rest, 110: Constant velocity, 111: Velocity-in-velocity.

Tab. 4-15: Motion step mode

Use

If the bits 0…7 equal 0, the step's profile is determined by bits 10...8.

If bits 0…7 display a number between 1 and 99, this step's profile is determined by the corresponding ELS point table (no. 1..99). This list must have at least as many elements as MotionProfile 0 has motion steps (A-0-2910).

A-0-2913 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2914, MotionProfile 0, list of distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list is used to determine the paths traveled in the individual motion steps for MotionProfile.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traveled in the corresponding step.

If a cam table is selected, the traveled path is derived from the product of the distances and the table's last value.

If an absolute position processing is set for this operation mode, the sum of the distances must equal the involved motion step 0 or a multiple of the modulo value.

This list must have at least as many elements as MotionProfile 0 has motion steps (A-0-2910).

A-0-2914 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2915, MotionProfile 0, list of slave axis velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list is used to determine the slave axis velocities that occur at the beginning or end of the individual motion steps for MotionProfile 0.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use

The information of the slave axis velocity is required if one of the standard profiles R-V (rest-in-velocity), V-R (velocity-in-rest) or V-V (velocity-in-velocity) is selected.

Taking into consideration the master axis range, distance and parameterized master axis velocity (A-0-2911), the coefficients of the 5th order polynomial is calculated so that the parameterized velocity is produced at the end of the slave axis (for R-V) or at the beginning of the motion step (for V-R and V-V).

If constant velocity is selected in a step's mode, the slave axis velocity is calculated from the master axis range, distance and parameterized master axis velocity values and displayed in the respective list element.

This list must have at least as many elements as MotionProfile 0 has motion steps (A-0-2910).

A-0-2915 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2920, MotionProfile 1, number of motion steps

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the number of motion steps in the motion sequence, which is processed for each master revolution, for the set 1 in the operation mode "electronic MotionProfile".

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use If a relative actual position value reference is set (the input parameter "RelativePositioning" at the "MB_MotionProfile" FB is FALSE), the motion sequence must comprise at least two steps.

A-0-2920 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	1	16	1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2921, MotionProfile 1, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates with which constant velocity the master axis moves if MotionProfile 1 is active.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which a slave axis velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest).

The specified value must refer to the electronic gear's output.

A-0-2921 - **Attributes:**

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.1	2147483647.0	0.1
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2922, MotionProfile 1, list of initial master axis positions

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is used to determine the master axis positions (or table access phases) at which the motion steps begin for MotionProfile 1.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use It is determined that motion step 1 begins with the master axis's initial position "0". The 1st element of this list must therefore be "0".

This list must have at least as many elements as MotionProfile 1 has motion steps (A-0-2920).

Describing individual parameters, arranged according to types

A-0-2922 - Attributes:

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2923, MotionProfile 1, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter is used to determine which properties the individual motion steps have for MotionProfile 1.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
7…0	**Profile BS** 0000 0000: Analytical profile 0000 0001: C-0-2001, ELS, point table 1, 0000 0010: C-0-2002, ELS, point table 2, 0000 0011: C-0-2003, ELS, point table 3, . 0110 0011: C-0-2099, ELS, point table 99.
10…8	**Profile type** 000: Rest-in-rest, with inclined sine curve, 001: Rest-in-rest, with 5th order polynomial, 010: Rest-in-velocity, 100: Velocity-in-rest, 110: Constant velocity, 111: Velocity-in-velocity.

Tab. 4-16: Motion step mode

Use

If the bits 0…7 equal 0, the step's profile is determined by bits 10...8.

If bits 0…7 display a number between 1 and 99, this step's profile is determined by the corresponding ELS point table (no. 1..99). This list must have at least as many elements as MotionProfile 0 has motion steps (A-0-2920).

A-0-2923 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2924, MotionProfile 1, list of distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list is used to determine the paths traveled in the individual motion steps for MotionProfile 1.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traveled in the corresponding step.

If a cam table is selected, the traveled path is derived from the product of the distances and the table's last value.

If an absolute position processing is set for this operation mode, the sum of the distances must equal the involved motion step 0 or a multiple of the modulo value.

This list must have at least as many elements as MotionProfile 1 has motion steps (A-0-2920).

A-0-2924 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2925, MotionProfile 1, list of slave axis velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list is used to determine the slave axis velocities that occur at the beginning or end of the individual motion steps for MotionProfile 1.

See also Functional Description: "MotionProfile with Real/Virtual Master Axis".

Use The information of the slave axis velocity is required if one of the standard profiles R-V (rest-in-velocity), V-R (velocity-in-rest) or V-V (velocity-in-velocity) is selected.

Taking into consideration the master axis range, distance and parameterized master axis velocity (A-0-2921), the coefficients of the 5th order polynomial is calculated so that the parameterized velocity is produced at the end of the slave axis (for R-V) or at the beginning of the motion step (for V-R and V-V).

If constant velocity is selected in a step's mode, the slave axis velocity is calculated from the master axis range, distance and parameterized master axis velocity values and displayed in the respective list element.

This list must have at least as many elements as MotionProfile 1 has motion steps (A-0-2920).

A-0-2925 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-2930, MotionProfile, control word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function By means of this parameter various functions can be set in the "MotionProfile" mode of operation.

Structure The following settings are possible

Bit	Functions
0	reserved
1	**Gear switching** 0: immediately effective (standard setting) 1: the change becomes effective on change of MotionProfile of the master axis phase
7..11	reserved
12	**Sampling parameter changes:** 0: immediately effective, 1: parameter sampling is active, acceptance of the change after resetting of bit 12.
13..15	reserved

Use **Bit 1:**

With the bit set, switching of the drive relation is not carried out immediately for active mode of operation, but together with the change of the MotionProfile. This happens if the position determined in parameter A-0-2900 "MotionProfile, master axis switching position"is passed.

Bit 12:

This bit defines the processing mode for a modification of parameters. It is effective for the parameters A-0-2901,

A-0-2910, A-0-2911, A-0-2912, A-0-2913, A-0-2914, A-0-2915,

A-0-2920, A-0-2921, A-0-2922, A-0-2923, A-0-2924, A-0-2925.

Bit 12 = 0: Parameter collection is not active. Every modification of parameters is immediately tested and, if the profile is free of errors, accepted.

Bit 12 = 1: Parameter collection is active, every modification of parameters is saved. The modification is accepted in the internal work data and the modified parameters are tested only carried out after bit 12 has been reset.

Describing individual parameters, arranged according to types

A-0-2930 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFF	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-2931, MotionProfile, status word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter provides status information on the execution of the operation mode "MotionProfile".

Structure The following status bits are available:

Bit	Functions
2..0	not assigned
3	**Acitve set:** 0: MotionProfile 0 active, 1: MotionProfile 1 active,
7..4	not assigned
8	**Synchronous operation mode in synchronisation:** 0: slave axis is not synchronized, 1: slave axis is synchronous.
9	reserved (active synchronous operation mode)
10	reserved (active synchronous operation mode)
11	not assigned

Describing individual parameters, arranged according to types

Bit	Functions
12	**MotionProfile 0, version profile check:** 0: check is not completed, 1: check is completed.
13	**MotionProfile 0, status profile check:** 0: profile error detected (or check is not completed), 1: profile is OK.
14	**MotionProfile 1, version profile check:** 0: check is not completed, 1: check is completed.
15	**MotionProfile 1, status profile check:** 0: profile error detected (or check is not completed), 1: profile is OK.
23..16	Number of the active cam table
31..24	Number of the active step

Use

Bit 12/13:

Bit 12 indicates whether the MotionProfile in MotionProfile 0 has been checked.

Then the result of the test has to be taken from bit 13. For more detailed information on a negative test result, please refer to "A-0-2902, MotionProfile 0, diagnostics".

Bit 14/15:

Bit 14 indicates whether the MotionProfile in MotionProfile 1 has been checked.

Then the result of the test has to be taken from bit 15. For more detailed information on a negative test result, please refer to "A-0-2903, MotionProfile 1, diagnostics".

Bit 23..16:

This byte displays the number of the currently active cam table.

1: C-0-2001, ELS, point table 1, ist active,

2: C-0-2002, ELS, point table 2, ist active,

...,

99: C-0-2099, ELS, point table 99, ist active,

Bit 31..24:

This byte displays the number of the currently active step.

1: Step 1 is active,

2: Step 2 is active,

...

16: Step 16 is active.

Describing individual parameters, arranged according to types

A-0-2931 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0x00
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

4.1.7 A-0-3000 - A-0-3499

A-0-3000, FlexProfile, current set

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which of the four FlexProfiles is currently selected. Whether a FlexProfile is currently active can be checked in the parameter "A-0-3010, FlexProfile, status word".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	3	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3001, FlexProfile, current step

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which motion step of the motion sequence is being processed. Whether a FlexProfile is currently active can be checked in the parameter "A-0-3010, FlexProfile, status word".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	15	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3002, FlexProfile, master axis switching position

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter defines the position at which another selected, inactive set is switched.

Whether the system is currently waiting for a switching position can be checked in the parameter "A-0-3010, FlexProfile, status word".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use When the operation mode "FlexProfile"is active, the motion sequence can be changed in another, inactive data set.

If all changes are parameterized and the "profile check" for the inactive set is successfully completed, this set can be switched.

Switching can be performed so that it occurs when the master axis crosses the position parameterized in parameter "A-0-3002, FlexProfile, master axis switching position".

A-0-3002 - Attributes:

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3003, FlexProfile, slave axis, additive command position value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the current offset by which the position of the slave axis is shifted.

A-0-3003 - Attributes:

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3004, FlexProfile, master axis, additive command position value

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the current offset by which the position of the slave axis is shifted relative to the master.

A-0-3004 **- Attributes:**

Function:	PARAMETER	**Unit:**	Deg
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3009, FlexProfile, control word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RW	--	RW	RW	RW	--	--	RW
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter defines control information on the execution of the "FlexProfile".

Describing individual parameters, arranged according to types

Structure

The following control bits are available:

Bit	Functionality
0	Profile switching 0: Immediately effective 1: Change becomes effective with switching phase (default value after re-start)
1	**Gear Switching** 0: Immediately effective 1: Change becomes effective with switching phase (default value after re-start)
6..0	not assigned
7	**Warning level check FlexProfile:** 0: Warning level normal (default value after restart) 1: Warning level low When checking and applying a FlexProfile set, a low warning level can be specified. This allows the sequence of any laws of motion.
31..8	not assigned

Use

Bit 0:

If a FlexProfile with the option "Switch to master axis position" is started or switched, this bit can be used to determine whether the switching position is also to be applied to the profile switching. If the bit is set, the profile change is carried out at the given master axis switching position. If the bit is not set, the profile switching is always taking place immediately.

Bit 1:

If a FlexProfile with the option "Switch to master axis position" is started or switched, this bit can be used to determine whether the switching position is also to be applied to the gear settings. If the bit is set, the gear is changed at the switching position and if bit 0 is also set, it is carried out together with the profile switching. If the bit is not set, the gear switching always takes places immediately.



Whether an immediate switching or a switching at the master axis position is to take place can be specified directly when commanding the FlexProfile (ML_FlexProfile). Use these bits to determine whether the switching is to only apply to the gear, but not for the profile or vice versa.

A-0-3009 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0x03
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3010, FlexProfile, status word

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter provides status information on the execution of the operation mode "FlexProfile".

Structure The following status bits are available:

Bit	Functions
7..0	not assigned
8	**Synchronous operation mode in synchronisation:** 0: slave axis not synchronized, 1: slave axis synchronized.
9	**FlexProfile active:** 0: FlexProfile not active 1: FlexProfile active
10	**Waiting on switching position:** 0: Profile does not wait for switch-over position 1: Profile waits for switching position
11	**Single profile execution completed** 0: The profile selected is currently still traveled 1: The profile selected was traveled once and is now completed Note: This status bit is only available if the FlexProfile was started with the option "Single execution". The FlexProfile is executed once. The status bit indicates that the execution is completed. The axis rotates with the profile end velocity.
12..15	not assigned
16	**Profile check FlexProfile 0 carried out/ not carried out:** 0: not carried out 1: carried out

Describing individual parameters, arranged according to types

Bit	Functions
17	**Profile check FlexProfile 0 carried out successfully:** 0: not carried out 1: carried out successfully
18	**Profile check FlexProfile 1 carried out/ not carried out:** 0: not carried out 1: carried out
19	**Profile check FlexProfile 1 carried out successfully:** 0: not carried out 1: carried out successfully
20	**Profile check FlexProfile 2 carried out/ not carried out:** 0: not carried out 1: carried out
21	**Profile check FlexProfile 2 carried out successfully:** 0: not carried out 1: carried out successfully
22	**Profile check FlexProfile 3 carried out/ not carried out:** 0: not carried out 1: carried out
23	**Profile check FlexProfile 3 carried out successfully:** 0: not carried out 1: carried out successfully
24	**Event check FlexProfile 0 carried out/ not carried out:** 0: not carried out 1: carried out
25	**Event check FlexProfile 0 carried out successfully:** 0: not carried out 1: carried out successfully
26	**Event check FlexProfile 1 carried out/ not carried out:** 0: not carried out 1: carried out
27	**Event check FlexProfile 1 carried out successfully:** 0: not carried out 1: carried out successfully
28	**Event check FlexProfile 2 carried out/ not carried out:** 0: not carried out 1: carried out
29	**Event check FlexProfile 2 carried out successfully:** 0: not carried out 1: carried out successfully

Describing individual parameters, arranged according to types

Bit	Functions
30	**Event check FlexProfile 3 carried out/ not carried out:** 0: not carried out 1: carried out
31	**Event check FlexProfile 3 carried out successfully:** 0: not carried out 1: carried out successfully

A-0-3010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3011, FlexProfile, conditions: control variables

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function The parameter is a bit string in which each bit refers to an event configured in the parameters

- A-0-3040 to A-0-3044, FlexProfile 0,
- A-0-3070 to A-0-3074, FlexProfile 1,
- A-0-3100 to A-0-3104, FlexProfile 2,
- A-0-3130 to A-0-3134, FlexProfile 3.

Describing individual parameters, arranged according to types

Structure

Bit	Functions
0	**Action triggered, event 0:** 0: Action for event 0 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 0 is initiated immediately.
1	**Action triggered, event 1:** 0: Action for event 1 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 1 is initiated immediately.
...	
15	**Action triggered, event 15:** 0: Action for event 15 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 15 is initiated immediately.

Use

By setting a bit, the action of the repective event can be triggered immediately.

In general, the action is executed as soon as the triggers specified in the parameters

- A-0-3041, FlexProfile 0, events, list of trigger modes and
- A-0-3043, FlexProfile 0, events, list of trigger values

apply (other profiles analog).

A-0-3011 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3012, FlexProfile, conditions: status variables

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function

The parameter is a bit string in which - depending on the parameters

Describing individual parameters, arranged according to types

- A-0-3042, FlexProfile 0, events, list of trigger modes,
- A-0-3072, FlexProfile 1, events, list of trigger modes,
- A-0-3102, FlexProfile 2, events, list of trigger modes,
- A-0-3132, FlexProfile 3, events, list of trigger modes.

Status bits are applied.

Structure

Bit	Functions
0	**Action triggered, event 0:** 0: Action for event 0 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 0 is initiated immediately.
1	**Action triggered, event 1:** 0: Action for event 1 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 1 is initiated immediately.
...	
15	**Action triggered, event 15:** 0: Action for event 15 only initiated by trigger (A-0-3041, A-0-3043). 1: Action for event 15 is initiated immediately.



The bits are only available for 1 cycle.

Reading can be carried out from the shared memory or using a direct variable.

Use

If the trigger determined in the parameters

- A-0-3041, FlexProfile 0, events, list of trigger modes and
- A-0-3043, FlexProfile 0, events, list of trigger values

applies, a bit is set in this bit string. This is specified by the parameter

- A-0-3042, FlexProfile 0, events, list of trigger modes.

Querying this bit string allows users to react to this triggered event.

After the event applied, the following actions can be started in the same manner (other FlexProfiles analog).

A-0-3012 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3013, FlexProfile, value, current time-master

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	RO	--	RO	RO	RO	--	--	RO
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	+	-	+	+	+	-	-	+
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the current time-master position in [ms].

It is the time basis for all time-controlled FlexProfile processes.

A-0-3013 **- Attributes:**

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3020, FlexProfile 0, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which constant master axis velocity the required motion step velocities of the FlexProfile refer to.

Describing individual parameters, arranged according to types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which an initial/end slave or travel velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest, etc...).

The specified value must refer to the electronic gear's output.

A-0-3020 - **Attributes:**

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.1	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3021, FlexProfile 0, list of master axis sources

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which of the two mater axis sources (master axis or time) is to be considered for each motion step if set 0 of the operation mode "FlexProfile" is active.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information on the master sources is required if a motion step is used whose time-related motion is determined.

A-0-3021 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3022, FlexProfile 0, list of slave axis distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines the paths traversed in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traveled in the corresponding step.

If a cam table is selected, the traversed path is derived from the product of the distance and the last value of the table.

A-0-3022 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3023, FlexProfile 0, list of master axis ranges

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the range of the master axis source, which the motion step covers for set 0 of the operation mode "FlexProfile".

If it is a time-related motion step, the information is provided in [ms].

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3023 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3024, FlexProfile 0, list of master axis ranges, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the master axis source for the parameter "A-0-3023, FlexProfile 0, list of master axis ranges" for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

A-0-3024 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3025, FlexProfile 0, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the motion laws of the individual motion steps for FlexProfile 0.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Structure

Describing individual parameters, arranged according to types

Bit	Name/function
7…0	**Profile BS** 0x0001: C-0-2001, ELS, point table 1, 0x0002: C-0-2002, ELS, point table 2, 0x0003: C-0-2003, ELS, point table 3, . 0x0063: C-0-2099, ELS, point table 99.
15…8	**Profile type** 0x0000: Rest-in-rest, inclined sinusoid, 0x0100: Rest-in-rest, polynomial 5th order, 0x0200: Rest-in-velocity, polynomial 5th order, 0x0300: Rest-in-velocity, polynomial 7th order, 0x0400: Velocity-in-rest, polynomial 5th order, 0x0500: Velocity-in-rest, polynomial 7th order, 0x0600: Constant velocity, 0x0700: Velocity-in-velocity, polynomial 5th order 0x0800: Rest-in-rest, standstill, 0x0900: Rest-in-rest, polynomial 7th order, 0x0A00: Rest-in-rest, sinusoid, 0x0B00: Rest-in-rest, Gutman sinusoid, 0x0C00: Rest-in-rest, acceleration-optimum inclined sinusoid, 0x0D00: Rest-in-rest, torque-optimum inclined sinusoid, 0x0E00: Rest-in-rest, modified acceleration trapezoid, 0x0F00: Rest-in-rest, modified sinusoid, 0x1000: Velocity-in-velocity, polynomial 7th order, 0x1100: Velocity-in-velocity, modified sinusoid, 0x2000: Motion-in-motion, polynomial 5th order, 0x2100: Motion-in-motion, polynomial 7th order, 0x4000: General motion, polynomial 5th order, 0x4100: General motion, polynomial 7th order, 0x6000: Extended motion law, velocity-limited polynomial 5th order, 0x6100: Extended motion law, overshoot-free polynomial 5th order, 0x7000: Extended motion law, velocity-limited motion (trapezoid), 0x7100: Extended motion law, velocity-limited motion (sinusoids), 0x7200: Extended motion law, jerk-limited motion (trapezoid).

Describing individual parameters, arranged according to types

A-0-3025 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3026, FlexProfile 0, list of motion step types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter determines whether a Flex or standard element (fix) is used for set 0 of the operation mode "FlexProfile".

The Flex element can be considered as active step. Its motion path results at runtime by inheriting the boundary values of the neighboring step. It corrects and adapts its own path correspondingly to impede velocity jumps. In a Flex element - instead of the distance - an absolute slave axis target position to be reached and - instead of the master axis range - an absolute master axis end position to be reached can be specified (the distance and the master axis range are calculated at runtime if necessary). (The distance and the master axis range are calculated at runtime if necessary.)

The Fix motion step (STEP_FIX) is fixed and cannot be changed at runtime.

Bit	Name/function
0...7	**Motion step type** 0x00: STEP_FIX, 0x01: STEP_FLEX_REL_REL, 0x02: STEP_FLEX_REL_ABS, 0x03: STEP_FLEX_ABS_REL, 0x04: STEP_FLEX_ABS_ABS,

Tab. 4-17: List of motion step types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure Only selected motion laws are flex-capable.

Motion laws	Name
Polynomial 5th order	COMMON_POLY5
Polynomial 7th order	COMMON_POLY7

Tab. 4-18: Table of valid combinations for the Flex elements

A-0-3026 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	0x04	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3027, FlexProfile 0, list of slave axis starting velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting velocities occur in the individual motion steps for set 0 of the operation mode "FlexProfile".

Use See also Functional Description"FlexProfile with Real/Virtual Master Axis".

	Start_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0

Describing individual parameters, arranged according to types

	Start_Velocity
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Vel-in-rest	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-19: Table of valid combinations for initial values

A-0-3027 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3028, FlexProfile 0, list of slave axis starting accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting accelerations occur in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-rest	

	Start_Acceleration
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-20: Table of valid combinations for initial values

A-0-3028 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3029, FlexProfile 0, list of slave axis starting jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting jerks occur in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

	Start_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically
Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-21: Table of valid combinations for initial values

Describing individual parameters, arranged according to types

A-0-3029 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3030, FlexProfile 0, list of slave axis end velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end velocities occur at the end in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	User-defined

Describing individual parameters, arranged according to types

	End_Velocity
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-22: Table of valid combinations for initial values

A-0-3030 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3031, FlexProfile 0, list of slave axis end accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end accelerations occur at the end in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined

Describing individual parameters, arranged according to types

	End_Acceleration
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-23: Table of valid combinations for initial values

A-0-3031 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3032, FlexProfile 0, list of slave axis end jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis final jerks occur at the end in the individual motion steps for set 0 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically

Describing individual parameters, arranged according to types

	End_Jerk
Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-24: Table of valid combinations for initial values

A-0-3032 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3033, FlexProfile 0, list of slave axis travel velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing velocities occur in the individual motion steps for set 0 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	

Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-25: Table of valid combinations for limit values

A-0-3033 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3034, FlexProfile 0, list of slave axis travel accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing accelerations occur at the end in the individual motion steps for set 0 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-26: Table of valid combinations for limit values

Describing individual parameters, arranged according to types

A-0-3034 - Attributes:

Function:	PARAMETER DOUBLE, 8BYTE_VAR	**Unit:**	A-0-0053
MLC data type:		**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3035, FlexProfile 0, list of slave axis travel jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing jerks occur at the end in the individual motion steps for set 0 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered

Describing individual parameters, arranged according to types

Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	Not considered
Acceleration-limited sinusoid	Not considered
Jerk-limited motion	User-defined

Tab. 4-27: Table of valid combinations for limit values

A-0-3035 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3036, FlexProfile 0, list of turning point displacements

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines at which point the curving behavior changes for a symmetrical motion law for set 0 of the operation mode "FlexProfile". By default, a turning point displacement of 0.5 has to be selected. This provides a turning point in the middle of the motion step.

Only selected motion laws support a turning point displacement.

Rest-in-rest	TPD
Simple sinusoid	0<TPD<1
Bestehorn sinusoid	0<TPD<1
Acceleration-optimum inclined sinusoid	0<TPD<1
Torque-optimum inclined sinusoid	0<TPD<1
Gutman sinusoid	0<TPD<1
Modified acceleration trapezoid	0<TPD<1
Polynomial 5th order	0<TPD<1
Polynomial 7th order	0<TPD<1

Tab. 4-28: Table of valid combinations for initial values

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3036 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	1.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3040, FlexProfile 0, events, list of motion step assignments

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines which motion step the respective event applies to. The event is only taken into consideration for the selected motion step.

A-0-3040 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	63	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3041, FlexProfile 0, events, list of trigger modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures triggers for events for set 0 of the operation mode "FlexProfile".

See also Parameter Description"A-0-3043, FlexProfile 0, events, list of trigger values".

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
7..0	**Trigger modes** 0x01: TRIGGER_CONTROLBIT_ONLY 0x02: TRIGGER_ABS_SLAVE_REACHED 0x03: TRIGGER_REL_SLAVE_REACHED 0x04: TRIGGER_ABS_MASTER_REACHED 0x05: TRIGGER_REL_MASTER_REACHED 0x06: TRIGGER_REL_TIME_MASTER_REACHED

Tab. 4-29: List of the trigger modes

A-0-3041 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3042, FlexProfile 0, events, list of action modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter configures the actions carried out once the triggers determined in the parameters "A-0-3041, FlexProfile 0, events, list of trigger modes" and "A-0-3043, FlexProfile 0, events, list of trigger values" apply.

An action can set or initiate a bit in parameter "A-0-3011, FlexProfile, conditions: control variables". Thus, the current motion step of the active motion sequence ends and continues with the next motion step.

The bit in parameter A-0-3011 can be set:

- immediately,
- after the current motion step is completed or
- after the current motion profile is completed.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
15..0	**Action modes** 16#0000, ACTION_STATUSBIT0_INSTANT 16#0001, ACTION_STATUSBIT1_INSTANT 16#0002, ACTION_STATUSBIT2_INSTANT ..... 16#000F,ACTION_STATUSBIT15_INSTANT 16#0100, ACTION_STATUSBIT0_AFTERSTEP 16#0101, ACTION_STATUSBIT1_AFTERSTEP 16#0102, ACTION_STATUSBIT2_AFTERSTEP .... 16#010F, ACTION_STATUSBIT15_AFTERSTEP 16#0200, ACTION_STATUSBIT0_AFTERPROFILE 16#0201, ACTION_STATUSBIT1_AFTERPROFILE 16#0202, ACTION_STATUSBIT2_AFTERPROFILE .... 16#020F, ACTION_STATUSBIT15_AFTERPROFILE 16#0300, ACTION_STATUSBIT0_INSTANT_NEXTSTEP 16#0301, ACTION_STATUSBIT1_INSTANT_NEXTSTEP 16#0302, ACTION_STATUSBIT2_INSTANT_NEXTSTEP ... 16#030F, ACTION_STATUSBIT15_INSTANT_NEXTSTEP

Tab. 4-30: List of motion step types

A-0-3042 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3043, FlexProfile 0, events, list of trigger values

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures trigger values.

Depending on the trigger mode selected in parameter "A-0-3041, FlexProfile 0, events, list of trigger modes", a value has to be specified here which is subsequently checked.

A-0-3043 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3044, FlexProfile 0, events, list of trigger values, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the list of values for parameter A-0-3043.

Describing individual parameters, arranged according to types

A-0-3044 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3046, FlexProfile 0, command: Check and apply event

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Executing the command checks all event parameters for FlexProfile 0 for plausibility and applies them internally.

Once the event parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3047, FlexProfile 0, diagnostics".

Use When executing the command, the following parameters must be checked:

- A-0-3040, FlexProfile 0, events, list of motion step assignments,
- A-0-3041, FlexProfile 0, events, list of trigger modes,
- A-0-3042, FlexProfile 0, events, list of trigger modes and
- A-0-3043, FlexProfile 0, events, list of trigger values.

A-0-3046 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3047, FlexProfile 0, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter indicates inconsistencies in the parameterized and checked profile and event set 0 of the operation mode "FlexProfile".

The motion sequence parameterized in set 0 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3048, FlexProfile 0, command: Check and apply profile".

The event set parameterized in set 0 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3046, FlexProfile 0, command: Check and apply event".

If one of the checks yields an inconsistency, the error number and the incorrect motion step for this profile are displayed in the first two elements of this parameter. The last two elements display the error number and the incorrect event.

See Diagnostics Description "Errors in FlexProfil".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3047 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3048, FlexProfile 0, command: Check and apply profile

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters that define the motion sequence for FlexProfile 0 for plausibility and applies them internally.

The result of the check can be queried in parameter "A-0-3010, FlexProfile, status word".

A MotionProfile can only be started if it has been declared OK and free of errors.

Once the parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3047, FlexProfile 0, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3020, FlexProfile 0, master axis velocity,
- A-0-3021, FlexProfile 0, list of master axis sources,
- A-0-3022, FlexProfile 0, list of slave axis distances,
- A-0-3023, FlexProfile 0, list of master axis ranges,
- A-0-3025, FlexProfile 0, list of motion laws,
- A-0-3026, FlexProfile 0, list of motion step types,
- A-0-3027, FlexProfile 0, list of slave axis starting velocities,
- A-0-3028, FlexProfile 0, list of slave axis starting accelerations,
- A-0-3029, FlexProfile 0, list of slave axis starting jerks,
- A-0-3030, FlexProfile 0, list of slave axis end velocities,
- A-0-3031, FlexProfile 0, list of slave axis end accelerations,
- A-0-3032, FlexProfile 0, list of slave axis end jerks,
- A-0-3033, FlexProfile 0, list of slave axis travel velocities,
- A-0-3034, FlexProfile 0, list of slave axis travel accelerations,
- A-0-3035, FlexProfile 0, list of slave axis travel jerks,
- A-0-3036, FlexProfile 0, list of turning point displacements (WPV).

A-0-3048 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Describing individual parameters, arranged according to types

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3049, FlexProfile 0, checksum

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the checksum on all parameters of FlexProfile 0. It contains the following parameters:

- A-0-3020, FlexProfile 0, master axis velocity,
- A-0-3021, FlexProfile 0, list of master axis sources,
- A-0-3022, FlexProfile 0, list of slave axis distances,
- A-0-3023, FlexProfile 0, list of master axis ranges,
- A-0-3025, FlexProfile 0, list of motion laws,
- A-0-3026, FlexProfile 0, list of motion step types,
- A-0-3027, FlexProfile 0, list of slave axis starting velocities,
- A-0-3028, FlexProfile 0, list of slave axis starting accelerations,
- A-0-3029, FlexProfile 0, list of slave axis starting jerks,
- A-0-3030, FlexProfile 0, list of slave axis end velocities,
- A-0-3031, FlexProfile 0, list of slave axis end accelerations,
- A-0-3032, FlexProfile 0, list of slave axis end jerks,
- A-0-3033, FlexProfile 0, list of slave axis travel velocities,
- A-0-3034, FlexProfile 0, list of slave axis travel accelerations,
- A-0-3035, FlexProfile 0, list of slave axis travel jerks,
- A-0-3036, FlexProfile 0, list of turning point displacements (WPV),
- A-0-3040, FlexProfile 0, events, list of motion step assignments,
- A-0-3041, FlexProfile 0, events, list of trigger modes,
- A-0-3042, FlexProfile 0, events, list of trigger modes and
- A-0-3043, FlexProfile 0, events, list of trigger values.

Describing individual parameters, arranged according to types

A-0-3049 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3050, FlexProfile 1, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which constant master axis velocity the required motion step velocities of the FlexProfile refer to.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which an initial/end slave or travel velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest, etc...).

The specified value must refer to the electronic gear's output.

A-0-3050 - Attributes:

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.1	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3051, FlexProfile 1, list of master axis sources

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which of the two master axis sources (master axis or time) is to be considered for each motion step if set 1 of the operation mode "FlexProfile" is active.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information on the master sources is required if a motion step is used whose time-related motion is determined.

A-0-3051 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3052, FlexProfile 1, list of slave axis distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines the paths traversed in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traversed in the corresponding step.

If a cam table is selected, the traversed path is derived from the product of the distance and the last value of the table.

A-0-3052 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3053, FlexProfile 1, list of master axis ranges

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the range of the master axis source the motion step covers for set 1 of the operation mode "FlexProfile".

If it is a time-related motion step, the information is provided in [ms].

Describing individual parameters, arranged according to types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3053 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3054, FlexProfile 1, list of master axis ranges, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the master axis source for the parameter "A-0-3053, FlexProfile 1, list of master axis ranges" for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3054 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3055, FlexProfile 1, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines for FlexProfile 1 which motion laws the individual motion steps are provided with.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Structure

Describing individual parameters, arranged according to types

Bit	Name/function
7…0	**Profile BS** 0x0001: C-0-2001, ELS, point table 1, 0x0002: C-0-2002, ELS, point table 2, 0x0003: C-0-2003, ELS, point table 3, . 0x0063: C-0-2099, ELS, point table 99.
15…8	**Profile type** 0x0000: Rest-in-rest, inclined sinusoid, 0x0100: Rest-in-rest, polynomial 5th order, 0x0200: Rest-in-velocity, polynomial 5th order, 0x0300: Rest-in-velocity, polynomial 7th order, 0x0400: Velocity-in-rest, polynomial 5th order, 0x0500: Velocity-in-rest, polynomial 7th order, 0x0600: Constant velocity, 0x0700: Velocity-in-velocity, polynomial 5th order 0x0800: Rest-in-rest, standstill, 0x0900: Rest-in-rest, polynomial 7th order, 0x0A00: Rest-in-rest, sinusoid, 0x0B00: Rest-in-rest, Gutman sinusoid, 0x0C00: Rest-in-rest, acceleration-optimum inclined sinusoid, 0x0D00: Rest-in-rest, torque-optimum inclined sinusoid, 0x0E00: Rest-in-rest, modified acceleration trapezoid, 0x0F00: Rest-in-rest, modified sinusoid, 0x1000: Velocity-in-velocity, polynomial 7th order, 0x1100: Velocity-in-velocity, modified sinusoid, 0x2000: Motion-in-motion, polynomial 5th order, 0x2100: Motion-in-motion, polynomial 7th order, 0x4000: General motion, polynomial 5th order, 0x4100: General motion, polynomial 7th order, 0x6000: Extended motion law, velocity-limited polynomial 5th order, 0x6100: Extended motion law, overshoot-free polynomial 5th order, 0x7000: Extended motion law, velocity-limited motion (trapezoid), 0x7100: Extended motion law, velocity-limited motion (sinusoids), 0x7200: Extended motion law, jerk-limited motion (trapezoid).

Describing individual parameters, arranged according to types

A-0-3055 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3056, FlexProfile 1, list of motion step types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter determines whether a Flex or standard element (fix) is used for set 1 of the operation mode "FlexProfile".

The Flex element can be considered as active step. Its motion path results at runtime by inheriting the boundary values of the neighboring step. It corrects and adapts its own path correspondingly to impede velocity jumps. In a Flex element - instead of the distance - an absolute slave axis target position to be reached and - instead of the master axis range - an absolute master axis end position to be reached can be specified (the distance and the master axis range are calculated at runtime if necessary). (The distance and the master axis range are calculated at runtime if necessary.)

The Fix motion step (STEP_FIX) is fixed and cannot be changed at runtime.

Bit	Name/function
0...7	**Motion step type** 0x00: STEP_FIX, 0x01: STEP_FLEX_REL_REL, 0x02: STEP_FLEX_REL_ABS, 0x03: STEP_FLEX_ABS_REL, 0x04: STEP_FLEX_ABS_ABS,

Tab. 4-31: List of motion step types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure

Only selected motion laws are flex-capable.

Motion laws	Name
Polynomial 5th order	COMMON_POLY5
Polynomial 7th order	COMMON_POLY7

Tab. 4-32: Table of valid combinations for the Flex elements

A-0-3056 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	0x04	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3057, FlexProfile 1, list of slave axis starting velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis starting velocities occur in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0

Describing individual parameters, arranged according to types

Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Vel-in-rest	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-33: Table of valid combinations for initial values

A-0-3057 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3058, FlexProfile 1, list of slave axis starting accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis starting accelerations occur in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-34: Table of valid combinations for initial values

A-0-3058 - **Attributes:**

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3059, FlexProfile 1, list of slave axis starting jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting jerks occur in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

	Start_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically
Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-35: Table of valid combinations for initial values

Describing individual parameters, arranged according to types

A-0-3059 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3060, FlexProfile 1, list of slave axis end velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end velocities occur at the end in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	

Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-36: Table of valid combinations for initial values

A-0-3060 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3061, FlexProfile 1, list of slave axis end accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end accelerations occur at the end in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined

Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-37: Table of valid combinations for initial values

A-0-3061 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3062, FlexProfile 1, list of slave axis end jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end jerks occur at the end in the individual motion steps for set 1 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically

Describing individual parameters, arranged according to types

Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-38: Table of valid combinations for initial values

A-0-3062 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3063, FlexProfile 1, list of slave axis travel velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing velocities occur in the individual motion steps for set 1 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-39: Table of valid combinations for limit values

A-0-3063 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3064, FlexProfile 1, list of slave axis travel accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis traversing accelerations occur at the end in the individual motion steps for set 1 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-40: Table of valid combinations for limit values

Describing individual parameters, arranged according to types

A-0-3064 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3065, FlexProfile 1, list of slave axis travel jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing jerks occur at the end in the individual motion steps for set 1 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	

Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	Not considered
Acceleration-limited sinusoid	Not considered
Jerk-limited motion	User-defined

Tab. 4-41: Table of valid combinations for limit values

A-0-3065 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3066, FlexProfile 1, list of turning point displacements

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines at which point the curving behavior changes for a symmetrical motion law for set 1 of the operation mode "FlexProfile". By default, a turning point displacement of 0.5 has to be selected. This provides a turning point in the middle of the motion step.

Only selected motion laws support a turning point displacement.

Rest-in-rest	TPD
Simple sinusoid	0<TPD<1
Bestehorn sinusoid	0<TPD<1
Acceleration-optimum inclined sinusoid	0<TPD<1
Torque-optimum inclined sinusoid	0<TPD<1
Gutman sinusoid	0<TPD<1
Modified acceleration trapezoid	0<TPD<1
Polynomial 5th order	0<TPD<1
Polynomial 7th order	0<TPD<1

Tab. 4-42: Table of valid combinations for initial values

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3066 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	1.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3070, FlexProfile 1, events, list of motion step assignments

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines which motion step the respective event applies to. The event is only taken into consideration for the selected motion step.

A-0-3070 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	15	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3071, FlexProfile 1, events, list of trigger modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures triggers for events for set 1 of the operation mode "FlexProfile".

See also Parameter Description: "A-0-3073, FlexProfile 1, events, list of trigger values".

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
7..0	**Trigger modes** 0x01: TRIGGER_CONTROLBIT_ONLY 0x02: TRIGGER_ABS_SLAVE_REACHED 0x03: TRIGGER_REL_SLAVE_REACHED 0x04: TRIGGER_ABS_MASTER_REACHED 0x05: TRIGGER_REL_MASTER_REACHED 0x06: TRIGGER_REL_TIME_MASTER_REACHED

Tab. 4-43: List of the trigger modes

A-0-3071 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3072, FlexProfile 1, events, list of action modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter configures the actions carried out once the triggers determined in the parameters "A-0-3071, FlexProfile 1, events, list of trigger modes" and "A-0-3073, FlexProfile 1, events, list of trigger values" apply.

An action can set or initiate a bit in parameter "A-0-3011, FlexProfile, conditions: control variables". Thus, the current motion step of the active motion sequence ends and continues with the next motion step.

The bit in parameter A-0-3011 can be set:

- immediately,
- after the current motion step is completed or
- after the current motion profile is completed.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
15..0	**Action modes** 16#0000, ACTION_STATUSBIT0_INSTANT 16#0001, ACTION_STATUSBIT1_INSTANT 16#0002, ACTION_STATUSBIT2_INSTANT ..... 16#000F,ACTION_STATUSBIT15_INSTANT 16#0100, ACTION_STATUSBIT0_AFTERSTEP 16#0101, ACTION_STATUSBIT1_AFTERSTEP 16#0102, ACTION_STATUSBIT2_AFTERSTEP .... 16#010F, ACTION_STATUSBIT15_AFTERSTEP 16#0200, ACTION_STATUSBIT0_AFTERPROFILE 16#0201, ACTION_STATUSBIT1_AFTERPROFILE 16#0202, ACTION_STATUSBIT2_AFTERPROFILE .... 16#020F, ACTION_STATUSBIT15_AFTERPROFILE 16#0300, ACTION_STATUSBIT0_INSTANT_NEXTSTEP 16#0301, ACTION_STATUSBIT1_INSTANT_NEXTSTEP 16#0302, ACTION_STATUSBIT2_INSTANT_NEXTSTEP ... 16#030F, ACTION_STATUSBIT15_INSTANT_NEXTSTEP

Tab. 4-44: List of motion step types

A-0-3072 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3073, FlexProfile 1, events, list of trigger values

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures trigger values.

Depending on the trigger mode selected in parameter "A-0-3071, FlexProfile 1, events, list of trigger modes", a value has to be specified which is subsequently checked.

A-0-3073 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3074, FlexProfile 1, events, list of trigger values, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the list of values for parameter A-0-3073.

Describing individual parameters, arranged according to types

A-0-3074 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3076, FlexProfile 1, command: Check and apply event

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters for FlexProfile 1 for plausibility and applies them internally.

Once the event parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3077, FlexProfile 1, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3070, FlexProfile 1, events, list of motion step assignments,
- A-0-3071, FlexProfile 1, events, list of trigger modes,
- A-0-3072, FlexProfile 1, events, list of trigger modes and
- A-0-3073, FlexProfile 1, events, list of trigger values.

A-0-3076 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3077, FlexProfile 1, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter indicates inconsistencies in the parameterized and checked profile and event set 1 of the operation mode "FlexProfile".

The motion sequence parameterized in set 1 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3078, FlexProfile 1, command: Check and apply profile".

The event set parameterized in set 1 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3076, FlexProfile 1, command: Check and apply event".

If one of the checks yields an inconsistency, the error number and the incorrect motion step for this profile are displayed in the first two elements of this parameter. The last two elements display the error number and the incorrect event.

See Diagnostics Description: "Error in FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3077 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3078, FlexProfile 1, command: Check and apply profile

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters that define the motion sequence for FlexProfile 1 for plausibility and applies them internally.

The result of the check can be queried in parameter "A-0-3010, FlexProfile, status word".

A MotionProfile can only be started if it has been declared OK and free of errors.

Once the parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3077, FlexProfile 1, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3050, FlexProfile 1, master axis velocity,
- A-0-3051, FlexProfile 1, list of master axis sources,
- A-0-3052, FlexProfile 1, list of slave axis distances,
- A-0-3053, FlexProfile 1, list of master axis ranges,
- A-0-3055, FlexProfile 1, list of motion laws,
- A-0-3056, FlexProfile 1, list of motion step types,
- A-0-3057, FlexProfile 1, list of slave axis starting velocities,
- A-0-3058, FlexProfile 1, list of slave axis starting accelerations,
- A-0-3059, FlexProfile 1, list of slave axis starting jerks,
- A-0-3060, FlexProfile 1, list of slave axis end velocities,
- A-0-3061, FlexProfile 1, list of slave axis end accelerations,
- A-0-3062, FlexProfile 1, list of slave axis end jerks,
- A-0-3063, FlexProfile 1, list of slave axis travel velocities,
- A-0-3064, FlexProfile 1, list of slave axis travel accelerations,
- A-0-3065, FlexProfile 1, list of slave axis travel jerks,
- A-0-3066, FlexProfile 1, list of turning point displacements (WPV).

A-0-3078 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Describing individual parameters, arranged according to types

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3079, FlexProfile 1, checksum

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the checksum on all parameters of FlexProfile 1. It contains the following parameters:

- A-0-3050, FlexProfile 1, master axis velocity,
- A-0-3051, FlexProfile 1, list of master axis sources,
- A-0-3052, FlexProfile 1, list of slave axis distances,
- A-0-3053, FlexProfile 1, list of master axis ranges,
- A-0-3055, FlexProfile 1, list of motion laws,
- A-0-3056, FlexProfile 1, list of motion step types,
- A-0-3057, FlexProfile 1, list of slave axis starting velocities,
- A-0-3058, FlexProfile 1, list of slave axis starting accelerations,
- A-0-3059, FlexProfile 1, list of slave axis starting jerks,
- A-0-3060, FlexProfile 1, list of slave axis end velocities,
- A-0-3061, FlexProfile 1, list of slave axis end accelerations,
- A-0-3062, FlexProfile 1, list of slave axis end jerks,
- A-0-3063, FlexProfile 1, list of slave axis travel velocities,
- A-0-3064, FlexProfile 1, list of slave axis travel accelerations,
- A-0-3065, FlexProfile 1, list of slave axis travel jerks,
- A-0-3066, FlexProfile 1, list of turning point displacements (WPV),
- A-0-3070, FlexProfile 1, events, list of motion step assignments,
- A-0-3071, FlexProfile 1, events, list of trigger modes,
- A-0-3072, FlexProfile 1, events, list of trigger modes and
- A-0-3073, FlexProfile 1, events, list of trigger values.

Describing individual parameters, arranged according to types

A-0-3079 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3080, FlexProfile 2, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which constant master axis velocity the required motion step velocities of the FlexProfile refer to.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which an initial/end slave or travel velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest, etc...).

The specified value must refer to the electronic gear's output.

A-0-3080 - Attributes:

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.1	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3081, FlexProfile 2, list of master axis sources

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which of the two master axis sources (master axis or time) is to be considered for each motion step if set 2 of the operation mode "FlexProfile" is active.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information on the master sources is required if a motion step is used whose time-related motion is determined.

A-0-3081 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	1	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3082, FlexProfile 2, list of slave axis distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines the paths traversed in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traversed in the corresponding step.

If a cam table is selected, the traveled path is derived from the product of the distance and the last value of the table.

A-0-3082 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3083, FlexProfile 2, list of master axis ranges

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the range of the master axis source, which the motion step covers for set 2 of the operation mode "FlexProfile".

If it is a time-related motion step, the information is provided in [ms].

Describing individual parameters, arranged according to types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3083 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3084, FlexProfile 2, list of master axis ranges, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the master axis source for the parameter "A-0-3083, FlexProfile 2, list of master axis ranges" for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3084 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3085, FlexProfile 2, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines for FlexProfile 2 which motion laws the individual motion steps are provided with.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Structure

Describing individual parameters, arranged according to types

Bit	Name/function
7…0	**Profile BS** 0x0001: C-0-2001, ELS, point table 1, 0x0002: C-0-2002, ELS, point table 2, 0x0003: C-0-2003, ELS, point table 3, . 0x0063: C-0-2099, ELS, point table 99.
15…8	**Profile type** 0x0000: Rest-in-rest, inclined sinusoid, 0x0100: Rest-in-rest, polynomial 5th order, 0x0200: Rest-in-velocity, polynomial 5th order, 0x0300: Rest-in-velocity, polynomial 7th order, 0x0400: Velocity-in-rest, polynomial 5th order, 0x0500: Velocity-in-rest, polynomial 7th order, 0x0600: Constant velocity, 0x0700: Velocity-in-velocity, polynomial 5th order 0x0800: Rest-in-rest, standstill, 0x0900: Rest-in-rest, polynomial 7th order, 0x0A00: Rest-in-rest, sinusoid, 0x0B00: Rest-in-rest, Gutman sinusoid, 0x0C00: Rest-in-rest, acceleration-optimum inclined sinusoid, 0x0D00: Rest-in-rest, torque-optimum inclined sinusoid, 0x0E00: Rest-in-rest, modified acceleration trapezoid, 0x0F00: Rest-in-rest, modified sinusoid, 0x1000: Velocity-in-velocity, polynomial 7th order, 0x1100: Velocity-in-velocity, modified sinusoid, 0x2000: Motion-in-motion, polynomial 5th order, 0x2100: Motion-in-motion, polynomial 7th order, 0x4000: General motion, polynomial 5th order, 0x4100: General motion, polynomial 7th order, 0x6000: Extended motion law, velocity-limited polynomial 5th order, 0x6100: Extended motion law, overshoot-free polynomial 5th order, 0x7000: Extended motion law, velocity-limited motion (trapezoid), 0x7100: Extended motion law, velocity-limited motion (sinusoids), 0x7200: Extended motion law, jerk-limited motion (trapezoid).

Describing individual parameters, arranged according to types

A-0-3085 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3086, FlexProfile 2, list of motion step types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter determines whether a Flex or standard element (fix) is used for set 2 of the operation mode "FlexProfile".

The Flex element can be considered as active step. Its motion path results at runtime by inheriting the boundary values of the neighboring step. It corrects and adapts its own path correspondingly to impede velocity jumps. In a Flex element - instead of the distance - an absolute slave axis target position to be reached and - instead of the master axis range - an absolute master axis end position to be reached can be specified (the distance and the master axis range are calculated at runtime if necessary). (The distance and the master axis range are calculated at runtime if necessary.)

The Fix motion step (STEP_FIX) is fixed and cannot be changed at runtime.

Bit	Name/function
0...7	**Motion step type** 0x00: STEP_FIX, 0x01: STEP_FLEX_REL_REL, 0x02: STEP_FLEX_REL_ABS, 0x03: STEP_FLEX_ABS_REL, 0x04: STEP_FLEX_ABS_ABS,

Tab. 4-45: List of motion step types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure Only selected motion laws are flex-capable.

Motion laws	Name
Polynomial 5th order	COMMON_POLY5
Polynomial 7th order	COMMON_POLY7

Tab. 4-46: Table of valid combinations for the Flex elements

A-0-3086 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	0x04	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3087, FlexProfile 2, list of slave axis starting velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting velocities occur in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0

Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Vel-in-rest	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-47: Table of valid combinations for initial values

A-0-3087 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3088, FlexProfile 2, list of slave axis starting accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting accelerations occur in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-48: Table of valid combinations for initial values

A-0-3088 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3089, FlexProfile 2, list of slave axis starting jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting jerks occur in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

	Start_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically
Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-49: Table of valid combinations for initial values

Describing individual parameters, arranged according to types

A-0-3089 - Attributes:

Function:	PARAMETER DOUBLE, 8BYTE_VAR	**Unit:**	A-0-0053
MLC data type:		**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3090, FlexProfile 2, list of slave axis end velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end velocities occur at the end in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	

Describing individual parameters, arranged according to types

Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-50: Table of valid combinations for initial values

A-0-3090 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3091, FlexProfile 2, list of slave axis end accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end accelerations occur at the end in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined

Describing individual parameters, arranged according to types

Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-51: Table of valid combinations for initial values

A-0-3091 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3092, FlexProfile 2, list of slave axis end jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis end jerks occur at the end in the individual motion steps for set 2 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically

Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-52: Table of valid combinations for initial values

A-0-3092 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3093, FlexProfile 2, list of slave axis travel velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing velocities occur in the individual motion steps for set 2 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-53: Table of valid combinations for limit values

A-0-3093 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3094, FlexProfile 2, list of slave axis travel accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis traversing accelerations occur at the end in the individual motion steps for set 2 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-54: Table of valid combinations for limit values

Describing individual parameters, arranged according to types

A-0-3094 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3095, FlexProfile 2, list of slave axis travel jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing jerks occur at the end in the individual motion steps for set 2 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	

Describing individual parameters, arranged according to types

Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	Not considered
Acceleration-limited sinusoid	Not considered
Jerk-limited motion	User-defined

Tab. 4-55: Table of valid combinations for limit values

A-0-3095 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3096, FlexProfile 2, list of turning point displacements

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines at which point the curving behavior changes for a symmetrical motion law for set 2 of the operation mode "FlexProfile". By default, a turning point displacement of 0.5 has to be selected. This provides a turning point in the middle of the motion step.

Only selected motion laws support a turning point displacement.

Rest-in-rest	TPD
Simple sinusoid	0<TPD<1
Bestehorn sinusoid	0<TPD<1
Acceleration-optimum inclined sinusoid	0<TPD<1
Torque-optimum inclined sinusoid	0<TPD<1
Gutman sinusoid	0<TPD<1
Modified acceleration trapezoid	0<TPD<1
Polynomial 5th order	0<TPD<1
Polynomial 7th order	0<TPD<1

Tab. 4-56: Table of valid combinations for initial values

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3096 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	1.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3100, FlexProfile 2, events, list of motion step assignments

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines which motion step the respective event applies to. The event is only taken into consideration for the selected motion step.

A-0-3100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	15	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3101, FlexProfile 2, events, list of trigger modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures triggers for events for set 2 of the operation mode "FlexProfile".

See also Parameter Description: "A-0-3103, FlexProfile 2, events, list of trigger values".

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
7..0	**Trigger modes** 0x01: TRIGGER_CONTROLBIT_ONLY 0x02: TRIGGER_ABS_SLAVE_REACHED 0x03: TRIGGER_REL_SLAVE_REACHED 0x04: TRIGGER_ABS_MASTER_REACHED 0x05: TRIGGER_REL_MASTER_REACHED 0x06: TRIGGER_REL_TIME_MASTER_REACHED

Tab. 4-57: List of the trigger modes

A-0-3101 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3102, FlexProfile 2, events, list of action modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter configures the actions carried out once the triggers determined in the parameters "A-0-3101, FlexProfile 2, events, list of trigger modes" and "A-0-3103, FlexProfile 2, events, list of trigger values" apply.

An action can set or initiate a bit in parameter "A-0-3011, FlexProfile, conditions: control variables". Thus, the current motion step of the active motion sequence ends and continues with the next motion step.

The bit in parameter A-0-3011 can be set:

- immediately,
- after the current motion step is completed or
- after the current motion profile is completed.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
15..0	**Action modes** 16#0000, ACTION_STATUSBIT0_INSTANT 16#0001, ACTION_STATUSBIT1_INSTANT 16#0002, ACTION_STATUSBIT2_INSTANT ..... 16#000F,ACTION_STATUSBIT15_INSTANT 16#0100, ACTION_STATUSBIT0_AFTERSTEP 16#0101, ACTION_STATUSBIT1_AFTERSTEP 16#0102, ACTION_STATUSBIT2_AFTERSTEP .... 16#010F, ACTION_STATUSBIT15_AFTERSTEP 16#0200, ACTION_STATUSBIT0_AFTERPROFILE 16#0201, ACTION_STATUSBIT1_AFTERPROFILE 16#0202, ACTION_STATUSBIT2_AFTERPROFILE .... 16#020F, ACTION_STATUSBIT15_AFTERPROFILE 16#0300, ACTION_STATUSBIT0_INSTANT_NEXTSTEP 16#0301, ACTION_STATUSBIT1_INSTANT_NEXTSTEP 16#0302, ACTION_STATUSBIT2_INSTANT_NEXTSTEP ... 16#030F, ACTION_STATUSBIT15_INSTANT_NEXTSTEP

Tab. 4-58: List of motion step types

A-0-3102 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3103, FlexProfile 2, events, list of trigger values

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures trigger values.

Depending on the trigger mode selected in parameter "A-0-3101, FlexProfile 2, events, list of trigger modes", a value has to be specified here which is subsequently checked.

A-0-3103 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3104, FlexProfile 2, events, list of trigger values, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the list of values for parameter A-0-3103.

Describing individual parameters, arranged according to types

A-0-3104 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3106, FlexProfile 2, command: Check and apply event

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function Executing the command checks all event parameters for FlexProfile 2 for plausibility and applies them internally.

Once the event parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3107, FlexProfile 2, diagnostics".

Use When executing the command, the following parameters must be checked:

- A-0-3100, FlexProfile 2, events, list of motion step assignments,
- A-0-3101, FlexProfile 2, events, list of trigger modes,
- A-0-3102, FlexProfile 2, events, list of trigger modes and
- A-0-3103, FlexProfile 2, events, list of trigger values.

A-0-3106 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3107, FlexProfile 2, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter indicates inconsistencies in the parameterized and checked profile and event set 2 of the operation mode "FlexProfile".

The motion sequence parameterized in set 2 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3108, FlexProfile 2, command: Check and apply profile".

The event set parameterized in set 2 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3106, FlexProfile 2, command: Check and apply event".

If one of the checks yields an inconsistency, the error number and the incorrect motion step for this profile are displayed in the first two elements of this parameter. The last two elements display the error number and the incorrect event.

See Diagnostics Description: "Error in FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3107 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3108, FlexProfile 2, command: Check and apply profile

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters that define the motion sequence for FlexProfile 2 for plausibility and applies them internally.

The result of the check can be queried in parameter "A-0-3010, FlexProfile, status word".

A MotionProfile can only be started if it has been declared OK and free of errors.

Once the parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3107, FlexProfile 2, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3080, FlexProfile 2, master axis velocity,
- A-0-3081, FlexProfile 2, list of master axis sources,
- A-0-3082, FlexProfile 2, list of slave axis distances,
- A-0-3083, FlexProfile 2, list of master axis ranges,
- A-0-3085, FlexProfile 2, list of motion laws,
- A-0-3086, FlexProfile 2, list of motion step types,
- A-0-3087, FlexProfile 2, list of slave axis starting velocities,
- A-0-3088, FlexProfile 2, list of slave axis starting accelerations,
- A-0-3089, FlexProfile 2, list of slave axis starting jerks,
- A-0-3090, FlexProfile 2, list of slave axis end velocities,
- A-0-3091, FlexProfile 2, list of slave axis end accelerations,
- A-0-3092, FlexProfile 2, list of slave axis end jerks,
- A-0-3093, FlexProfile 2, list of slave axis travel velocities,
- A-0-3094, FlexProfile 2, list of slave axis travel accelerations,
- A-0-3095, FlexProfile 2, list of slave axis travel jerks,
- A-0-3096, FlexProfile 2, list of turning point displacements (WPV).

A-0-3108 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Describing individual parameters, arranged according to types

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3109, FlexProfile 2, checksum

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the checksum on all parameters of FlexProfile 2. It contains the following parameters:

- A-0-3080, FlexProfile 2, master axis velocity,
- A-0-3081, FlexProfile 2, list of master axis sources,
- A-0-3082, FlexProfile 2, list of slave axis distances,
- A-0-3083, FlexProfile 2, list of master axis ranges,
- A-0-3085, FlexProfile 2, list of motion laws,
- A-0-3086, FlexProfile 2, list of motion step types,
- A-0-3087, FlexProfile 2, list of slave axis starting velocities,
- A-0-3088, FlexProfile 2, list of slave axis starting accelerations,
- A-0-3089, FlexProfile 2, list of slave axis starting jerks,
- A-0-3090, FlexProfile 2, list of slave axis end velocities,
- A-0-3091, FlexProfile 2, list of slave axis end accelerations,
- A-0-3092, FlexProfile 2, list of slave axis end jerks,
- A-0-3093, FlexProfile 2, list of slave axis travel velocities,
- A-0-3094, FlexProfile 2, list of slave axis travel accelerations,
- A-0-3095, FlexProfile 2, list of slave axis travel jerks,
- A-0-3096, FlexProfile 2, list of turning point displacements (WPV),
- A-0-3100, FlexProfile 2, events, list of motion step assignments,
- A-0-3101, FlexProfile 2, events, list of trigger modes,
- A-0-3102, FlexProfile 2, events, list of trigger modes and
- A-0-3103, FlexProfile 2, events, list of trigger values.

Describing individual parameters, arranged according to types

A-0-3109 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3110, FlexProfile 3, master axis velocity

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which constant master axis velocity the required motion step velocities of the FlexProfile refer to.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information of the master axis velocity is required, if a motion step is used for which an initial/end slave or travel velocity is determined (standard profile rest-in-velocity, velocity-in-velocity or velocity-in-rest, etc...).

The specified value must refer to the electronic gear's output.

A-0-3110 - Attributes:

Function:	PARAMETER	**Unit:**	1/min
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.1	2147483647.0	10.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3111, FlexProfile 3, list of master axis sources

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates which of the two mater axis sources (master axis or time) is to be considered for each motion step, if set 3 of the operation mode "FlexProfile" is active.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use The information on the master sources is required if a motion step is used whose time-related motion is determined.

A-0-3111 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	1	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3112, FlexProfile 3, list of distances

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines the paths traversed in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use If a standard profile is in the motion step and no cam table is selected, the distance determines the path traveled in the corresponding step.

If a cam table is selected, the traversed path is derived from the product of the distance and the last value of the table.

A-0-3112 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0059
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3113, FlexProfile 3, list of master axis ranges

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines the range of the master axis source, which the motion step covers for set 3 of the operation mode "FlexProfile".

If it is a time-related motion step, the information is provided in [ms].

Describing individual parameters, arranged according to types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3113 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3114, FlexProfile 3, list of master axis ranges, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the master axis source for the parameter "A-0-3113, FlexProfile 3, list of master axis ranges" for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3114 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3115, FlexProfile 3, list of motion laws

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines for FlexProfile 3 which motion laws the individual motion steps are provided with.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Structure

Describing individual parameters, arranged according to types

Bit	Name/function
7…0	**Profile BS** 0x0001: C-0-2001, ELS, point table 1, 0x0002: C-0-2002, ELS, point table 2, 0x0003: C-0-2003, ELS, point table 3, . 0x0063: C-0-2099, ELS, point table 99.
15…8	**Profile type** 0x0000: Rest-in-rest, inclined sinusoid, 0x0100: Rest-in-rest, polynomial 5th order, 0x0200: Rest-in-velocity, polynomial 5th order, 0x0300: Rest-in-velocity, polynomial 7th order, 0x0400: Velocity-in-rest, polynomial 5th order, 0x0500: Velocity-in-rest, polynomial 7th order, 0x0600: Constant velocity, 0x0700: Velocity-in-velocity, polynomial 5th order 0x0800: Rest-in-rest, standstill, 0x0900: Rest-in-rest, polynomial 7th order, 0x0A00: Rest-in-rest, sinusoid, 0x0B00: Rest-in-rest, Gutman sinusoid, 0x0C00: Rest-in-rest, acceleration-optimum inclined sinusoid, 0x0D00: Rest-in-rest, torque-optimum inclined sinusoid, 0x0E00: Rest-in-rest, modified acceleration trapezoid, 0x0F00: Rest-in-rest, modified sinusoid, 0x1000: Velocity-in-velocity, polynomial 7th order, 0x1100: Velocity-in-velocity, modified sinusoid, 0x2000: Motion-in-motion, polynomial 5th order, 0x2100: Motion-in-motion, polynomial 7th order, 0x4000: General motion, polynomial 5th order, 0x4100: General motion, polynomial 7th order, 0x6000: Extended motion law, velocity-limited polynomial 5th order, 0x6100: Extended motion law, overshoot-free polynomial 5th order, 0x7000: Extended motion law, velocity-limited motion (trapezoid), 0x7100: Extended motion law, velocity-limited motion (sinusoids), 0x7200: Extended motion law, jerk-limited motion (trapezoid).

Describing individual parameters, arranged according to types

A-0-3115 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3116, FlexProfile 3, list of motion step types

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter determines whether a Flex or standard element (fix) is used for set 3 of the operation mode "FlexProfile".

The Flex element can be considered as active step. Its motion path results at runtime by inheriting the boundary values of the neighboring step. It corrects and adapts its own path correspondingly to impede velocity jumps. In a Flex element - instead of the distance - an absolute slave axis target position to be reached and - instead of the master axis range - an absolute master axis end position to be reached can be specified (the distance and the master axis range are calculated at runtime if necessary). (The distance and the master axis range are calculated at runtime if necessary.)

The Fix motion step (STEP_FIX) is fixed and cannot be changed at runtime.

Bit	Name/function
0...7	**Motion step type** 0x00: STEP_FIX, 0x01: STEP_FLEX_REL_REL, 0x02: STEP_FLEX_REL_ABS, 0x03: STEP_FLEX_ABS_REL, 0x04: STEP_FLEX_ABS_ABS,

Tab. 4-59: List of motion step types

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Structure

Only selected motion laws are flex-capable.

Motion laws	Name
Polynomial 5th order	COMMON_POLY5
Polynomial 7th order	COMMON_POLY7

Tab. 4-60: Table of valid combinations for the Flex elements

A-0-3116 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x04	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3117, FlexProfile 3, list of slave axis starting velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis starting velocities occur in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0

Describing individual parameters, arranged according to types

Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Vel-in-rest	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-61: Table of valid combinations for initial values

A-0-3117 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3118, FlexProfile 3, list of slave axis starting accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting accelerations occur in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	Start_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-62: Table of valid combinations for initial values

A-0-3118 - **Attributes:**

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3119, FlexProfile 3, list of slave axis starting jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis starting jerks occur in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

	Start_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically
Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-63: Table of valid combinations for initial values

Describing individual parameters, arranged according to types

A-0-3119 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3120, FlexProfile 3, list of slave axis end velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end velocities occur at the end in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Velocity
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	

Linear interpolation	User-defined
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Modified sinusoid	User-defined
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined
Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-64: Table of valid combinations for initial values

A-0-3120 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3121, FlexProfile 3, list of slave axis end accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end accelerations occur at the end in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Acceleration
Rest-in-rest	
Linear rest	0
Simple sinusoid	0
Bestehorn sinusoid	0
Acceleration-optimum inclined sinusoid	0
Torque-optimum inclined sinusoid	0
Gutman sinusoid	0
Modified sinusoid	0
Modified acceleration trapezoid	0
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	0
Polynomial 7th order	0
Modified sinusoid	0
Velocity-limited trapezoid	0
Rest-in-velocity	
Polynomial 5th order	0
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	0
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	User-defined

Polynomial 7th order	User-defined
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-65: Table of valid combinations for initial values

A-0-3121 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3122, FlexProfile 3, list of slave axis end jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis end jerks occur at the end in the individual motion steps for set 3 of the operation mode "FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

	End_Jerk
Rest-in-rest	
Linear rest	0
Simple sinusoid	Calculated automatically
Bestehorn sinusoid	Calculated automatically
Acceleration-optimum inclined sinusoid	Calculated automatically

Describing individual parameters, arranged according to types

Torque-optimum inclined sinusoid	Calculated automatically
Gutman sinusoid	Calculated automatically
Modified sinusoid	Calculated automatically
Modified acceleration trapezoid	Calculated automatically
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-velocity	
Linear interpolation	0
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Modified sinusoid	Calculated automatically
Velocity-limited trapezoid	Calculated automatically
Rest-in-velocity	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Velocity-in-rest	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Motion-in-motion	
Polynomial 5th order	Calculated automatically
Polynomial 7th order	0
Polynomial 5th order, limited velocity	Calculated automatically
Interpolation	
Acceleration-limited motion (trapezoid)	Calculated automatically
Acceleration-limited sinusoid	Calculated automatically
Jerk-limited motion	Calculated automatically

Tab. 4-66: Table of valid combinations for initial values

A-0-3122 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3123, FlexProfile 3, list of slave axis travel velocities

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing velocities occur in the individual motion steps for set 3 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered

Describing individual parameters, arranged according to types

Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	User-defined
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-67: Table of valid combinations for limit values

A-0-3123 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0056
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3124, FlexProfile 3, list of slave axis travel accelerations

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines which slave axis traversing accelerations occur at the end in the individual motion steps for set 3 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Describing individual parameters, arranged according to types

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	
Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	User-defined
Acceleration-limited sinusoid	User-defined
Jerk-limited motion	User-defined

Tab. 4-68: Table of valid combinations for limit values

Describing individual parameters, arranged according to types

A-0-3124 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3125, FlexProfile 3, list of slave axis travel jerks

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This list determines which slave axis traversing jerks occur at the end in the individual motion steps for set 3 of the operation mode "FlexProfile".

This setting is only supported by special motion laws.

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

Use

Rest-in-rest	
Linear rest	Not considered
Simple sinusoid	Not considered
Bestehorn sinusoid	Not considered
Acceleration-optimum inclined sinusoid	Not considered
Torque-optimum inclined sinusoid	Not considered
Gutman sinusoid	Not considered
Modified sinusoid	Not considered
Modified acceleration trapezoid	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-velocity	

Linear interpolation	Not considered
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Modified sinusoid	Not considered
Velocity-limited trapezoid	User-defined
Rest-in-velocity	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Velocity-in-rest	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Motion-in-motion	
Polynomial 5th order	Not considered
Polynomial 7th order	Not considered
Polynomial 5th order, limited velocity	Not considered
Interpolation	
Acceleration-limited motion (trapezoid)	Not considered
Acceleration-limited sinusoid	Not considered
Jerk-limited motion	User-defined

Tab. 4-69: Table of valid combinations for limit values

A-0-3125 - Attributes:

Function:	PARAMETER	**Unit:**	A-0-0053
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-2147483647.0	2147483647.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3126, FlexProfile 3, list of turning point displacements

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This list determines at which point the curving behavior changes for a symmetrical motion law for set 3 of the operation mode "FlexProfile". By default, a turning point displacement of 0.5 has to be selected. This provides a turning point in the middle of the motion step.

 Only selected motion laws support a turning point displacement.

Rest-in-rest	TPD
Simple sinusoid	0<TPD<1
Bestehorn sinusoid	0<TPD<1
Acceleration-optimum inclined sinusoid	0<TPD<1
Torque-optimum inclined sinusoid	0<TPD<1
Gutman sinusoid	0<TPD<1
Modified acceleration trapezoid	0<TPD<1
Polynomial 5th order	0<TPD<1
Polynomial 7th order	0<TPD<1

Tab. 4-70: Table of valid combinations for initial values

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3126 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	1.0	0.0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3130, FlexProfile 3, events, list of motion step assignments

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter determines which motion step the respective event applies to.

The event is only taken into consideration for the selected motion step.

A-0-3130 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	15	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3131, FlexProfile 3, events, list of trigger modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures triggers for events for set 3 of the operation mode "FlexProfile".

See also Parameter Description: "A-0-3133, FlexProfile 3, events, list of trigger values".

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
7..0	**Trigger modes** 0x01: TRIGGER_CONTROLBIT_ONLY 0x02: TRIGGER_ABS_SLAVE_REACHED 0x03: TRIGGER_REL_SLAVE_REACHED 0x04: TRIGGER_ABS_MASTER_REACHED 0x05: TRIGGER_REL_MASTER_REACHED 0x06: TRIGGER_REL_TIME_MASTER_REACHED

Tab. 4-71: List of the trigger modes

A-0-3131 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3132, FlexProfile 3, events, list of action modes

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter configures the actions carried out once the triggers determined in the parameters "A-0-3131, FlexProfile 3, events, list of trigger modes" and "A-0-3133, FlexProfile 3, events, list of trigger values" apply.

An action can set or initiate a bit in parameter "A-0-3011, FlexProfile, conditions: control variables". Thus, the current motion step of the active motion sequence ends and continues with the next motion step.

The bit in parameter A-0-3011 can be set:

- immediately,
- after the current motion step is completed or
- after the current motion profile is completed.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
15..0	**Action modes** 16#0000, ACTION_STATUSBIT0_INSTANT 16#0001, ACTION_STATUSBIT1_INSTANT 16#0002, ACTION_STATUSBIT2_INSTANT ..... 16#000F,ACTION_STATUSBIT15_INSTANT 16#0100, ACTION_STATUSBIT0_AFTERSTEP 16#0101, ACTION_STATUSBIT1_AFTERSTEP 16#0102, ACTION_STATUSBIT2_AFTERSTEP .... 16#010F, ACTION_STATUSBIT15_AFTERSTEP 16#0200, ACTION_STATUSBIT0_AFTERPROFILE 16#0201, ACTION_STATUSBIT1_AFTERPROFILE 16#0202, ACTION_STATUSBIT2_AFTERPROFILE .... 16#020F, ACTION_STATUSBIT15_AFTERPROFILE 16#0300, ACTION_STATUSBIT0_INSTANT_NEXTSTEP 16#0301, ACTION_STATUSBIT1_INSTANT_NEXTSTEP 16#0302, ACTION_STATUSBIT2_INSTANT_NEXTSTEP ... 16#030F, ACTION_STATUSBIT15_INSTANT_NEXTSTEP

Tab. 4-72: List of motion step types

A-0-3132 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3133, FlexProfile 3, events, list of trigger values

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter configures trigger values.

Depending on the trigger mode selected in parameter "A-0-3131, FlexProfile 3, events, list of trigger modes", a value has to be specified which is subsequently checked.

A-0-3133 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	FLASH	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3134, FlexProfile 3, events, list of trigger values, units

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the corresponding units of the list of values for parameter A-0-3133.

Describing individual parameters, arranged according to types

A-0-3134 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3136, FlexProfile 3, command: Check and apply event

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters for FlexProfile 3 for plausibility and applies them internally.

Once the event parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3137, FlexProfile 3, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3130, FlexProfile 3, events, list of motion step assignments,
- A-0-3131, FlexProfile 3, events, list of trigger modes,
- A-0-3132, FlexProfile 3, events, list of trigger modes and
- A-0-3133, FlexProfile 3, events, list of trigger values.

A-0-3136 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3137, FlexProfile 3, diagnostics

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

This parameter indicates inconsistencies in the parameterized and checked profile and event set 3 of the operation mode "FlexProfile".

The motion sequence parameterized in set 3 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3138, FlexProfile 3, command: Check and apply profile".

The event set parameterized in set 3 for the operation mode "FlexProfile" is checked for plausibility by parameter "A-0-3136, FlexProfile 3, command: Check and apply event".

If one of the checks yields an inconsistency, the error number and the incorrect motion step for this profile are displayed in the first two elements of this parameter. The last two elements display the error number and the incorrect event.

See Diagnostics Description: "Error in FlexProfile".

See also Functional Description"FlexProfile with Real/Virtual Master Axis".

A-0-3137 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

Describing individual parameters, arranged according to types

A-0-3138, FlexProfile 3, command: Check and apply profile

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function

Executing the command checks all event parameters that define the motion sequence for FlexProfile 3 for plausibility and applies them internally.

The result of the check can be queried in parameter "A-0-3010, FlexProfile, status word".

A MotionProfile can only be started if it has been declared OK and free of errors.

Once the parameter for the MotionProfile is changed, a check must be reinitiated.

If a check fails, detailed information on the cause can be found in parameter "A-0-3137, FlexProfile 3, diagnostics".

Use

When executing the command, the following parameters must be checked:

- A-0-3110, FlexProfile 3, master axis velocity,
- A-0-3111, FlexProfile 3, list of master axis sources,
- A-0-3112, FlexProfile 3, list of slave axis distances,
- A-0-3113, FlexProfile 3, list of master axis ranges,
- A-0-3115, FlexProfile 3, list of motion laws,
- A-0-3116, FlexProfile 3, list of motion step types,
- A-0-3117, FlexProfile 3, list of slave axis starting velocities,
- A-0-3118, FlexProfile 3, list of slave axis starting accelerations,
- A-0-3119, FlexProfile 3, list of slave axis starting jerks,
- A-0-3120, FlexProfile 3, list of slave axis end velocities,
- A-0-3121, FlexProfile 3, list of slave axis end accelerations,
- A-0-3122, FlexProfile 3, list of slave axis end jerks,
- A-0-3123, FlexProfile 3, list of slave axis travel velocities,
- A-0-3124, FlexProfile 3, list of slave axis travel accelerations,
- A-0-3125, FlexProfile 3, list of slave axis travel jerks,
- A-0-3126, FlexProfile 3, list of turning point displacements (WPV).

A-0-3138 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB, PM
		MinMax check:	+
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFF	---
HydraulicDrive:			---

Describing individual parameters, arranged according to types

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

A-0-3139, FlexProfile 3, checksum

	IndraDrive		HydraulicDrive		Sercos-Drive	Virtual axis	Encoder axis	Link axis	Control axis
	Drive	Control	Drive	Control					
Supported:	-	+	-	+	+	+	-	-	+
Direct access:	--	--	--	--	--	--	--	--	--
C2C access:	--	--	--	--	--	--	--	--	--
Oscilloscope:	-	-	-	-	-	-	-	-	-
Probe:	-	-	-	-	-	-	-	-	-

Function This parameter indicates the checksum on all parameters of FlexProfile 3. It contains the following parameters:

- A-0-3110, FlexProfile 3, master axis velocity,
- A-0-3111, FlexProfile 3, list of master axis sources,
- A-0-3112, FlexProfile 3, list of slave axis distances,
- A-0-3113, FlexProfile 3, list of master axis ranges,
- A-0-3115, FlexProfile 3, list of motion laws,
- A-0-3116, FlexProfile 3, list of motion step types,
- A-0-3117, FlexProfile 3, list of slave axis starting velocities,
- A-0-3118, FlexProfile 3, list of slave axis starting accelerations,
- A-0-3119, FlexProfile 3, list of slave axis starting jerks,
- A-0-3120, FlexProfile 3, list of slave axis end velocities,
- A-0-3121, FlexProfile 3, list of slave axis end accelerations,
- A-0-3122, FlexProfile 3, list of slave axis end jerks,
- A-0-3123, FlexProfile 3, list of slave axis travel velocities,
- A-0-3124, FlexProfile 3, list of slave axis travel accelerations,
- A-0-3125, FlexProfile 3, list of slave axis travel jerks,
- A-0-3126, FlexProfile 3, list of turning point displacements (WPV),
- A-0-3130, FlexProfile 3, events, list of motion step assignments,
- A-0-3131, FlexProfile 3, events, list of trigger modes,
- A-0-3132, FlexProfile 3, events, list of trigger modes and
- A-0-3133, FlexProfile 3, events, list of trigger values.

Describing individual parameters, arranged according to types

A-0-3139 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
		MinMax check:	-
Var. data type:	-	**Var. min/max value:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---
HydraulicDrive:			---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	---
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	---
HydraulicDrive/ Control:	---
SercosDrive:	---

4.2 Control parameters (C-parameters)

4.2.1 Control Parameters, General Information

The following parameters exist only once for each control:

- IndraLogic XLC L25, L45, L65 with onboard sercos III bus,
- IndraMotion MLC L25, L45, L65 and

Only the parameters required for the respective control types are created.



The C-parameters from C-0-0300 to C-0-0396 are used to implement the programmable limit switch function in the MLC 03VRS and MLC 04VRS.

Due to reasons of compatibility, they are also available for the IndraMotion MLC L25, L45, L65.

Use the N-parameters.

A part of the C-parameters is not used by kinematics. These parameters are marked with "+" supproted or "-" not supported for Robot Control V1 or Robot Control V2.

See also "Control-specific parameters" on page 66.

4.2.2 C-0-0000 - C-0-0499

C-0-0000, Dummy, C-parameter

Function A-parameter serves as a placeholder; it does not have a function. The parameter can be written and read cyclically.

Use Measure dead time for writing and reading.

C-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0001, Language selection

Function

In the controls of the type IndraLogic XLC/IndraMotion MLC, all parameter names, units, diagnostics and menu items of the display are stored in several languages.

The language in which the texts are issued is specified via this parameter.

- 0: German,
- 1: English,
- 99: User-defined (parsing and transfer of texts from the files specified in C-0-0002, C-0-0003 and C-0-0004 as language 3.
- 100: Creating the XML files based on the current language set.

C-0-0001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	100	0

C-0-0002, Name of parameter file

Function

Controls of the type IndraLogic XLC/IndraMotion MLC can output parameter names and units in a user-defined language (see C-0-0001).

The name of the XML files in which the parameter names and units are stored, is specified by this parameter.

C-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Parameter_EN.xml"

C-0-0003, Name of diagnostic file

Function

Controls of the type IndraLogic XLC/IndraMotion MLC can output diagnostics in a user-defined language (see C-0-0001).

The name of the XML files in which the diagnostics are stored, is specified by this parameter.

C-0-0003 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Diagnoses_EN.xml"

C-0-0004, Name of menu file

Function Controls of the type IndraLogic XLC/IndraMotion MLC can show menu items of the display in a user-defined language (see C-0-0001).

The name of the XML files in which the menu items are stored, is specified by this parameter.

C-0-0004 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Menue_EN.xml"

C-0-0009, Osci: list of all C-parameters that can be oscilloscoped

Function This parameter contains the list of all C-parameters which can be oscilloscoped.

C-0-0009 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0010, Version number, hardware

Function This parameter contains the control's hardware version.

Example: "CML40.1-SP-220-NA"

C-0-0010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"HW_VERSION_STRING"

C-0-0011, Version number, PLC firmware

Function This parameter contains the firmware version of the PLC card.

Example: "IL-MLC-RUN-01T05.125" or "IL-MLC-RUN 01V07.00"

C-0-0011 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"PLCFW_VERSION_STRING"

C-0-0012, Version number, firmware

Function This parameter contains the control's firmware version.

Example: "CML40s-MLs-10V0x.083"



Since various firmware versions can be used with an interface version, please specify this version in case of an error.

C-0-0012 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"FW_VERSION_STRING"

C-0-0013, Version number, BSP

Function This parameter contains the version of the control's board support packages (BSP).

C-0-0013 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"BSP_VERSION_STRING"

C-0-0014, Version number, MLPI Server Core

Function This parameter contains the version of the MLPI Server Core.

Example:

1.0.0.0 Build 42

Meaning:

Major:	Major release, changes of interfaces, behavior or significant changes of code may occurs.
Minor:	Minor release, new features or a significant set of bugfixes may occurs.

Bugfix:	Bugfixes of existing features.
Patch:	Patch of an existing release.
Build:	Build number.

C-0-0014 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"MLPI_SERVER_CORE_VERSION_STRING"

C-0-0017, Reserved for internal use

Function This parameter is only intended for internal use.

C-0-0017 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	";"

C-0-0020, Hardware, configuration

Function The control displays its internal hardware configuration in this parameter.

This parameter is only intended for internal use.

C-0-0020 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x0000	0xFFFF	0x0000

C-0-0021, Hardware, details

Function This parameter displays detailed information on the used hardware:

Example:

"HWVersion = 0x0; FPGAVersion = 0x104; BlpVerBasis = 0x66012D; BlpNrBasis = 0x3FC83B2C;"

C-0-0021 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"HW_DE-TAILS_STRING"

C-0-0022, Local bus, configuration

Function The control displays the internal local bus configuration in this 64 bit string.

Structure 16 bits for the hardware ID are reserved for the two onboard modules and 16 bits for the device-internal extensions:

- Slot address 5: Bits 0…15
- Slot address 6: Bits 16…31
- Slot address 5: Bits 32…47 (reserved for future extensions)
- Slot address 254: Bits 48…63 (SRAM mounting variant)

The function modules supported by the control are provided with the following bit IDs:

Function module	**ID**	
	Binary	**hex**
netX (empty module)	2#0000.0001.0000.0000	16#0100
sercos III PCI-BusMaster	2#0000.0000.0000.1110	16#000E
SRAM (internal memory extension for RobotControl)	2#0000.0000.0001.0011	16#0013

Use *Example: The hardware is provided with the following onboard modules:*

- Slot address 5: netX (empty module)
- Slot address 6: sercos III PCI-BusMaster
- Slot address 5: n/a
- Slot address 254: Hardware with internal SRAM memory extension

Thus, the parameter C-0-0022 has the following bit assignment:

C-0-0022 = 2#0000.0000.0001.0011.0000.0000.0000.0000.0000.0000.0000.1110.0000.0001.0000.0000 = 16#0013.0000.000E.0100

C-0-0022 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 8BYTE	**PLC data type:**	LWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0023, System status

Function This parameter displays the current system status.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
3..0	**System Status** 0 0 0 0: undefined 0 0 0 1: Win32 instance of IndraMotion 0 0 1 0: VxWorks instance of IndraMotion 0 1 0 0: VxWin instance of IndraMotion 1 0 0 0: WindowsCE instance of IndraMotion
7..4	Reserved
10..8	**PLC status** 000: undefined, 001: PLC in STOP 010: PLC in RUN 100: PLC in INIT
15..11	Reserved
16	**Download** 0: not possible, since (PLC in stop and Sercos in phase 0) not met 1: possible, since PLC in stop and Sercos in phase 0
17	**Phase switching** 0: Not active 1: active, (e.g. when switching from Sercos phase 2 to phase 4); the bit remains active until the phase is successfully switched or terminated with an error)
18	Reserved
19	**Active axes** 0: no active axis 1: there is at least one active axis, i.e. real axes must be in "Power on" or virtual axes may not be in "Standstill". Encoder axes do not have any influence
20	**Temperature warning** 0: no temperature warning 1: Overtemperatur warning, see also diagnostics "E0200002, Temperature warning"
21	**Fan** 0: fan off, if installed 1: fan on, if installed
22	**System mode Debugging** 0: System mode Debugging of the control is not active 1: System mode Debugging of the control is active. In parameter C-0-0036, the system mode Debugging is enabled.

Describing individual parameters, arranged according to types

Bit	Name/function
23	**Booting** 0: control is booting; interaction with control is not yet possible (e.g. communication) 1: control finished booting, interaction possible (e.g. communication)
24	**Messages** 0: no message available 1: at least one message has occurred since the last "C-0-1030, command: Clear all control errors"
25	**Warning** 0: No warning 1: at least one warning has occurred since the last "C-0-1030, command: Clear all control errors"
26	**Errors** 0: No error 1: at least one error has occurred since the last "C-0-1030, command: Clear all control errors"
31..27	**Sercos phases** 00000: undefined 00001: Sercos phase 0 is active 00010: Sercos phase 1 is active (not used) 00100: Sercos phase 2 is active 01000: Sercos phase 3 is active 10000: Sercos phase 4 is active

C-0-0023 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0024, Internal system status

Function This parameter is only intended for internal use.

C-0-0024 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0025, Function module bus, configuration

Function In this 64-bit date, the control indicates the function module bus configuration of all plugged function modules. The configuration is set via the address switches.

Structure At the control (PCI bus), 16 bits are reserved for the hardware ID for each of the up to four slots:

- Slot address 1: Bits 0…15
- Slot address 2: Bits 16…31
- Slot address 3: Bits 32…47
- Slot address 4: Bits 48…63

The function modules supported by the control are provided with the following bit IDs:

Function module	ID	
	Binary	hexadecimal
netX (empty module/not configured)	0b0000.0001.0010.0000	0x0120
RT-Ethernet / Profibus DP	0b0000.0001.0010.0001	0x0121
RT-Ethernet / DeviceNet	0b0000.0001.0010.0010	0x0122
RT-Ethernet / CANopen	0b0000.0001.0010.0011	0x0123
CrossComm (cross link and drive ring with sercos II):	0b0000.0000.0010.1001	0x0029
N1 PLS (programmable limit switch)	0b0000.0000.0010.1010	0x002A
sercos III (cross link and drive ring)	0b0000.0000.0010.1011	0x002B
SRAM (memory card for RobotControl)	0b0000.0000.0011.0000	0x0030
FastIO (fast digital inputs and outputs)	0b0000.0000.0010.1101	0x002D
DeviceNet master	0b0000.0000.0010.0001	0x0021
PROFIBUS DP Master	0b0000.0000.0010.0100	0x0024
Safety (PLC for safety engineering)	0b0000.0000.0010.1100	0x002C

Use *Example: The items below are mounted to the PCI bus:*

- Slot address 1: sercos III for one drive ring
- Slot address 2: N1 PLS for the first programmable limit switch
- Slot address 3: SRAM for RobotControl
- Slot address 4: N1 PLS for a second programmable limit switch

Thus, the parameter C-0-0025 has the following assignment:

C-0-0025 = 0b0000.0000.0010.1010.0000.0000.0011.0000.0000.0000.0010.1010.0000.0000.0010.1011 = 0x002A.0030.002A.002B

Describing individual parameters, arranged according to types



The function modules RT-Ethernet / Profibus DP, RT-Ethernet / DeviceNet and RT-Ethernet / CANopen are netX function modules configured in the PLC (field bus stack has been loaded).

The RT Ethernet interface is freely configurable in these function modules (PROFINET IO, EtherNet/IP, TCP/IP).

Unconfigured modules have the ID of the netX function module.

The function module RT-Ethernet / CANopen can only be used for IndraControl L45 and L65.

C-0-0025 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 8BYTE	**PLC data type:**	LWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

C-0-0026, Hardware details of function module no. 1

Function

This parameter displays detailed information about the function module on slot 1.

Example:

TypeCode = CFL01.1-Q2; SN = 005655884; MaterialIndexNo = 0x65; MaterialNo = 0x364F59D9; WorkingTime = 0

For more information, refer to parameter C-0-0041.

C-0-0026 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"HW_DETAILS_FM1_STRING"

C-0-0027, Hardware details of function module no. 2

Function

This parameter displays detailed information about the function module on slot 2.

Example:

TypeCode = CFL01.1-Q2; SN = 005655884; MaterialIndexNo = 0x65; MaterialNo = 0x364F59D9; WorkingTime = 0

For more information, refer to parameter C-0-0041.

C-0-0027 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"HW_DETAILS_FM2_STRING"

C-0-0028, Hardware details of function module no. 3

Function

This parameter displays detailed information about the function module on slot 3.

Example:

TypeCode = CFL01.1-Q2; SN = 005655884; MaterialIndexNo = 0x65; MaterialNo = 0x364F59D9; WorkingTime = 0

For more information, refer to parameter C-0-0041.

C-0-0028 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"HW_DETAILS_FM3_STRING"

C-0-0029, Hardware details of function module no. 4

Function

This parameter displays detailed information about the function module on slot 4.

Example:

TypeCode = CFL01.1-Q2; SN = 005655884; MaterialIndexNo = 0x65; MaterialNo = 0x364F59D9; WorkingTime = 0

For more information, refer to parameter C-0-0041.

C-0-0029 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"HW_DETAILS_FM4_STRING"

C-0-0030, Control name

Function

A character string can be entered in this parameter, which contains the type or the designation of an application, for example.

However, this parameter does not influence any IndraMotion function.

Describing individual parameters, arranged according to types

C-0-0030 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x50	"Control_name"

C-0-0031, Control address

Function

An address can be assigned to a control using this parameter. The control is assigned via this address (e.g. the control link).

Control link (bit 0 is set in C-0-0701)

- 0: Control is not configured for a link,
- 1..64: Control participates in the link with this address.

Use

Control link (bit 0 is set in C-0-0701)

The parameter is displayed in the diagnostics dialog for the "Cross communication" function module and can be written or modified in the configuration dialog.

If the link master axes have been configured (C-0-0703), a valid control address must be assigned.

This control address is checked when switching into operating mode.

In the sercos II link (CFL01.1-Q2), the maximum usable control address depends on the cycle time of the control link.

Link cycle time	Maximum control address
2 ms	16
4 ms	32
8 ms	64

Tab. 4-73: Maximum control address



In the C2C link (sercos III with CFL01.1-R3), all valid control addresses can be specified irrespective of the cycle time of the control link.



The control address can also (additionally to the control link) be used for a **TCP/IP routing** for all connected sercos devices.

Refer to the chapter "IP Communication" in

- **Rexroth IndraMotion MLC 13VRS Functional Description**
  DOK-MLC***-FUNC****V13-APRS-EN-P, R911336295
  or
- **Rexroth IndraLogic XLC 13VRS Functional Description**
  DOK-XLC***-FUNC****V13-APRS-EN-P, R911336352

C-0-0031 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT

Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	64	0

C-0-0032, Serial number of control

Function This parameter contains the control's serial number. The number is unique for each control.

The parameter does not influence the control's function.

C-0-0032 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Serial number"

C-0-0033, Project identification number

Function IndraWorks generates a unique character string in this parameter for the global identification of the project. The character string is unique for each project.

This parameter is only intended for internal use.

C-0-0033 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Project ID number"

C-0-0034, Client, access locking number

Function This parameter is designated for the client access locking number.

It contents indicate to which user computer the control is currently assigned.

"locked to COMPUTER-123456".

C-0-0034 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Client Access Locking Number"

Describing individual parameters, arranged according to types

C-0-0035, C2C, identification number

Function

IndraWorks generates a unique character string in this parameter for the global identification of a link ring. The character string is unique for each link ring.

This parameter is only intended for internal use.

C-0-0035 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Link ring ID number"

C-0-0036, Control configuration

Function

This parameter configures the control behavior.

Individual bits of this parameter should only be used in coordination with Bosch Rexroth.

Structure

Bit	Name/function
0	0: A-parameters are synchronized with the corresponding S/P-parameters in the drive when switching from Phase2 to Phase4. 1: No synchronization of the A-parameters to S/P-parameters in the drive. Reduces the switching time required from phase 2 to phase 4.
1	0: Updating of the shared memory structure (ProbeData_SM) disabled. 1: Updating of the shared memory structure (ProbeData_SM) enabled.
2	0: Parameters are accessed to S/P-parameters of a sercos III via the IP-channel of sercos III via the SIS protocol. If this is not possible, parameters are accessed via the service channel. 1: Parameters are accessed to S/P-parameters of a sercos III device via the service channel.
3	0: Errors occurring while reading the Motion command status are not written to the diagnostic log. 1: Errors occurring while reading the Motion command status are written to the diagnostic log.
4	0: Switching to P0 after one AT error. 1: Switching to P0 after 10 AT errors.
5	A bit change only becomes effective after a control restart. 0: Sercos III IP channel is active for the master communication. 1: Sercos III IP channel for master communication inactive.
6	A bit change only becomes effective after a control restart. 0: Sercos III IP channel is active for the cross link. 1: Sercos III IP channel is not active for the cross link.

Describing individual parameters, arranged according to types

Bit	Name/function
7	A change of the bit is only applied for new blocks. 0: The inverse path length function is used for the slope type CONT_SLOPE while blending. Thus, a constant path velocity is reached while blending. 1: The inverse path length function is not used for the slope type CONT_SLOPE while blending. This can cause velocity drops and/or exceedances while blending.
8	A change of the bit is only applied for new blocks. 0: For the slope type PROGR_SLOPE, there is no blending at a blending radius smaller than 5 mm. 1: For the slope type PROGR_SLOPE, there is no blending at a blending radius smaller than 0.1 mm.
9	Reserved
10	Reserved
11..29	Reserved
30	0: No recording of the runtime of the parameter accesses to the S-/P-parameters of a controller axis 1: Recording of the runtime of the parameter accesses to the S-/P-parameters of a controller axis
31	0: Stops the recording of the internal runtime of Motion commands in the firmware and saves the result in the "PerfLog.csv" file on the CF card of the control. 1: Starts the recording of the internal runtime of Motion commands in the firmware

C-0-0036 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0x40

C-0-0039, sercos local and function module bus, actual configuration

Function The parameter contains the current configuration of the sercos modules at the local module bus or function module bus.

Structure It is stored as character string and structured as follows:

Describing individual parameters, arranged according to types

Entry	Significance	Prefix	Possible entries
1	Slot address at the PCI bus (that is the internal address for onboard modules or DIP switches on the function modules)	A	• Onboard modules: 5, 6 (f.l.t.r.) • Function modules: 1 … 4
2	Type ID of onboard or function module	F	• Onboard R3 • CFL01.1-R3 • CFL01.1-Q2
3	Function mode (that means for which function the module is intended or configured)	P	• 0x0000.0000: sercos module configured as master communication • 0x0000.0001: sercos module configured as cross link • 0xFFFF.FFFF: Module not (yet) configured
4	Configuration of the command/ actual comparison	C	• 0x00000000: Command/ actual comparison is active • 0x00000001: Command/ actual comparison is inactive (currently not available)
5	Module status	S	• 0x0000.0000: Module is active • 0x0000.0002: Module is inactive

Tab. 4-74: Current configuration of the sercos modules available at the local and function bus modules

Use

Example

The control is provided with the following modules:

- a sercos III onboard module as "master communication" on address 6
- a sercos II function module as "cross link" on address 1
- a disabled sercos II function module without a defined function mode on address 2

A6,FOnboard-R3,P0x00000000,C0x00000000,S0x00000000,
A1,FCFL01.1-Q2,P0x00000001,C0x00000000,S0x00000000,
A2,FCFL01.1-Q2,P0xFFFFFFFF,C0x00000000,S0x00000002

C-0-0039 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0040, sercos local and function module bus, command configuration

Function The parameter contains the command configuration of the sercos modules at the local module bus or function module bus.

Structure The parameter is stored as character string and structured as follows:

Entry	Significance	Prefix	Possible entries
1	Slot address at the PCI bus (that is the internal address for onboard modules or DIP switches on the function modules)	A	• Onboard modules: 5, 6 (f.l.t.r.) • Function modules: 1 … 4
2	Type ID of onboard or function module	F	• Onboard R3 • CFL01.1-R3 • CFL01.1-Q2
3	Function mode (that means for which function the module is intended or configured)	P	• 0x0000.0000: sercos module configured as master communication • 0x0000.0001: sercos module configured as cross link • 0xFFFF.FFFF: Module not (yet) configured
4	Configuration of the command/ actual comparison	C	• 0x00000000: Command/ actual comparison is active • 0x00000001: Command/ actual comparison is inactive (currently not available)
5	Module status	S	• 0x0000.0000: Module is active • 0x0000.0002: Module is inactive

Tab. 4-75: Command configuration of the sercos modules available at the local and function bus module

Use Example:

The control is provided with the following modules:

- a sercos III onboard module as "master communication" on address 6
- a sercos II function module as "cross communication" on address 1
- a disabled sercos II function module without a defined function mode on address 2

A6,FOnboard-R3,P0x00000000,C0x00000000,S0x00000000,
A1,FCFL01.1-Q2,P0x00000001,C0x00000000,S0x00000000,
A2,FCFL01.1-Q2,P0xFFFFFFFF,C0x00000000,S0x00000002

Describing individual parameters, arranged according to types

Slot address at the PCI bus, type ID

The addresses of the function modules derivate from their DIP switch configuration. The addresses of the onboard modules are fixedly defined. The addressing of their slots starts from left to right with the address 5. Controls with only one onboard interface do not use the first onboard slot. Due to this reason, the existing onboard module gets address 6.

The system supports the sercos modules listed in the table.

Function mode, module status:

If two or multiple **active** sercos modules are listed in the command configuration, different functions modes have to be specified for them. The function mode of a module is limited as follows with regard to the configuration options:

- The function mode "master communication" can be configured on a sercos III onboard module or on a sercos II function module.
- The function mode "" can be configured on a sercos III function module ("cross communication C2C") or on a sercos II function module.
- The function mode "master communication" is mandatory on the "IndraMotion MLC".

☞ After changing the current function mode, activating or deactivating a module or removing or adding a new module in this parameter, the control **has to be** switched off and on again. The engineering environment IndraWorks points out this circumstance before writing the new command configuration.

After write-access, the control generates the warning "Changed functionality of the sercos FM restart" (E0200009). This ensures that if the command configuration is modified using an interface other than IndraWorks, it is informed about a required restart.

Command/actual comparison:

While the connection is established via IndraWorks, a comparison between command and actual value (see also C-0-0039) is carried out. This fails if function modules and onboard modules that are physically not present are configured. However, function modules may be physically present that are not supported in the command configuration. Deactivating the command/ actual comparison is currently not possible.

Resetting to state of delivery:

☞ After deleting the NVRAM, the configuration is reset to the state of delivery.

- First sercos module: "Master communication"
- Second sercos module: "Cross communication"
- Further sercos module(s): Not configured and deactivated

Counting the sercos modules starts at the onboard modules and then the function modules using addressing via DIP switch.

Due to a changed configuration, unidentifiable errors can occur during startup, e.g. "sercos ring not closed" or "Axis configuration not supported". Thus, the cross communication ring has to be opened before startup.

C-0-0040 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0041, Local and function module bus, actual configuration

Function When control startup begins, the addresses and types of all modules connected at the local module bus and function module bus are determined and stored in this parameter.

Structure The parameter is stored as character string and structured as follows:

Entry	Description	Prefix	Possible entries
1	Slot address at the PCI bus, that is the internal address for onboard modules or DIP switches on the function modules	SlotNbr =	• Onboard modules: 5, 6 (f.l.t.r.), 254 (internal) • Function modules: 1 … 4
2	Type ID of the onboard module or the function module	TypeCode =	EmptyBoard, Onboard-TP, Onboard-R3, Onboard-Y1, CFL01.1-Y1, CFL01.1-N1, CFL01.1-R3, CFL01.1-Q2, CFL01.1-V1, CFL01.1-P1, CFL01.1-E2, CFL01.1-F1, CFL01.1-Tx, CFL01.1-TP, CFL01.1-TD, CFL01.1-TC
3	Function mode, that means for which function the module is intended or was configured	FuncMode =	• 0x0000.0000: sercos module is configured as drive interface • 0x0000.0001: sercos module is configured as C2C interface • 0x00000002: Module is a fixedly defined interface • 0xFFFF.FFFF: Module not (yet) configured
4	Module status	Status =	• 0x0000.0000: Module is active • 0x0000.0002: Module is inactive
5	Serial number of the module or for onboard modules of the device	SN =	• Serial number • Zero or "not set" if not available

Describing individual parameters, arranged according to types

Entry	Description	Prefix	Possible entries
6	Material index number of the module or for onboard modules of the device	MaterialIndexNo =	• Material index number • Zero or "not set" if not available
7	Part number of the module or for onboard modules of the device	PartNo =	• Part number • Zero or "not set" if not available
8	Operating hour counter of the module or for onboard modules of the device	OperatingHours =	• Operating hours • Zero or "not set" if not available

Tab. 4-76: Local and function module bus, actual configuration

Use

Example:

The control is provided with an onboard SRAM on address 254 and the following modules:

- an NextX onboard module (ETH, PROFIBUS) on address 5
- a sercos III onboard module (sercos) as "drive interface" on address 6
- a sercos III function modules as "C2C interface" on address 1
- a disabled sercos II function module without a defined function mode on address 2
- a Fast I/O function module on address 3
- a PROFIBUS function module on address 4

SlotNbr = 254; TypeCode = Onboard-Y1; FuncMode = 0x00000002; Status = 0x00000000; SN = 0005660459; MaterialIndexNo = 300; PartsNo = R911170899; OperatingHours = 45208869,

SlotNbr = 6; TypeCode = Onboard-R3; FuncMode = 0x00000000; Status = 0x00000000; SN = 0005660459; MaterialIndexNo = 300; PartsNo = R911170899; OperatingHours = 45208869,

SlotNbr = 1; TypeCode = CFL01.1-R3; FuncMode = 0x00000001; Status = 0x00000000; SN = 005461491; MaterialIndexNo = 103; PartsNo = R911170008; OperatingHours = 0,

SlotNbr = 2; TypeCode = CFL01.1-Q2; FuncMode = 0xFFFFFFFF; Status = 0x00000002; SN = not set; MaterialIndexNo = 101; PartsNo = R911170009; OperatingHours = 0,

SlotNbr = 3; TypeCode = CFL01.1-E2; FuncMode = 0x00000002; Status = 0x00000000; SN = not set; MaterialIndexNo = 100; PartsNo = R911170365; OperatingHours = 0,

SlotNbr = 4; TypeCode = CFL01.1-P1; FuncMode = 0x00000002; Status = 0x00000000; SN = 006338144; MaterialIndexNo = 106; PartsNo = R911170005; OperatingHours = 0,

SlotNbr = 5; TypeCode = Onboard-TP; FuncMode = 0x00000002; Status = 0x00000000; SN = 0005660459; MaterialIndexNo = 300; PartsNo = R911170899; OperatingHours = 45208869

Describing individual parameters, arranged according to types



The function module with TypeCode "CFL01.1-Tx" is an unconfigured netX function module.

The function module can assume the following TypeCodes after a configuration in the PLC:

- "CFL01.1-TP" (Profibus DP),
- "CFL01.1-TD" (DeviceNet),
- "CFL01.1-TC" (CANopen).

The RT Ethernet interface is freely configurable in these function modules (PROFINET IO, EtherNet/IP, TCP/IP).

During the module configuration, additional type code information (e.g. serial number) is completed.

The function module RT-Ethernet / CANopen (TypeCode = "CFL01.1-TC") can only be used for L45 and L65.

C-0-0041 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Current Function Module Config"

C-0-0050, System time

Function

This parameter includes the hexadecimal-coded control system time.

The system time is a 64 bit value. The first list element contains the lower 32 bits and the second element contains the upper 32 bits. This number is the amount of 100 nanosecond intervals passed since 1st of January 1601.

The value "0x1C984660 0x01BF5458" represents the date "1/1/2000, 12:00:00" in UTC (Coordinated Universal Time), for example.



If multiple controls are operated in the link, the slave controls automatically apply the system time of the master.

The times of the slaves cannot be described in this case.

C-0-0050 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFFFFFF	0x00

Parameter is copied to associated S-/P-parameters:

Describing individual parameters, arranged according to types

IndraDrive/ Drive:	P-0-0197, MPx04
IndraDrive/ Control:	---
HydraulicDrive/ Drive:	P-0-0197, HNC analog MPx04
HydraulicDrive/ Control:	---
SercosDrive:	---

C-0-0051, Operating hour counter

Function This parameter contains the control's operating time in industrial minutes:

e.g. 45 minutes = 0.75 h.

C-0-0051 - Attributes:

Function:	PARAMETER	**Unit:**	h
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFFFFFF	0x00

C-0-0052, Operating hour counter, fan

Function This parameter contains the fan's operating time in industrial minutes:

e.g. 45 minutes = 0.75 h.

C-0-0052 - Attributes:

Function:	PARAMETER	**Unit:**	h
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0060, Switch-on delay time

Function The control's switch-on procedure is delayed by the time set here.

C-0-0060 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	50000	0

C-0-0063, Scaling type for temperature data of the control

Function This parameter is used to set the unit of the control's temperature data in °C (Celsius) or in °F (Fahrenheit).

The display is show values in precisely 0.5 degree increments.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
0	**Temperature data in** 0: degrees Celsius (°C), 1: Fahrenheit (F).
15..1	**Reserved**

C-0-0063 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

C-0-0070, Control temperature

Function

This parameter contains the current temperature, which is measured by a sensor in the control. The values are displayed with the first decimal place.

The unit of "C-0-0070" depends on the scaling set.

See also Parameter Description"C-0-0063, Scaling type for temperature data of the control"-

C-0-0070 - Attributes:

Function:	PARAMETER	**Unit:**	C-0-0063
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0071, Maximum control temperature

Function

This parameter contains the maximum measured temperatur of the control since it was last switched on. The values are displayed with the first decimal place.

Its unit depends on the scaling set (C-0-0063, Scaling type for temperature data of the control).

C-0-0071 - Attributes:

Function:	PARAMETER	**Unit:**	C-0-0063
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0080, User-defined decimal number

Function

A user-defined decimal number can be entered in this parameter.

This parameter does not influence the control's function.

Describing individual parameters, arranged according to types

C-0-0080 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0081, User-defined text

Function

A user-defined text can be entered in this parameter.

This parameter does not influence the control's function.

C-0-0081 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"User defined Text"

C-0-0110, List of all C-parameters

Function

This list includes all C-parameters. The entry is made in ID number format.

The entries are sorted according to meaning and how they related to each other and not according to identity number or alphabetically.

C-parameters are stored in the order of these entries.

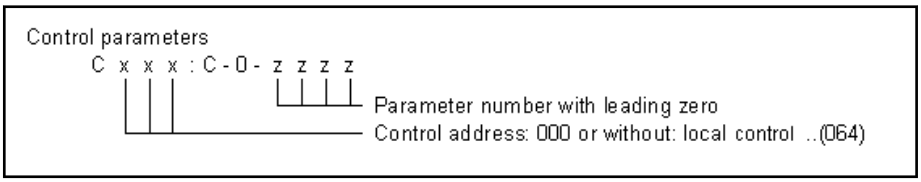


Fig. 4-22: Structure of a C-parameter

Examples:

C000: C-0-0023 - local control; parameter C-0-0023

or

C-0-0023 - local control; parameter C-0-0023.

C-0-0110 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x200000000	0x200000FFF	---

C-0-0111, List of all invalid C-parameters

Function

This list displays all invalid C-parameters in the result

- of a checksum test, e.g. after a firmware update, or

- a plausibility test, e.g. in the result of an illegal operation mode.

The entry is made in ID number format.

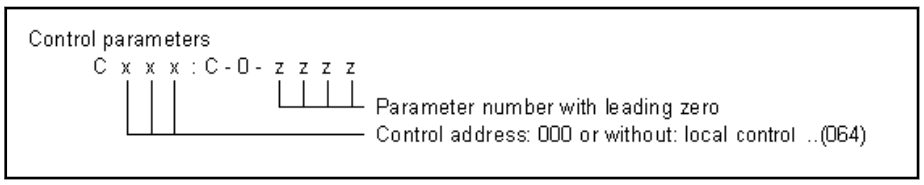


Fig. 4-23: Structure of a C-parameter

Examples:

C000: C-0-0023 - local control; parameter C-0-0023

or

C-0-0023 - local control; parameter C-0-0023.

C-0-0111 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x200000000	0x200000FFF	---

C-0-0112, Checksum of all C-parameters

Function

When reading this parameter, the checksum on all parameter values is formed and its ID numbers are listed in parameter "C-0-0113, IDN list of the C checksum parameter".

C-0-0112 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0113, IDN list of checksum C-parameters

Function

The parameter`s ident numbers, whose checksum is to be generated are entered in this parameter. The checksum generation is triggered when the "C-0-0112, Checksum of all C-parameters" is read out.

The parameter is empty by default.

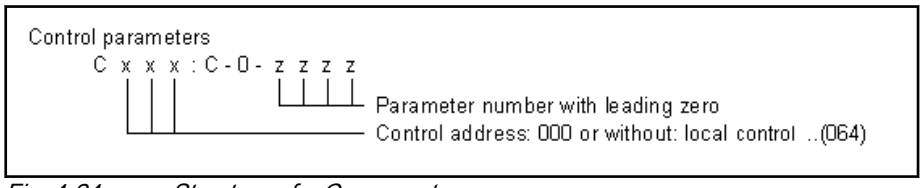


Fig. 4-24: Structure of a C-parameter

Examples:

C000: C-0-0023 - local control; parameter C-0-0023

or

Describing individual parameters, arranged according to types

C-0-0023 - local control; parameter C-0-0023.

C-0-0113 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4095	---

C-0-0114, IDN list of import errors

Function If a parameter cannot be written when the import command (C-0-1011) is executed, it is listed in this parameter.

C-0-0114 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	NVRAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4095	0

C-0-0120, Maximum number of controls

Function This parameter indicates the maximum number of the controls in the cross link.

C-0-0120 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0121, Maximum number of axes

Function This parameter indicates the maximum number of axes.

C-0-0121 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0122, Maximum number of axes of a producer

Function This parameter indicates the maximum number of the axes, which can set a producer in the cross link.

C-0-0122 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0123, Maximum number of kinematics

Robot-Control V1: +, Robot-Control V2: +

Function This parameter indicates the maximum number of kinematics.

C-0-0123 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0124, Maximum number of touch probes

Function This parameter indicates the maximum number of touch probes.

C-0-0124 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0125, Maximum number of programmable limit switches

Function This parameter indicates the maximum number of programmable limit switches.

C-0-0125 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0126, Maximum number of oscilloscope channels

Function This parameter indicates the maximum number of oscilloscope channels.

C-0-0126 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY

Describing individual parameters, arranged according to types

Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0140, Minimum logic axis number

Function This parameter indicates the smallest logical axis number.

C-0-0140 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0141, Maximum logic axis number

Function This parameter indicates the largest logical axis number.

C-0-0141 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0200, Engineering, IP address

Function This parameter is used to specify the control's IP address for the Ethernet interface.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0200 **- Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"192.168.001.001"

C-0-0201, Engineering, subnet mask

Function This parameter is used to specify the control's subnet mask for the Ethernet interface.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

Describing individual parameters, arranged according to types

C-0-0201 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
	Memory:	RAM	**Editability:**	P0, P2, BB
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"255.255.255.0"

C-0-0202, Engineering, standard gateway

Function This parameter is used to specify the control's standard gateway IP address for the Ethernet interface.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0202 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
	Memory:	RAM	**Editability:**	P0, P2, BB
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"192.168.001.001"

C-0-0203, Engineering, user name

Function The name of the current user can be entered in this parameter.

This parameter does not influence the control's function.

C-0-0203 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
	Memory:	NVRAM	**Editability:**	P0, P2, BB
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0205, Engineering, MAC address

Function This parameter indicates the control's MAC address for the Ethernet interface. For the format, see below:

· 00:00:00:00:00:00.

C-0-0205 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
	Memory:	RAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

Describing individual parameters, arranged according to types

C-0-0206, TCP, time to live

Function This parameter is used to specify the TCP TimeToLive time.

This is a header field in the Internet protocol (IP) that specifies which delay time a packet is allowed before it is rejected or discarded.

C-0-0206 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1024	32

C-0-0207, UDP, ports

Function This parameter contains the list of UDP port numbers, which deal with cyclic communication.

C-0-0207 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

C-0-0208, TCP, port for acyclic channels

Function This parameter specifies the TCP port numbers for acyclic communication.

A client connects to this parameter to establish communication.

C-0-0208 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	5003

C-0-0209, Sender timeout

Function This parameter specifies the waiting time for sending an Ethernet message to an equivalent control.

C-0-0209 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	3000

Describing individual parameters, arranged according to types

C-0-0210, TCP, max. number of connection

Function This parameter specifies the maximum number of connections, which are allowed for the TCP port numbers.

C-0-0210 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	32	15

C-0-0211, Reserved

Function This parameter is only intended for internal use.

C-0-0211 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0212, Drive server, configuration

Function This parameter organizes the drive server configuration for the offline Windows instance.

The client, which is controlled by the WIN-MLC through configuration information, can add, modify and deleted a drive server instance.

The data format below is used:

"**N,P,I**", with:

N - drive number 1..99.

P - TCP/IP port address.

I - IP address in the dot format.

Use A current drive server configuration is represented in the form of a common character chain.

For two drive servers, it could be called as follows:

"**1,5004,127.0.0.1,2,5005,127.0.0.1**"

C-0-0212 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

Describing individual parameters, arranged according to types

C-0-0216, Engineering, IP address, actual configuration

Function The Ethernet interface's current IP address is displayed in this parameter. If the interface is not assigned an IP address, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0216 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0217, Engineering, subnet mask, actual configuration

Function The Ethernet interface's current subnet mask is displayed in this parameter. If the interface is not assigned a subnet mask, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0217 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"255.255.255.0"

C-0-0218, List of existing network interfaces

Function This parameter includes the names of the existing network interfaces. The interfaces are separated by commas.

Designation of the interfaces:

Interface name	Description
fei,0	Engineering interface
sIII,0	sercos III master communication
sIII,1	sercos III C2C
netX,4	netX interface
mirror,0	Bridge

This is a read-only parameter. Only interfaces existing in the current configuration are displayed.

C-0-0218 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0219, Status of network configuration

Function

This 32-bit parameter displays in which subnet of the IP network changes were made bit by bit.

Only changes that are still invalid are displayed.

The command C-0-1023 resets the parameters, since all changes are valid.

Bit	Description of the interfaces for which changes were made.
0	sercos III master communication
1	sercos III C2C
2	netX
3	Bridge
4..30	reserved
31	Other network interfaces

Tab. 4-77: Status of the interfaces

Example:

Changes were made for the sercos III control communication and the sercos III C2C interface

"0000 0000 0000 0000 0000 0000 0000 0011"

C-0-0219 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0220, sercos master, IP address, command configuration

Function

This parameter is used to specify the IP address of the sercos III master communication interface.

The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0220 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

Describing individual parameters, arranged according to types

C-0-0221, sercos master, subnet mask, command configuration

Function This parameter is used to specify the subnet mask of the sercos III master communication interface.

The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0221 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"255.255.255.0"

C-0-0222, sercos master, IP address, actual configuration

Function The current IP address of the sercos III master communication interface is displayed in this parameter.

If the interface is not assigned an IP address, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0222 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0223, sercos master, subnet mask, actual configuration

Function The current subnet mask of the sercos III master communication interface is displayed in this parameter.

If the interface is not assigned a subnet mask, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0223 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0224, sercos master, MAC address

Function This parameter indicates the MAC address of the sercos III master communication interface. For the format, see below:

· 00:00:00:00:00:00.

C-0-0224 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0225, C2C, IP address, command configuration

Function This parameter is used to specify the IP address of the sercos III control link interface.

The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0225 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0226, C2C, subnet mask, command configuration

Function This parameter is used to specify the subnet mask of the sercos III control link interface.

The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0226 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"255.255.0.0"

C-0-0227, C2C, IP address, actual configuration

Function The current IP address of the sercos III control link interface is displayed in this parameter.

If the interface is not assigned an IP address, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0227 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0228, C2C, subnet mask, actual configuration

Function The current subnet mask of the sercos III control link interface is displayed in this parameter.

If the interface is not assigned a subnet mask, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0228 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0229, C2C, MAC address

Function This parameter indicates the MAC address of the sercos III control link interface. For the format, see below:

· 00:00:00:00:00:00.

C-0-0229 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	---

C-0-0230, Bridge, IP address, command configuration

Function This parameter is used to specify the IP address of the Bridge interface. The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0230 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"0.0.0.0"

Describing individual parameters, arranged according to types

C-0-0231, Bridge, subnet mask, command configuration

Function This parameter is used to specify the subnet mask of the bridge interface. The setting becomes effective after the C-0-1023 command.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0231 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"255.255.0.0"

C-0-0232, Bridge, command configuration of assigned interfaces

Function This parameter contains the names of the interfaces that are part of the bridge. The interfaces are separated by commas.

Designation of the interfaces:

Interface name	Description
sIII,0	sercos III master communication
sIII,1	sercos III C2C
netX,4	netX interface

Interfaces that are not available in the current hardware configuration are ignored. The setting becomes effective after the C-0-1023 command.

Example:

Bridging the sercos III control communication and sercos III C2C interface

To merge the two interfaces into one bridge, the parameter must contain the following value:

sIII,0,sIII,1,

C-0-0232 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"sIII,0,sIII,1"

C-0-0233, Bridge, actual configuration of assigned interfaces

Function This parameter contains the names of the interfaces that are actually part of the bridge. The interfaces are separated by commas.

Designation of the interfaces:

Interface name	Description
sIII,0	sercos III master communication

Describing individual parameters, arranged according to types

sIII,1	sercos III C2C
netX,4	netX interface

This is a read-only parameter. Only interfaces that are really contained in the bridge are displayed.

Example:

Bridging the sercos III control communication and sercos III C2C interface

If the parameters display the following value

sIII,0,sIII,1,

the sercos III control communication and sercos III C2C are really bridged.

C-0-0233 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0234, Automatic IP address generation, actual configuration

Function

This 32-bit parameter displays the current setting of the automatic IP address generation bit by bit.

Current setting of the automatic IP address generation

Bit	Description of the interfaces for which the automated IP assignment is switched on
0	sercos III control communication and IP address assignment for IP-capable sercos III devices in the ring of the control communication (sIII0; if available; otherwise, it has no effect)
1	sercos III C2C (sIII1 ; if available; otherwise, it has no effect)
2	netX (if available; otherwise, it has no effect)
3	Bridge (if available; otherwise, it has no effect)
4..30	Reserved
31	Other network interfaces (if available; otherwise, it has no effect; except for engineering interface)

In this case, the term "optional" stands for all network interfaces outside of the engineering interface

Example:

Automated IP assignment for bridging, which is switched on the sercos III control communication and sercos III C2C interface

If the automated IP assignment is switched on for the specified interfaces, the parameter contains the following binary value:

"0000 0000 0000 0000 0000 0000 0000 1011"

C-0-0234 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0235, Automatic IP address generation, command configuration

Function

This 32-bit parameter controls the automatic IP address generation bit by bit for all optional network interfaces on the control and the bridge and controls the IP address assignment of the IP-capable sercos III devices in the ring of the control communication

Switching on the automatic IP address generation bit by bit

Bit	Description of the interfaces for which the automated IP assignment can be switched on
0	sercos III control communication and IP address assignment for IP-capable sercos III devices in the ring of the control communication (sIII0; if available; otherwise, it has no effect)
1	sercos III C2C (sIII1; if available; otherwise, it has no effect)
2	netX (if available; otherwise, it has no effect)
3	Bridge (if available; otherwise, it has no effect)
4..30	Reserved
31	Other network interfaces (if available; otherwise, it has no effect; except for engineering interface)

In this case, the term "optional" stands for all network interfaces outside of the engineering interface

Example:

Automated IP assignment for bridging, which is switched on the sercos III control communication and sercos III C2C interface

If the automated IP assignment is switched on for the specified interfaces, the parameter contains the following binary values:

"0000 0000 0000 0000 0000 0000 0000 1011"

C-0-0235 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x8000000F	0x0000000B

C-0-0236, Bridge, IP address, actual configuration

Function

The bridge interface's current IP address is displayed in this parameter.

If the interface is not assigned an IP address, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

Describing individual parameters, arranged according to types

C-0-0236 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0237, Bridge, subnet mask, actual configuration

Function The bridge interface's current subnet mask is displayed in this parameter.

If the interface is not assigned a subnet mask, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0237 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0238, Bridge, MAC address

Function This parameter displays the bridge's MAC address. For the format, see below:

· 00:00:00:00:00:00.

C-0-0238 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	---

C-0-0242, Onboard RT Ethernet, IP address, actual configuration

Function The onboard real-time Ethernet interface's current IP address is displayed in this parameter.

If the interface is not assigned an IP address, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0242 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0243, Onboard RT Ethernet, subnet mask, actual configuration

Function The onboard real-time Ethernet interface's current subnet mask is displayed in this parameter.

If the interface is not assigned a subnet mask, 0.0.0.0 is displayed.

The input format corresponds to the Ethernet specification:

· XXX.XXX.XXX.XXX (.dot format).

C-0-0243 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	RAM	Editability:	READ_ONLY
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0244, Onboard RT Ethernet, MAC address, actual configuration

Function This parameter displays the onboard real-time interface's MAC address. For the format, see below:

· 00:00:00:00:00:00.

C-0-0244 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	RAM	Editability:	READ_ONLY
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0250, Engineering, DHCP configuration

Function This parameter is reserved for future applications.

C-0-0250 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	BINARY, 4BYTE	PLC data type:	DWORD
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	+
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0x00000003	0x00000001

C-0-0251, Engineering, DNS server IP

Function This parameter is reserved for future applications.

C-0-0251 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0252, Engineering, DHCP initial address

Function This parameter is reserved for future applications.

C-0-0252 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"192.168.1.2"

C-0-0253, Engineering, DHCP end address

Function This parameter is reserved for future applications.

C-0-0253 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"192.168.1.254"

C-0-0254, Engineering, DHCP lease time

Function This parameter is reserved for future applications.

C-0-0254 - Attributes:

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	60	4294967295	3600

C-0-0260, sercos master, DHCP configuration

Function This parameter is reserved for future applications.

C-0-0260 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0x00000003	0x00000002

Describing individual parameters, arranged according to types

C-0-0261, sercos master, DNS server IP

Function This parameter is reserved for future applications.

C-0-0261 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0262, sercos master, DHCP initial address

Function This parameter is reserved for future applications.

C-0-0262 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0263, sercos master, DHCP end address

Function This parameter is reserved for future applications.

C-0-0263 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0264, sercos master, DHCP lease time

Function This parameter is reserved for future applications.

C-0-0264 - Attributes:

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	60	4294967295	3600

C-0-0270, Bridge, DHCP configuration

Function This parameter is reserved for future applications.

C-0-0270 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD

Describing individual parameters, arranged according to types

Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00000000	0x00000003	0x00000002

C-0-0271, Bridge, DNS server IP

Function This parameter is reserved for future applications.

C-0-0271 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"0.0.0.0"

C-0-0272, Bridge, DHCP initial address

Function This parameter is reserved for future applications.

C-0-0272 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	---

C-0-0273, Bridge, DHCP end address

Function This parameter is reserved for future applications.

C-0-0273 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	---

C-0-0274, Bridge, DHCP lease time

Function This parameter is reserved for future applications.

C-0-0274 - **Attributes:**

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	60	4294967295	3600

C-0-0280, Onboard RT Ethernet, DHCP configuration

Function This parameter is reserved for future applications.

C-0-0280 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	BINARY, 4BYTE	PLC data type:	DWORD
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	+
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0x00000003	0x00000002

C-0-0281, Onboard RT Ethernet, DNS server IP

Function This parameter is reserved for future applications.

C-0-0281 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0282, Onboard RT Ethernet, DHCP initial address

Function This parameter is reserved for future applications.

C-0-0282 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0283, Onboard RT Ethernet, DHCP end address

Function This parameter is reserved for future applications.

C-0-0283 - Attributes:

Function:	PARAMETER	Unit:	--
MLC data type:	TEXT, 1BYTE_VAR	PLC data type:	STRING
Memory:	NVRAM	Editability:	P0, P2
Direct access:	--	MinMax check:	-
Var. data type:	-	Var. min/max value:	-
Oscilloscope:	-	Probe:	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0284, Onboard RT Ethernet, DHCP lease time

Function This parameter is reserved for future applications.

Describing individual parameters, arranged according to types

C-0-0284 - Attributes:

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	60	4294967295	3600

C-0-0290, C2C, DHCP configuration

Function This parameter is reserved for future applications.

C-0-0290 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0x00000003	0x00000002

C-0-0291, C2C, DNS server IP

Function This parameter is reserved for future applications.

C-0-0291 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"0.0.0.0"

C-0-0292, C2C, DHCP initial address

Function This parameter is reserved for future applications.

C-0-0292 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0293, C2C, DHCP end address

Function This parameter is reserved for future applications.

C-0-0293 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	---

C-0-0294, C2C, DHCP lease time

Function This parameter is reserved for future applications.

C-0-0294 - Attributes:

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	60	4294967295	3600

C-0-0300, PLS No.1, control word

Function Control word for the first programmable limit switch module on the control's module bus.

Structure

Bit	Designation/function
1..0	**Output control** 0 0: deactivated. 0 1: activated: an error of error class 'FO' is generated when an output is overloaded. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
3..2	**Voltage control** 0 0: deactivated. 0 1: activated: In case of undercurrent on the function module, an error of error class 'FO' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
4	**Function module** 0: deactivated, 1: activated.
5	**Command function C-0-0316** 0: Initialize switch track. 1: Initialize and activate switch track.

Tab. 4-78: Relevant bits in the control word

Use When changing from a lower to a higher phase, the control word is checked against parameter "C-0-0025, Function module bus, configuration". If there is no programmable limit switch module 'CFL01.1-N1' on the module bus and if bit 4 is set in the control word, the error "F0160024, Error in cross-check C-parameters" is generated.

C-0-0300 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	(P2+Stop)

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x05

C-0-0301, PLS No.1, status word

Function

Status word for the first programmable limit switch module on the control's module bus.

Structure

Bit	Designation/function
0	Passive switch track group initialized
1	Active switch track group initialized

Tab. 4-79: Relevant bits in the status word

Use

Bit 0:

The passive switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch can be activated (see parameter "C-0-0316, PLS No. 1, command: Initialize switch track").

Bit 1:

The active switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch is active (see parameter "C-0-0316, PLS No.1, command: Activate switch track").



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0301 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0302, PLS No.1, signal selection

Function

This parameter is used to diagnose the first programmable limit switch.

This parameter can be used to read out the bytes "Source_0.y" (low byte, y: bit 0...7) and "Source_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the first programmable limit switch module.

Structure

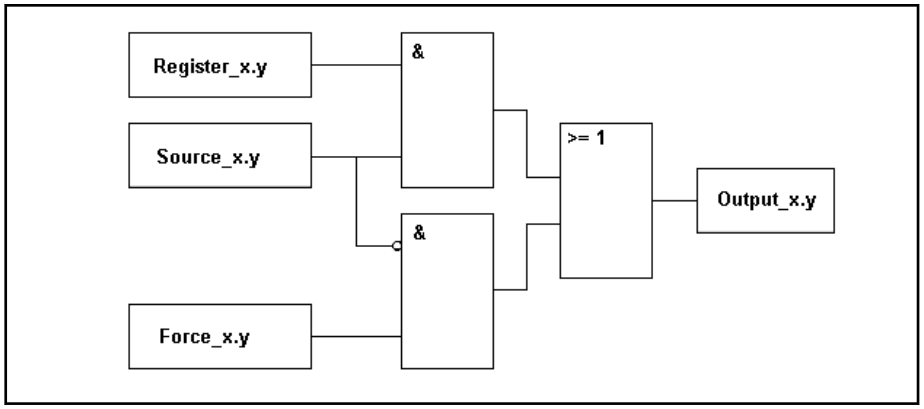


Fig. 4-25: Output control logic

Use

The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Source_0.y" and "Source_1.y" are cleared.

These bytes can be used to define the signal source for each of the programmable limit switch's outputs.

C-0-0302 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0303, PLS No.1, control signal

Function

This parameter is used to diagnose the first programmable limit switch.

This parameter can be used to read out the bytes "Force_0.y" (low byte, y: bit 0...7) and "Force_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the first programmable limit switch module.

Structure

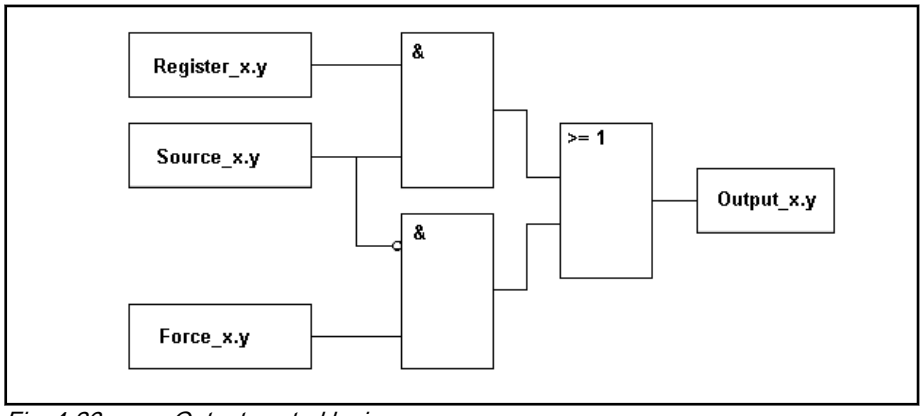


Fig. 4-26: Output control logic

Use

The bytes "Force_0.y" and "Force_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Force_0.y" and "Force_1.y" are cleared.

Describing individual parameters, arranged according to types

These bytes can be used to override all the programmable limit switch's outputs, depending on the content of the bytes "Source_0.y" and "Source_1.y" - the defined signal source.

C-0-0303 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0304, PLS No.1, outputs

Function

This parameter is used to diagnose the first programmable limit switch. This parameter can be used to read out the bytes "Output_0.y" (low byte, y: bit 0...7) and "Output_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the first programmable limit switch module.

Structure

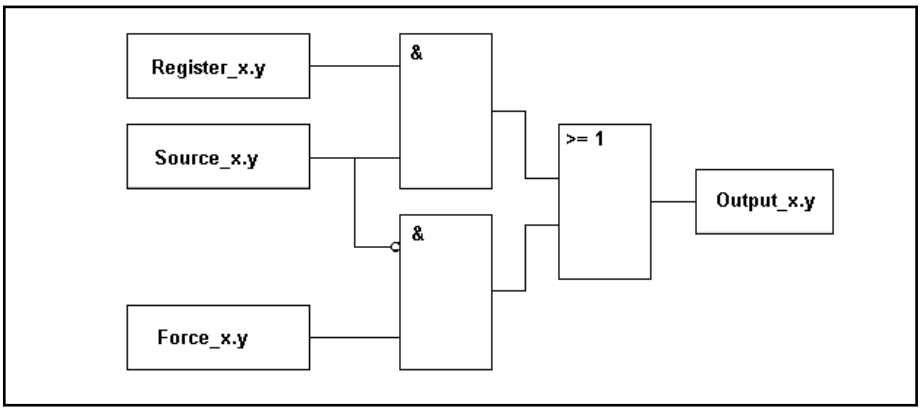


Fig. 4-27: Output control logic

Use

The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The control cyclically updates the bytes in operating mode.

In operation mode, the function module's output signals can be processed in the PLC.

C-0-0304 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0305, PLS No.1, internal registers

Function

This parameter is used to diagnose the first programmable limit switch.

This parameter can be used to read out the bytes "Register_0.y" (low byte, y: bit 0...7) and "Register_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the first programmable limit switch module.

Structure

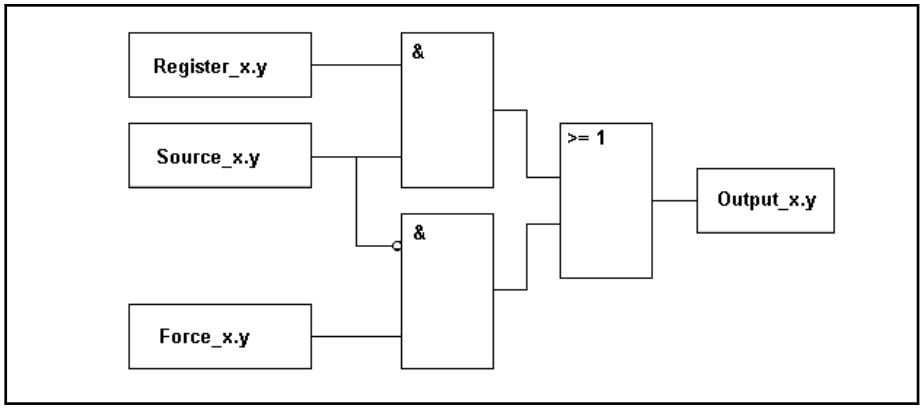


Fig. 4-28: Output control logic

Use

The bytes "Register_0.y" and "Register_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The bytes display the programmable limit switch's internal state and are cyclically updated by the control in operating mode. In operating mode, the programmable limit switch's output signals can be processed in the PLC.

C-0-0305 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0307, PLS No.1, reference axis configuration

Function

Of the axes configured and activated in the control, up to eight of them can be selected for the programmable limit switch in this parameter.

Describing individual parameters, arranged according to types

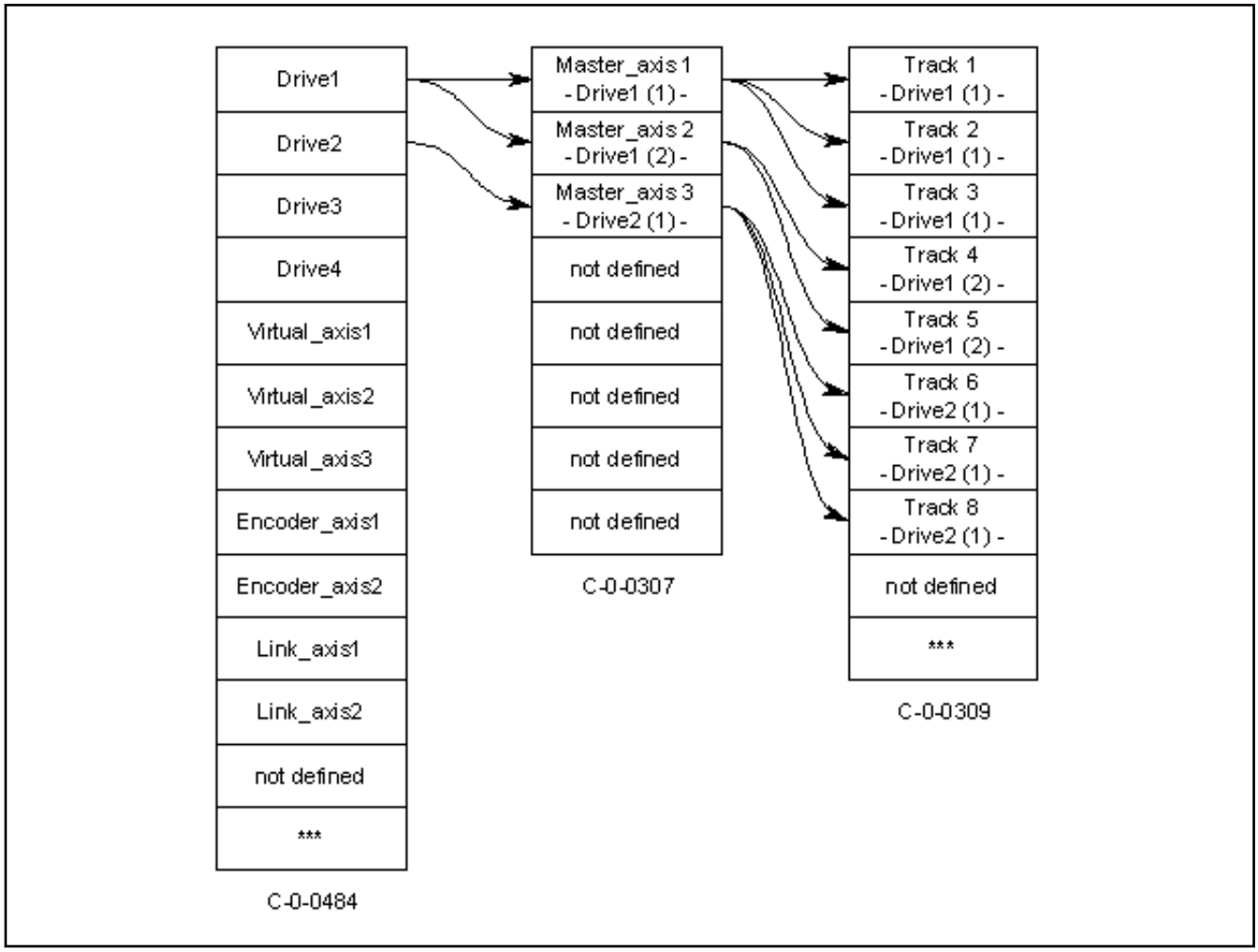


Fig. 4-29: Configuration and definition of reference axes

Structure The position and velocity of the selected axes are cyclically transmitted to the programmable limit switch in operation mode.

The reference axes are configured in parameterization mode. A single axis can be configured as a reference axis more than once. This allows switch tracks with a different position offset to be operated by the same axis.

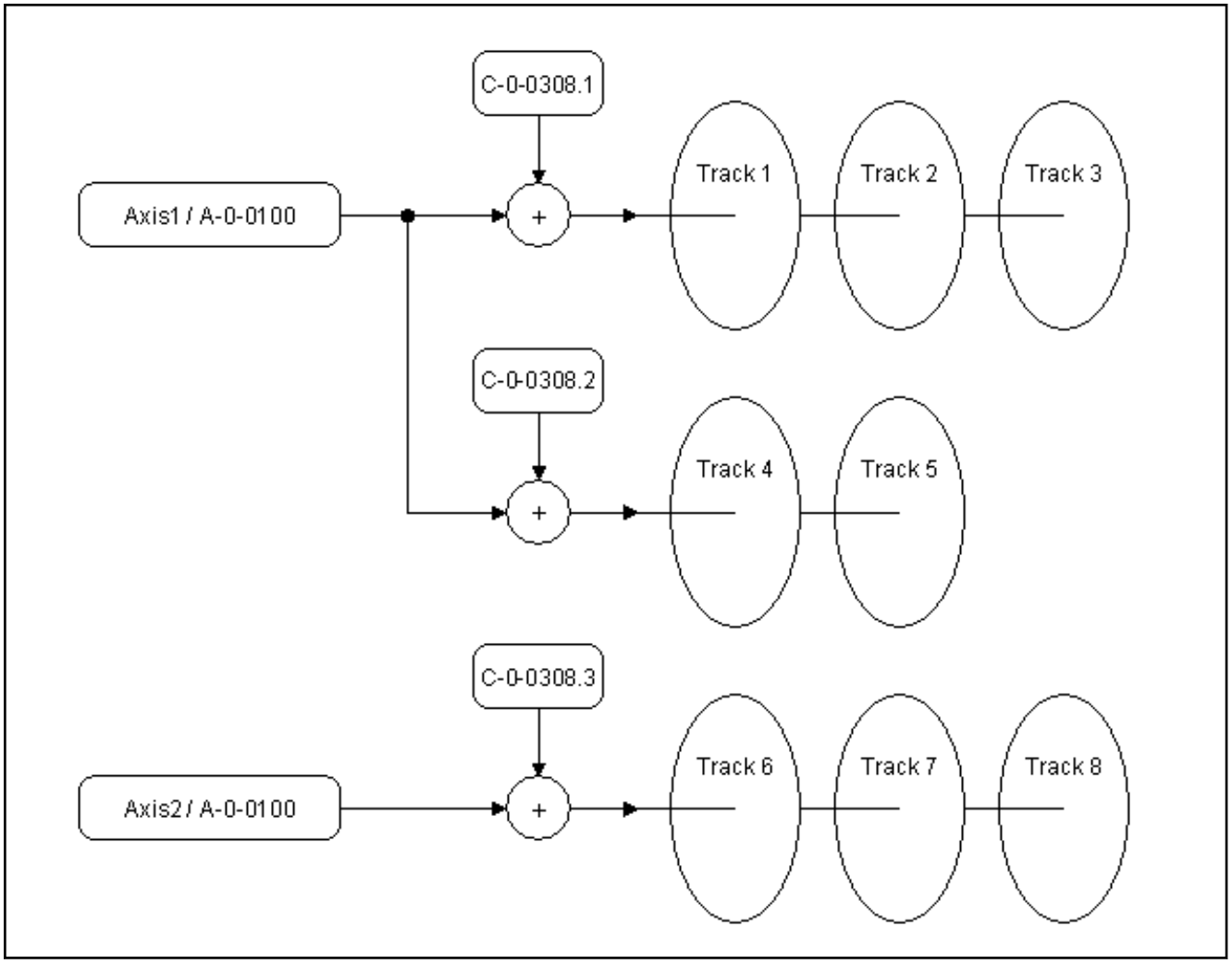


Fig. 4-30: Position offset

Use

When switching from a lower to a higher phase, the reference axis configuration is checked against parameter "C-0-0484, Axes configuration list" and parameter "A-0-0024, Axis condition" of the respective axis.

The error "F0160024, Error in cross-check C-parameters" is generated if one of the selected axes is deactivated or not configured.

C-0-0307 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0

C-0-0308, PLS No.1, reference axis position, additive

Function

This parameter is used to move the position of the connected switch track relative to the position of the reference axis. The position offset is entered in the input unit of the reference axis.

Describing individual parameters, arranged according to types

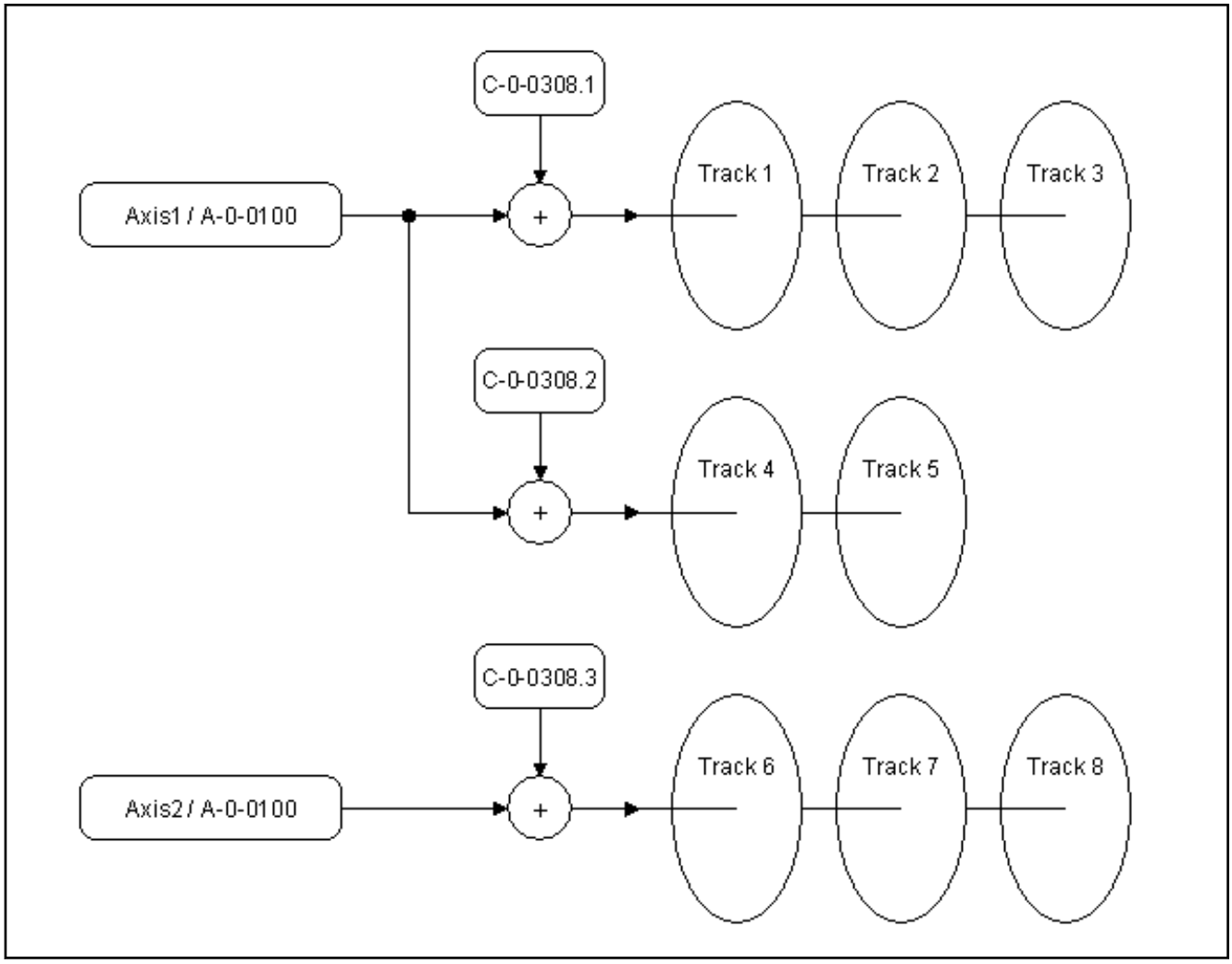


Fig. 4-31: Position offset

Use The position offset is cyclically transmitted to the programmable limit switch module and added to the switch track position after the hysteresis is calculated. As a result, a change to the position offset is active in its unmodified form.

$$X_{PIS} = \frac{(X_{MA} + \langle C\text{-}0\text{-}0308 \rangle) \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

PLS Programmable limit switch
MA Master axis (reference axis)

Fig. 4-32: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

C-0-0308 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0309, PLS No.1, reference axis definition

Function This parameter is used to define the reference axis for each switch track. All reference axes configured in parameter "C-0-0307, PLS No.1, reference axis configuration" are available for selection. In addition to the position and velocity of the selected reference axis, the position offset, parameter "C-0-0308, PLS No.1, reference axis position, additive", is assigned to the respective switch track

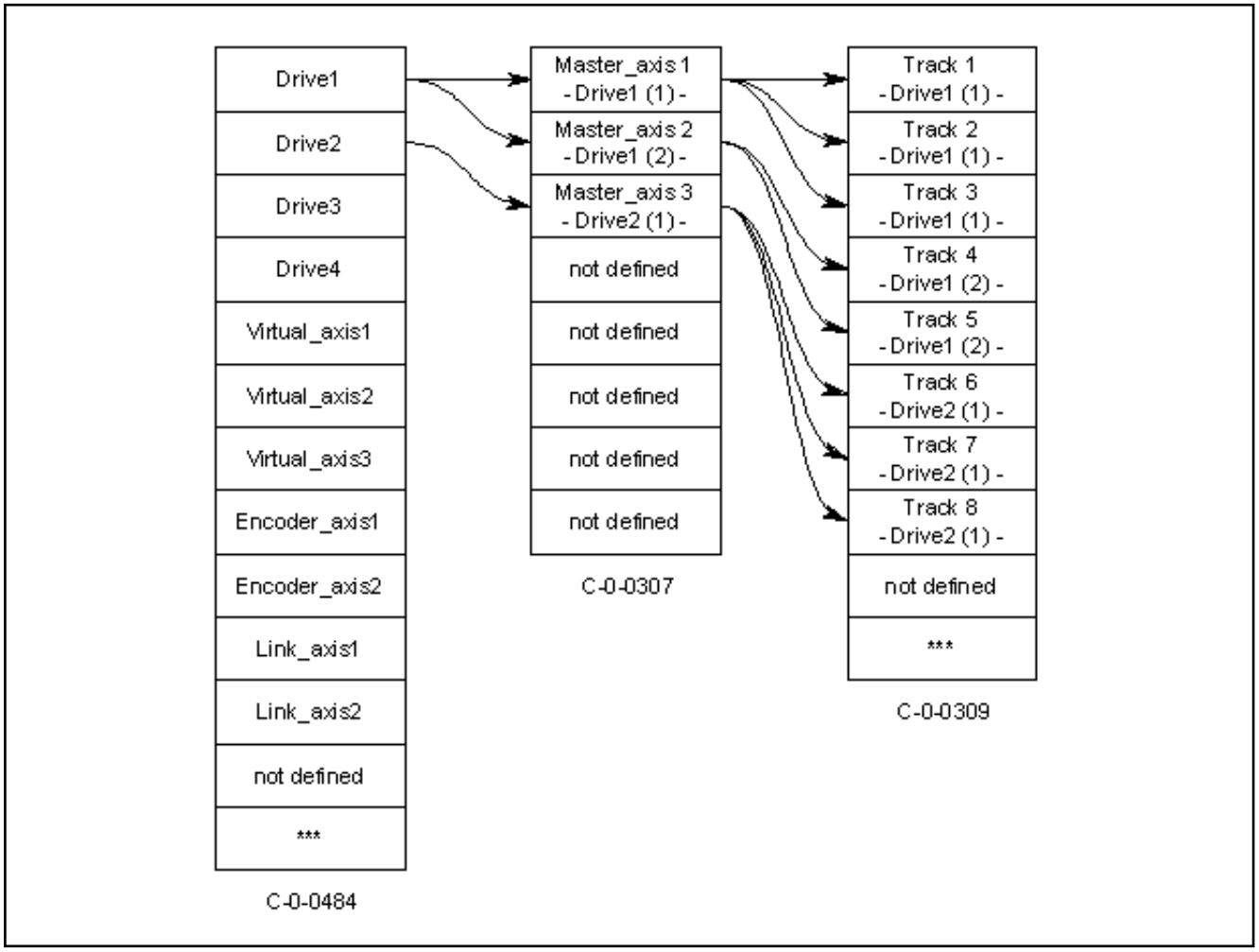


Fig. 4-33: Configuration and definition of reference axes

Use When switching from a lower to a higher phase, the reference axis definition is checked against parameter "C-0-0307, PLS No.1, reference axis configuration".

The error "F0160024, Error in cross-check C-parameter" is generated if one of the selected reference axes is deactivated or not configured.

C-0-0309 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2

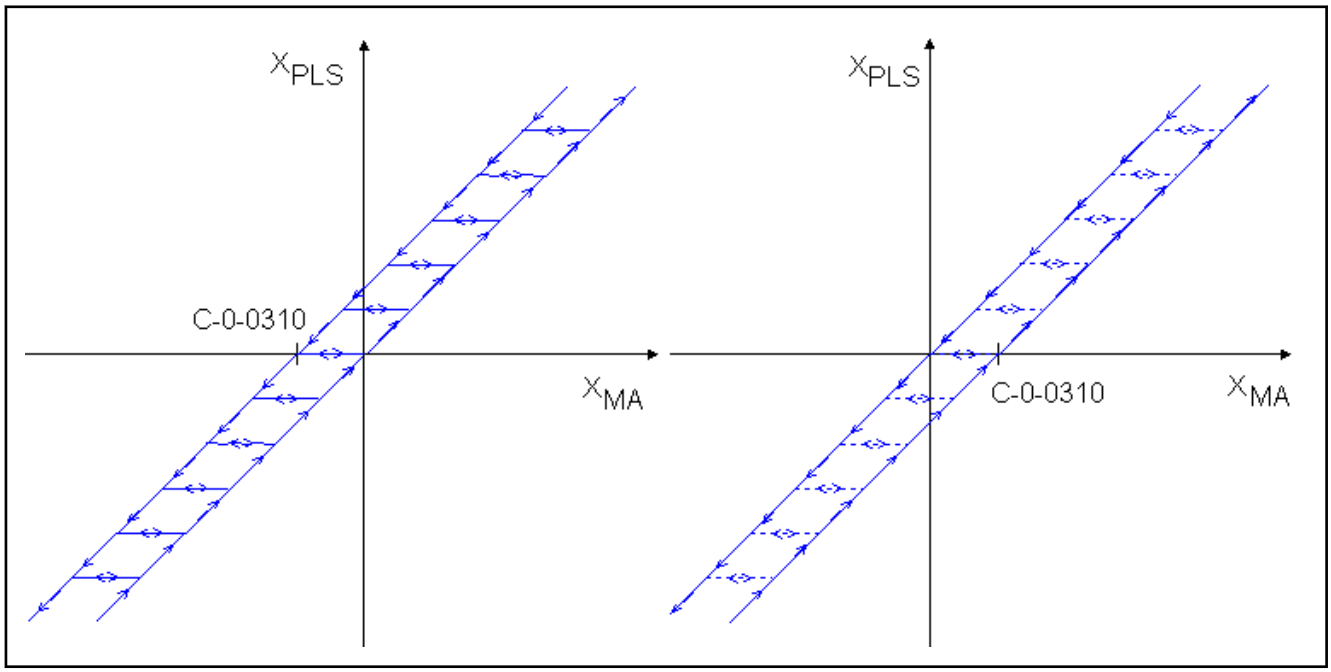
Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

C-0-0310, PLS No.1, hysteresis

Function This list of parameters is used to define a position hysteresis for each switch track. The hysteresis functions direction-dependently, see figure.



X_{MA} Reference axis position
X_{PLS} Switch track position
Fig. 4-34: Negative and positive hysteresis

Use The position hysteresis is entered in the input unit of the reference axis.

The hysteresis serves to compensate position fluctuations. The fluctuations can cause the output on the programmable limit switch to jitter.

If a real axis comes to a standstill, the position controller moves. The velocity of this movement multiplied by the dead time to be compensated equals the standstill fluctuation.

If there is a delay with an axis, extrapolation errors occur. Half of the delay multiplied by the dead time to be compensated squared equals the extrapolation error.

$$H_{PLS} = \frac{H_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

MA Master axis (reference axis)
PLS Switch track
Fig. 4-35:

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

Describing individual parameters, arranged according to types

C-0-0310 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0311, PLS No.1, lead time when switching on

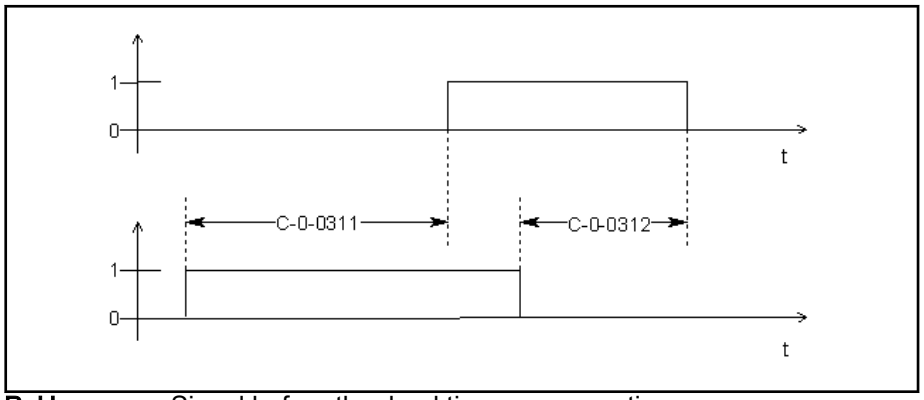
Function

A) For state-controlled outputs

This parameter is used to define the dead time compensation for state-controlled outputs (see "C-0-0318, PLS No.1, output mode") when switching on an output on the programmable limit switch.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-36: Dead time compensation (state-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * <\text{C-0-0311}>)) \bmod 2^{16}$$

Fig. 4-37: Extrapolation function for switching on an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

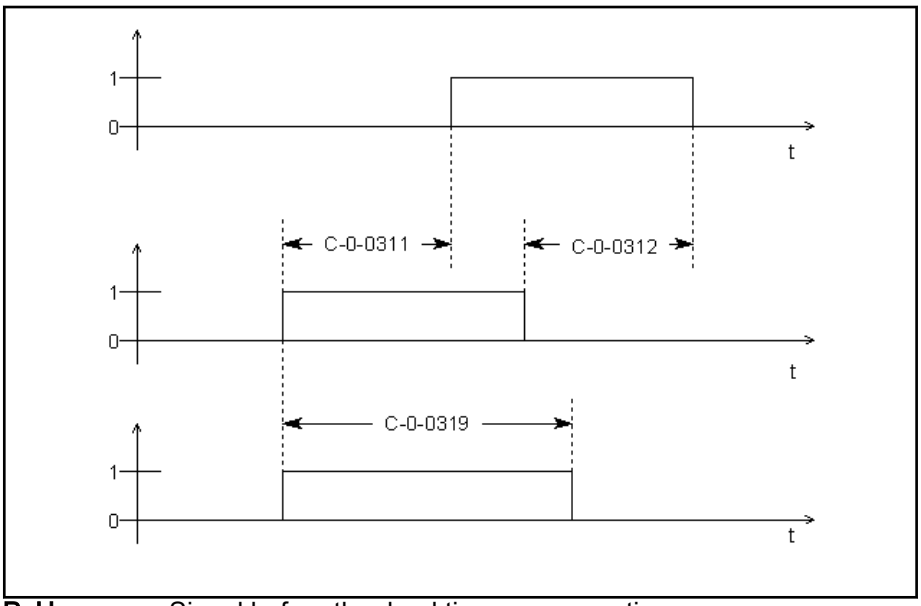
☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

B) For time-controlled outputs

This parameter is used to define the dead time compensation for time-controlled outputs (see "C-0-0318, PLS No.1, output mode") when switching on and off outputs.

Describing individual parameters, arranged according to types

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
Center Extrapolated trigger signal
PgDn Time-controlled output signal

Fig. 4-38: Dead time compensation (time-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity.

Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \text{<C-0-0311>})) \bmod 2^{16}$$

Fig. 4-39: Extrapolation function for switching on an output

The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0311 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000000	0

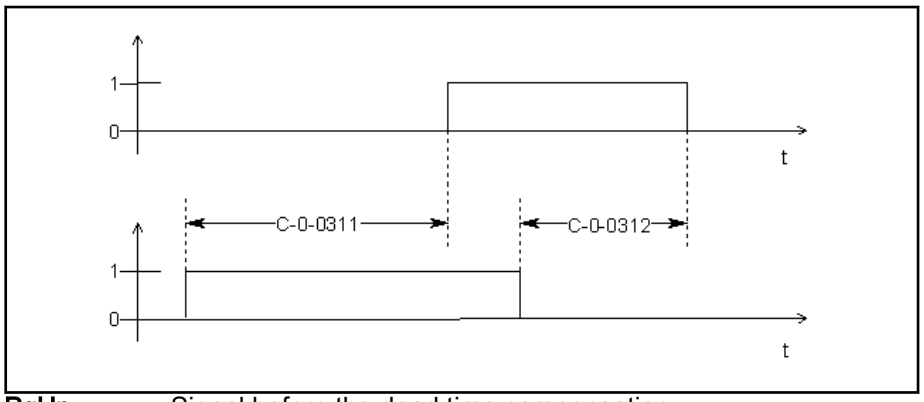
C-0-0312, PLS No.1, lead time when switching off

Function

This parameter is used to control the dead time compensation when switching off an output on the programmable limit switch.

The parameter only functions if the output is operated in a time-controlled manner (see "C-0-0318, PLS No.1, output mode").

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-40: Dead time compensation (state-controlled)

Use

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PIS} = (X_{PIS} + (V_{PIS} * \text{<C-0-0312>})) \bmod 2^{16}$$

Fig. 4-41: Extrapolation function for switching off an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

☞ The parameter "C-0-0311, PLS No.1, lead time when switching on" (see "C-0-0318, PLS No.1, output mode") is only effective if an output functions in a state-controlled manner.

C-0-0312 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1000000	0

C-0-0313, PLS No.1, switch track number

Function

This parameter is used to activate up to 64 switches and assign the 16 switch tracks.

Structure

The list has 64 possible spots (switches) that are assigned with "0" after initialization (no switch track is assigned).

If only one swítch is activated and assigned one of the 16 switch tracks, the number of the switch track is available in place of "0".

Describing individual parameters, arranged according to types

C-0-0313 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

C-0-0314, PLS No.1, switch-on position of switch track

Function

This parameter and parameter "C-0-0315, PLS No.1, switch-off position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-42: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

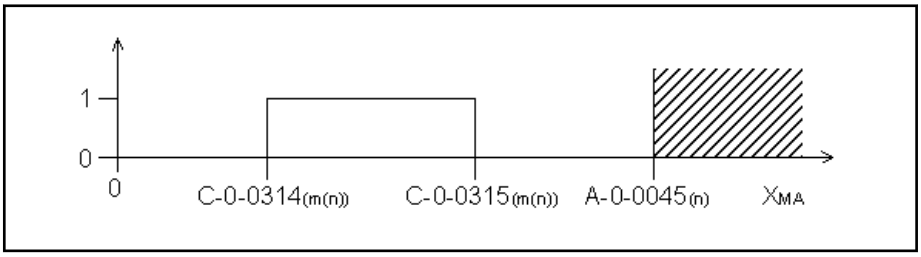


Fig. 4-43: Switch-on position less than switch-off position

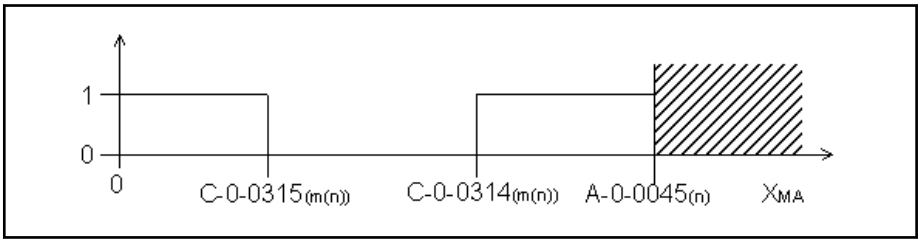


Fig. 4-44: Switch-on position larger than switch-off position

The parameter "C-0-0313, PLS No.1, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

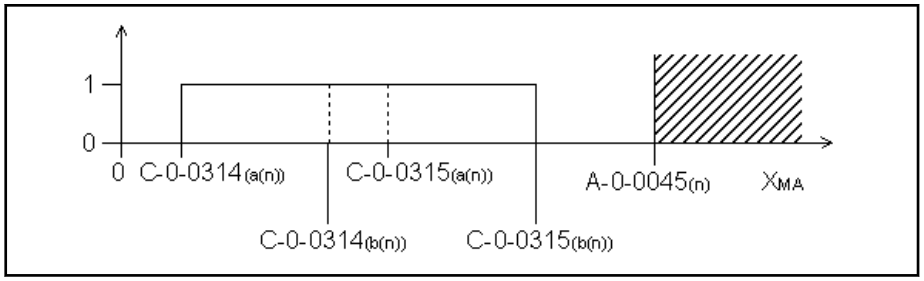


Fig. 4-45: Overlapping switches

C-0-0314 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0315, PLS No.1, switch-off position of switch track

Function

This parameter and parameter "C-0-0314, PLS No.1, switch-on position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-46: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

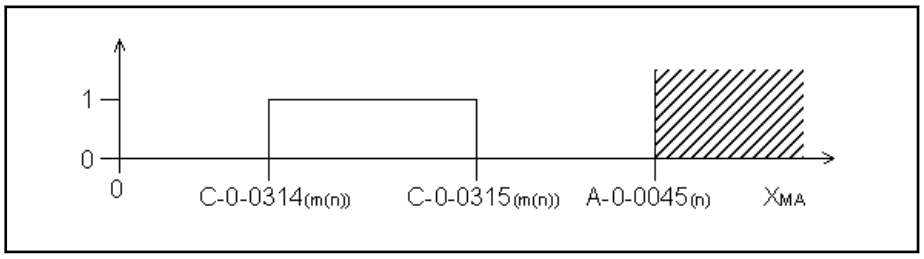


Fig. 4-47: Switch-on position less than switch-off position

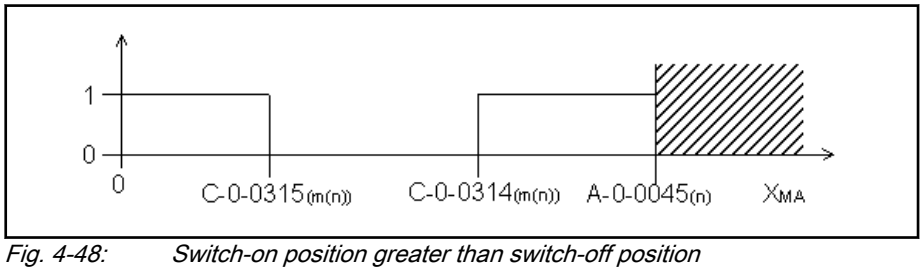


Fig. 4-48: Switch-on position greater than switch-off position

The parameter "C-0-0313, PLS No.1, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

Describing individual parameters, arranged according to types

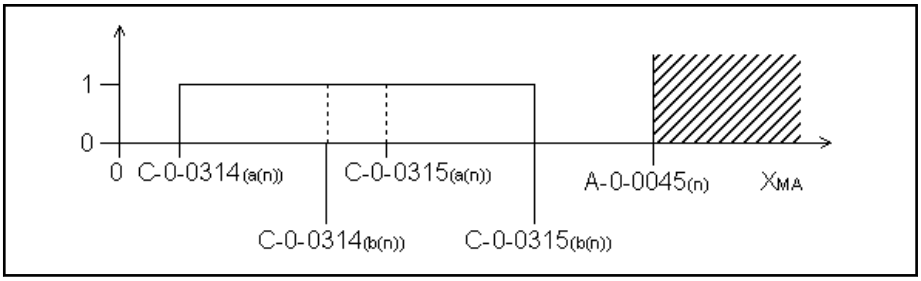


Fig. 4-49: Overlapping switches

C-0-0315 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0316, PLS No.1, command: Initialize switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. Using the command "Initialize switch track", the passive group is reinitialized according to the parameters:

- C-0-0311, PLS No.1, lead time when switching on
- C-0-0312, PLS No.1, lead time when switching off
- C-0-0313, PLS No.1, switch track number
- C-0-0314, PLS No.1, switch-on position of switch track
- C-0-0315, PLS No.1, switch-off position of switch track
- C-0-0318, PLS No.1, output mode
- C-0-0319, PLS No.1, switch-on duration

.

Use

The initialized switch track group is immediately activated, depending on the setting in the control word "C-0-0300, bit 5= 1".

The switch track group can be switched at all times using the command "C-0-0317, PLS No.1, command: Activate switch track".



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0316 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

Describing individual parameters, arranged according to types

C-0-0317, PLS No.1, command: Activate switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode.

The passive group is activated using the command "Activate switch track". The active group is simultaneously deactivated.

The passive switch track group can be subsequently reinitialized using the command "C-0-0316, PLS No.1, commando: Initialize switch track".



When the operation mode is switched on, the first switch track group is activated.

C-0-0317 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0318, PLS No.1, output mode

Function

When switching from a lower to a higher phase, this parameter is checked against parameter "C-0-0309, PLS No.1, reference axis definition".

If no reference axis was defined for the switch track and the output is activated (direction of motion ≠ zero), the error "F0160024, Error in cross-check C-parameters" is generated.

Structure

Bit	Designation/function
1..0	**Direction of movement** 0 0: deactivated: The internal output is deactivated. 0 1: activated depending on direction: The switch track's sampling signal is used for movement in the positive direction. 1 0: activated depending on direction: The switch track's sampling signal is used for movement in the negative direction. 1 1: activated independent of the direction The switch track's sampling signal is used irrespective of the motion direction.
2	**Control mode** 0: state-controlled: The switch track's sampling signal controls the register bit of the programmable limit switch. 1: time-controlled: The switch track's sampling signal controls the pulse generator's clock input. The pulse generator controls the register bit of the programmable limit switch.

Tab. 4-80: Relevant bits in the parameter

Use

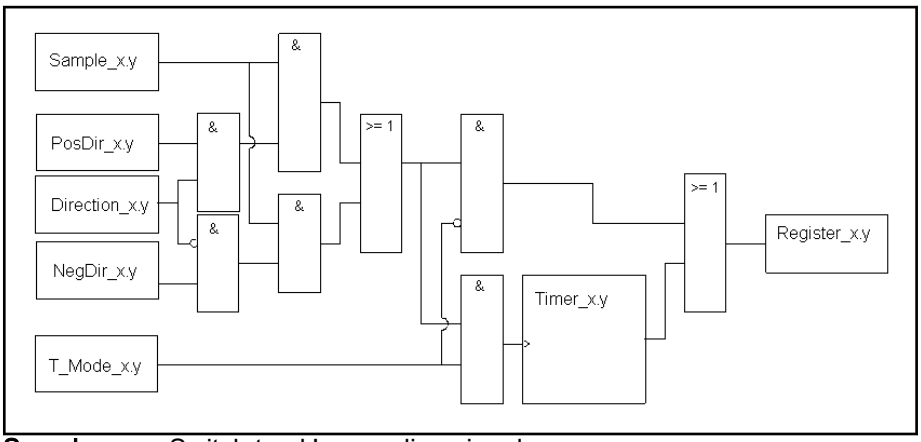
This parameter is used to control the internal register of the programmable limit switch (register_0 and register_1), depending on the direction of movement (forward and/or backward) of the reference axis.

A register bit can be operated directly (state-controlled) or by a pulse generator (time-controlled).

Describing individual parameters, arranged according to types

The control mode influences the dead time compensation (see parameter "C-0-0311, PLS No.1, lead time when switching on" and "C-0-0312, PLS No. 1, lead time when switching off").

The pulse duration in time-controlled mode can be defined in parameter "C-0-0319, PLS No.1, switch-on duration".



Sample_x Switch track's sampling signal
PosDir_x Active in positive movement direction
Direction_x Current movement direction
NegDir_x Active in positive movement direction
T_Mode_x Time-controlled mode
Register_x Internal register
Fig. 4-50: Output control

C-0-0318 - Attributes:

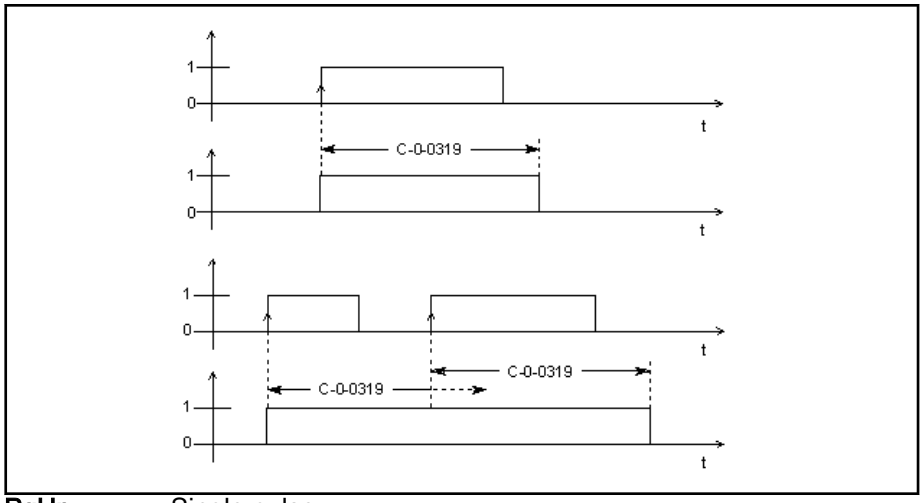
Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0319, PLS No.1, switch-on duration

Function This parameter is used to define the pulse duration in time-controlled mode (see parameter "C-0-0319, PLS No.1, output mode").

The programmable limit switch operates with a cycle time of 125 µs. Within this time period, the programmable limit switch can generate pulses with a maximum duration of one second.



PgUp Single pulse
PgDn Extended pulse
Fig. 4-51: Pulse generator

Use The pulse generator is started by a rising edge at the clock input. The pulse generator is reset and restarted with each additional rising edge. This extends the output pulse for active pulse generators.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0319 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	125	1000000	125

C-0-0325, PLS No.2, control word

Function Control word for the second programmable limit switch module on the control's module bus.

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
1..0	**Output control** 0 0: deactivated. 0 1: activated: When an output is overloaded, an error of error class 'F0' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
3..2	**Voltage control** 0 0: deactivated. 0 1: activated: In case of undercurrent on the function module, an error of error class 'FO' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
4	**Function module** 0: deactivated, 1: activated.
5	**Command function** C-0-0341 0: Initialize switch track. 1: Initialize and activate switch track.

Tab. 4-81: Relevant bits in the control word

Use

When changing from a lower to a higher phase, the control word is checked against parameter "C-0-0025, Function module bus, configuration". If there is no programmable limit switch module 'CFL01.1-N1' on the module bus and if bit 4 is set in the control word, the error "F0160024, Error in cross-check C-parameters" is generated.

C-0-0325 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x05

C-0-0326, PLS No.2, status word

Function

Status word for the second programmable limit switch module on the control's module bus.

Structure

Bit	Designation/function
0	Passive switch track group initialized
1	Active switch track group initialized

Tab. 4-82: Relevant bits in the status word

Use

Bit 0:

The passive switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch can be activated (see parameter "C-0-0341, PLS No. 2, command: Initialize switch track").

Bit 1:

The active switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch is active (see parameter "C-0-0342, PLS No.2, command: Activate switch track").



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0326 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0327, PLS No.2, signal selection

Function

This parameter is used to diagnose the second programmable limit switch.

This parameter can be used to read out the bytes "Source_0.y" (low byte, y: bit 0...7) and "Source_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the second programmable limit switch module.

Structure

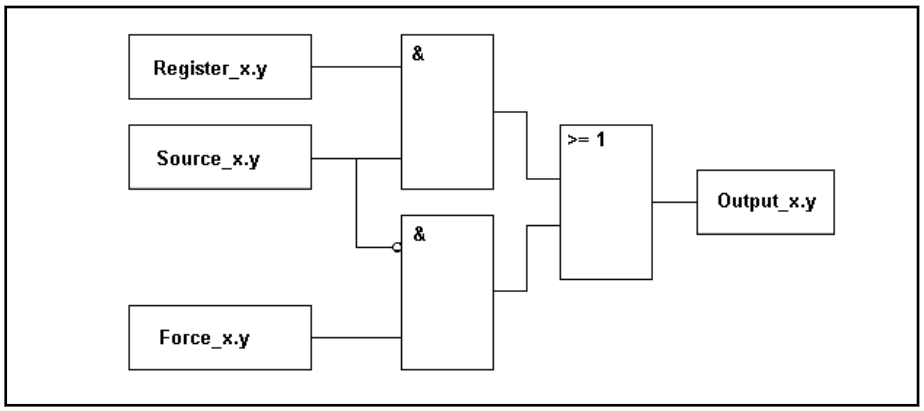


Fig. 4-52: Output control logic

Use

The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Source_0.y" and "Source_1.y" are cleared.

These bytes can be used to define the signal source for each of the programmable limit switch's outputs.

C-0-0327 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0328, PLS No.2, control signal

Function This parameter is used to diagnose the second programmable limit switch.

This parameter can be used to read out the bytes "Force_0.y" (low byte, y: bit 0...7) and "Force_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the second programmable limit switch module.

Structure

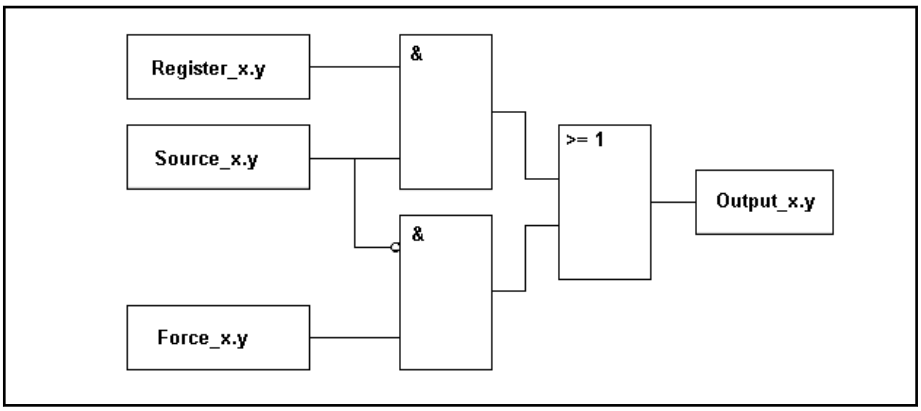


Fig. 4-53: Output control logic

Use The bytes "Force_0.y" and "Force_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Force_0.y" and "Force_1.y" are cleared.

These bytes can be used to override all the programmable limit switch's outputs, depending on the content of the bytes "Source_0.y" and "Source_1.y" - the defined signal source.

C-0-0328 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0329, PLS No.2, outputs

Function This parameter is used to diagnose the second programmable limit switch. This parameter can be used to read out the bytes "Output_0.y" (low byte, y: bit 0...7) and "Output_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the second programmable limit switch module.

Structure

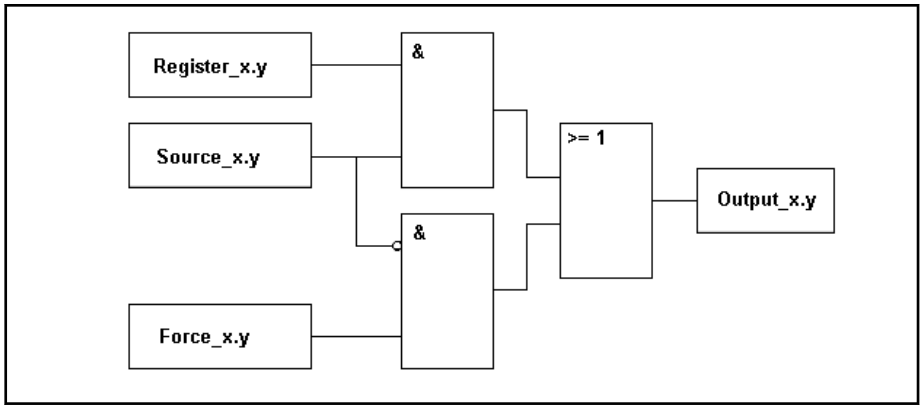


Fig. 4-54: Output control logic

Use The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The control cyclically updates the bytes in operating mode.

In operation mode, the function module's output signals can be processed in the PLC.

C-0-0329 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0330, PLS No.2, internal registers

Function This parameter is used to diagnose the second programmable limit switch.

This parameter can be used to read out the bytes "Register_0.y" (low byte, y: bit 0...7) and "Register_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the second programmable limit switch module.

Structure

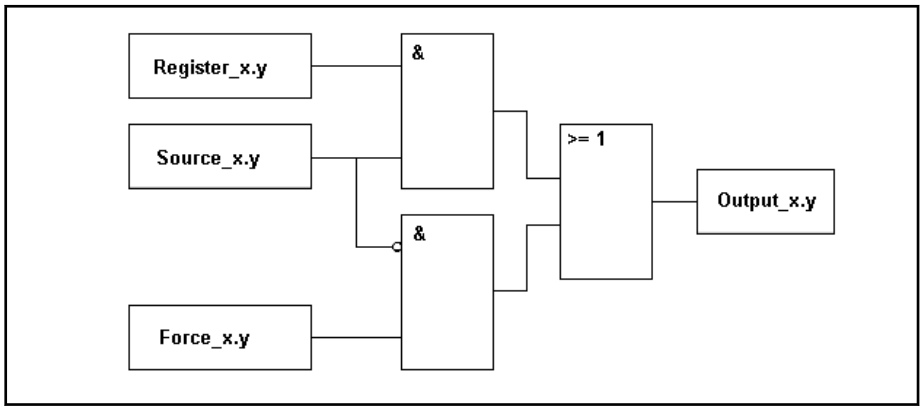


Fig. 4-55: Output control logic

Use The bytes "Register_0.y" and "Register_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The bytes display the programmable limit switch's internal state and are cyclically updated by the control in operating mode. In operating mode, the programmable limit switch's output signals can be processed in the PLC.

Describing individual parameters, arranged according to types

C-0-0330 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
	Memory:	RAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-
		Minimum value	**Maximum value**	**Default value**
	Common:	---	---	---

C-0-0332, PLS No.2, reference axis configuration

Function Of the axes configured and activated in the control, up to eight of them can be selected for the programmable limit switch in this parameter.

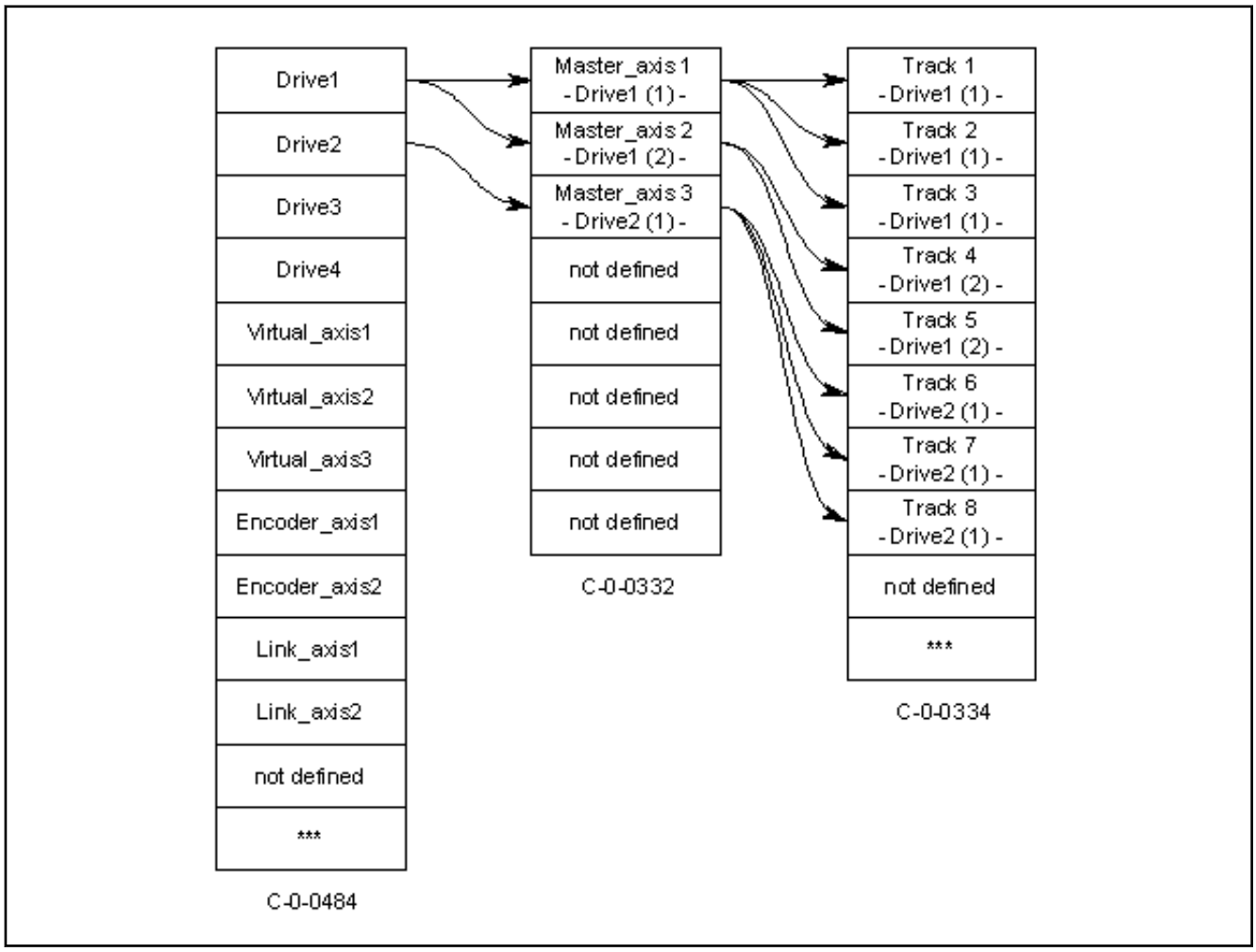


Fig. 4-56: Configuration and definition of reference axes

Structure The position and velocity of the selected axes are cyclically transmitted to the programmable limit switch in operation mode.

The reference axes are configured in parameterization mode. A single axis can be configured as a reference axis more than once. This allows switch tracks with a different position offset to be operated by the same axis.

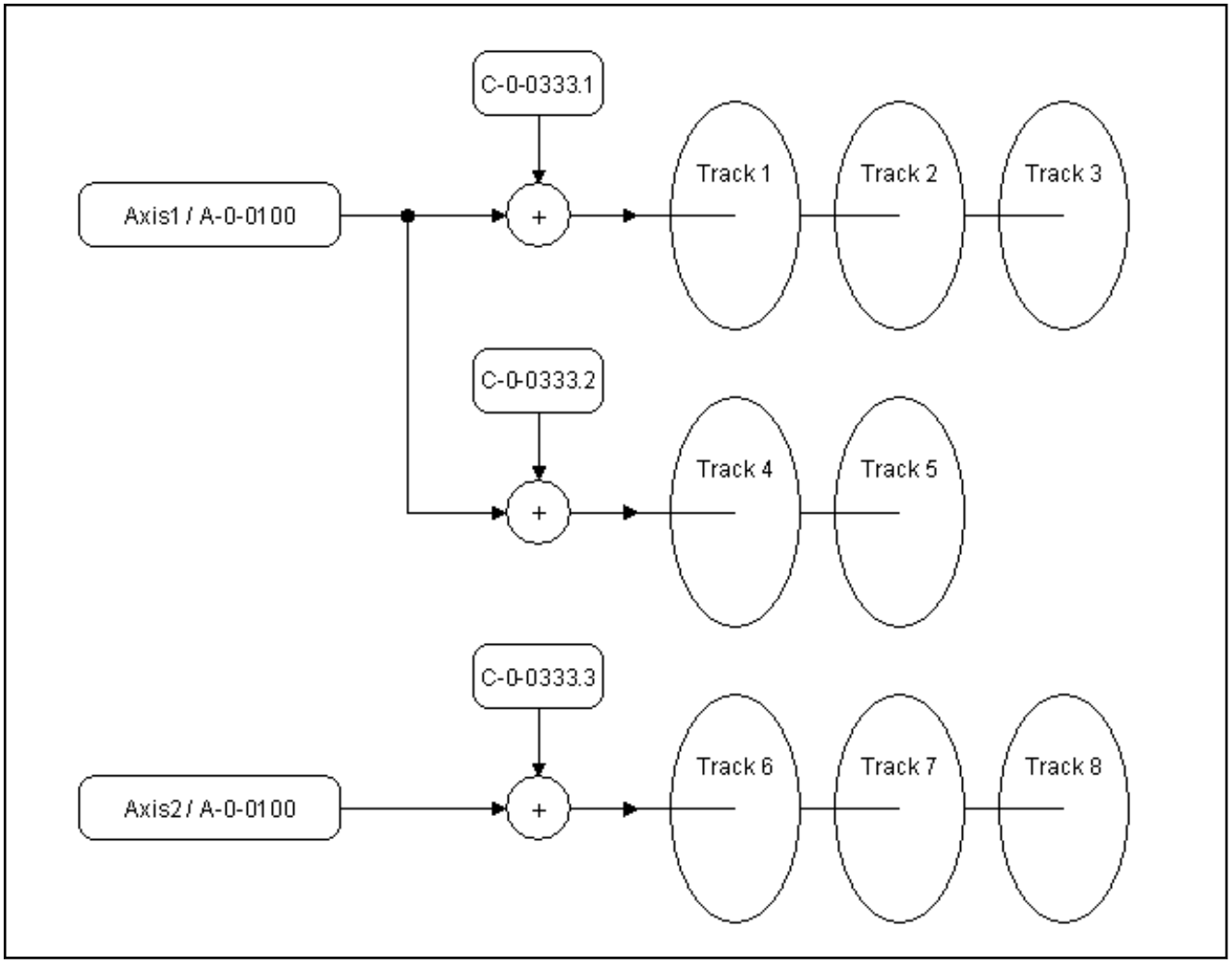


Fig. 4-57: Position offset

Use

When switching from a lower to a higher phase, the reference axis configuration is checked against parameter "C-0-0484, Axes configuration list" and parameter "A-0-0024, Axis condition" of the respective axis.

The error "F0160024, Error in cross-check C-parameters" is generated if one of the selected axes is deactivated or not configured.

C-0-0332 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0

C-0-0333, PLS No.2, reference axis position, additive

Function

This parameter is used to move the position of the connected switch track relative to the position of the reference axis. The position offset is entered in the input unit of the reference axis.

Describing individual parameters, arranged according to types

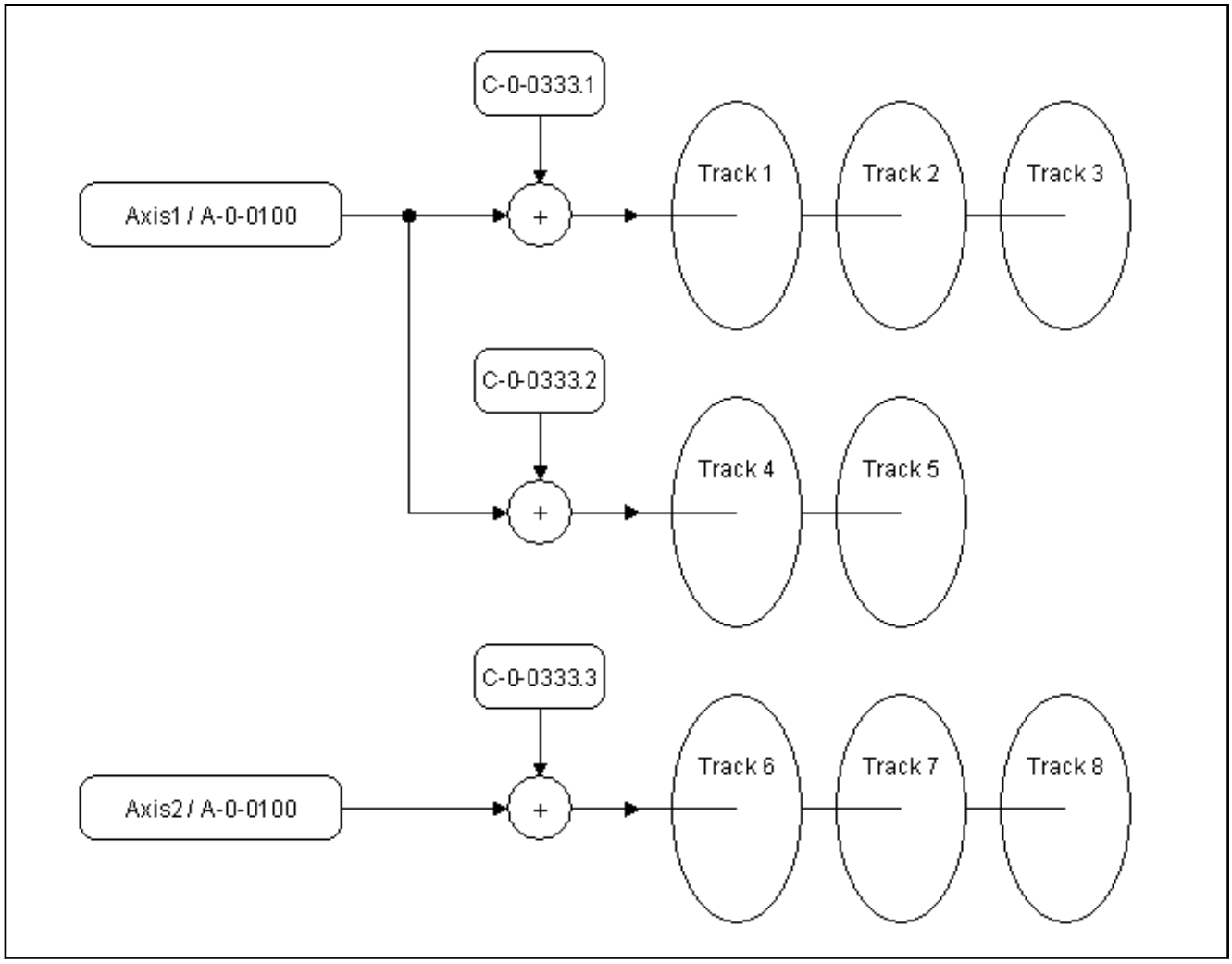


Fig. 4-58: Position offset

Use The position offset is cyclically transmitted to the programmable limit switch module and added to the switch track position after the hysteresis is calculated. As a result, a change to the position offset is active in its unmodified form.

$$X_{PIS} = \frac{(X_{MA} + \langle C\text{-}0\text{-}0333 \rangle) \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

PLS Programmable limit switch
MA Master axis (reference axis)

Fig. 4-59: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

C-0-0333 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0334, PLS No.2, reference axis definition

Function This parameter is used to define the reference axis for each switch track. All reference axes configured in parameter "C-0-0332, PLS No.2, reference axis configuration" are available for selection. In addition to the position and velocity of the selected reference axis, the position offset, parameter "C-0-0334, PLS No.2, reference axis position, additive", is assigned to the respective switch track.

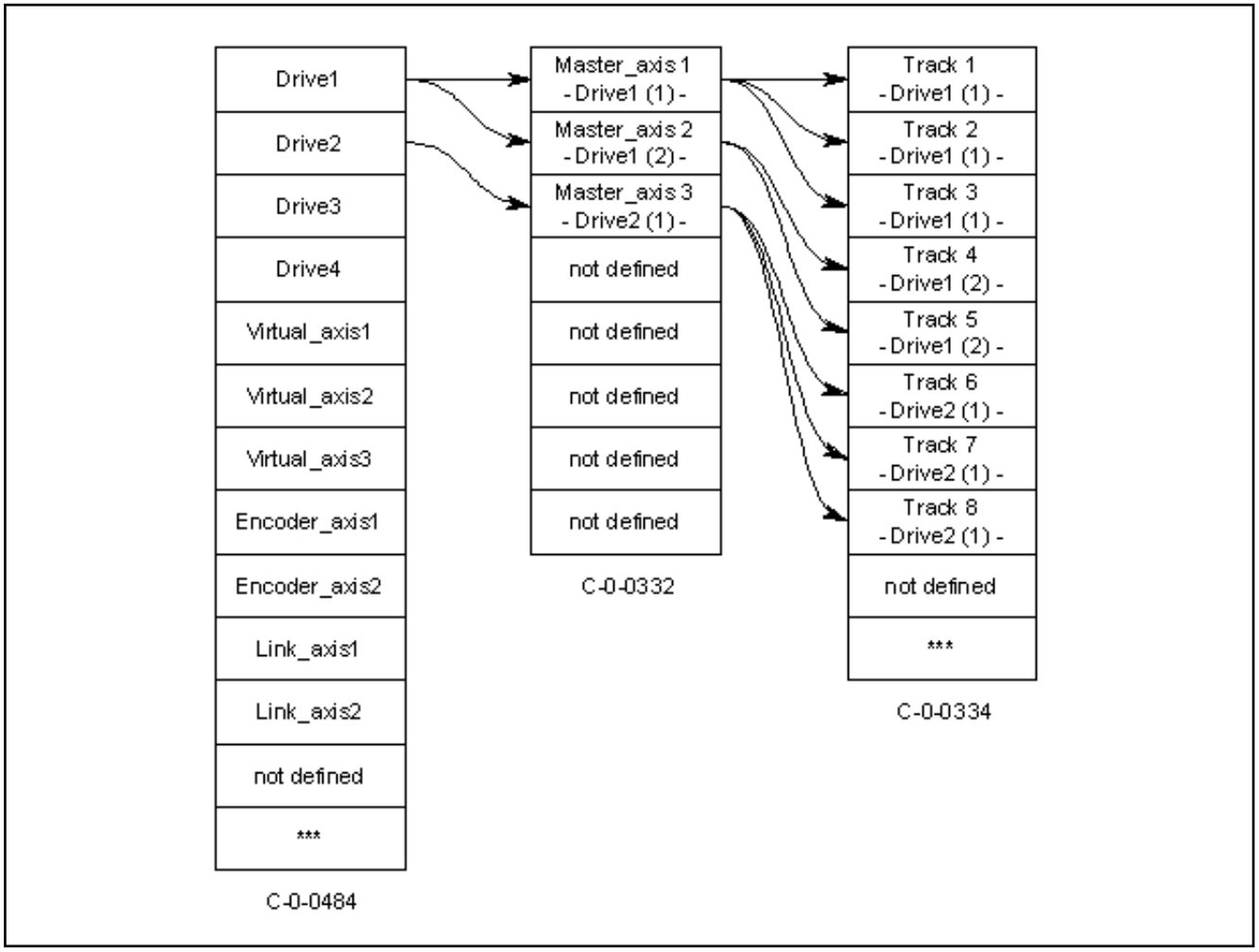


Fig. 4-60: Configuration and definition of reference axes

Use When switching from a lower to a higher phase, the reference axis definition is checked against parameter "C-0-0332, PLS No.2, reference axis configuration".

The error "F0160024, Error in cross-check C-parameter" is generated if one of the selected reference axes is deactivated or not configured.

C-0-0334 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2

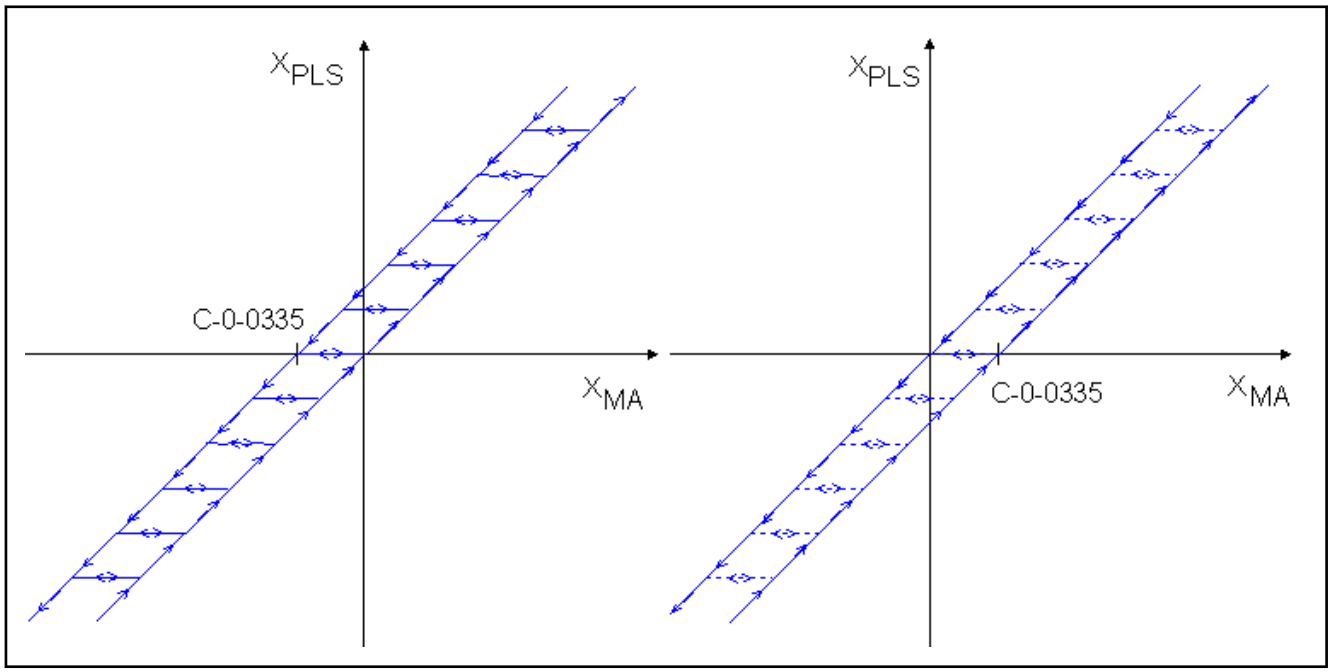
Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

C-0-0335, PLS No.2, hysteresis

Function This list of parameters is used to define a position hysteresis for each switch track. The hysteresis functions direction-dependently, see figure.



X_{MA} Reference axis position
X_{PLS} Switch track position
Fig. 4-61: Negative and positive hysteresis

Use The position hysteresis is entered in the input unit of the reference axis.

The hysteresis serves to compensate position fluctuations. The fluctuations can cause the output on the programmable limit switch to jitter.

If a real axis comes to a standstill, the position controller moves. The velocity of this movement multiplied by the dead time to be compensated equals the standstill fluctuation.

If there is a delay with an axis, extrapolation errors occur. Half of the delay multiplied by the dead time to be compensated squared equals the extrapolation error.

$$H_{PLS} = \frac{H_{MA} \bmod <\text{A-0-0045}>}{<\text{A-0-0045}>} * 2^{16}$$

MA Master axis (reference axis)
PLS Switch track
Fig. 4-62:

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

Describing individual parameters, arranged according to types

C-0-0335 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0336, PLS No.2, lead time when switching on

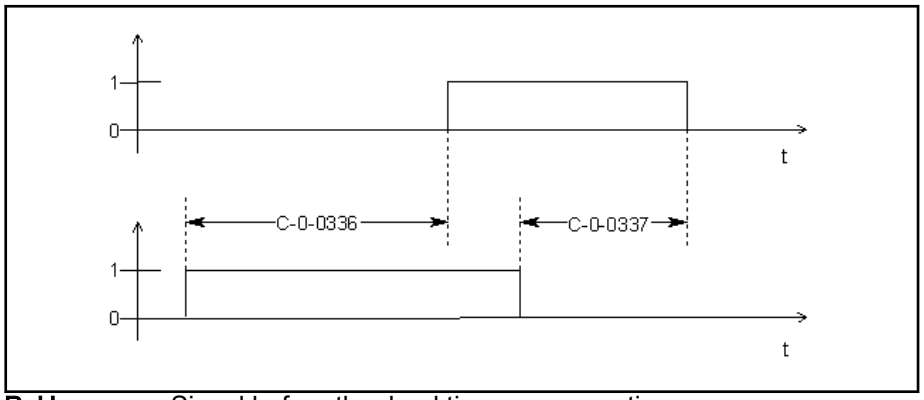
Function

A) For state-controlled outputs

This parameter is used to define the dead time compensation for state-controlled outputs (see "C-0-0343, PLS No.2, output mode") when switching on an output on the programmable limit switch.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-63: Dead time compensation (state-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * <\text{C-0-0336}>)) \bmod 2^{16}$$

Fig. 4-64: Extrapolation function for switching on an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

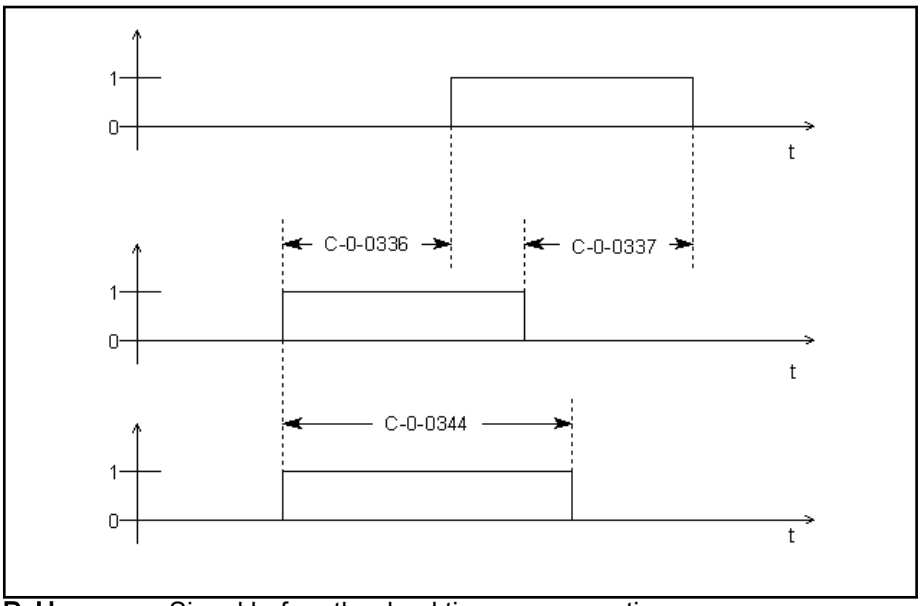
☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

B) For time-controlled outputs

This parameter is used to define the dead time compensation for time-controlled outputs (see "C-0-0343, PLS No.2, output mode") when switching on and off outputs.

Describing individual parameters, arranged according to types

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
Center Extrapolated trigger signal
PgDn Time-controlled output signal

Fig. 4-65: Dead time compensation (time-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \text{<C-0-0336>})) \bmod 2^{16}$$

Fig. 4-66: Extrapolation function for switching on an output

The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0336 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1000000	0

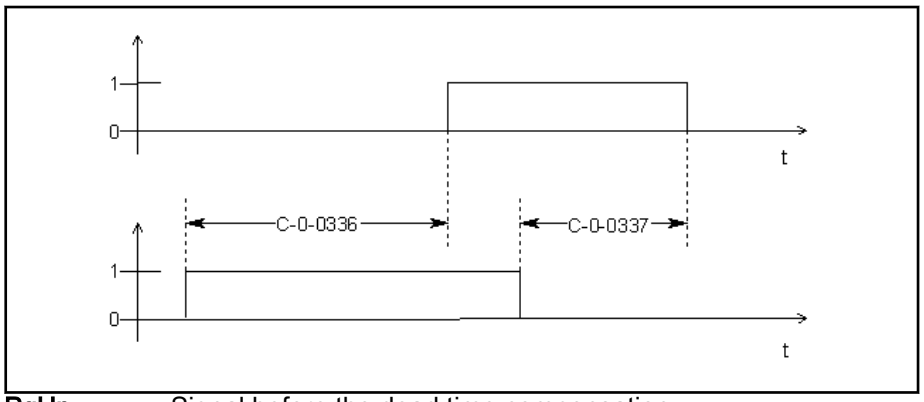
C-0-0337, PLS No.2, lead time when switching off

Function

This parameter is used to control the dead time compensation when switching off an output on the programmable limit switch.

The parameter only functions if the output is operated in a time-controlled manner (see "C-0-0343, PLS No.2, output mode").

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-67: Dead time compensation (state-controlled)

Use

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PIS} = (X_{PIS} + (V_{PIS} * \text{<C-0-0337>})) \bmod 2^{16}$$

Fig. 4-68: Extrapolation function for switching off an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

☞ The parameter "C-0-0336, PLS No.2, lead time when switching on" (see "C-0-0343, PLS No.2, output mode") is only effective if an output functions in a state-controlled manner.

C-0-0337 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1000000	0

C-0-0338, PLS No.2, switch track number

Function

This parameter is used to activate up to 64 switches and assign the 16 switch tracks.

Structure

The list has 64 possible spots (switches) that are assigned with "0" after initialization (no switch track is assigned).

If only one swítch is activated and assigned one of the 16 switch tracks, the number of the switch track is available in place of "0".

Describing individual parameters, arranged according to types

C-0-0338 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

C-0-0339, PLS No.2, switch-on position of switch track

Function

This parameter and parameter "C-0-0340, PLS No.2, switch-off position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-69: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

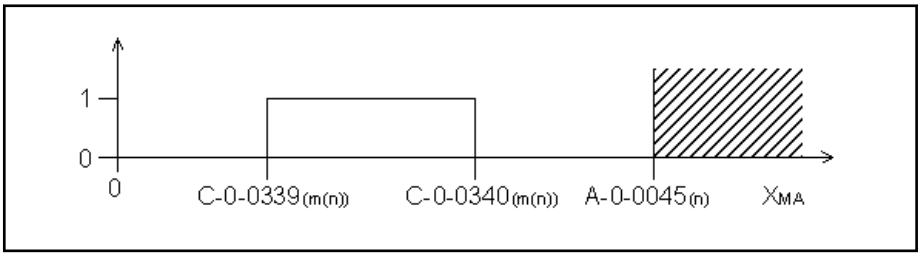


Fig. 4-70: Switch-on position less than switch-off position

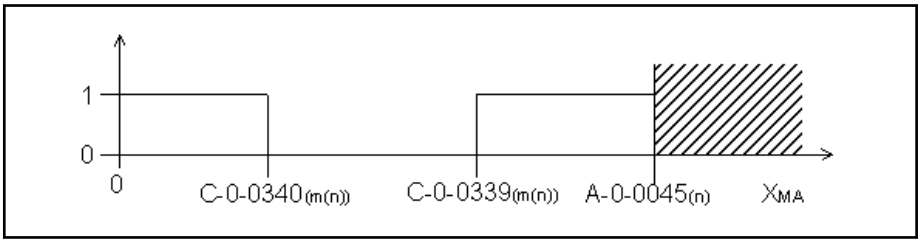


Fig. 4-71: Switch-on position greater than switch-off position

The parameter "C-0-0338, PLS No.1, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

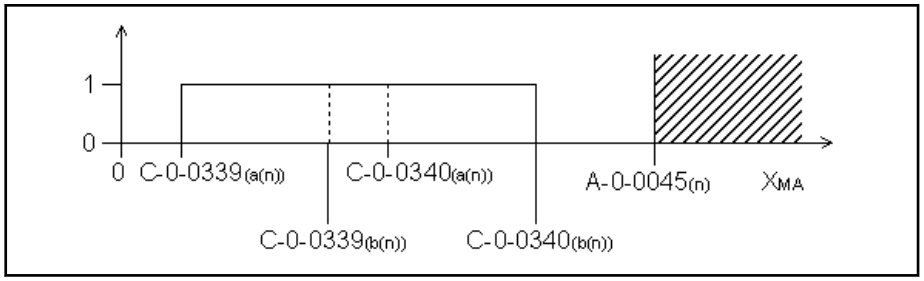


Fig. 4-72: Overlapping switches

C-0-0339 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0340, PLS No.2, switch-off position of switch track

Function

This parameter and parameter "C-0-0339, PLS No.2, switch-on position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-73: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

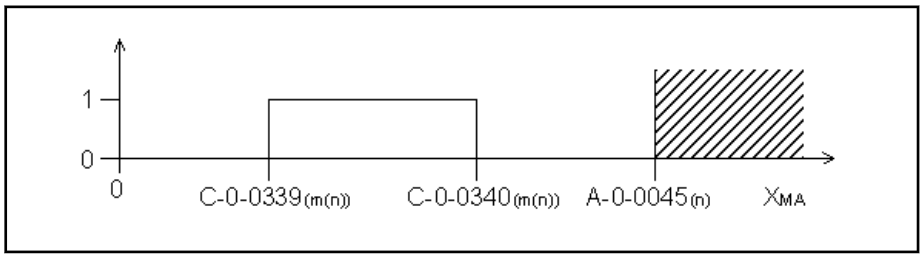


Fig. 4-74: Switch-on position less than switch-off position

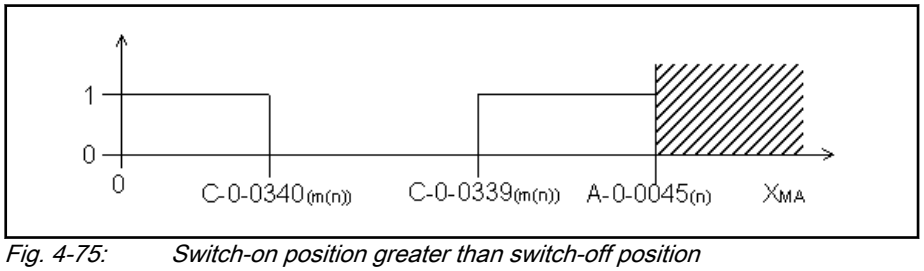


Fig. 4-75: Switch-on position greater than switch-off position

The parameter "C-0-0338, PLS No.2, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

Describing individual parameters, arranged according to types

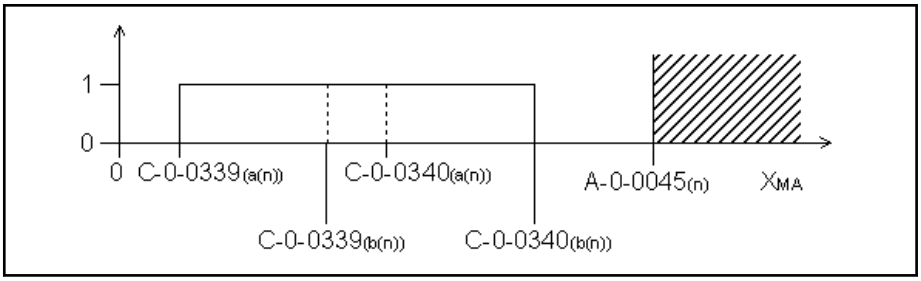


Fig. 4-76: Overlapping switches

C-0-0340 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0341, PLS No.2, command: Initialize switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. Using the command "Initialize switch track", the passive group is reinitialized according to the parameters:

- C-0-0336, PLS No.2, lead time when switching on
- C-0-0337, PLS No.2, lead time when switching off
- C-0-0338, PLS No.2, switch track number
- C-0-0339, PLS No.2, switch-on position of switch track
- C-0-0340, PLS No.2, switch-off position of switch track
- C-0-0343, PLS No.2, output mode
- C-0-0344, PLS No.2, switch-on duration

.

Use

The initialized switch track group is immediately activated, depending on the setting in the control word "C-0-0325, bit 5= 1".

The switch track group can be switched at all times using the command "C-0-0342, PLS No.2, command: Activate switch track".



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0341 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

Describing individual parameters, arranged according to types

C-0-0342, PLS No.2, command: Activate switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. The passive group is activated using the command "Activate switch track". The active group is simultaneously deactivated.

The passive switch track group can be subsequently reinitialized using the command "C-0-0341, PLS No.2, commando: Initialize switch track".



When the operation mode is switched on, the first switch track group is activated.

C-0-0342 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0343, PLS No.2, output mode

Function

When switching from a lower to a higher phase, this parameter is checked against parameter "C-0-0334, PLS No.2, reference axis definition".

If no reference axis was defined for the switch track and the output is activated (direction of motion ≠ zero), the error "F0160024, Error in cross-check C-parameters" is generated.

Structure

Bit	Designation/function
1..0	**Direction of movement** 0 0: deactivated: The internal output is deactivated. 0 1: activated depending on direction: The switch track's sampling signal is used for movement in the positive direction. 1 0: activated depending on direction: The switch track's sampling signal is used for movement in the negative direction. 1 1: activated independent of the direction The switch track's sampling signal is used irrespective of the motion direction.
2	**Control mode** 0: state-controlled: The switch track's sampling signal controls the register bit of the programmable limit switch. 1: time-controlled: The switch track's sampling signal controls the pulse generator's clock input. The pulse generator controls the register bit of the programmable limit switch.

Tab. 4-83: Relevant bits in the parameter

Use

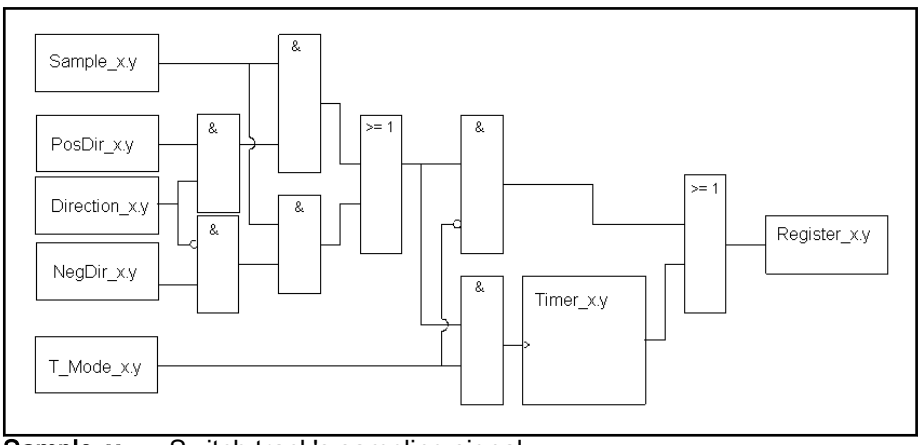
This parameter is used to control the internal register of the programmable limit switch (register_0 and register_1), depending on the direction of movement (forward and/or backward) of the reference axis.

A register bit can be operated directly (state-controlled) or by a pulse generator (time-controlled).

The control mode influences the dead time compensation (see parameter "C-0-0336, PLS No.2, lead time when switching on" and "C-0-0337, PLS No.

Describing individual parameters, arranged according to types

2, lead time when switching off"). The pulse duration in time-controlled mode can be defined in parameter "C-0-0344, PLS No.2, switch-on duration".



Sample_x Switch track's sampling signal
PosDir_x Active in positive movement direction
Direction_x Current movement direction
NegDir_x Active in positive movement direction
T_Mode_x Time-controlled mode
Register_x Internal register
Fig. 4-77: Output control

C-0-0343 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

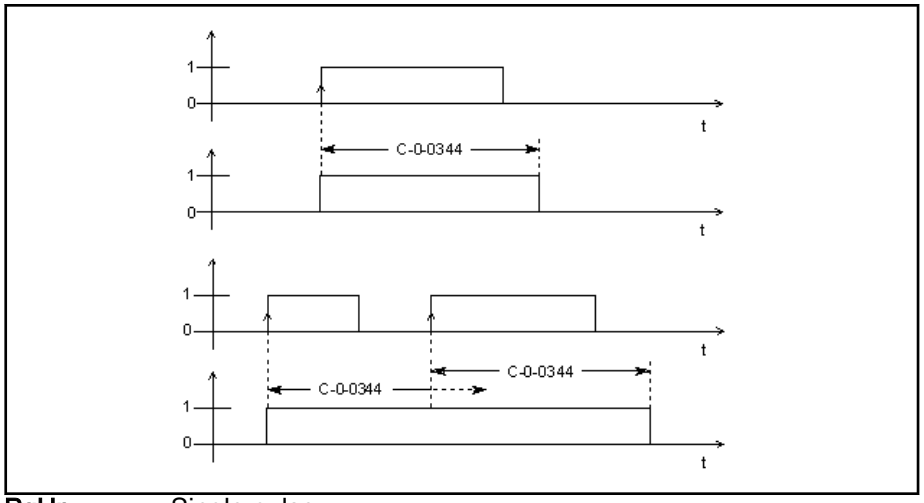
C-0-0344, PLS No.2, switch-on duration

Function

This parameter is used to define the pulse duration in time-controlled mode (see parameter "C-0-0343, PLS No.2, output mode").

The programmable limit switch operates with a cycle time of 125 µs. Within this time period, the programmable limit switch can generate pulses with a maximum duration of one second.

Describing individual parameters, arranged according to types



PgUp Single pulse
PgDn Extended pulse
Fig. 4-78: Pulse generator

Use The pulse generator is started by a rising edge at the clock input. The pulse generator is reset and restarted with each additional rising edge. This extends the output pulse for active pulse generators.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0344 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	125	1000000	125

C-0-0350, PLS No.3, control word

Function Control word for the third programmable limit switch module on the control's module bus.

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
1..0	**Output control** 0 0: deactivated. 0 1: activated: When an output is overloaded, an error of error class 'F0' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
3..2	**Voltage control** 0 0: deactivated. 0 1: activated: In case of undercurrent on the function module, an error of error class 'FO' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
4	**Function module** 0: deactivated, 1: activated.
5	**Command function** C-0-0366 0: Initialize switch track. 1: Initialize and activate switch track.

Tab. 4-84: Relevant bits in the control word

Use

When changing from a lower to a higher phase, the control word is checked against parameter "C-0-0025, Function module bus, configuration". If there is no programmable limit switch module 'CFL01.1-N1' on the module bus and if bit 4 is set in the control word, the error "F0160024, Error in cross-check C-parameters" is generated.

C-0-0350 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x05

C-0-0351, PLS No.3, status word

Function

Status word for the third programmable limit switch module on the control's module bus.

Structure

Bit	Designation/function
0	Passive switch track group initialized
1	Active switch track group initialized

Tab. 4-85: Relevant bits in the status word

Use

Bit 0:

The passive switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch can be activated (see parameter "C-0-0366, PLS No. 3, command: Initialize switch track").

Bit 1:

The active switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch is active (see parameter "C-0-0367, PLS No.3, command: Activate switch track").



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0351 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0352, PLS No.3, signal selection

Function

The parameter "signal selection" is used to diagnose the third programmable limit switch.

This parameter can be used to read out the bytes "Source_0.y" (low byte, y: bit 0...7) and "Source_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the third programmable limit switch module.

Structure

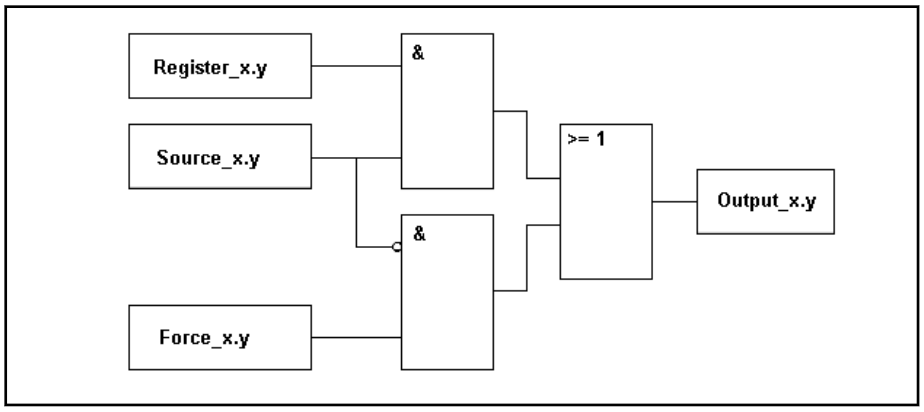


Fig. 4-79: Output control logic

Use

The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Source_0.y" and "Source_1.y" are cleared.

These bytes can be used to define the signal source for each of the programmable limit switch's outputs.

C-0-0352 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0353, PLS No.3, control signal

Function The parameter control signal is used to diagnose the third programmable limit switch.

This parameter can be used to read out the bytes "Force_0.y" (low byte, y: bit 0...7) and "Force_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the third programmable limit switch module.

Structure

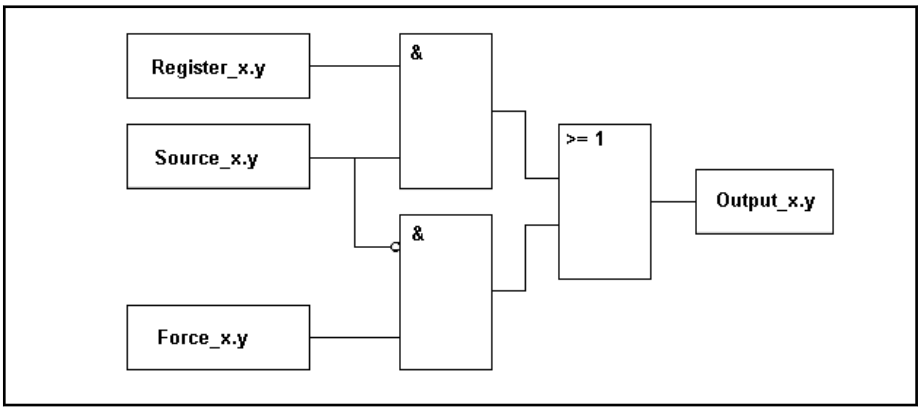


Fig. 4-80: Output control logic

Use The bytes "Force_0.y" and "Force_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Force_0.y" and "Force_1.y" are cleared.

These bytes can be used to override all the programmable limit switch's outputs, depending on the content of the bytes "Source_0.y" and "Source_1.y" - the defined signal source.

C-0-0353 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0354, PLS No.3, outputs

Function This parameter is used to diagnose the third programmable limit switch. This parameter can be used to read out the bytes "Output_0.y" (low byte, y: bit 0...7) and "Output_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the third programmable limit switch module.

Describing individual parameters, arranged according to types

Structure

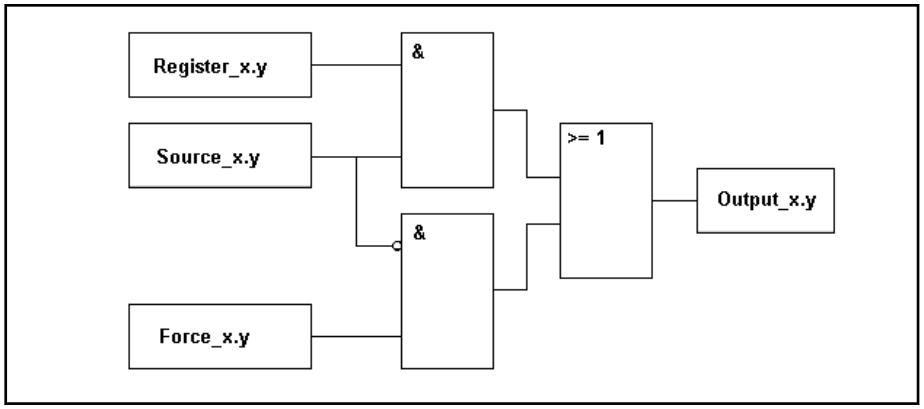


Fig. 4-81: Output control logic

Use The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The control cyclically updates the bytes in operating mode. In operation mode, the function module's output signals can be processed in the PLC.

C-0-0354 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0355, PLS No.3, internal registers

Function This parameter is used to diagnose the third programmable limit switch.

This parameter can be used to read out the bytes "Register_0.y" (low byte, y: bit 0...7) and "Register_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the third programmable limit switch module.

Structure

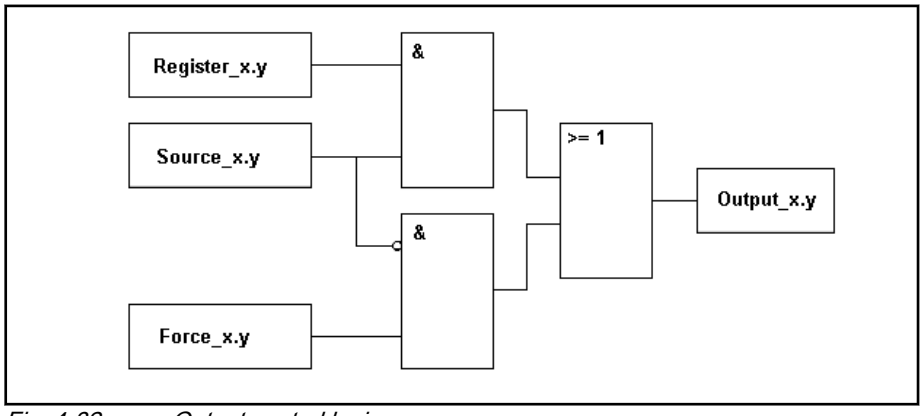


Fig. 4-82: Output control logic

Use The bytes "Register_0.y" and "Register_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The bytes display the programmable limit switch's internal state and are cyclically updated by the control in operating mode. In operating mode, the programmable limit switch's output signals can be processed in the PLC.

Describing individual parameters, arranged according to types

C-0-0355 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
	Memory:	RAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-
		Minimum value	**Maximum value**	**Default value**
	Common:	---	---	---

C-0-0357, PLS No.3, reference axis configuration

Function Of the axes configured and activated in the control, up to eight of them can be selected for the programmable limit switch in this parameter.

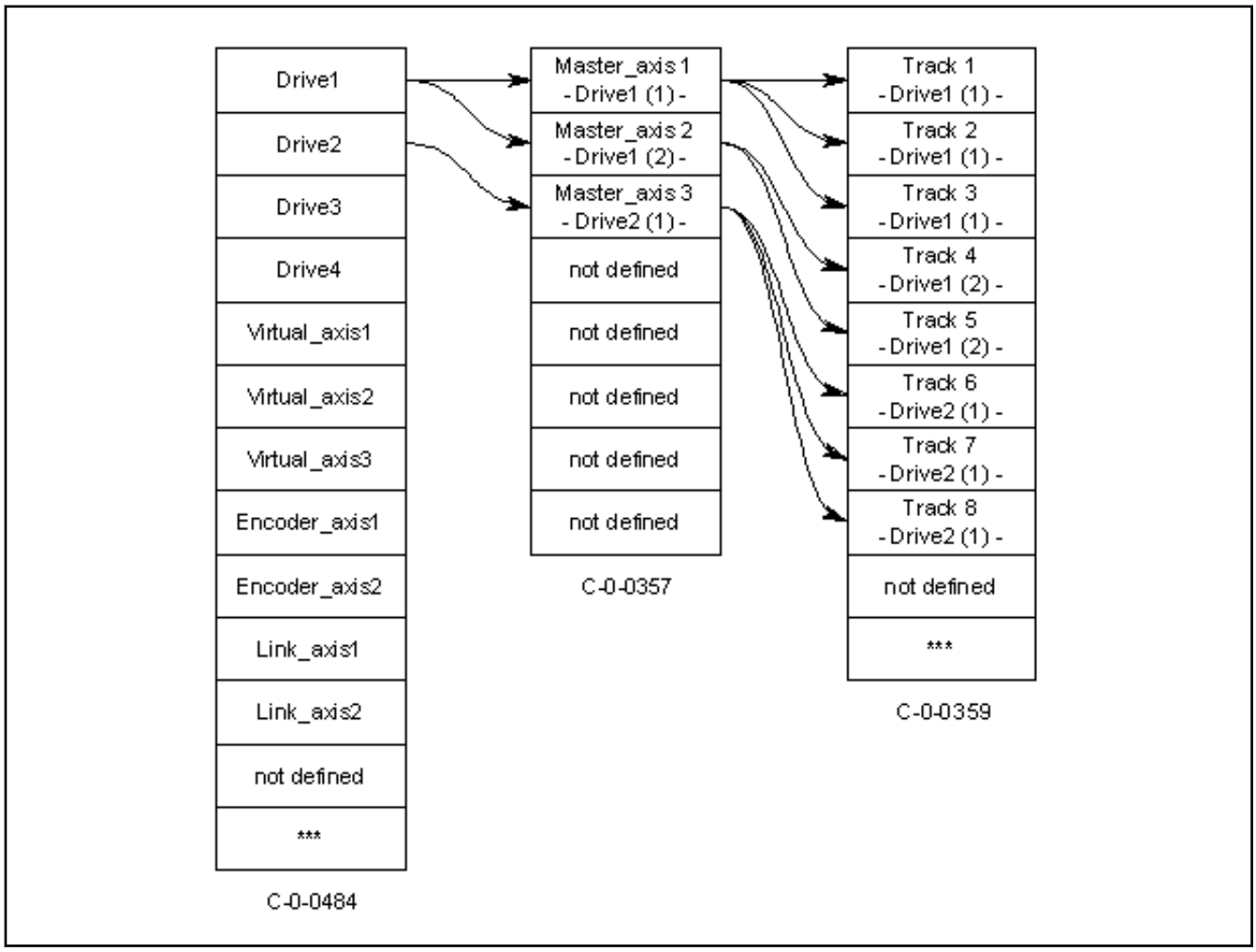


Fig. 4-83: Configuration and definition of reference axes

Structure The position and velocity of the selected axes are cyclically transmitted to the programmable limit switch in operation mode.

The reference axes are configured in parameterization mode. A single axis can be configured as a reference axis more than once. This allows switch tracks with a different position offset to be operated by the same axis.

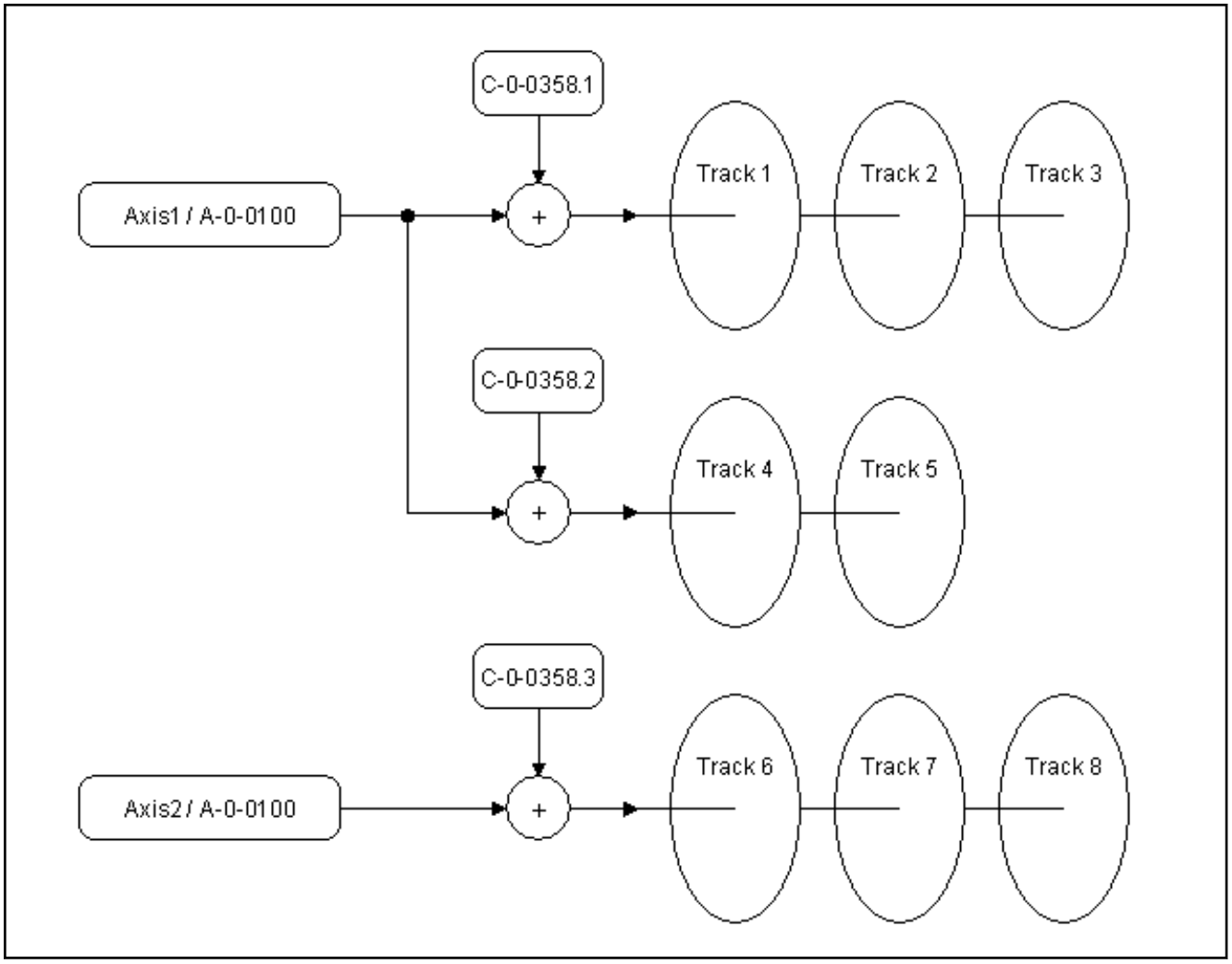


Fig. 4-84: Position offset

Use

When switching from a lower to a higher phase, the reference axis configuration is checked against parameter "C-0-0484, Axes configuration list" and parameter "A-0-0024, Axis condition" of the respective axis.

The error "F0160024, Error in cross-check C-parameters" is generated if one of the selected axes is deactivated or not configured.

C-0-0357 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0

C-0-0358, PLS No.3, reference axis position, additive

Function

This parameter is used to move the position of the connected switch track relative to the position of the reference axis. The position offset is entered in the input unit of the reference axis.

Describing individual parameters, arranged according to types

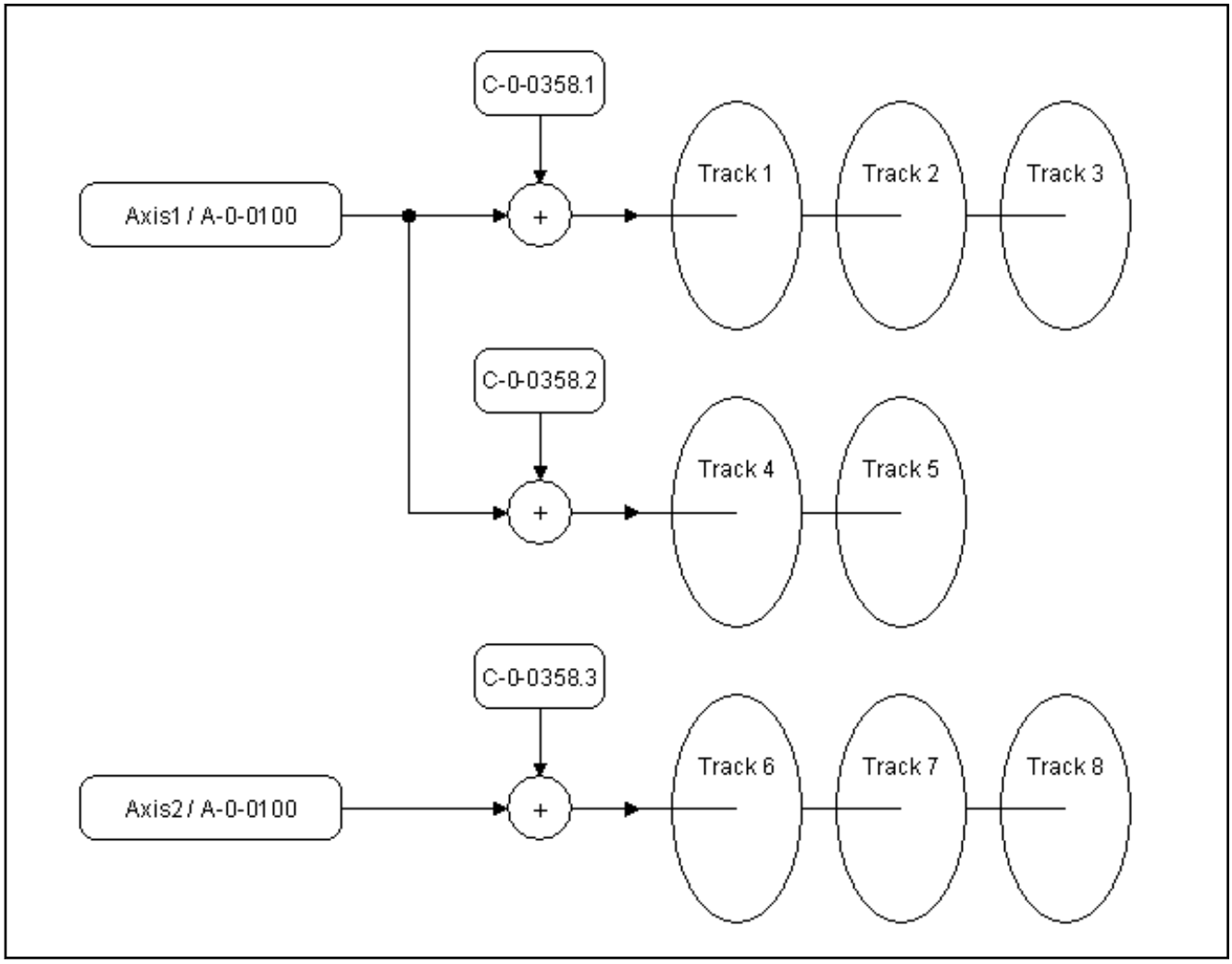


Fig. 4-85: Position offset

Use The position offset is cyclically transmitted to the programmable limit switch module and added to the switch track position after the hysteresis is calculated. As a result, a change to the position offset is active in its unmodified form.

$$X_{PIS} = \frac{(X_{MA} + \langle C\text{-}0\text{-}0358 \rangle) \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

PLS Programmable limit switch
MA Master axis (reference axis)

Fig. 4-86: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

C-0-0358 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0359, PLS No.3, reference axis definition

Function This parameter is used to define the reference axis for each switch track. All reference axes configured in parameter "C-0-0357, PLS No.3, reference axis configuration" are available for selection. In addition to the position and velocity of the selected reference axis, the position offset, parameter "C-0-0359, PLS No.3, reference axis position, additive", is assigned to the respective switch track.

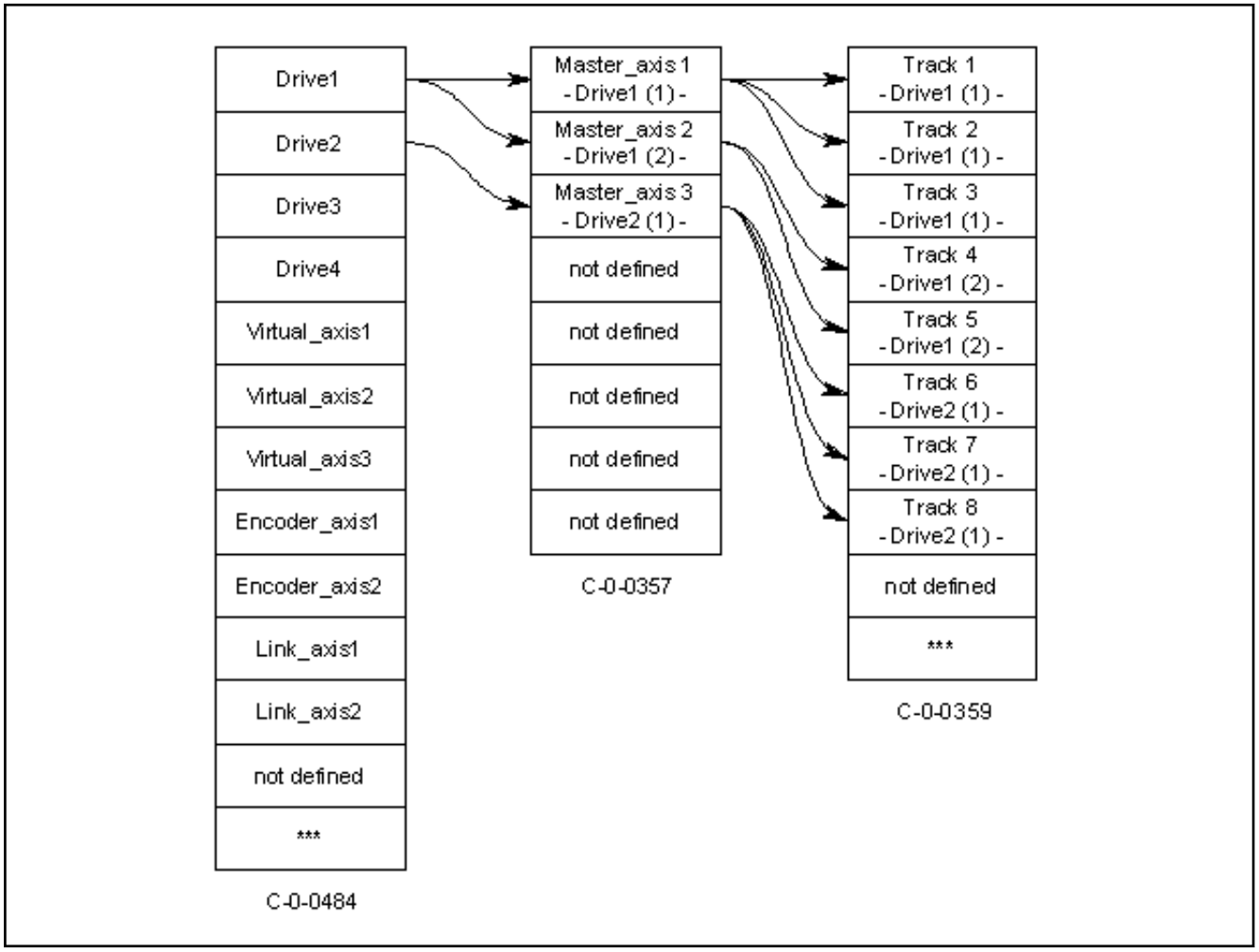


Fig. 4-87: Configuration and definition of reference axes

Use When switching from a lower to a higher phase, the reference axis definition is checked against parameter "C-0-0357, PLS No.3, reference axis configuration".

The error "F0160024, Error in cross-check C-parameter" is generated if one of the selected reference axes is deactivated or not configured.

C-0-0359 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2

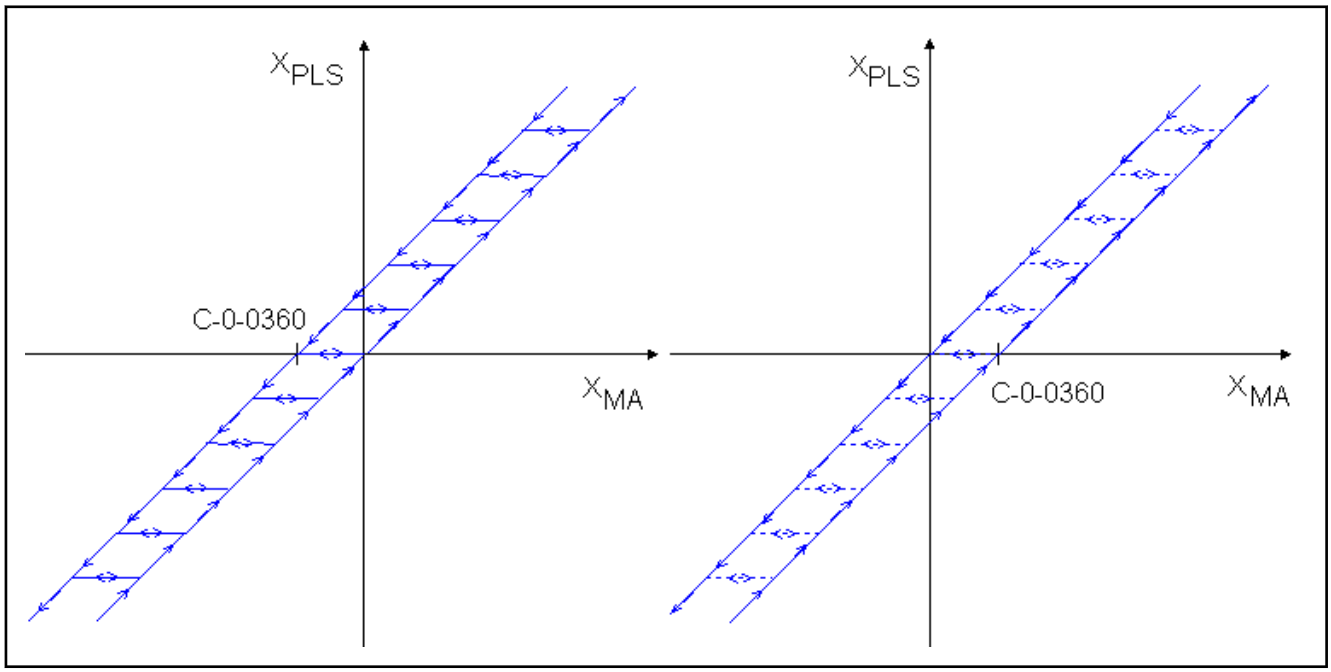
Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

C-0-0360, PLS No.3, hysteresis

Function This list of parameters is used to define a position hysteresis for each switch track. The hysteresis functions direction-dependently, see figure.



X_{MA} Reference axis position
X_{PLS} Switch track position
Fig. 4-88: Negative and positive hysteresis

Use The position hysteresis is entered in the input unit of the reference axis.

The hysteresis serves to compensate position fluctuations. The fluctuations can cause the output on the programmable limit switch to jitter.

If a real axis comes to a standstill, the position controller moves. The velocity of this movement multiplied by the dead time to be compensated equals the standstill fluctuation.

If there is a delay with an axis, extrapolation errors occur. Half of the delay multiplied by the dead time to be compensated squared equals the extrapolation error.

$$H_{PLS} = \frac{H_{MA} \bmod <\text{A-0-0045}>}{<\text{A-0-0045}>} * 2^{16}$$

MA Master axis (reference axis)
PLS Switch track
Fig. 4-89:

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

Describing individual parameters, arranged according to types

C-0-0360 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0361, PLS No.3, lead time when switching on

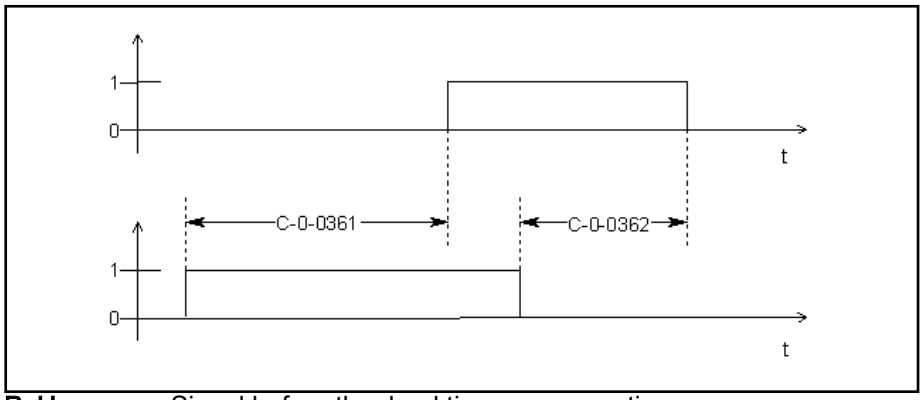
Function

A) For state-controlled outputs

This parameter is used to define the dead time compensation for state-controlled outputs (see "C-0-0368, PLS No.3, output mode") when switching on an output on the programmable limit switch.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-90: Dead time compensation (state-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * <\text{C-0-0361}>)) \bmod 2^{16}$$

Fig. 4-91: Extrapolation function for switching on an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

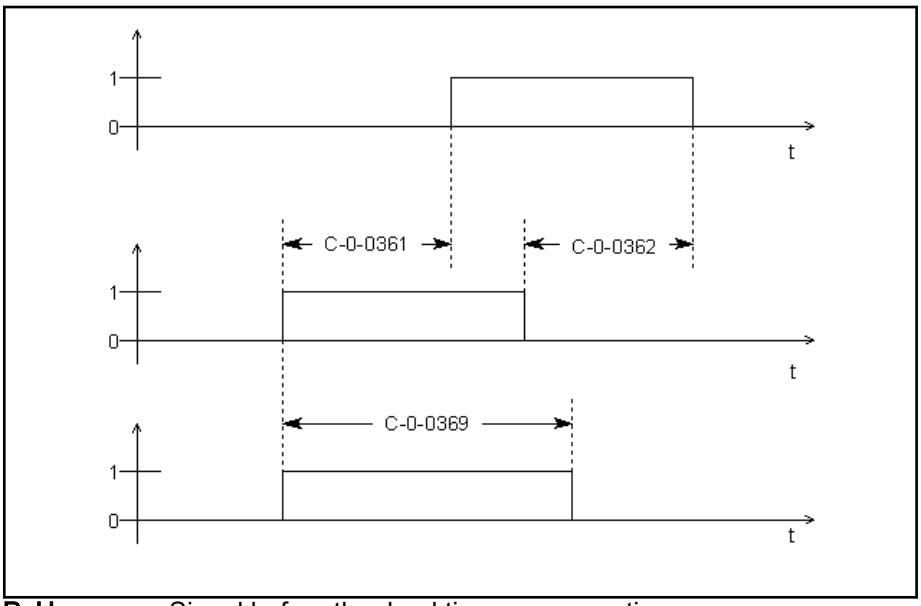
☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

B) For time-controlled outputs

This parameter is used to define the dead time compensation for time-controlled outputs (see "C-0-0368, PLS No.3, output mode") when switching on and off outputs.

Describing individual parameters, arranged according to types

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
Center Extrapolated trigger signal
PgDn Time-controlled output signal

Fig. 4-92: Dead time compensation (time-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \text{<C-0-0361>})) \bmod 2^{16}$$

Fig. 4-93: Extrapolation function for switching on an output

The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0361 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000000	0

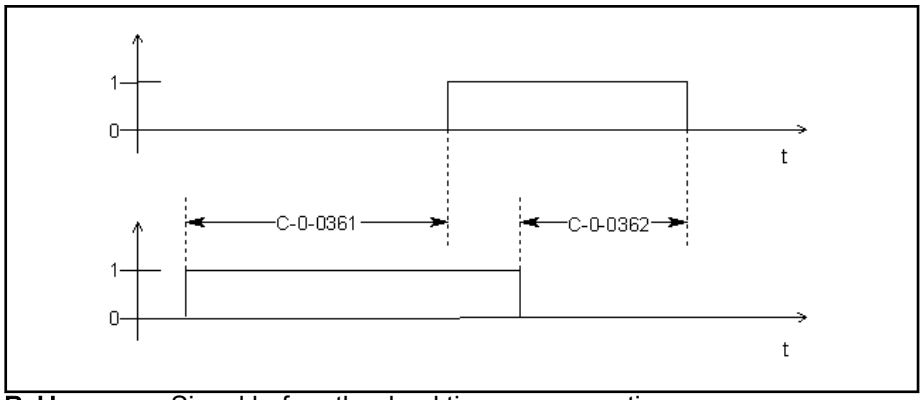
C-0-0362, PLS No.3, lead time when switching off

Function

This parameter is used to control the dead time compensation when switching off an output on the programmable limit switch.

The parameter only functions if the output is operated in a time-controlled manner (see "C-0-0368, PLS No.3, output mode"). The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch

can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-94: Dead time compensation (state-controlled)

Use The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PIS} = (X_{PIS} + (V_{PIS} * \text{<C-0-0362>})) \bmod 2^{16}$$

Fig. 4-95: Extrapolation function for switching off an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

☞ The parameter "C-0-0361, PLS No.3, lead time when switching on" (see "C-0-0368, PLS No.3, output mode") is only effective if an output functions in a state-controlled manner.

C-0-0362 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1000000	0

C-0-0363, PLS No.3, switch track number

Function This parameter is used to activate up to 64 switches and assign the 16 switch tracks.

Structure The list has 64 possible spots (switches) that are assigned with "0" after initialization (no switch track is assigned).

If only one swítch is activated and assigned one of the 16 switch tracks, the number of the switch track is available in place of "0".

Describing individual parameters, arranged according to types

C-0-0363 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

C-0-0364, PLS No.3, switch-on position of switch track

Function

This parameter and parameter "C-0-0365, PLS No.3, switch-off position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-96: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

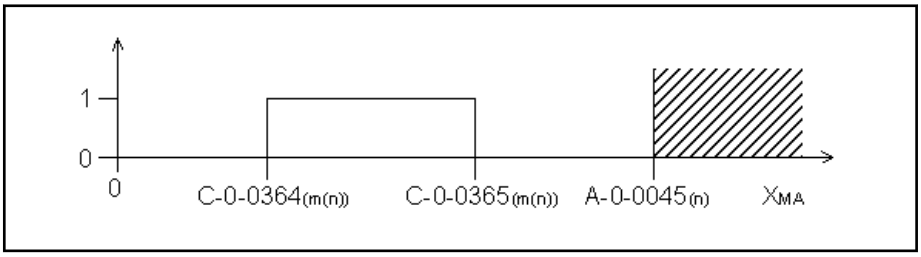


Fig. 4-97: Switch-on position less than switch-off position

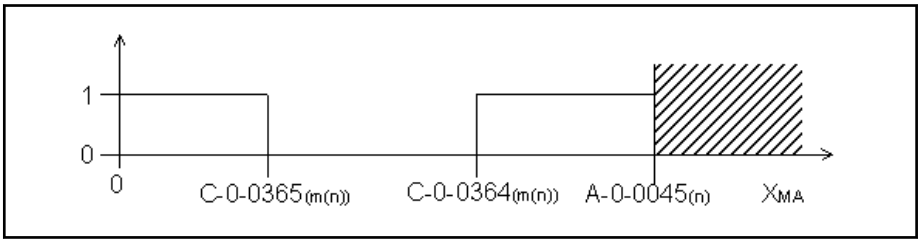


Fig. 4-98: Switch-on position greater than switch-off position

The parameter "C-0-0363, PLS No.3, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

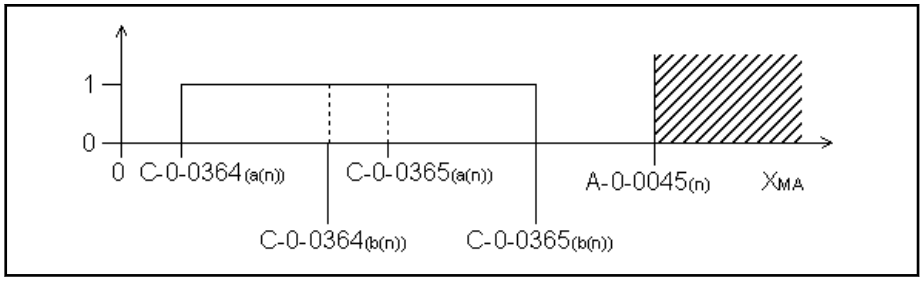


Fig. 4-99: Overlapping switches

C-0-0364 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0365, PLS No.3, switch-off position of switch track

Function

This parameter and parameter "C-0-0364, PLS No.3, switch-on position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-100: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

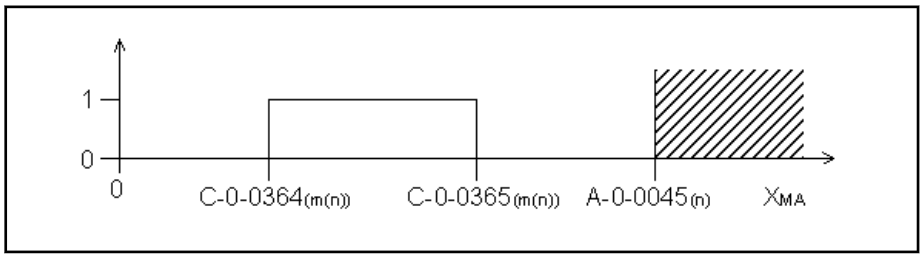


Fig. 4-101: Switch-on position less than switch-off position

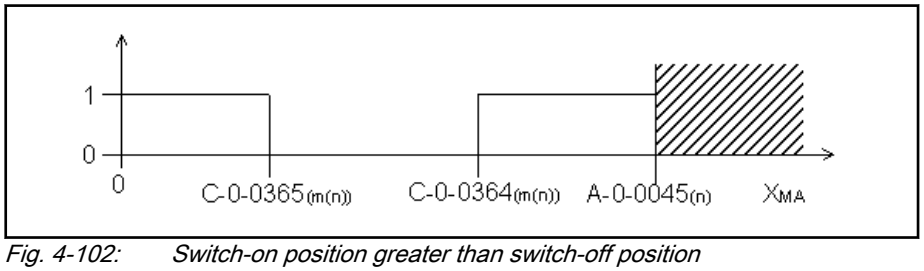


Fig. 4-102: Switch-on position greater than switch-off position

The parameter "C-0-0363, PLS No.3, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

Describing individual parameters, arranged according to types

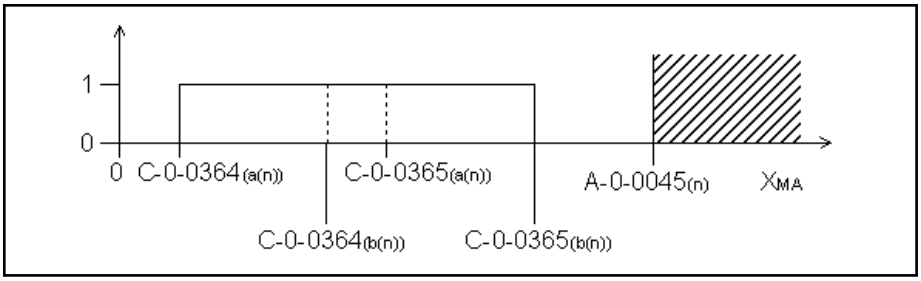


Fig. 4-103: Overlapping switches

C-0-0365 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0366, PLS No.3, command: Initialize switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. Using the command "Initialize switch track", the passive group is reinitialized according to the parameters:

- C-0-0361, PLS No.3, lead time when switching on
- C-0-0362, PLS No.3, lead time when switching off
- C-0-0363, PLS No.3, switch track number
- C-0-0364, PLS No.3, switch-on position of switch track
- C-0-0365, PLS No.3, switch-off position of switch track
- C-0-0368, PLS No.3, output mode
- C-0-0369, PLS No.3, switch-on duration

.

Use

The initialized switch track group is immediately activated, depending on the setting in the control word "C-0-0350, bit 5= 1".

The switch track group can be switched at all times using the command "C-0-0367, PLS No.3, command: Activate switch track".

☞ When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0366 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

Describing individual parameters, arranged according to types

C-0-0367, PLS No.3, command: Activate switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode.

The passive group is activated using the command "Activate switch track". The active group is simultaneously deactivated.

The passive switch track group can be subsequently reinitialized using the command "C-0-0366, PLS No.3, commando: Initialize switch track".



When the operation mode is switched on, the first switch track group is activated.

C-0-0367 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0368, PLS No.3, output mode

Function

When switching from a lower to a higher phase, this parameter is checked against parameter "C-0-0359, PLS No.3, reference axis definition".

If no reference axis was defined for the switch track and the output is activated (direction of motion ≠ zero), the error "F0160024, Error in cross-check C-parameters" is generated.

Structure

Bit	Designation/function
1..0	**Direction of movement** 0 0: deactivated: The internal output is deactivated. 0 1: activated depending on direction: The switch track's sampling signal is used for movement in the positive direction. 1 0: activated depending on direction: The switch track's sampling signal is used for movement in the negative direction. 1 1: activated independent of the direction The switch track's sampling signal is used irrespective of the motion direction.
2	**Control mode** 0: state-controlled: The switch track's sampling signal controls the register bit of the programmable limit switch. 1: time-controlled: The switch track's sampling signal controls the pulse generator's clock input. The pulse generator controls the register bit of the programmable limit switch.

Tab. 4-86: Relevant bits in the parameter

Use

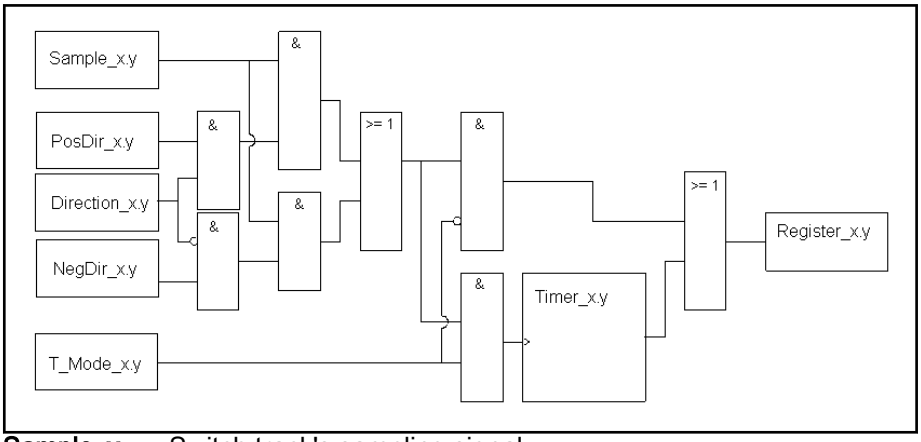
The parameter "output mode" is used to control the internal register of the programmable limit switch (register_0 and register_1), depending on the direction of movement (forward and/or backward) of the reference axis.

A register bit can be operated directly (state-controlled) or by a pulse generator (time-controlled).

The control mode influences the dead time compensation (see parameter "C-0-0361, PLS No.3, lead time when switching on" and "C-0-0362, PLS Nr.

Describing individual parameters, arranged according to types

3, lead time when switching off"). The pulse duration in time-controlled mode can be defined in parameter "C-0-0369, PLS No.3, switch-on duration".



Sample_x Switch track's sampling signal
PosDir_x Active in positive movement direction
Direction_x Current movement direction
NegDir_x Active in positive movement direction
T_Mode_x Time-controlled mode
Register_x Internal register
Fig. 4-104: Output control

C-0-0368 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

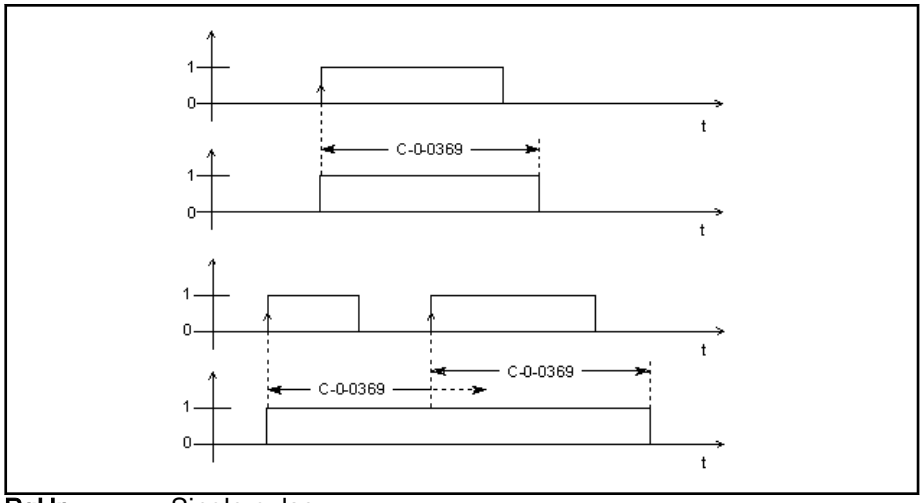
	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-0369, PLS No.3, switch-on duration

Function

This parameter is used to define the pulse duration in time-controlled mode (see parameter "C-0-0368, PLS No.3, output mode").

The programmable limit switch operates with a cycle time of 125 µs. Within this time period, the programmable limit switch can generate pulses with a maximum duration of one second.



PgUp Single pulse
PgDn Extended pulse

Fig. 4-105: Pulse generator

Use The pulse generator is started by a rising edge at the clock input. The pulse generator is reset and restarted with each additional rising edge. This extends the output pulse for active pulse generators.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0369 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	125	1000000	125

C-0-0375, PLS No.4, control word

Function Control word for the fourth programmable limit switch module on the control's module bus.

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
1..0	**Output control** 0 0: deactivated. 0 1: activated: When an output is overloaded, an error of error class 'F0' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
3..2	**Voltage control** 0 0: deactivated. 0 1: activated: In case of undercurrent on the function module, an error of error class 'FO' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
4	**Function module** 0: deactivated, 1: activated.
5	**Command function** C-0-0391 0: Initialize switch track. 1: Initialize and activate switch track.

Tab. 4-87: Relevant bits in the control word

Use

When changing from a lower to a higher phase, the control word is checked against parameter "C-0-0025, Function module bus, configuration". If there is no programmable limit switch module 'CFL01.1-N1' on the module bus and if bit 4 is set in the control word, the error "F0160024, Error in cross-check C-parameters" is generated.

C-0-0375 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x05

C-0-0376, PLS No.4, status word

Function

Status word for the fourth programmable limit switch module on the control's module bus.

Structure

Bit	Designation/function
0	Passive switch track group initialized
1	Active switch track group initialized

Tab. 4-88: Relevant bits in the status word

Use

Bit 0:

The passive switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch can be activated (see parameter "C-0-0391, PLS No. 4, command: Initialize switch track").

Bit 1:

The active switch track group is initialized with the current parameter set of the programmable limit switch or the parameterization entered for the programmable limit switch is active (see parameter "C-0-0392, PLS No.4, command: Activate switch track").



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0376 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0377, PLS No.4, signal selection

Function

This parameter is used to diagnose the fourth programmable limit switch.

This parameter can be used to read out the bytes "Source_0.y" (low byte, y: bit 0...7) and "Source_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the fourth programmable limit switch module.

Structure

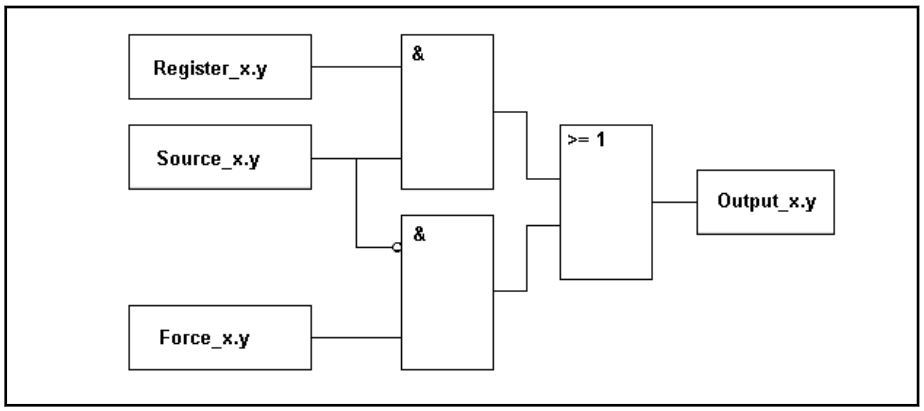


Fig. 4-106: Output control logic

Use

The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Source_0.y" and "Source_1.y" are cleared.

These bytes can be used to define the signal source for each of the programmable limit switch's outputs.

C-0-0377 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0378, PLS No.4, control signal

Function This parameter is used to diagnose the fourth programmable limit switch.

This parameter can be used to read out the bytes "Force_0.y" (low byte, y: bit 0...7) and "Force_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the fourth programmable limit switch module.

Structure

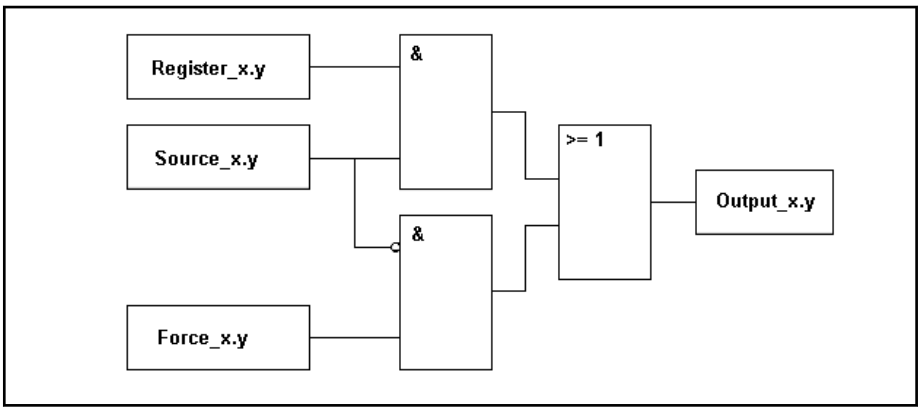


Fig. 4-107: Output control logic

Use The bytes "Force_0.y" and "Force_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Force_0.y" and "Force_1.y" are cleared.

These bytes can be used to override all the programmable limit switch's outputs, depending on the content of the bytes "Source_0.y" and "Source_1.y" - the defined signal source.

C-0-0378 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0379, PLS No.4, outputs

Function This parameter is used to diagnose the fourth programmable limit switch. This parameter can be used to read out the bytes "Output_0.y" (low byte, y: bit 0...7) and "Output_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the fourth programmable limit switch module.

Structure

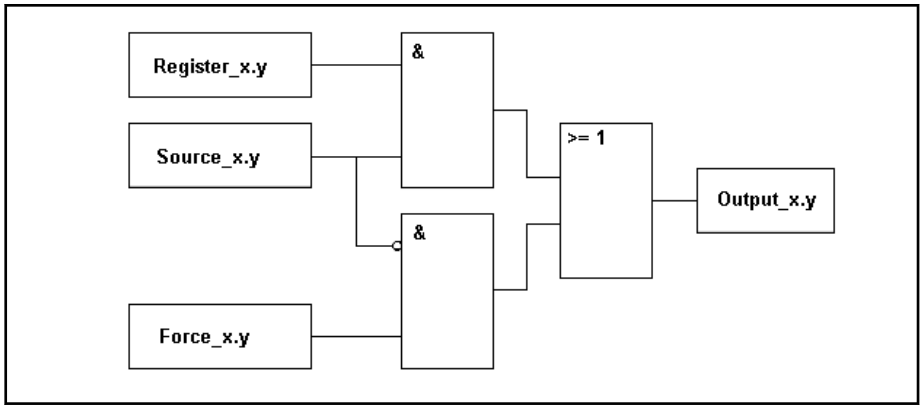


Fig. 4-108: Output control logic

Use The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The control cyclically updates the bytes in operating mode.

In operation mode, the function module's output signals can be processed in the PLC.

C-0-0379 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0380, PLS No.4, internal registers

Function This parameter is used to diagnose the fourth programmable limit switch.

This parameter can be used to read out the bytes "Register_0.y" (low byte, y: bit 0...7) and "Register_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the fourth programmable limit switch module.

Structure

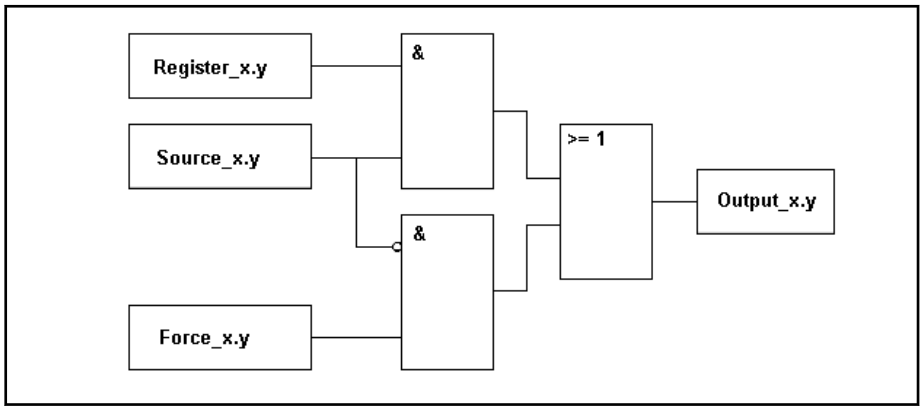


Fig. 4-109: Output control logic

Use The bytes "Register_0.4" and "Register_1.4" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The bytes display the programmable limit switch's internal state and are cyclically updated by the control in operating mode. In operating mode, the programmable limit switch's output signals can be processed in the PLC.

Describing individual parameters, arranged according to types

C-0-0380 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
	Memory:	RAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-
		Minimum value	**Maximum value**	**Default value**
	Common:	---	---	---

C-0-0382, PLS No.4, reference axis configuration

Function Of the axes configured and activated in the control, up to eight of them can be selected for the programmable limit switch in this parameter.

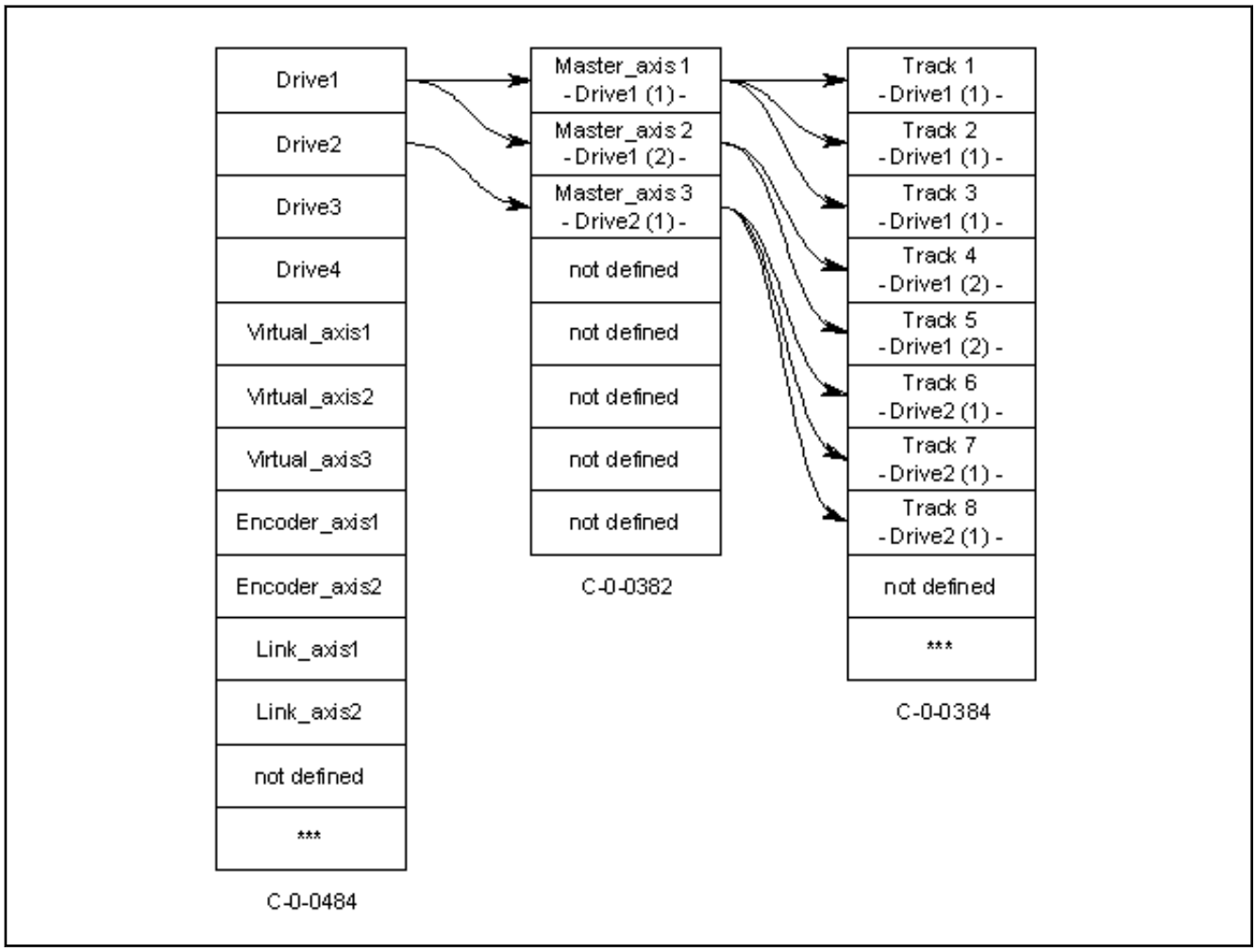


Fig. 4-110: Configuration and definition of reference axes

Structure The position and velocity of the selected axes are cyclically transmitted to the programmable limit switch in operation mode.

The reference axes are configured in parameterization mode. A single axis can be configured as a reference axis more than once. This allows switch tracks with a different position offset to be operated by the same axis.

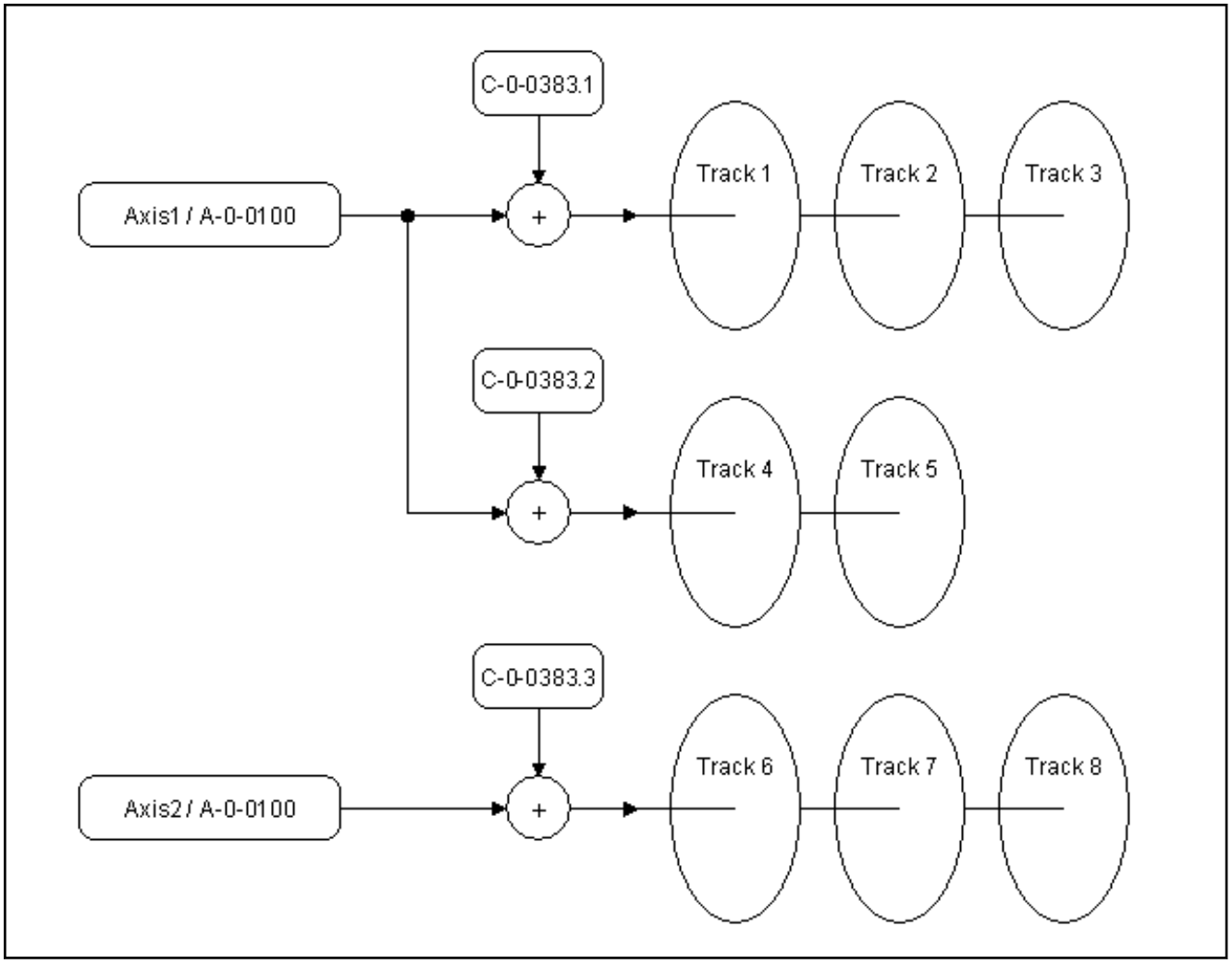


Fig. 4-111: Position offset

Use

When switching from a lower to a higher phase, the reference axis configuration is checked against parameter "C-0-0484, Axes configuration list" and parameter "A-0-0024, Axis condition" of the respective axis.

The error "F0160024, Error in cross-check C-parameters" is generated if one of the selected axes is deactivated or not configured.

C-0-0382 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0

C-0-0383, PLS No.4, reference axis position, additive

Function

This parameter is used to move the position of the connected switch track relative to the position of the reference axis. The position offset is entered in the input unit of the reference axis.

Describing individual parameters, arranged according to types

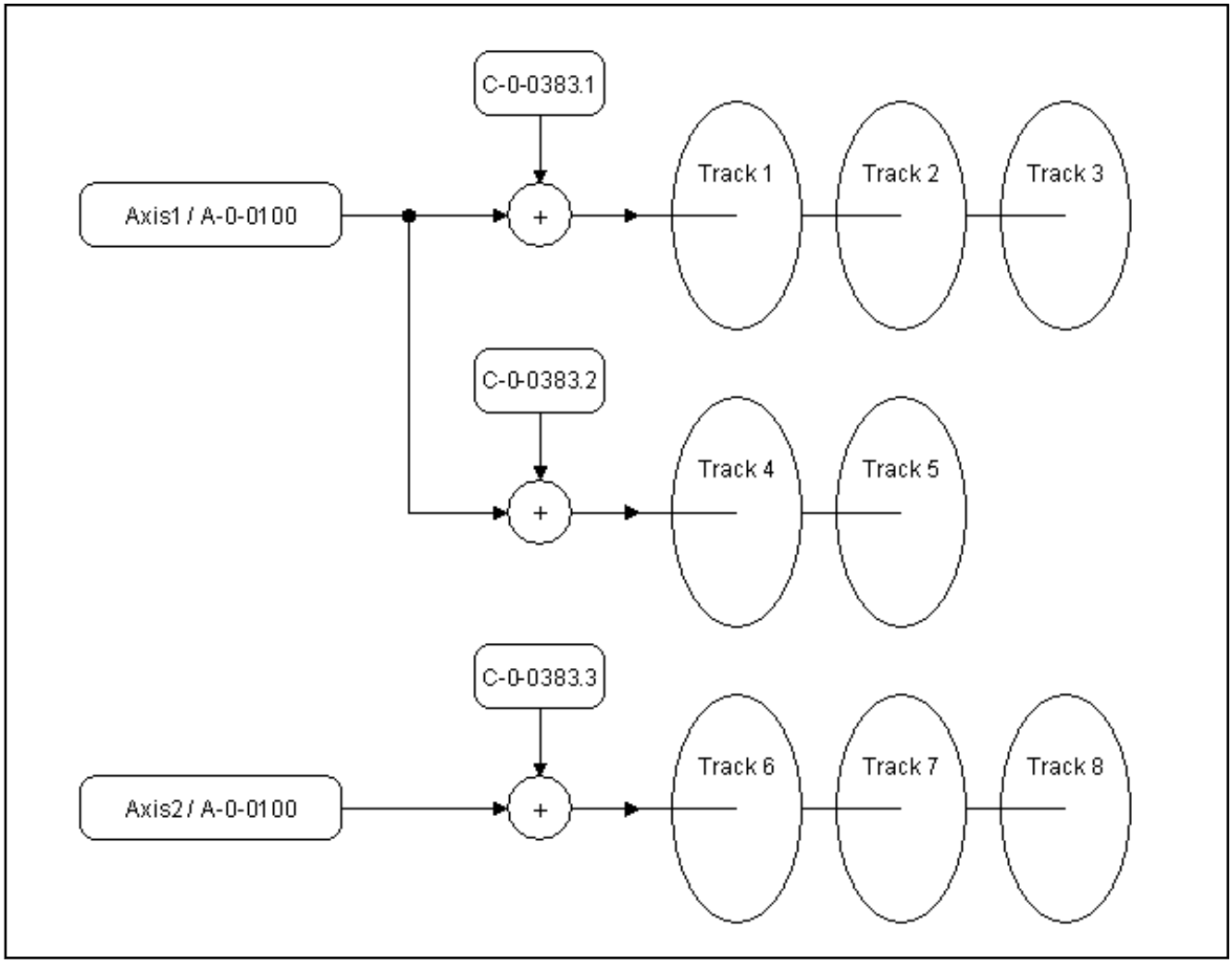


Fig. 4-112: Position offset

Use The position offset is cyclically transmitted to the programmable limit switch module and added to the switch track position after the hysteresis is calculated. As a result, a change to the position offset is active in its unmodified form.

$$X_{PLS} = \frac{(X_{MA} + \text{<C-0-0383>}) \bmod \text{<A-0-0045>}}{\text{<A-0-0045>}} * 2^{16}$$

PLS Programmable limit switch
MA Master axis (reference axis)

Fig. 4-113: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

C-0-0383 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0384, PLS No.4, reference axis definition

Function This parameter is used to define the reference axis for each switch track. All reference axes configured in parameter "C-0-0382, PLS No.4, reference axis configuration" are available for selection. In addition to the position and velocity of the selected reference axis, the position offset, parameter "C-0-0384, PLS No.4, reference axis position, additive", is assigned to the respective switch track.

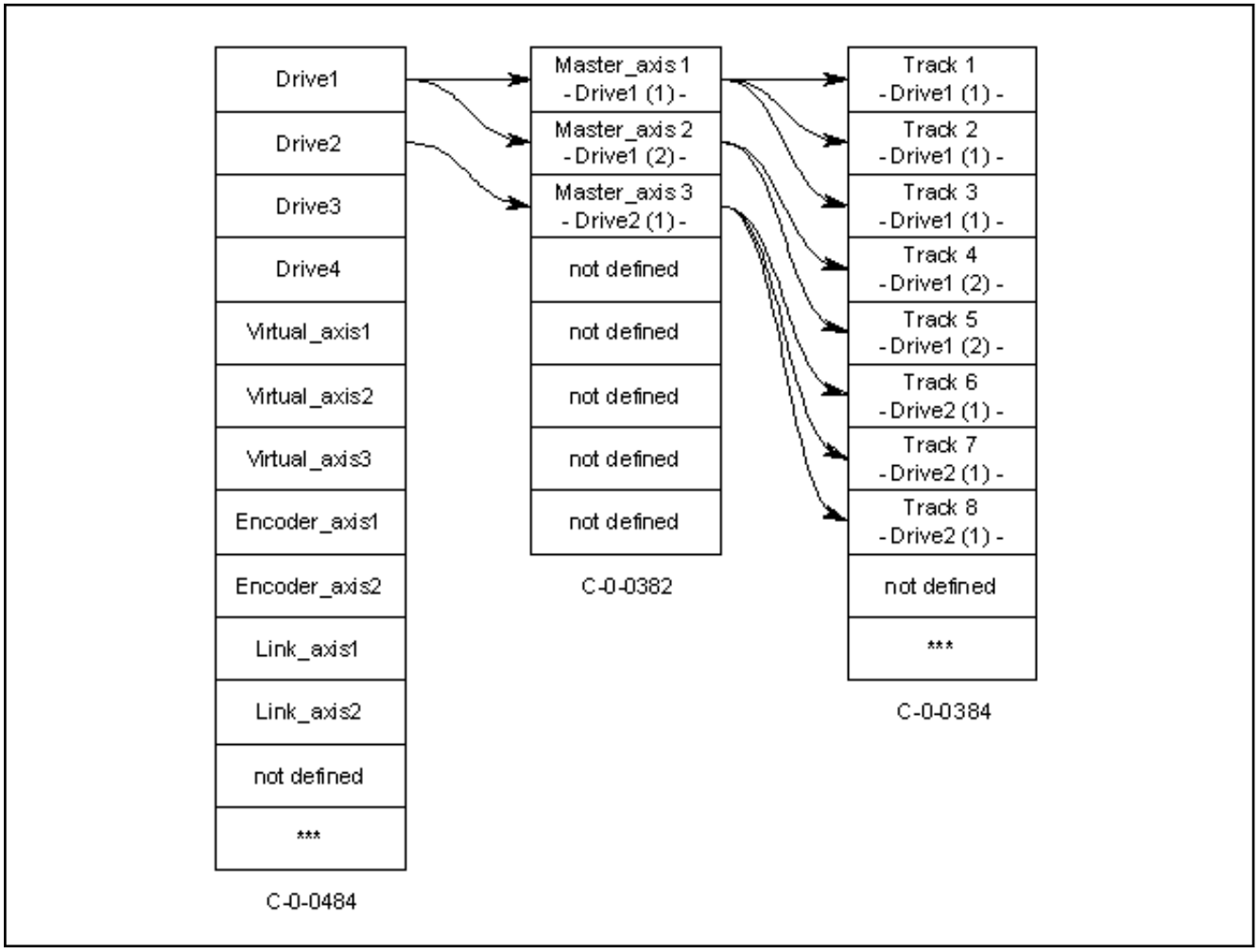


Fig. 4-114: Configuration and definition of reference axes

Use When switching from a lower to a higher phase, the reference axis definition is checked against parameter "C-0-0382, PLS No.4, reference axis configuration".

The error "F0160024, Error in cross-check C-parameter" is generated if one of the selected reference axes is deactivated or not configured.

C-0-0384 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2

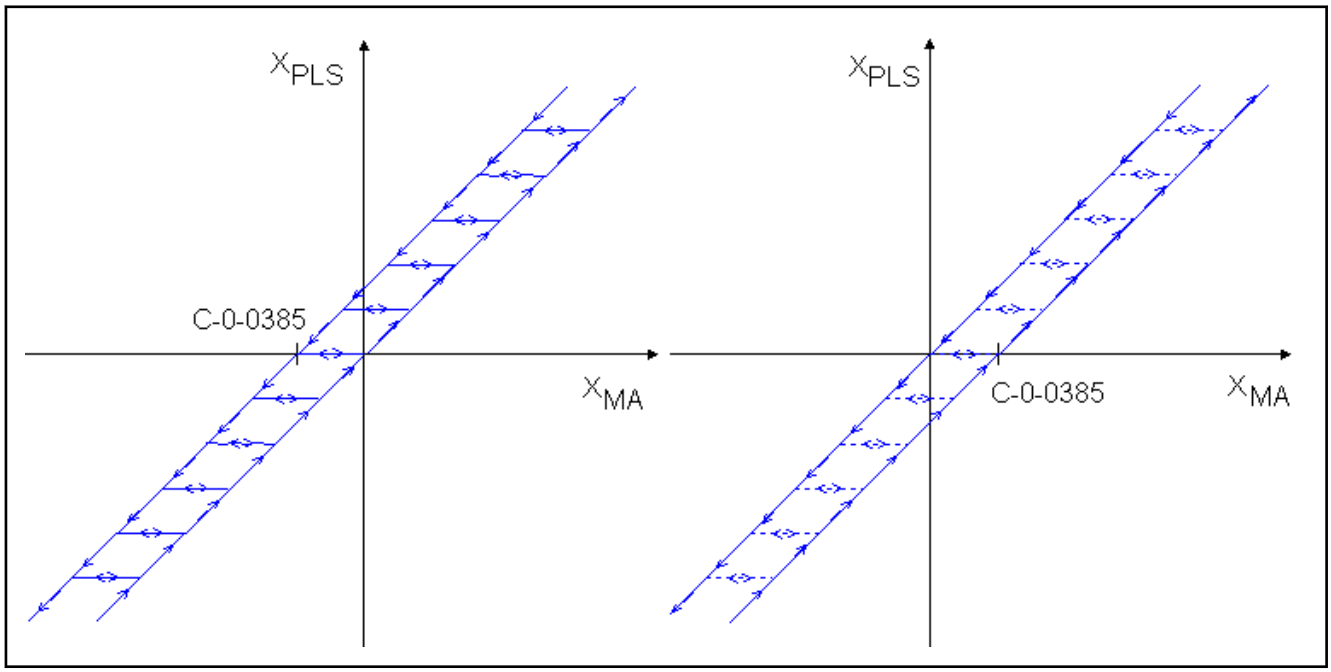
Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

C-0-0385, PLS No.4, hysteresis

Function This list of parameters is used to define a position hysteresis for each switch track. The hysteresis functions direction-dependently, see figure.



XMA Reference axis position
XPLS Switch track position
Fig. 4-115: Negative and positive hysteresis

Use The position hysteresis is entered in the input unit of the reference axis.

The hysteresis serves to compensate position fluctuations. The fluctuations can cause the output on the programmable limit switch to jitter.

If a real axis comes to a standstill, the position controller moves. The velocity of this movement multiplied by the dead time to be compensated equals the standstill fluctuation.

If there is a delay with an axis, extrapolation errors occur. Half of the delay multiplied by the dead time to be compensated squared equals the extrapolation error.

$$H_{PLS} = \frac{H_{MA} \bmod \langle \text{A-0-0045} \rangle}{\langle \text{A-0-0045} \rangle} * 2^{16}$$

MA Master axis (reference axis)
PLS Switch track
Fig. 4-116:



The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

Describing individual parameters, arranged according to types

C-0-0385 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

C-0-0386, PLS No.4, lead time when switching on

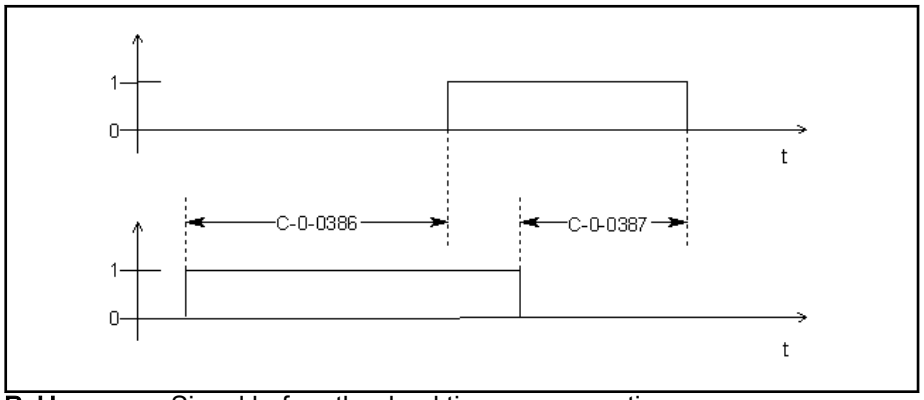
Function

A) For state-controlled outputs

This parameter is used to define the dead time compensation for state-controlled outputs (see "C-0-0393, PLS No.4, output mode") when switching on an output on the programmable limit switch.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-117: Dead time compensation (state-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * <\text{C-0-0386}>)) \bmod 2^{16}$$

Fig. 4-118: Extrapolation function for switching on an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

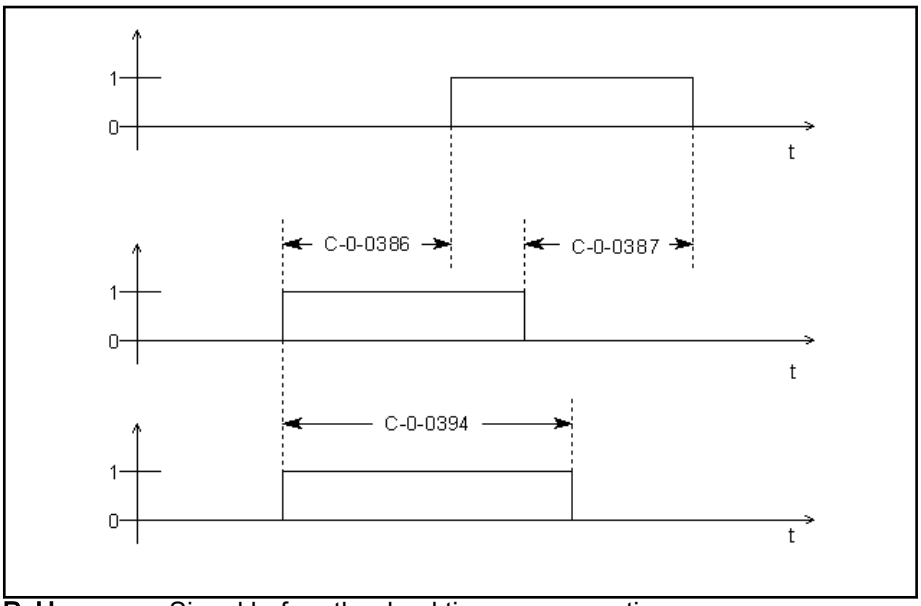
☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

B) For time-controlled outputs

This parameter is used to define the dead time compensation for time-controlled outputs (see "C-0-0393, PLS No.4, output mode") when switching on and off outputs.

Describing individual parameters, arranged according to types

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
Center Extrapolated trigger signal
PgDn Time-controlled output signal

Fig. 4-119: Dead time compensation (time-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \text{<C-0-0386>})) \bmod 2^{16}$$

Fig. 4-120: Extrapolation function for switching on an output

The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0386 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000000	0

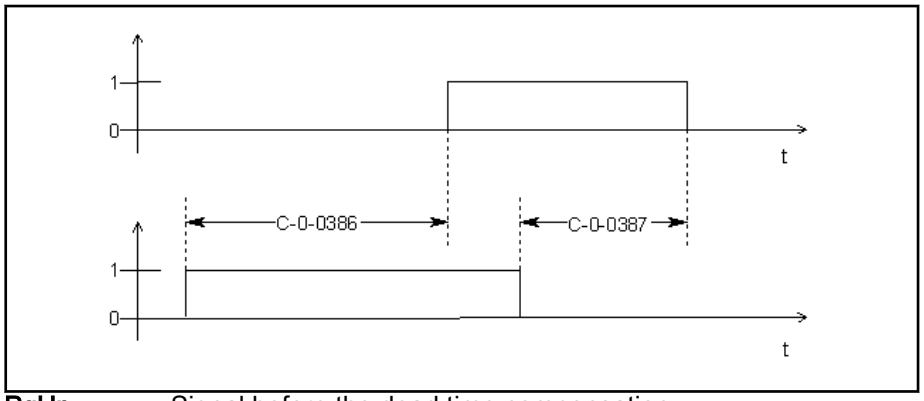
C-0-0387, PLS No.4, lead time when switching off

Function

This parameter is used to control the dead time compensation when switching off an output on the programmable limit switch.

The parameter only functions if the output is operated in a time-controlled manner (see "C-0-0393, PLS No.4, output mode").

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-121: Dead time compensation (state-controlled)

Use

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \text{<C-0-0387>})) \bmod 2^{16}$$

Fig. 4-122: Extrapolation function for switching off an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

☞ The parameter "C-0-0386, PLS No.4, lead time when switching on" (see "C-0-0393, PLS No.4, output mode") is only effective if an output functions in a state-controlled manner.

C-0-0387 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000000	0

C-0-0388, PLS No.4, switch track number

Function

This parameter is used to activate up to 64 switches and assign the 16 switch tracks.

Structure

The list has 64 possible spots (switches) that are assigned with "0" after initialization (no switch track is assigned).

If only one swítch is activated and assigned one of the 16 switch tracks, the number of the switch track is available in place of "0".

Describing individual parameters, arranged according to types

C-0-0388 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

C-0-0389, PLS No.4, switch-on position of switch track

Function

This parameter and parameter "C-0-0390, PLS No.4, switch-off position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-123: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

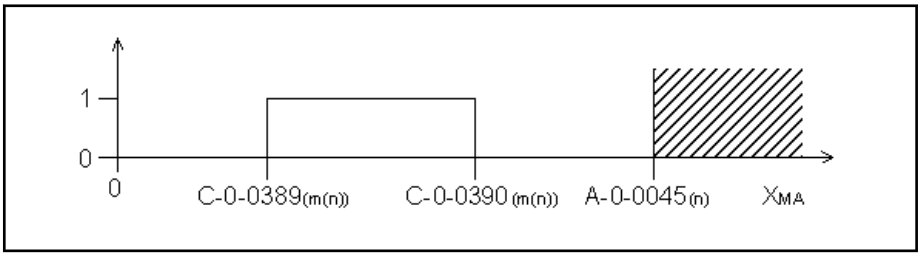


Fig. 4-124: Switch-on position less than switch-off position

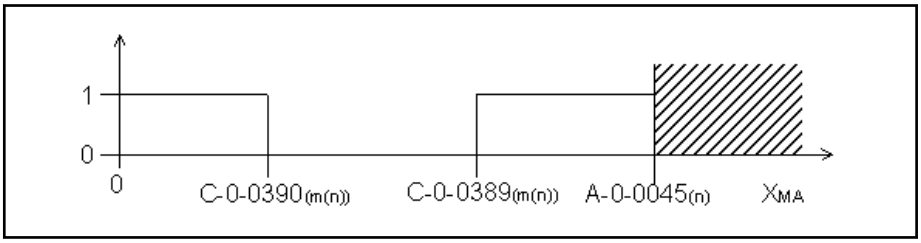


Fig. 4-125: Switch-on position greater than switch-off position

The parameter "C-0-0388, PLS No.4, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

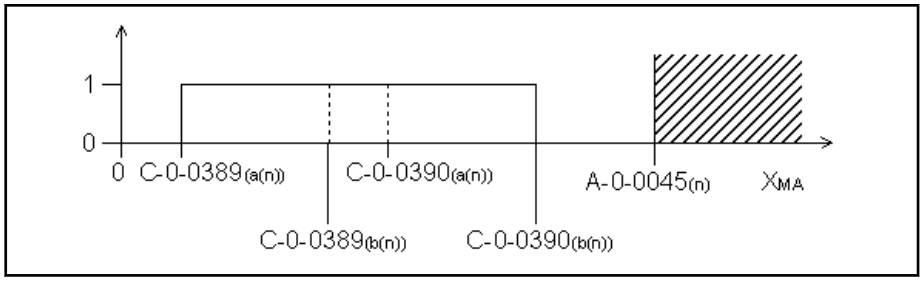


Fig. 4-126: Overlapping switches

C-0-0389 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0390, PLS No.4, switch-off position of switch track

Function

This parameter and parameter "C-0-0389, PLS No.4, switch-on position of switch track" are used to define the a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-127: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

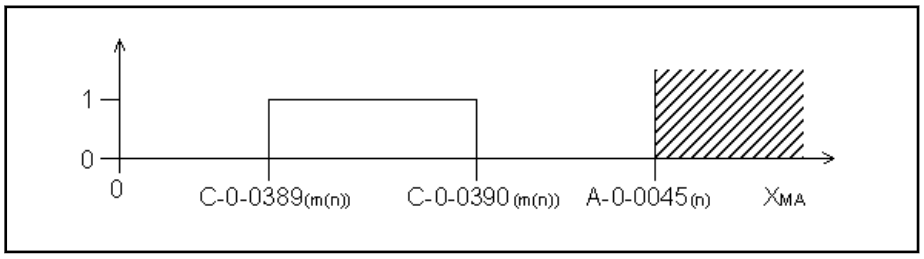


Fig. 4-128: Switch-on position less than switch-off position

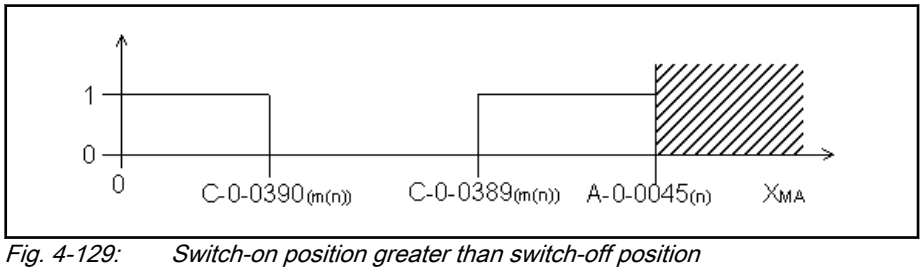


Fig. 4-129: Switch-on position greater than switch-off position

The parameter "C-0-0388, PLS No.4, switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

Describing individual parameters, arranged according to types

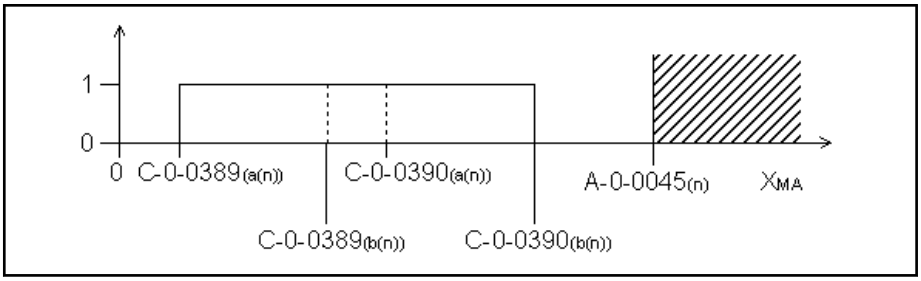


Fig. 4-130: Overlapping switches

C-0-0390 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0391, PLS No.4, command: Initialize switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. Using the command "Initialize switch track", the passive group is reinitialized according to the parameters:

- C-0-0386, PLS No.4, lead time when switching on
- C-0-0387, PLS No.4, lead time when switching off
- C-0-0388, PLS No.4, switch track number
- C-0-0389, PLS No.4, switch-on position of switch track
- C-0-0390, PLS No.4, switch-off position of switch track
- C-0-0393, PLS No.4, output mode
- C-0-0394, PLS No.4, switch-on duration

.

Use

The initialized switch track group is immediately activated, depending on the setting in the control word "C-0-0375, bit 5= 1".

The switch track group can be switched at all times using the command "C-0-0392, PLS No.4, command: Activate switch track".



When switching on the operation mode, the two switch track groups are initialized identically.

C-0-0391 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

Describing individual parameters, arranged according to types

C-0-0392, PLS No.4, command: Activate switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. The passive group is activated using the command "Activate switch track". The active group is simultaneously deactivated.

The passive switch track group can be subsequently reinitialized using the command "C-0-0391, PLS No.4, commando: Initialize switch track".

When the operation mode is switched on, the first switch track group is activated.

C-0-0392 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0393, PLS No.4, output mode

Function

When switching from a lower to a higher phase, this parameter is checked against parameter "C-0-0384, PLS No.4, reference axis definition".

If no reference axis was defined for the switch track and the output is activated (direction of motion ≠ zero), the error "F0160024, Error in cross-check C-parameters" is generated.

Structure

Bit	Designation/function
1..0	**Direction of movement** 0 0: deactivated: The internal output is deactivated. 0 1: activated depending on direction: The switch track's sampling signal is used for movement in the positive direction. 1 0: activated depending on direction: The switch track's sampling signal is used for movement in the negative direction. 1 1: activated independent of the direction The switch track's sampling signal is used irrespective of the motion direction.
2	**Control mode** 0: state-controlled: The switch track's sampling signal controls the register bit of the programmable limit switch. 1: time-controlled: The switch track's sampling signal controls the pulse generator's clock input. The pulse generator controls the register bit of the programmable limit switch.

Tab. 4-89: Relevant bits in the parameter

Use

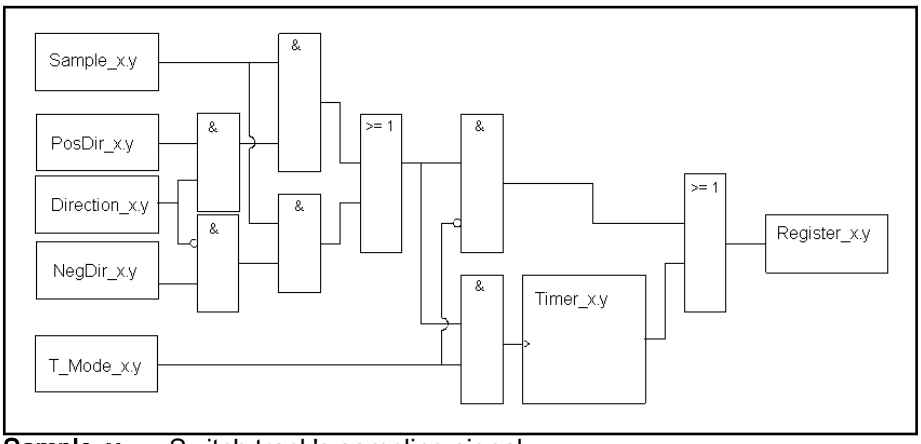
This parameter is used to control the internal register of the programmable limit switch (register_0 and register_1), depending on the direction of movement (forward and/or backward) of the reference axis.

A register bit can be operated directly (state-controlled) or by a pulse generator (time-controlled).

Describing individual parameters, arranged according to types

The control mode influences the dead time compensation (see parameter "C-0-0386, PLS No.4, lead time when switching on" and "C-0-0387, PLS Nr. 4, lead time when switching off").

The pulse duration in time-controlled mode can be defined in parameter "C-0-0394, PLS No.4, switch-on duration".



Sample_x Switch track's sampling signal
PosDir_x Active in positive movement direction
Direction_x Current movement direction
NegDir_x Active in positive movement direction
T_Mode_x Time-controlled mode
Register_x Internal register
Fig. 4-131: Output control

C-0-0393 - Attributes:

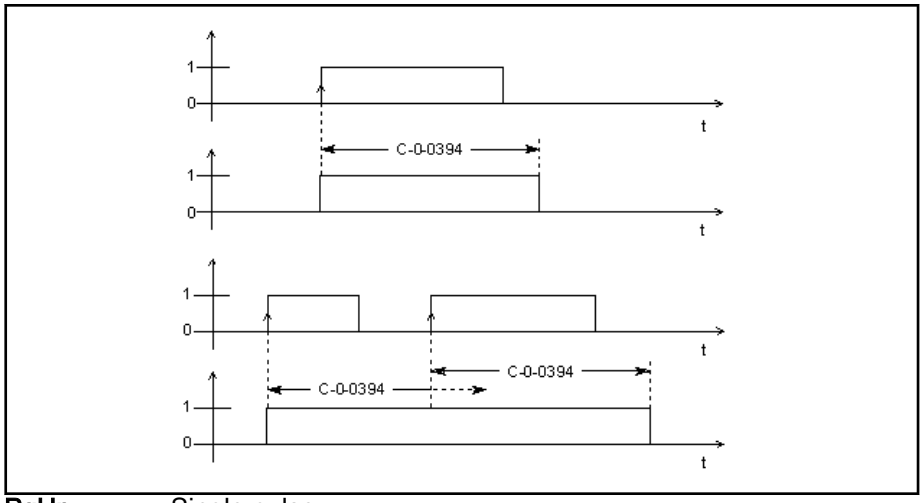
Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0394, PLS No.4, switch-on duration

Function This parameter is used to define the pulse duration in time-controlled mode (see parameter "C-0-0393, PLS No.4, output mode").

The programmable limit switch operates with a cycle time of 125 µs. Within this time period, the programmable limit switch can generate pulses with a maximum duration of one second.



PgUp Single pulse
PgDn Extended pulse

Fig. 4-132: Pulse generator

Use

The pulse generator is started by a rising edge at the clock input. The pulse generator is reset and restarted with each additional rising edge. This extends the output pulse for active pulse generators.



The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

C-0-0394 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	125	1000000	125

C-0-0400, Motion, cycle time, command value

Function

This parameter can be used to set the command value for the MC cycle time.

The MC cycle time indicates the time intervals at which the Motion control provides new command values.

This can be read in the **Motion ▸ Cycle Times** dialog window.

Hardware	Minimum cycle time with sercos II	Minimum cycle time with sercos III
L25		2.0 ms
L45	1.0 ms	1.0 ms
L65	1.0 ms	0.5 ms
MLP		1.0 ms

Tab. 4-90: Minimum cycle time for different hardware combinations

C-0-0400 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT

Describing individual parameters, arranged according to types

Memory:	NVRAM	**Editability:**	P2
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	500	32000	2000

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0001
IndraDrive/ Control:	S-0-0001
HydraulicDrive/ Drive:	S-0-0001
HydraulicDrive/ Control:	S-0-0001
SercosDrive:	S-0-0001

C-0-0401, Time period of the integrated PLC of the MC cycle time

Function This parameter is only intended for internal use.

C-0-0401 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	25	75	50

C-0-0402, Motion, startup of cycle time

Function The time provided for the communication with each drive (service data) when booting can be specified in this parameter.

If IndraDrive is used as a drive, the initial value 1000 µs is sufficient. However, for hydraulic axes, the initial value can be a multiple thereof.

C-0-0402 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1000	32000	1000

C-0-0403, Motion, priority calculation

Function The priority for motion calculation can be set using this parameter.

The priority for motion calculation expresses how urgent it is for the motion calculation task to be executed.



Attention:

Reducing the priority for motion calculation can cause the motion calculation for high priority tasks to be displaced such that it can no longer be processed in the motion cycle C-0-0400 specified for it.

Describing individual parameters, arranged according to types

C-0-0403 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	20	3

C-0-0404, Time slot control

Function This parameter is only intended for internal use.

C-0-0404 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0x00

C-0-0405, PLC, configuration

Function The parameter is used to configuration the general behavior of the integrated PLC.

Structure

Bit	Designation/function
2,1,0	**Start behavior of the PLC** **000:** Last state: If the PLC was in RUN when switched off, it starts when the control is booted. Otherwise, it remains in STOP. **001:** Starts during booting: The PLC starts when booting, regardless of the last state. **010:** Stop: The PLC remains in the STOP state. **011:** Start in the operating mode: The PLC automatically starts when booting in the operating mode. **100:** Last state: If the PLC was in RUN when switched off, it starts when the control is booted. Otherwise, it remains in STOP. In addition, the PLC starts if the STOP state was caused by a PLC exception.

Tab. 4-91: Relevant bits in parameter PLC configuration

Attention:

The PLC no longer starts automatically when switching into the operating mode if (in parameterization mode) a new program was previously being loaded, or start/stop or reset was executed.

C-0-0405 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0x00000000	0x00000007	0x00000001

C-0-0406, Preset of operating state of all PLC applications

Function This parameter is only intended for internal use.

C-0-0406 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	5	0

C-0-0407, Watchdog, communication

Function This parameter can be used to set the time after which a reaction from the communication watchdog is triggered.

The tasks to control communication are of low priority. Due to this reason, they are displaced by tasks with a higher priority, e.g. PLC tasks.

Displacing communication can be tolerated for a certain period. This tolerable period is set via this parameter.

If the watchdog is triggered, the warning "E0370001; System overloaded" is output.

Setting the parameter to 0, the communication watchdog is deactivated and no warning is output.

C-0-0407 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000	500

C-0-0408, Timeslot, communication

Function The time reserved for the communication with the control can be set via this parameter.

During this time, no tasks having a higher priority such as PLC tasks or the motion calculation can run. The time is reserved at the end of a cycle. By increasing this time, the available calculation time for PLC tasks and the task for calculating the motion is reduced.

If a sercos module is active, the specification in percent refers to the MC cycle time (C-0-0400).

If no sercos module is active, the specification in percent refers to a fixed basic value of 4000 µs.

Describing individual parameters, arranged according to types

NOTICE **If the parameter is set to zero in case of an inactive sercos module, no time slot is reserved for the communication.**

If the system load in this state is very high, the communication to the control can become very slow or is canceled.

Use

Example:

- sercos module active

  MC cycle time (C-0-0400) = 2000 µs

  Time slot, communication = 5 %

  The time is reserved for the communication and is 5% of 2000µs. This results in a time span of 100µs reserved in each Motion cycle.

- sercos module inactive

  Basic value = 4000µs

  Time slot, communication = 5 %

  The time is reserved for the communication and is 5% of 4000µs. Result: A time span of 200µs .

C-0-0408 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	20	5

C-0-0410, Motion, cycle time (Tcyc), actual value

Function

This parameter indicates the actual value of the MC cycle time.

The MC cycle time indicates the time intervals at which the Motion control provides new command values.

This can be read in the **Motion ▸ Cycle Times** dialog window.

C-0-0410 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-0412, List of current time slot measurements

Function

This parameter includes the current values of the time measurements of the control`s task system.

Use

The parameter is supplemented by the lists

- "C-0-0413, List of the maximum time slot measurements",
- "C-0-0414, List of the minimum time slot measurements",

The list contains eight measured values in total:

Describing individual parameters, arranged according to types

The list "Display of the Motion times" includes eight measured values in total:

- Is not used by the MLC 10VRS or higher (zero),
- Time for the actual value detection: Period between the beginning and the end of the actual value detection
- Time for the command value generation: Period between the beginning and the end of the command value generation
- Sum of the times for the actual value detection and the command value generation
- Is not used by the MLC 10VRS or higher (zero)
- Interruption period by motion-synchronous PLC tasks
- Total time for Motion calculations: Period between the beginning of the actual value detection and the end of the command value generation
- Is not used by the MLC 10VRS or higher (zero)

This can be read in the **Motion ▸ Cycle times** dialog window.

C-0-0412 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x10	0x00

C-0-0413, List of maximum time slot measurements

Function

This parameter includes the maximum values of the time measurements of the control´s task system. The maxima only have a collector´s value and result from different cycles.

The parameter is supplemented by the lists:

- "C-0-0412, List of the current time slot measurements",
- "C-0-0414, List of the minimum time slot measurements",

The list "Display of the Motion times" includes eight measured values in total:

- Is not used by the MLC 10VRS or higher (zero),
- Maximum value of the time used for the actual value detection: Period between the beginning and the end of the actual value detection
- Maximum value of the time for the command value generation: Period between the beginning and the end of the command value generation
- Maximum value of the times in total for the actual value detection and the command value generation.
- Is not used by the MLC 10VRS or higher (zero)
- Maximum interruption period by motion-synchronous PLC tasks
- Total time for Motion calculations: Period between the beginning of the actual value detection and the end of the command value generation
- Is not used by the MLC 10VRS or higher (zero)

This can be read in the **Motion ▸ Cycle times** dialog window.

The list can be reset to record them again in this window ("C-0-1050, Command: Reset the lists C-0-0413 and C-0-0414").

C-0-0413 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	0	0

C-0-0414, List of minimum time slot measurements

Function

This parameter includes the minimum values of the time measurements of the control´s task system. The minima only have a collector´s value and result from different cycles.

The parameter is supplemented by the lists:

- "C-0-0412, List of the current time slot measurements",
- "C-0-0413, List of the maximum time slot measurements"

The list "Display of the Motion times" includes eight measured values in total:

- Is not used by the MLC 10VRS or higher (zero),
- Minimum value of the time for the actual value detection: Period between the beginning and the end of the actual value detection
- Minimum value of the time for the command value generation: Period between the beginning and the end of the command value generation
- Minimum value of the times in total for the actual value detection and the command value generation.
- Is not used by the MLC 10VRS or higher (zero)
- Minimum interruption period by motion-synchronous PLC tasks
- Total time for Motion calculations: Period between the beginning of the actual value detection and the end of the command value generation
- Is not used by the MLC 10VRS or higher (zero)

This can be read in the **Motion ▸ Cycle times** dialog window.

The list can be reset to record them again in this window ("C-0-1050, Command: Reset the lists C-0-0413 and C-0-0414").

C-0-0414 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	0	0

C-0-0415, CPU load, current

Function

This parameter contains the current CPU load of the control in percent.

C-0-0415 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY

Describing individual parameters, arranged according to types

Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	100.0	---

C-0-0416, CPU load, maximum

Function This parameter contains the maximum measured percentage of CPU load since it was last switched on.

The value can be reset using the parameter "C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417".

C-0-0416 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	100.0	---

C-0-0417, CPU load, minimum

Function This parameter contains the minimum measured percentage of CPU load since it was last switched on.

The list can be reset using the parameter "C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417".

C-0-0417 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	100.0	---

C-0-0418, CPU load, threshold value for warning

Function This parameter contains the threshold percentage value, which once exceeded, a warning due to an excessive CPU load is output.

The current CPU laod can be read out using the parameter "C-0-0415, CPU load, current".

C-0-0418 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	100.0	100.0

Describing individual parameters, arranged according to types

C-0-0420, Motion, watchdog sensitivity

Function This parameter is only intended for internal use.

C-0-0420 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	1	1

C-0-0421, Motion, absolute error counter

Function This parameter indicates the total number of errors that occurred during Motion calculation.

The following errors can occur:

- F0180008: Motion Kernel Exceeded Control Cycle Time
- F5180005: Motion Kernel Exceeded Control Cycle Time
- F5180006: Cycle time exceeded for actual value detection

This can be read in the Cycle times dialog box.

This parameter can be reset using the command "C-0-1052, Command: Reset Parameter C-0-0421 and C-0-0422".

C-0-0421 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	0

C-0-0422, Motion, number of successive errors

Function This parameter indicates the total number of errors that occurred during Motion calculation.

The following errors can occur:

- F0180008: Motion Kernel Exceeded Control Cycle Time
- F5180005: Motion Kernel Exceeded Control Cycle Time
- F5180006: Cycle time exceeded for actual value detection

This can be read in the Cycle times dialog box.

This parameter can be reset using the command "C-0-1052, Command: Reset Parameter C-0-0421 and C-0-0422".

C-0-0422 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0	65535	0

C-0-0423, Motion, cycle counter

Function

The cycle counter is displayed in this parameter. The counter is increased twice in the Motion cycle. One time at the beginning and one time at the end of the cycle. Even parameter values indicate that the Motion kernel is currently not operating and uneven values show that the Motion kernel is operating.

C-0-0423 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4294967295	0

C-0-0425, TaskViewer, buffer size

Function

This parameter can be used to set the size of the TaskViewer buffer.

During a TaskViewer recording, the values are saved in the control's usable memory.

This size of this buffer in the usable memory can be set using this parameter. The larger the buffer, the longer the runtime behavior of the task can be recorded.

This parameter can be set in the "TaskViewer" dialog window.

C-0-0425 - Attributes:

Function:	PARAMETER	**Unit:**	KByte
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	128	10240	1024

C-0-0440, Configuration PM/OM switching

Function

This parameter configures changing between parameterization and operation mode.

Switching of operating modes is triggered via the C-0-1070, command: Switch PM/OM.

Structure

Bit	Name/function
0	Reserved
1	Execute switching for all axes
2-30	Reserved
31	Preselecting the PM/OM switching

Use

Bit 1:

1: Switching is performed for all configured axes supporting the parameterization level.

Read from the parameter A-0-0004 "Axis type" whether the axis supports the parameterization mode.

Bit 31:

0: Switching to parameterization mode

1: Switching to operating mode

Parameterization level support

Irrespective of the control and communication phase, devices can be configured via the parameterization level.

Thus, axes can be moved further, the I/Os can continue to exchange cyclic data and the PLC program keeps running.

Thus, these devices support two modes:

Parameterization mode

- In the parameterization mode, all device parameters - that are not write-protected - can be changed. This does not apply to communication partners such as configuration, timing or user-defined data containers.
- If a device is in the parameterization mode, it remains irrespective of the communication phase.

Operating mode

- Only parameters without write protection in this mode can be changed in the operating mode.
- The parameter crosscheck is performed when switching from parameterization to operating mode.
- The adjustment of A- to S-/P-parameter is executed.

Switching the modes

- For **one** device, switching between the two modes is controlled using the parameter "A-0-0024, Axis state".
- To switch **multiple** devices, the parameter "C-0-1070, Command: PM/OM switching" executed.

  The devices are selected using "A-0-0004 Axis type, bit 15".
- To switch an axis, it has to be in the "Standstill“ state.

  The real axis has to be in the "Power off“ state.

  An axis in the parameterization mode cannot be traversed.

C-0-0440 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x2

C-0-0450, Motion, startup target mode

Function

After the control voltage is switched on, the control starts up a link start up until it reaches a predefined mode.

This mode is defined using this parameter.

Describing individual parameters, arranged according to types

Structure

Value	Motion mode	Display	What is allowed?
2	Parameterization mode	P2 STOP P2 RUN	The control is in parameterization mode. Almost all parameters allow write access.
4	Operating mode	BB STOP BB RUN	The control is in run mode. Only selected parameters allow write access.

C-0-0450 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4	4

C-0-0451, Motion, target mode

Function
This parameter switches the control into the desired target mode:

Structure

Value	Motion mode	Display	What is allowed?
2	Parameterization mode	P2 STOP P2 RUN	The control is in parameterization mode. Almost all parameters allow write access.
4	Operating mode	BB STOP BB RUN	The control is in run mode. Only selected parameters allow write access.

C-0-0451 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4	0

C-0-0452, Motion, current mode

Function
This parameter contains the control's current operation mode.

Describing individual parameters, arranged according to types

Structure

Value	Motion mode	Display	What is allowed?
2	Parameterization mode	P2 STOP P2 RUN	The control is in parameterization mode. Almost all parameters allow write access.
4	Operating mode	BB STOP BB RUN	The control is in run mode. Only selected parameters allow write access.

C-0-0452 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0476, Configured user tasks

Function

This parameter can be used to read out the tasks created by the user.

Tasks that users can create are PLC tasks and user tasks created with the MLPI.

Entry	Meaning	Possible entries
1	Type	**S**xxx: PLC task **U**xxx: User- task
2	Name	Name of the task
3	Priority	Priority of the task
4	Watchdog	**Watchdog** • 0 - not enabled • 1 - enabled
5	Watchdog sensitivity	Sensitivity of the watchdog
6	Watchdog time	Time after which the watchdog is triggered in µs.
7	Start condition	**Start condition for the task** • 0 - cyclic • 1 - event-controlled • 2 - externally controlled • 3 - free
8	External event	**External event** • 0 - no external event • 1 - Sercos • 2 - Motion • 3 - Onboard I/O

Describing individual parameters, arranged according to types

Example:

U001,UserTask,10,0,0,0,0,0,
S001,PlcTask,5,0,0,0,0,0,
S002,MotionTask,2,1,1,2000,2,1

C-0-0476 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	255	0

C-0-0477, Command-actual comparison of the sercos devices

Function This parameter is used for diagnostic purposes. It checks which sercos devices were configured in IndraWorks and which are actually connected to the controller.

Structure The parameter is a list parameter with the following structure:

- Element 1: sercos address of the first incorrectly configured device
- Element 2: Error cause of the first incorrectly configured device
- Element 3: sercos address of the second incorrectly configured device
- Element 4: Error cause of the second incorrectly configured device
- ...
- Element 31: sercos address of the sixteenth incorrectly configured device
- Element 32: Error cause of the sixteenth incorrectly configured device
- ...

Valid values of a sercos address: 1 .. 99

Valid values of an error cause listed in the table.

Value	Description
2	Wrong firmware
4	Wrong function package
6	Wrong firmware and wrong function package
8	Device is disabled in the IndraWorks project or not present, but a device with the corresponding sercos address is still connected with the controller (only sercos III)
16	Device is configured in the IndraWorks project, but there is no device with the applicable firmware and sercos address connected with the controller
32	Wrong type plate information, element L03 (manufacturer code) or L05(device ID) incorrect

Tab. 4-92: Possible error causes

The parameter remains empty if no error was found.

Describing individual parameters, arranged according to types

Use

☞ The parameter "C-0-0477" is only filled with the correct data when leaving phase 2 (P2) for phase 4 (P4). Data stored in the parameter at an earlier point in time, can be incomplete.

Example A (sercos III)

Two drives are connected to the controller.

MPH-05, sercos address 1, function package 0x22.

MPB-04, sercos address 2, function package 0x22.

Three drives are configured in IndraWorks:

MPB-05, sercos address 1, function package 0x22, FWA comparison active, drive is activated

MPB-04, sercos address 2, function package 0x22, FWA comparison active, drive is deactivated

MPH-05, sercos address 3, function package 0x22, FWA comparison active, drive is activated

C-0-0477 indicates:

Element	Value	Comment
1	1	sercos address of the first defective drive
2	2	Drive has the wrong firmware
3	2	sercos address of the second defective drive
4	8	Drive is deactivated in the IndraWorks project, but a drive with the same sercos address is still connected with the controller (only sercos III)
5	3	sercos address of the third defective drive
6	16	Drive is configured in the IndraWorks project, but there is no drive with the applicable firmware and sercos address connected with the controller

Example B

Three drives are connected to the controller.

MPH-05, sercos address 1, function package 0x22.

MPB-04, sercos address 2, function package 0x22.

MPH-05, sercos address 3, function package 0x22.

The following are configured in IndraWorks:

MPD-05, sercos address 1, function package 0x22, FWA comparison active, axis is deactivated

MPD-05, sercos address 2, function package 0x22, FWA comparison active, axis is deactivated

MPH-05, sercos address 3, function package 0x22, FWA comparison active, drive is activated

MPH-05, sercos address 4, function package 0x22, FWA comparison active, drive is deactivated

MPB-04, sercos address 5, function package 0x22, FWA comparison active, drive is activated

C-0-0477 indicates:

Describing individual parameters, arranged according to types

Element	Value	Comment
1	1	sercos address of the first defective drive
2	8	Drive is deactivated in the IndraWorks project, but a drive with the same sercos address is still connected with the controller (only sercos III)
3	2	sercos address of the second defective drive
4	8	Drive is deactivated in the IndraWorks project, but a drive with the same sercos address is still connected with the controller (only sercos III)
5	5	sercos address of the third defective drive
6	16	Drive is configured in the IndraWorks project, but there is no drive with the applicable firmware and sercos address connected with the controller

C-0-0477 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	255	0

C-0-0478, sercos device configuration

Function The parameter contains the configuration of the sercos devices.

Structure It is stored as character string and structured as follows:

Entry	Description	Prefix	Possible entries
1	sercos address	A	1-99
2	Firmware version	F	MPH-03, others, ...

Describing individual parameters, arranged according to types

Entry	Description	Prefix	Possible entries
3	Axis properties	P	*Bit 0: Axis without actual value position feedback (open-loop operation)* • 0 - Inactive • 1 - Active *Bit 1: Axis with actual value position feedback (closed-loop operation)* • 0 - Inactive • 1 - Active **Bit 2: Reserved** **Bit 3: Reserved** *Bit 4: Axis with servo functionality* • 0 - Inactive • 1 - Active *Bit 5: Axis with synchronous functionality* • 0 - Inactive • 1 - Active
4	Configuration	C	*Bit 0: FWA comparison* • 0 - active • 1 - inactive *Bit 1: Interpolation* • 0 - in the drive • 1 - in the control *Bit 4: Electr. type plate comparison* • 0 - Inactive • 1 - Active
5	Device state (active, parking axis, deactivated)	S	0: Active 1: Parking 2: Deactivated
6	Available addresses in the sercos device	V	1-99|1-99 (The second entry is optional for double-axis devices)
7 (optional)	Manufacturer code	L03	Device-specific, S-0-1300.0.3
8 (optional)	Device ID	L05	Device-specific, S-0-1300.0.5

Tab. 4-93: Drive configuration

Use



Describing individual parameters, arranged according to types

Example:

3 drives

A1, FFWA-INDRV*-MPE-17, P0x00000022, C0x00000000, S0x00000000, V1

A2, FFWA-INDRV*-MPD-07, P0x00000022, C0x00000000, S0x00000002, V2|3

A2, FFWA-INDRV*-MPD-07, C0x00000000, S0x00000002, V2|3

A4, FFWA-INDRV*-MPH-06, P0x00000022, C0x00000000, S0x00000000, V1,L03100,L05MPH-06

- If a drive is **deactivated** in C-0-0478, create an axis with this drive. It can be written on all A-parameters of this axis. There is no transfer to the S-/P-parameters. The drive does not have to exist physically.
- If a drive is **parked** in C-0-0478, the command "S-0-0139, C1600 Parking axis" is activated in the drive. The drive has to be in the sercos ring.
- The entries 7 and 8 are optional as long as the comparison of the electronic type plate is not active in the entry 4 (prefix C).

C-0-0478 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Drive Setup"

C-0-0479, Extended sercos device information

Function

During the transition from P0 to P2, the sercos bus is scanned and the addresses of all connected sercos devices are determined.

This list is displayed in the parameter "C-0-0481, List of detected sercos devices".

In addition, the command "C-0-1009, Command: Determine extended sercos device information ", can be used to retrieve the device firmware and for drives the enabled function package for all connected devices. The command can only be executed in P2.

Data read is displayed in the parameter "C-0-0479, Extended sercos device information".

Structure

Entry	Significance	Prefix	Possible entries
1	sercos address	A	0-511
2	Firmware version	F	Device-specific, S-0-1300.0.9 or S-0-0030 or S-0-1300.0.4 according to availability in the device
3	Function package	P	Content of P-0-2004

Describing individual parameters, arranged according to types

Entry	Significance	Prefix	Possible entries
4	Available addresses in the sercos device	V	0-511|0-511 (The second entry is optional for double-axis devices)
5	Manufacturer code	L03	Device-specific, S-0-1300.0.3
6	Device name	L04	Device-specific, S-0-1300.0.4
7	Device ID	L05	Device-specific, S-0-1300.0.5
8	Function revision	L07	Device-specific, S-0-1300.0.7
9	FSP type and version	T01	sercos-specific, S-0-1302.0.1

Tab. 4-94: Device configuration

Use

Example:

1 I/O module + 2 drives

A65,FR-ILB S3 AI12 AO4 SSI-IN4,P0x00000000,V65,L03100,L04R-ILB S3 AI12 AO4 SSI-IN4,L05R911171949,L070,T010x00010001,

A1,FFWA-INDRV*-MPH-07V24-D5-1-SNC-ML,P0x00000222,V1,L03100,-,L05FWA-INDRV*-MPH-07,-,T010x00020001,

A216,FFWA-INDRV*-MPB-07V18-D5-1-SNC-TF,P0x00000222,V16,L03100,-,L05FWA-INDRV*-MPB-07,-,T010x00020001

Since not all information is available, the missing entries are labeled with a '-'.

C-0-0479 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Current Drive Config"

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	P-0-2004, S-0-0030, S-0-1300.0.3,, S-0-1302.0.1
IndraDrive/ Control:	S-0-0030, S-0-1300.0.3,, S-0-1302.0.1
HydraulicDrive/ Drive:	P-0-2004, S-0-0030, S-0-1300.0.3,, S-0-1302.0.1
HydraulicDrive/ Control:	S-0-0030, S-0-1300.0.3,, S-0-1302.0.1
SercosDrive:	S-0-0030

C-0-0480, Configured axis number

Function This parameter shows the amount of configured axes.

Describing individual parameters, arranged according to types

C-0-0480 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0481, List of detected sercos devices

Function This parameters displays devices found at the sercos bus in the order in which they are found.

Use **Example:**

3 drives with the addresses 1, 2 and 5 are running at the bus.

C-0-0481 indicates:

Element	Value	Comment
1	1	Drive 1 found
2	5	Drive 5 found
3	2	Drive 2 found

C-0-0481 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0482, List of non-linked sercos devices

Function This list parameter displays the sercos devices found at the sercos bus and not assigned to a real axis.

A drive can only be assigned one real axis, but several encoder axes are possible.

C-0-0482 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	0	0

C-0-0483, List of configured axes

Function This parameter shows the configured axes of the system. The values represent the logical axis address.

Use **Examples:**

3 axes (axis 1, 2 and 5) are configured in the system.

This means C-0-0483 looks like:

Element	Value	Comment
1	1	Axis 1 is configured
2	2	Axis 2 is configured
3	5	Axis 5 is configured

C-0-0483 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	512	0

C-0-0484, Axis configuration list

Function This parameter defines the axis system. It configures the axes and assigns the drives.

Structure The parameter is a list parameter with the following structure:

- Element 1: axis configuration of axis 1
- Element 2: drive assigned to axis 1
- Element 3: axis configuration of axis 2
- Element 4: drive assigned to axis 2
- ...
- Element 31: axis configuration of axis 16
- Element 32: drive assigned to axis 16
- ...

Value	Comment
0	No axis configured
8	Real axis configured
16	Virtual axis configured
32	Encoder axis configured
64	Link axis configured
128	Controller axis

Tab. 4-95: Valid values of an axis configuration

Describing individual parameters, arranged according to types

Use

If link axes have been configured and not deactivated by parameter "A-0-0024, Axis state", it is checked when switching to phase 4 whether the control participates in the link ("C-0-0701, C2C, configuration of function modes").

If this is not the case, parameter "C-0-0484, Axes configuration list" is entered into parameter "C-0-0111, List of all invalid C-parameters" and an incorrect configuration is displayed ("F0160024, Error in cross-check of C-parameters").

Valid drive values: 1 .. 99

A drive can only be assigned one real axis, but several encoder axes are possible.

Example A

The drive with the address 1 is connected to the control. Two axes are desired:

- Axis 1 is a real axis connected to drive 1,
- Axis 2 is a virtual axis.

C-0-0484 indicates:

Element	Value	Comment
1	8	Axis 1 is a real axis
2	1	Drive with address 1 used for the axis
3	16	Axis 2 is a virtual axis
4	0	No drive used/required
5	0	Axis 3 is not defined
6	0	No drive used/required
....		
31	0	Axis 16 is not defined
32	0	No drive used/required
....		

Example B

Two drives with the addresses 1 and 2 are connected to the control. Three axes are desired:

- Axis 1 is a real axis connected to drive 1
- Axis 2 is an encoder axis connected to drive 1
- Axis 3 is a real axis connected to drive 2,

C-0-0484 indicates:

Element	Value	Comment
1	8	Axis 1 is a real axis
2	1	Drive with address 1 used for the axis
3	32	Axis 2 is an encoder axis
4	1	Drive with address 1 used for the axis
5	8	Axis 3 is a real axis

Element	Value	Comment
6	2	Drive with address 2 used for the axis
7	0	Axis 4 is not defined
8	0	No drive used/required
....		
31	0	Axis 16 is not defined
32	0	No drive used/required
....		

C-0-0484 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	512	0

4.2.3 C-0-0500 - C-0-0999

C-0-0500, sercos master, configuration

Function
This parameter configures the drive bus interface.

Structure

Parameter value	Configuration
0	sercos bus

C-0-0500 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0501, sercos master, baud rate

Function
This parameter configures the baud rate of the drive bus in Mbaud.

Structure

Parameter value	Configuration
2	Baud rate is 2 Mbaud
4	Baud rate is 4 Mbaud
8	Baud rate is 8 Mbaud
16	Baud rate is 16 Mbaud

C-0-0501 - Attributes:

Function:	PARAMETER	**Unit:**	Mbaud
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	2	16	4

C-0-0502, sercos master, OWG length

Function This parameter is used to adjust the control's transmitting power to the length of the optical fiber.

The length specified refers to the optical fiber cable from X7S1 to the first drive.



Generally, it is sufficient to use the default value of 5 m (197 in) to describe the fiber optic length regardless of the actual length of the fiber optic cable.

C-0-0502 - Attributes:

Function:	PARAMETER	**Unit:**	m
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.1	50.0	5.0

C-0-0503, sercos master, cycle time

Function The sercos cycle time can be set using this parameter.

The sercos cycle time defines the interval in which the cyclical data is transferred.

C-0-0503 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	250	65000	2000

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0002
IndraDrive/ Control:	S-0-0002
HydraulicDrive/ Drive:	S-0-0002
HydraulicDrive/ Control:	S-0-0002
SercosDrive:	S-0-0002

C-0-0504, sercos master, SVC busy timeout

Function The parameter determines the service channel busy timeout for sercos III.

If the busy bit is present for a longer time at a sercos III slave during a service channel transmission, a service channel error message is generated.

The changed value only becomes active after a successfully completed sercos phase switching. When changing the value in sercos phase 2, phase switching via phase 0 is required to enable the value for phase 2.

C-0-0504 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1000	65000	2000

C-0-0505, sercos master, consumer timeout

Function

When CP4 is reached, the controls of all synchronous sercos participants expect active sercos connections. This means that the NewData bit changes cyclically in all sercos connections consumed by the control.

The parameter specifies the period that is waited for the active connections of the sercos participants to the control before the error F80B0019 is output.

C-0-0505 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	100	65000	10000

C-0-0506, sercos Master, sercos III, configuration of function modes

Function

The configuration bits for the onboard sercos interface are stored in the parameter. The parameter is only active for sercos III.

Structure

Bit	Name/function
0...6	Reserved
7	Disable warning E00B0179
8	Enable automatic redundancy restoration
9...31	Reserved

Tab. 4-96: C-0-0506, sercos master, sercos III, configuration of the function modes

Use

Bits 0...3: Reserved

Bit 7: Disable warning E00B0179

If bit 7 is not set (default setting), a warning E00B0179 is output when the redundancy loss is detected. As long as no ring topology is detected, this warnings remains active. It the sercos bus is not to be operated in a ring topology, the warning can be disabled by setting the bit.

Bit 8: Enable automatic redundancy restoration

If bit 8 is set, the automatic redundancy restoration starting from phase 2 is enabled. The control cyclically checks the sercos topology status. If no redundant ring topology is detected, the redundancy restoration is automatically triggered every 30 seconds.

Describing individual parameters, arranged according to types

If redundancy cannot be restored, an error message is not output. To enable the automatic redundancy restoration, the warning has to be enabled in case of redundancy loss (bit 7 = 0).

C-0-0506 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0507, sercos master, allowed telegram losses

Function

This parameter parameterizes the permitted telegram failures before reporting the error F80B0004. The parameter indicates the number of permitted AT telegram failures that can occur directly one after each other in phase 4.

C-0-0507 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	65535	2

C-0-0510, sercos master, address configuration

Function

This parameter displays the devices found on the sercos bus along with their sercos addresses. These are sorted into the topological sequence of the bus wiring.

If it is written on the parameter in phase 2, the sercos addresses are written in the individual devices.

Use

Example:

3 devices with sercos addresses 1, 2 and 5 are connected.

C-0-0510 indicates:

Element	Value	Comment
1	1	Device 1 found at topology position 1
2	5	Device 5 found at topology position 2
3	2	Device 2 found at topology position 3

C-0-0510 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	511	---

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-1040
IndraDrive/ Control:	S-0-1040
HydraulicDrive/ Drive:	S-0-1040
HydraulicDrive/ Control:	S-0-1040
SercosDrive:	S-0-1040

C-0-0511, sercos master, binary inputs, command values

Function

The control bits for the onboard sercos interface are stored in the parameter. The parameter is only active for sercos III.

Structure

Bit no.	Name
0...3	Reserved
4	Restore redundancy
5...31	Reserved

Tab. 4-97: Status of the onboard sercos interface

Use

Bits 0...3: Reserved

Bit 4: Restore redundancy

If bit 4 is set, the control tries to restore the redundant ring topology after a loss of redundancy in the sercos ring. This is only possible if the reason for the loss of redundancy is detected and eliminated first. After the function is completed in the control, the control resets the bit to 0. If the redundancy could not be restored, the error message F00B0173 is output.

C-0-0511 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0514, sercos master, status

Function

The diagnostic bits for the onboard sercos interface are stored in the parameter.

Structure

Bit no.	Designation
0	Reserved
1	Error port 1
2	Error port 2
3	Redundancy error
4	Reserved
5	Phase switching active
6...26	Reserved
27	sercos phase 0 active

Describing individual parameters, arranged according to types

Bit no.	Designation
28	sercos phase 1 active
29	sercos phase 2 active
30	sercos phase 3 active
31	sercos phase 4 active

Tab. 4-98: Status of the onboard sercos interface

Use

Bit 0: Reserved

Bit 1: Error port 1

An interruption was detected between port 1 of the control and the first device. The sercos address of the first device can be read out in C-0-0517.

Bit 2: Error port 2

An interruption was detected between port 2 of the control and the last device. The sercos address of the last device can be read out in C-0-0517.

Bit 3: Redundancy error

An interruption between two devices was detected in the sercos ring. The sercos addresses - between which an interruption was detected - can be read from C-0-0517.

Bit 5: Phase switching active

The bit remains active until the phase is successfully switched or terminated with an error (e.g. when switching from sercos phase 2 to phase 4)

Bit 27: sercos phase 0 active

The bit is active during sercos phase 0.

Bit 28: sercos phase 1 active

The bit is active during sercos phase 1.

Bit 29: sercos phase 2 active

The bit is active during sercos phase 2.

Bit 30: sercos phase 3 active

The bit is active during sercos phase 3.

Bit 31: sercos phase 4 active

The bit is active during sercos phase 4.

C-0-0514 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0515, sercos master, sercos III, FPGA, image

Function

This parameter is used for an extended diagnostics for sercos III.

C-0-0515 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY

Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0516, sercos master, slave identification

Function

The parameter commands the identification function of the sercos LEDs to the connected devices. If the identification function is started in one device, the sercos LED flashes with 4 Hz in orange.

The identification function is started in the corresponding device by entering topology positions in these list parameters. The identification function remains active in the other devices until the parameter is changed or the next phase switching takes place. During phase switching, the complete list parameter is deleted and the identification function is closed in all devices.

The maximum number that can be commanded is equal to the number detected at the sercos bus in phase 0.

Topology position 1 is assigned to the first device at master port 1. For further devices, it is increasingly counted along the cabling.

Structure

Element	Value
1	First device for which the identification function is started.
2	Second device for which the identification function is started.
...	Further devices for which the identification function is started.

Tab. 4-99: C-0-0517, sercos master, slave identification

C-0-0516 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	512	0

C-0-0517, sercos master, addresses ring break

Function

The list parameter contains two list elements filled with the sercos address of the slaves at the end of the lines in a line topology. If the ring is available, the two list elements have the value 0. If no slave is connected to the port of the master, the respective list element displays the value 0. The parameter can be used to diagnose a ring break.

Structure

Element	Value
1	sercos address of the slave at the end of the line at port 1
2	sercos address of the slave at the end of the line at port 2

Tab. 4-100: C-0-0517, sercos master, addresses, ring break

C-0-0517 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0518, sercos master, position ring break

Function

The parameter indicates a topology position of a ring interruption. The topology position refers to the connected devices starting at port 1 of the master. The ring interruption is between this device and the closest device seen from the topology.

In case of topology position 0, the interruption takes place directly between the master port 1 of the control and the first slave.

In case of topology position 65535, no ring interruption is detected.

C-0-0518 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-0519, sercos master, sercos III, internal connection configuration

Function

This parameter specifies all connections managed by IndraWorks. This parameter is checked during the online/offline comparison and updated if required.

The configuration is stored in CSMCfg_bin format.

C-0-0519 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0520, sercos master, sercos III, external connection configuration

Function

External applications (e.g. PLC program) can store their connection configuration incrementally in this parameter. When reading the parameter, a summary of all previously incrementally specified connection configurations is returned. If the parameter content is deleted, all previously incrementally stored connection configurations are deleted. This parameter is not checked during the online/offline comparison. An external application is responsible for the management.

The configuration is stored in CSMCfg_bin format.

In the external connection configurations, only values >= 10.000 may be used for the AppID in CSMCfg_bin format.

Describing individual parameters, arranged according to types

C-0-0520 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0521, sercos master, sercos III, connection configuration active

Function

The parameter contains the complete configuration of sercos III connections.

The configuration is stored in CSMCfg_bin format.

C-0-0521 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0535, sercos master, error counter for Port1 and Port2

Function

The parameter is the image of the sercos FPGA register "SercosErrorCount" in which all incorrect telegrams (e.g. FCS errors) are displayed related to the port.

The error counters stop at a maximum of 65535. The error register is not automatically deleted in the FPGA. Deletion is only carried out by writing on the parameter.

Structure

Bit	Name/function
15-0	Error counter Port1
31-16	Error counter Port2

Tab. 4-101: C-0-0535, sercos III: Error counters Port1 and Port2

C-0-0535 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0620, Diagnostic memory index

Function

This parameter is used to select an arbitrary entry in the internal control error memory for system diagnostics.

The entries selected in this parameter can be output using parameter "C-0-0621, Diagnostics, indexed message".

Describing individual parameters, arranged according to types

The error memory is chronologically sorted.

The possible indexes are created from parameter "C-0-0624, Diagnostics, absolute indices".

This parameter is only intended for internal use.

C-0-0620 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x1	0xFFFFFFFF	0x1

C-0-0621, Diagnostics, indexed message

Function

This parameter is used to display the diagnostic message from the control's diagnostic memory, which were selected using parameter "C-0-0620, Diagnostic memory, index".

The data is displayed in binary form, i.e. it is not legible.



This parameter is only intended for internal use.

C-0-0621 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of INT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0622, Diagnostics, number of messages in the memory

Function

This parameter contains the number of messages stored in the diagnostic memory.

C-0-0622 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE	**PLC data type:**	INT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	1

C-0-0623, Diagnostics, last reset message

Function

This parameter is used to display the absolute index of the last reset message from the control's diagnostic memory.

This parameter is only intended for internal use.

C-0-0623 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x01	0xFFFFFFFF	0x01

C-0-0624, Diagnostics, absolute indices

Function In this case, the absolute indices of the control error memory's continuous numbering are displayed.

This parameter is only intended for internal use.

C-0-0624 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0625, Diagnostics, display message

Function This parameter contains the current display message in binary form.

This parameter is only intended for internal use.

C-0-0625 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	INT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of INT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0626, Diagnostics

Function This parameter contains the current relevant control diagnostic in text form.

The prefix to the text is the respective content from parameter "C-0-0627, Diagnostic number".

Example:

"F0220202, Invalid axis number"

C-0-0626 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	---

Describing individual parameters, arranged according to types

C-0-0627, Diagnostic number

Function This parameter stores the diagnostic number shown in the display.

This enables the user to generate his own diagnostics using this number (HMI, additional languages).

C-0-0627 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0650, Diagnostics, status word

Function This parameter contains the control's status information version.

Structure

Bit	Designation/function
0	**Message** 0: there is no message, 1: there is at least one message.
1	**Warning** 0: there is no warning, 1: there is at least one warning.
2	**Class 0 error** 0: there is no class 0 error, 1: there is at least one class 0 error.
3	**Class 1..9 error** 0: there is no class 1..9 error, 1: there is at least one class 1..9 error.
4	**System reset**
15...5	reserved
16	**System in Phase0**
17	**System in Phase1**
18	**System in Phase2**
19	**System in Phase3**
20	**System in Phase4**
21	**Phase switching active**
30..22	reserved
31	**Common message** 0: there is no warning or error. 1: there is at least one warning or error of some class. Messages do not influence the bit

Describing individual parameters, arranged according to types

C-0-0650 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x01

C-0-0660, Dispay, display period of messages

Function

The display duration of diagnostic messages on the display can be configured using this parameter.

If this parameter is set to "0", nothing is output on the display.

An entry is still made in the diagnostic memory.

C-0-0660 - Attributes:

Function:	PARAMETER	**Unit:**	s
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0xFFFFFFFF

C-0-0670, List of active trace modules

Function

This parameter contains a list of all activated Trace modules. Adding and removing module names can activate or deactivate modules.

C-0-0670 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	" "

C-0-0671, Trace, storage settings

Function

Trigger, saving and file settings are activated by setting individual bits via this parameter.

Structure

Bit	Function
0	Trigger on DSH message
1	Trigger on Trace warning
2	Trigger on Trace error
3-7	Reserved
8	Saving after specified time
9	Saving if buffer is full
10	Saving after trigger signal

Describing individual parameters, arranged according to types

Bit	Function
11	Reserved
12	Save trace in new file (attaching time)
13-15	Reserved

C-0-0671 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x0000	0xFFFF	0

C-0-0672, Save trace after this DSH message

Function In this parameter, a DSH message can be saved after the Trace buffers are blocked.

C-0-0672 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0xFFFFFFFF	0

C-0-0673, Save trace in DSH message mask

Function A DSH message mask can be set using this parameter. That means it can be triggered on error groups, e.g.

C-0-0672 = 0xF12C0492 and

C-0-0673 = 0xFF000000

⇒ It is triggered on all messages starting with 0xF1....

C-0-0673 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00000000	0xFFFFFFFF	0

C-0-0674, Save trace after specified time

Function This parameter can be used to determine a time interval after which all Trace buffers are saved regularly.

C-0-0674 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x0000000A	0xFFFFFFFF	20

C-0-0675, Save trace under this file name

Function

A file name can be specified in this parameter. The Trace recordings are saved under this file name.

If no name is specified, the recordings are saved under the respective buffer names.

C-0-0675 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xff	---

C-0-0676, Percentage of trace data saved after trigger signal

Function

The parameter determines the number of measured values (in percent of the buffer size) that should still be recorded after the trigger event.

C-0-0676 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	100	50

C-0-0700, C2C, cycle time (Tcyc), command value

Function

In parameterization mode, these parameters can be used to set the command value for the cycle time in the cross connection.

Use

The control link cycle time indicates the time intervals at which the motion controller makes new command values in the cross connection available.

It is displayed in the diagnostics dialog for the CrossCom (CFL01.1-Q2) and C2C CrossCom (CFL01.1-R3) function modules and can be written or modified in the configuration dialog.

The only valid values are 2000 ms 4000 ms and 8000 ms.

The value set must be the same as "C-0-0400, Motion, cycle time, command value " and "C-0-0503, Master communication, cycle time"

This is checked when switching into operating mode.



This parameter is write-protected in a C2C slave depending on the configuration. A C2C slave receives its command value for the cycle time via the connection from the C2C master in the C2C start-up.

Describing individual parameters, arranged according to types

C-0-0700 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	2000	8000	2000

C-0-0701, C2C, configuration of function modes

Function

In parameterization mode, it can be specified in this parameter if the control participates in the cross connection and with which functionality.

Structure

Bit	Designation/function
0	**Control link via CrossCom (CFL01.1-Q2) or C2C CrossCom (CFL01.1-R3)** 0: Control is the only control, 1: Control participates in the link.
1	**Function as link participant** 0: Control is a link slave, 1: Control is a link master.
3..2	reserved
4	**Ring structure for CrossCom (CFL01.1-Q2)** 0: Single ring 1: Double ring

Tab. 4-102: MLC in the link

C2C CrossCom (CFL01.1-R3)

Bit 4: Ring structure for CrossCom (CFL01.1-Q2) is only effective and can only be modified for CrossCom participants.

For a C2C participant (CFL01.1-R3), setting this bit is rejected as invalid operation data. For C2C, the physical structure (ring or line/double line) is automatically recognized.

Use

CrossCom (CFL01.1-Q2)

If link axes have been configured, when switching to phase 4 it is checked whether or not the control is participating in a link ("C-0-0701, C2C - configuration of function modes").

If this is not the case, parameter "C-0-0484, Axes configuration list" is entered into parameter "C-0-0111, List of all invalid C-parameters" and an incorrect configuration is displayed ("F0160024, Error in cross-check of C-parameters").

The parameter is displayed in the diagnostics dialog for the CrossCom (CFL01.1-Q2) and C2C CrossCom (CFL01.1-R3) function modules and can be described or modified in the configuration dialog.

C-0-0701 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x00

C-0-0702, C2C, OWG length

Function

In parameterization mode, this parameter can be used to adjust the transmitting power of the CrossCom function module to the length of the optical fiber cable.



Due to the configuration, this parameter is write-protected for sercos III C2C link (no FOC connections).

Use

The first length specified in the list refers to the optical fiber cable from X7S1 to the next participant connected in the primary ring.

The second length specified in the list refers to the optical fiber cable from X7S3 to the next participant connected in the secondary ring.

Both lengths are displayed in the diagnostics dialog for the CrossCom function module and can be written or modified in the configuration dialog.



Generally it is sufficient to use the default value of 2 m to describe the fiber optic length regardless of the actual length of the fiber optic cable.



The transmitting power is not adjusted in the operating mode until start up.

C-0-0702 - Attributes:

Function:	PARAMETER	**Unit:**	m
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.1	50.0	5.0

C-0-0703, C2C, configuration of master axes

Function

sercos II link (CFL01.1-Q2):

Both local axes of the control which are to make their axis positions available in the cross connection can be entered in this parameter in parameterization mode (P2).

The first logical axis address specified in the list determines the first master axis in the cross connection and the second axis address determines the second master axis. To configure a master axis, the axis must first be created in the axis configuration list (C-0-0484).

Both of these configured axis positions are sent cyclically from each link slave in its link AT as master position A (first axis address) and master position B (second axis address) to the link master.

The link master copies the positions of all link ATs into the link MDT and adds both of its configured axis positions. The position of both axis positions within the link MDT are firmly fixed to the link address.

Describing individual parameters, arranged according to types

C2C link (CFL01.1-R3):

This parameter is write-protected in the C2C link and is used only to provide a clear display of the local axes of the control, which are to make their axis positions available in the cross connection. The configuration of these producer axes for C2C is carried out using parameter C-0-0778, "Command configuration of the link".

The first logical axis address specified in the list determines the data for the first master axis in the cross connection and the nth axis address determines it for the nth master axis. In order to configure a master axis, the axis must first be created in the axis configuration list (C-0-0484).

These configured axis positions are sent cyclically from each link slave in its link AT as a master position in 'Double' data type to the link master. In addition to the master axis position, each producer axis also makes its current axis status (A-0-0021) and modulo value (A-0-0045) available cyclically in the link.

The link master copies the cyclical data of all link ATs into the link MDT and adds its configured data. The position of the cyclical data within the link MDT is a result of the command configuration in C-0-0778.

Structure

sercos II link (CFL01.1-Q2):

LinkAdr = 2 * (MlcAdr - 1) + AxisAdr.

LinkPos1	LinkPos2	LinkPos3	LinkPos4	...	LinkPos2N-1	LinkPos2N
MLC1:PosA	MLC1:PosB	MLC2:PosA	MLC2:PosB		MLCN:PosA	MLCN:PosB

Tab. 4-103: Fixed assignment of MDT addresses to MLC and axis addresses

C2C link (CFL01.1-R3):

Example: As the first link participant, MLC 4 produces the C2C data for local axes 3, 1 and 6 in the link. The 9 data produced (A-0-0021, A-0-0045 and A-0-0101 for axes 1, 3 and 6 respectively) are specified using C-0-0778 as follows:

C2CData1	C2CData2	C2CData3	C2CData4...6	C2CData7	C2CData8	C2CData9
MLC4, A003: A-0-0101	MLC4, A003: A-0-0021	MLC4, A003: A-0-0045	MLC4,A001:..... ..	MLC4, A006: A-0-0045	MLC4, A006: A-0-0101	MLC4, A006: A-0-0021

Tab. 4-104: Configurable assignment of MDT addresses to MLC and axis addresses (see C-0-0778)

Use

sercos II link (CFL01.1-Q2):

A local link axis can access these axis positions using the parameter "A-0-0008, Link axis, master axis selection".

Both master axes can be selected or written in the settings dialog for the CrossCom (CFL01.1-Q2) function modules.

C2C link (CFL01.1-R3):

In C2C there are no local link axes for access to the link data. With multi-axis function blocks the PLC can access the desired master axis position from the link directly using the master axis structure AXIS_REF. The address of the control (removed or local) and the address of the local axis of this control are entered in AXIS_REF for this purpose.

Due to the configuration, this parameter is write-protected for C2C, as the C2C command configuration is performed using parameter C-0-0778.

Parameter C-0-0703 is only used for C2C for improved diagnostics of the local producer axes.

C-0-0703 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	---

C-0-0704, C2C, binary inputs, command values

Function

In operating mode the user can use this parameter to set and delete the binary inputs for the cross connection.

The binary command values in this parameter become only effective if no PLC program is loaded. Otherwise they are cyclically overwritten by the binary PLC command values in the ControlData (Shared Memory) structure.

Use

Bits 0..0.3: 4 synchronous link inputs

The synchronous link inputs "Link SYNCn" are used with enabled link participants for simultaneously setting/deleting the binary status bit "Link participant m, input link SYNCn enabled" (m = 1..64, n = 1..4).

If the link participant m (m = 1..64) sets/deletes the input "Link SYNC1" (bit 0), all link participants (including participant m) simultaneously set/delete the status "Link participant m, input link SYNC1 enabled" (see parameter C-0-0713).

This mechanism, for example, can be used to start the same PLCopen function blocks or the same processes on all controls simultaneously.

Bit 4: Restore redundancy

Bit 4: Restoring redundancy can only be modified or effective for CrossComm participants (CFL01.1-Q2) and the C2C master (CFL01.1-R3).

For a C2C slave (CFL01.1-R3), setting this bit is rejected as invalid operation data.

When bit 4 is set, after a loss of redundancy in the link ring, the control tries to restore the redundant link structure with primary and secondary ring (sercos II: double ring) or ring topology (sercos III: ring).

But this is only possible if the reason for the loss of redundancy is recognized and eliminated first.

Bit 5: Enable hot plug

Describing individual parameters, arranged according to types

☞ Bit 5: Enabling the hot plug can only be modified or effective for the C2C master (CFL01.1-R3).

For a C2C slave (CFL01.1-R3) or a CrossComm participant (CFL01.1-Q2), setting this bit is rejected as invalid operation data.

Bit 5 is only effective with a C2C master with a sercos III interface (CFL01.1-R3).

If it is set, the C2C master executes the hot plug mechanism. If a new (or re-booted) C2C slave has been physically added to the running link the C2C master will insert it into the link during operation. If no new participant exists, the C2C master reports a hot plug error.

After deleting bit 5, the C2C master does not execute the hot plug mechanism, even if a new (or rebooted) C2C slave has been physically added to the running link. If the new or rebooted C2C slave recognizes that the C2C master does not support or execute a hot plug, it generates a corresponding diagnostic message.

☞ If the parameter "C-0-0031, Control address" has the value "0", this parameter cannot be read.

C-0-0704 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

C-0-0705, C2C, calibration of dead time compensation

Function

In parameterization mode, the percentage of linear dead time compensation in the cross connection for the axes configured in "C-0-0703, C2C, configuration of master axes" can be set in this parameter.

The first value specified in the list refers to the first master axis in the cross connection and the second value adjusts the dead time compensation for the second master axis.

☞ In C2C this parameter is write-protected depending on the configuration. Calibration of dead time compensation is not supported in the C2C link.

The **Adjustment** is in the interval

0: no dead time compensation (0%)

100: linear dead time compensation (100%)

Use

The adjustment is displayed in the diagnostics dialog for the CrossCom function module and can be written or modified in the configuration dialog by the PLC and using IndraWorks.

Notes on dimensioning:

Because the consumers receive the producer's position values only after one cycle of the sercos ring, this is referred to as "dead time". The consumer axis lags behind.

To minimize this effect, an automatic compensation for dead time is supported for every link axis. This means that in the position values made available in the link are extrapolated, i.e. pre-calculated position values are made available to provide the slave axes with position values that are as close to identical as possible.

Very good pre-calculations are made for the consumers for the continuously changing position values of the producing axes. For non-continuous changes overshoots can occur on the consumer side due to unsuitable pre-calculations. If such cases are expected, the dead time compensation should be set to values less than 100%, i.e. the pre-calculation yield corresponding "reductions". However, this causes the consumer to lag behind.

The following dependencies and rules apply for the dead time compensation:

- A value of 100% produces the best possible correlation of the producer and consumer position values.
- The shorter the sercos cycle time for the link ring, the better the pre-calculation functions and the lower the risk of overshooting on the consumer side.
- The risk of overshooting increases with the cascading depth on the consumer side, i.e. if a consumer makes a link axis available in the link again, etc. If overshoot effects occur (e.g. mechanical vibrations/ machine humming or warnings regarding excessive jerk and acceleration at consumer axes or their slave axes), the dead time compensation values can be changed based on the following table:

Cascading depth	Value for dead time compensation
1	50 %
2	33 %
3	25 %
4	20 %
5	17 %
6	14 %
7	12 %
8	11 %
9	10 %
10	9 %

Tab. 4-105: Cascading depth and values for dead time compensation

C-0-0705 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	100	100

Describing individual parameters, arranged according to types

C-0-0710, C2C, cycle time (Tcyc), actual value

Function This parameter indicates the actual value of the cycle time in the cross connection.

Use The control link cycle time indicates the time intervals at which the motion controller makes new command values in the cross connection available.

This parameter can be read in the diagnostics dialog for the CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3) function module.

C-0-0710 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	4000

C-0-0711, C2C, error counter MDT

Function Every link slave counts all the invalid master data telegrams (MDT). Depending on the link cycle time, a certain maximum number of consecutive MDT failures are permitted (8 ms: 8, 4 ms: 16, 2 ms: 32) and are compensated for by extrapolation of the master axis position.

Use If at least half of the permitted number of MDTs fail consecutively, the control reacts as follows:

- All status bits "Link members' # data valid" (C-0-0712, elements 1 and 2) are set to zero.
- The error message "Control link master axis position incorrect (MDT)" is output.

If at least the permitted number of MDTs fail consecutively, the control continues to react as follows:

- All drives are disengaged with "P-0-0119, Best possible deceleration".
- All positions on the master axes stop.
- All status bits "Status input link SYNCn, participant m" (C-0-0713, elements 1 and 8) are set to zero.
- The "MDT error counter" stops counting.

The maximum value of the error counter is 65535. When transfer is malfunctioning significantly, this value can be reached after an extended period.

This parameter can be read in the diagnostics dialog for the CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3) function module.



This error counter is not currently supported in a C2C link with the CFL01.1-R3 function module.

C-0-0711 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0712, C2C, link data, status

Function

All of the valid bits for the cross connection with a maximum of 64 participants are stored in this list of two 32 bit strips.

Structure

List element	Bit no.	Designation
1	31...0	Status link data, participant 1...Status link data, participant 32
2	31...0	Status link data, participant 33...Status link data, participant 64

Tab. 4-106: Status link data

Use

sercos II link (CFL01.1-Q2):

The following apply for the status of the link data:

0 = all data for this participant are invalid

1 = all data for this participant are valid

If the data for a participant are invalid, bits 14 and 15 from the control link - status function module (C-0-0714) can be used to test if the control is already actively participating in the cyclic exchange of link data and is synchronized with the link (PLL is in steady state).

C2C link (CFL01.1-R3):

The following apply for the status of the link participants and data:

0 = the participant does not participate in the link and does not provide valid link data

1 = the participant participates in the link and the link data could be valid

If a control participates in the link, bits 14 and 15 from the control link - status function module (C-0-0714) can be used to test if the control is already actively participating in the cyclic exchange of link data and is synchronized with the link (PLL is in steady state). These are the basic requirements for valid link data.

In parameter axis status (A-0-0021), bit 30 (0x4000) indicates whether the data produced in the link for this (external) master axis are valid or not. There are two reasons that the link data for (external) master axes may be invalid:

Either the (removed) control is not located in P4 and all master axes for this participant are affected, or the local axis of the (removed) control is deactivated or parked. Other bits from A-0-0021 give further related information.

This parameter can be read in the diagnostics dialog for the CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3) function module.

C-0-0712 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE_VAR	**PLC data type:**	ARRAY of DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

Describing individual parameters, arranged according to types

C-0-0713, C2C, binary inputs, status

Function

All of the status bits for the binary inputs of the cross connection with a maximum of 64 participants are stored in this list of eight 32 bit strips.

Structure

List element	Bit no.	Designation
1	31...0	Status input link SYNC1, participant 1...Status input link SYNC1, participant 32
2	31...0	Status input link SYNC1, participant 33...Status input link SYNC1, participant 64
3	31...0	Status input link SYNC2, participant 1...Status input link SYNC2, participant 32
4	31...0	Status input link SYNC2, participant 33...Status input link SYNC2, participant 64
5	31...0	Status input link SYNC3, participant 1...Status input link SYNC3, participant 32
6	31...0	Status input link SYNC3, participant 33...Status input link SYNC3, participant 64
7	31...0	Status input link SYNC4, participant 1...Status input link SYNC4, participant 32
8	31...0	Status input link SYNC4, participant 33...Status input link SYNC4, participant 64

Tab. 4-107: Status binary inputs

Use

The following apply for the status of the binary inputs 1...4:

0 = the binary input for this participant is not enabled

1 = the binary input for this participant is enabled

This parameter can be read in the diagnostics dialog for the CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3) function module.

C-0-0713 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE_VAR	**PLC data type:**	ARRAY of DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

C-0-0714, C2C, function module, status

Function

The diagnostic bits for the function modules CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3) of the link participant are stored in this parameter.

Structure

Bit no.	Designation
0	Control link - Transmission error
1	CFL01.1-Q2 - Error primary ring/CFL01.1-R3 - Error port 1
2	CFL01.1-Q2 - Error secondary ring/CFL01.1-R3 - Error port 2

Bit no.	Designation
3	Control link - Redundancy error
4	CFL01.1-R3 - Hot plug error
5	CFL01.1-R3 - Hot plug error bit 0
6	CFL01.1-R3 - Hot plug error bit 1
7	CFL01.1-R3 - Hot plug error bit 2
8	CFL01.1-R3 - Phase switching enabled
9	CFL01.1-Q2/CFL01.1-R3 - Hot plug enabled in running link
10	CFL01.1-R3 - Hot plug in running link aborted
11	CFL01.1-Q2/CFL01.1-R3 - Hot plug status bit 0
12	CFL01.1-Q2/CFL01.1-R3 - Hot plug status bit 1
13	CFL01.1-Q2/CFL01.1-R3 - Hot plug status bit 2
14	CFL01.1-Q2/CFL01.1-R3 - Cyclic exchange of link data enabled
15	CFL01.1-Q2/CFL01.1-R3 - PLL engaged, synchronized with link master
16	CFL01.1-R3 - Acyclically transferred parameters currently adjusted

Tab. 4-108: Status: Function module

Use This parameter can be read in the diagnostic dialog for the function modules CrossComm (CFL01.1-Q2) or C2C CrossComm (CFL01.1-R3).

Bits 5...7: CFL01.1-R3 - Hot plug error bit 0...2

The three hot plug error bits indicate an error offset on the error messages of the C2C hot plug driver. The combination of these three bits result the error offset 0...7 for the basic error messages. In turn, these depend on the C2C functionality. The following error offsets and messages apply:

- C2C master, basic error message F0280060:

  0 ... 5 (error message F0280060 ... error message F0280065)
- C2C slave, basic error message F0280080:

  0 ... 7 (error message F0280080 ... error message F0280087)

Bit 10: CFL01.1-R3 - Hot plug in running link aborted

This bit indicates that a new link startup was triggered with the parameter C-0-0751 during an active hot plug process. In this case, the hot plug mechanism is aborted. The bit is deleted after a successful C2C startup.

Bits 11...13: CFL01.1-Q2/CFL01.1-R3 - Hot plug status bit 0...2

The three hot plug status bits indicate the current state of the hot plug mechanism. They provide the current hot plug phase (CFL01.1-R3) or status (CFL01.1-Q2). The state machines depend on the hardware. The following phases apply respectively: 0 ... 4:

- CFL01.1-Q2, a state machine replaces the "normal link startup as hot plug:

  Status 0 ... Status 4 (0 -> Link ring not closed ... 4 -> Cyclic exchange of link data enabled)
- CFL01.1-R3:

  Hot plug phase 0 ... Hot plug phase 4 (HP0 -> Start hot plug ... HP4 -> Hot plug successfully executed)

Describing individual parameters, arranged according to types



No link startup executed in the control link with a CFL01.1-Q2 function module. The hot plug state machine simulates a link startup.

The simulated link phases also remain in the status bits after successful hot plug or startup and correspond to the values in the diagnostic parameter C-0-0752.

In a CFL01.1-R3 function module ,the hot plug status is deleted after successful hot plug.

Bit 16: CFL01.1-R3 - Acyclically transferred parameters currently adjusted

A part of the link data (modulo value A-0-0045 and feed distance slave drive A-0-0046) is acyclically transferred via the link. If one of these parameters is changed at an axis produced in the link, these are updated on all link participants via acyclic communication. This bit remains set during the adjustment. At the same time, bit 30 "Position data of (external) master axis is valid" is deleted in the parameter A-0-0021.

C-0-0714 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

C-0-0715, FM, sercos III, FPGA, image

Function This parameter is used for an extended diagnostics for sercos III.

C-0-0715 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0716, C2C, sercos III, error counter for data loss

Function The list parameter indicates the number of consumer failures already detected by the link master.

Each list element corresponds to the counter of failures of a consumer connection of the link master.

List element 1 is the error counter for the consumer connection of control address 1, list element 2 for the control address 2, etc.

Each list element stops at a maximum of 65535 and has no overflow. Each individual element is reset by the rising edge of ProducerReady in the connection control word (C-Con) of the respective control.

Describing individual parameters, arranged according to types

Structure

Element	Value
1	Error counter for the data of control 1
2	Error counter for the data of control 2
64	Error counter for the data of control 64

Tab. 4-109: C-0-0716, C2C-sercos III connection: Error counter for data loss

C-0-0716 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0717, C2C, addresses ring break

Function

The list parameter contains two list elements filled with the sercos address of the slaves at the end of the lines in a line topology. If the ring is available, the two list elements have the value 0. If no slave is connected to the port of the master, the respective list element displays the value 0. The parameter can be used to diagnose a ring break.

Structure

Element	Value
1	sercos address of the slave at the end of the line at port 1
2	sercos address of the slave at the end of the line at port 2

Tab. 4-110: C-0-0717, C2C, addresses ring break

C-0-0717 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0735, C2C, error counter for Port1/Port2

Function

In an enabled link with the C2C CrossCom function module (CFL01.1-R3), sercos errors at ports 1 and 2 are counted as well.

This parameter contains the current status of the C2C error counter.

Use

Conclusions can be made regarding the stability or quality of hte sercos transfer based on the current status and the time modifications of the C2C error counter.

Reasons that the C2C error counter is enabled can include:

- EMC disturbances
- Wiring problems (loose Ethernet plug or defective cable)

Describing individual parameters, arranged according to types

- Topology problems

The less often the C2C error counter is enabled, the more stable the C2C connection.



This error counter is not currently supported in a C2C link with the CFL01.1-R3 function module and never in a C2C link with the CFL01.1-R2 function module.

C-0-0735 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0750, C2C, startup target mode

Function

After the control voltage is switched on, the C2C master executes a link start up until it reaches a predefined C2C mode.

This parameter determines the C2C mode in the C2C master.

The C2C target mode during startup is specified at the same time as the specification of the Motion target mode in parameter C-0-0450.

Structure

Value	C2C mode	Display	What happens with C2C?
0	Initialization mode	C2C mode is not included in the display	When being in the target mode, the C2C link is located in the initialization mode. The C2C master checks only the link line.
2	Parameterization mode	C2C mode is not included in the display	When being in the target mode, the C2C link is located in the parameterization mode. The C2C master can transfer its configuration parameters asynchronously to the C2C slaves. No cyclic exchange of C2C data is possible.
4	Operating mode	C2C mode is not included in the display	When being in the target mode, the C2C link has started up successfully and is in operating mode. The cyclic exchange of configured C2C data is enabled.

Tab. 4-111: Startup of C2C target mode

Use

With the default value 4, the C2C link automatically starts up in operating mode. If the C2C master does not find a slave for startup or if the startup cannot be executed without errors with the existing slave, the master aborts the startup and reports a C2C error. The affected slaves also report a C2C error.

By specifying the C2C target mode in C-0-0751, another C2C startup can be initialized.

These error messages can be suppressed if the initialization mode was specified 0. This is useful for example, if no C2C slaves are available a link partner when commissioning the C2C master.

If the entire C2C link was commissioned, the default value can be set again.

Describing individual parameters, arranged according to types

The C2C link and the drive ring of the control start up independently of each other.

This parameter is only applied in the C2C master that controls the C2C startup. In the C2C slave or a stand-alone control, it can be written on C-0-0750, but it is not applied.

C-0-0750 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	4	4

C-0-0751, C2C, target mode

Function

This parameter switches to the desired target mode of the C2C link.

The C2C target mode is specified like the Motion target mode in parameter C-0-0451.

Structure

Value	C2C mode	Display	What happens with C2C?
0	Initialization mode	C2C mode is not included in the display	When being in the target mode, the C2C link is located in the initialization mode. The C2C master checks only the link line.
2	Parameterization mode	C2C mode is not included in the display	When being in the target mode, the C2C link is located in the parameterization mode. The C2C master can transfer its configuration parameters asynchronously to the C2C slaves. No cyclic exchange of C2C data is possible.
4	Operating mode	C2C mode is not included in the display	When being in the target mode, the C2C link has started up successfully and is in operating mode. The cyclic exchange of configured C2C data is enabled.

Tab. 4-112: C2C target mode

Use

Suppression of C2C error messages

With the default value 4, the C2C link automatically starts up in operating mode. If the C2C master does not find a slave for startup or if the startup cannot be executed without errors with the existing slave, the master aborts the startup and reports a C2C error. The affected slaves also report a C2C error.

These error messages can be suppressed temporarily if the initialization mode 0 is specified. This is useful for example if the C2C master is commissioned for the first time and there is still no C2C slaves available as link partner.

If the entire C2C link was commissioned, the default value can be set again.

Linking C2C devices

Describing individual parameters, arranged according to types

If all C2C devices support the hot plug functionality, both failed and returning/new link devices - up to a defined number - can be dynamically linked (again) into the C2C link. This occurs automatically without exiting the C2C operating mode.

However, devices in the C2C link that do not support a hot plug can only be linked if C2C is restarted. The C2C master has to be switched to the parameterization or initialization mode an back and then to the operating mode.

☞ During a new C2C startup for linking (new) devices, a cyclic exchange of configured C2C data for the already active link devices is no longer possible.

☞ The C2C link and the drive ring of the control start up independently of each other.

☞ Writing on this parameter is only possible in the C2C master that controls the C2C startup. In the C2C slave or a stand-alone controller, C-0-0751 is write-protected due to the configuration.

C-0-0751 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	4	0

C-0-0752, C2C, current mode

Function This parameter contains the current C2C mode.

Structure

Value	C2C mode	Display	What happens with C2C?
0	Initialization mode	C2C mode is not included in the display	The C2C link is in initialization mode. The C2C master checks only the link line.
2	Parameterization mode	C2C mode is not included in the display	The C2C link is in the parameterization mode. The C2C master can transfer its configuration parameters asynchronously to the C2C slaves. No cyclic exchange of C2C data is possible.
4	Operating mode	C2C mode is not included in the display	The C2C link has started up successfully and is in operating mode. The cyclic exchange of configured C2C data is enabled.

Tab. 4-113: Current C2C mode

Use

☞ The C2C link and the drive ring of the control start up independently of each other.

Describing individual parameters, arranged according to types



This parameter also displays C2C modes 1 and 3 which cannot be set.

C-0-0752 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0778, C2C, command configuration

Function

This parameter contains the C2C configuration for the entire link.

Its content is stored as an ASCII string and is automatically generated by IndraWorks using the configuration dialog.

The command configuration of the link can also be created manually. However, the specified syntax must be observed.

Use

The syntax for this configuration list provides various terms:

- **MLC:<n>[,]**
  - <n> specifies the control address of control as a C2C participant
  - [,] the comma as a separator is omitted for the last participant in the list if no additional container data (see below) is expected

  Each control that can participate in the C2C link must be entered in C-0-0778, including the C2C master. For controls that do not produce data in the link, this specification is sufficient.

  All producing participants must specify their link data more precisely.
- **P:**

  This term introduces the specification of the link data for the previously specified control.

  Now, the specifications are set for the telegram offsets and parameter IDs for all axis data produced.
- **T:0x<nnnn>:A<mmm>:A-0-<kkkk>[|T:0x<nnnn>:A<mmm>:A-0-<kkkk>][,]**
  - <nnnn> specifies the four digit telegram offset
  - <mmm> specifies the three digit axis address
  - <kkkk> specifies the four digit parameter ID
  - [|.....] Repetition of the term composed for each additional data item produced after entering the pipe character | as a separator
  - [,] the comma as a separator is omitted for the last participant in the list if no additional container data (see below) is expected

  This specification is used to inform all C2C participants regarding the link data for this producer. Because all of the participants permitted in the C2C link must be listed in the command configuration, all of the data produced in the link is known to all participants. This way, it can be accessed for consumption by every participant.

  The valid bits of the data container for the cyclical link data from the control are automatically added at the end of the configuration list.
- **CVB:**

Describing individual parameters, arranged according to types

This term introduces the specification of the container valid bits of the data container for list parameters.

Now, the specifications are set for the telegram offsets and parameter EIDNs for the valid bits for all existing container data.

- **T:0x<nnnn>:P-0-<kkkk>.<i>.<j>[|T:0x<nnnn>:P-0-<kkkk.<i>.<j>]**
  - <nnnn> specifies the four digit telegram offset
  - <kkkk> specifies the four digit parameter EID
  - <i> specifies the instance of the EIDN parameter
  - <i> specifies the element of the EIDN parameter
  - [|.....] Repetition of the term composed for each additional valid bit parameter after entering the pipe character | as a separator

This configuration string is parsed by all C2C participants in order to analyze both the local data to be produced and all consumable link data.



At the moment, from each C2C participant only the parameters A-0-0021, A-0-0045 and A-0-0101 for all local axes in the link can be produced. They are automatically written by IndraWorks with the selection of the local axis in the command configuration. Expanding to a free selection of parameter types and IDs is planned.

Example:

The controls with addresses 1, 2, 3, 11, 12 and 23 are participating in the C2C link. The C2C master has control address 1 and produces the data of local axes 1, 3 and 6 in the link. The C2C slave with control address 23 produces the data of local axes 1, 2 and 3 in the link. This ends the entry in the IndraWorks configuration dialog.

All further steps for creating the configuration string are carried out automatically by IndraWorks or the control.

The data for the local axes are predetermined with parameters A-0-0021, A-0-0045 and A-0-0101.

The sequence of controls, local axes and the respective three axis parameters can be as desired. It mainly depends on the entry in the IndraWorks configuration dialog.

In our example, the master is to be entered as the first control and the producing slave as the third control in the link telegram.

The valid bits of the data container are in the first producing link participant (here the master) in P-0-3091.0.4, in the second (here the slave) in P-0-3091.1.4.

The following configuration string is located in parameter C-0-0778, which the C2C master sends to all C2C participants.

MLC:1,

P:

T:0x0000:A003:A-0-0045|T:0x0004:A003:A-0-0021|

T:0x0008:A003:A-0-0101|T:0x000C:A001:A-0-0021|

T:0x0010:A001:A-0-0101|T:0x0014:A001:A-0-0045|

T:0x0018:A006:A-0-0101|T:0x001C:A006:A-0-0045|

T:0x0020:A006:A-0-0021,

MLC:3,

MLC:23,

Describing individual parameters, arranged according to types

P:

T:0x0024:A001:A-0-0045|T:0x0028:A001:A-0-0021|

T:0x002C:A001:A-0-0101| T:0x0030:A002:A-0-0045|

T:0x0034:A002:A-0-0021|T:0x0038:A002:A-0-0101|

T:0x003C:A003:A-0-0045|T:0x0040:A003:A-0-0021|

T:0x0044:A003:A-0-0101,

MLC:11,

MLC:12,

MLC:2,

CVB:

T:0x0048:P-0-3091.0.4|T:0x0050:P-0-3091.1.4

The line by line display has been selected here so that individual terms can be read more easily.

☞ This parameter can only be described in the C2C master, which transfers the C2C configuration to all slaves via the service channel. In the C2C slave or a stand-alone controller, C-0-0778 is always write-protected.

☞ The configuration of the local axes of the MLC, which are to make their axis positions available in the cross connection, can be specified using parameter "C-0-0703, C2C, configuration of master axes". In this parameter (write-protected in the C2C link), these producer axes are clearly specified in a list with the logical axis addresses.

☞ The command configuration of the link is not supported in a control link with function module FL01.1-Q2.

The link telegram remains specified as it was previously.

C-0-0778 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0779, C2C, device information

Function

The parameter contains the sercos addresses and the firmware versions of the devices connected to the function module CFL01.1-R3.

The parameter provides the device information from link phase 2 onwards.

This information is read out again from each device via the service channel whenever the parameter is read.

Describing individual parameters, arranged according to types

Structure

Entry	Meaning	Prefix	Possible entries
1	sercos address	O	1-99
2	Firmware version	F	MPH-06, CML,...

Tab. 4-114: C-0-0779, Device information

Use

Example:

3 devices

A1, FCML65s-MLs-10V0x.083,

A2, FMPH-06V08,

A3,FCML65s-MLs-10V0x.079,



This parameter is only available in the C2C master that controls the C2C startup. In the C2C slave or in a stand-alone control, C-0-0779 cannot be used due to the configuration.

C-0-0779 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0800, Oscilloscope, status word

Function

Use

The parameter displays the current status of the oscilloscope function.

Bit	Designation/function
0	Recording is running **0:** Recording is completed **1:** Recording is active. Changes to several oscilloscope parameter are disabled. The parameter for creating and deleting axes (C-0-0484) and cinematics (C-0-2484) is also disabled, if an axis cinematics parameter is configured in the oscilloscope.
1	Trigger start **0:** Trigger function is completed **1:** Trigger function is completed. Internal trigger not yet triggered. Comparison continues running.
2	Internal trigger **0:** Internal trigger not yet triggered. **1:** Internal trigger triggered. Comparison successfully completed.
3	Trigger function completed **1:** When triggering using an external trigger signal, an external trigger signal was detected. When triggering using only internal sources, this bit and bit 2 are set.

Bit	Designation/function
4	Delay function completed 0: Delay function completed. 1: Delay function is still active New measured values can be read out. Bit 0 is cleard.
7	Trigger error 0: Trigger function correctly initialized at recording start 1: Trigger function not correctly initialized at recording start (e.g. no correct trigger source (C-0-0851). Therefore, the value cannot be recorded.
9/8	Trigger signal state (displays the current comparison between the trigger signal and trigger threshold) **00:** --- **01:** Signal > threshold (C-0-0852) **10:** Signal < threshold (C-0-0852) **11:** Signal = threshold (C-0-0852)

C-0-0800 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0801, Oscilloscope, time resolution

Function

This parameter is used to determine the time intervals in which the measured values are recorded (sampling rate).

In this case, the time resolution can be selected in the time period of the control clocking pulse:

$T_{Osci} = N * T_{control}$; N = 1, 2, 3, 4, …

The control's clocking pulse can be read out from parameter "C-0-0400, Motion, cycle time, command value".

Use

The time resolution of the oscilloscope function (i.e. the sampling rate) can be defined using parameter "C-0-0801, Oscilloscope, time resolution".

In this case, the signal's maximum rate (= highest sample rate) can be recorded in the control clocking pulse (1 ms up to 4294967 ms (≈1.19 h) / default 2 ms).

The following applies when setting the parameter:

- The parameter's input range depends on the hardware and firmware used (or the performance set in "C-0-0400, Motion, cycle time, command value""),
- When entering a new value, it is automatically replaced by a multiple of the minimum value.

"C-0-0801" can only be changed if the oscilloscope is deactivated.

Describing individual parameters, arranged according to types

C-0-0801 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	500	4294967000	2000

C-0-0802, Oscilloscope, memory depth

Function

The memory depth determines the number of measured values to be recorded for each measurement. A maximum of up to 8192 measured values can be recorded per channel.

Use

The recording duration along with the time resolution ("C-0-0801, Oscilloscope, time resolution") can be determined using the memory depth.

☞ The minimum recording duration is one control clocking pulse!

Recording duration [µs] = time resolution * memory depth

With:

- "C-0-0801, Oscilloscope, time resolution",
- "C-0-0802, Oscilloscope, memory depth",

In general, the following applies:

The measured value lists can be adjusted to user requirements (e.g. existing memory or recording duration) using the memory depth. The parameter can only be changed if the oscilloscope is deactivated.

C-0-0802 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	8191	8191

C-0-0803, Oscilloscope, signal selection list

Function

The parameter contains all parameters that are suitable as a trigger signal (C-0-0851) or measuring signal (O-0-0003).

C-0-0803 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	NVRAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0804, Oscilloscope, number of valid values

Function The number of measured values that were recorded can be read out from this parameter.

Use If the oscilloscope function is activated, the signal to be recorded is continuously added to the measured value memory. In this case, the oldest measured value is the first element in the list, the newest is the last element.

If the trigger event occur before the measured memory can be completely filled, this parameter indicates the number of recorded measured values.

C-0-0804 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8191	0

C-0-0805, Oscilloscope, control word

Function The recording can be started and the parameter import / parameter export executed using this parameter.

Use

Bit	Designation/function
0	Recording start **0:** Recording is stopped or completed. **1:** Recording is started. Changes to several oscilloscope parameters are disabled. The parameter for creating and deleting axes (C-0-0484) and cinematics (C-0-2484) is also disabled.
14	Parameter import **1:** The parameter import is executed. Here, all parameters that are stored on the control are imported. Lists of measured values are also imported.
15	Parameter export **1:** All oscilloscope parameters are exported to the control. This also includes the complete measured value lists.

C-0-0805 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x00

C-0-0806, Oscilloscope, number of channels

Function This parameter indicates the number of existing measuring channels (O-parameters).

Describing individual parameters, arranged according to types

Use This is a read-only parameter.

The oscilloscope parameters occur in instances (similar to the axis parameters).

The individual channels can be accessed as follows:

OXXX:O-0-0002.

Here, XXX can lie between "1" and the value stored in this parameter.

The instance is the same channel number.

C-0-0806 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0807, Oscilloscope, sample time stamp

Function This parameter is reserved for future applications.

C-0-0807 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE_VAR	**PLC data type:**	ARRAY of ULINT
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0820, Oscilloscope, sample task selection

Function This parameter is reserved for future applications.

C-0-0820 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0821, Oscilloscope, sample task interval

Function This parameter is reserved for future applications.

C-0-0821 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0822, Oscilloscope, sample task task ID

Function This parameter is reserved for future applications.

C-0-0822 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0825, Oscilloscope, sample task status

Function This parameter is reserved for future applications.

C-0-0825 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0830, Oscilloscope, IEC sample task 00

Function This parameter is reserved for future applications.

C-0-0830 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0831, Oscilloscope, IEC sample task 01

Function This parameter is reserved for future applications.

C-0-0831 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0832, Oscilloscope, IEC sample task 02

Function This parameter is reserved for future applications.

C-0-0832 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0833, Oscilloscope, IEC sample task 03

Function This parameter is reserved for future applications.

C-0-0833 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0834, Oscilloscope, IEC sample task 04

Function This parameter is reserved for future applications.

C-0-0834 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0840, Oscilloscope, system sample task 00

Function This parameter is reserved for future applications.

C-0-0840 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0841, Oscilloscope, system sample task 01

Function This parameter is reserved for future applications.

C-0-0841 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0850, Oscilloscope, trigger mask

Function This parameter is used to set an additional trigger mask using the trigger signal, especially for trigger signals with a "binary" and "hexadecimal" display format (as well as all others) before the comparison is executed.

C-0-0850 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 8BYTE	**PLC data type:**	LWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFFFFFFFFFFFFFF	0xFFFFFFFFFFFFFFFF

C-0-0851, Oscilloscope, trigger signal

Function The parameter determines the trigger unit and the signal (from "C-0-0803, Oscilloscope: signal selectiion list") with which the trigger threshold (C-0-0852) is to be compared.

Use

☞ Selecting a trigger signal (C-0-0851) also determines the unit and the format for parameter "C-0-0852, Oscilloscope, trigger threshold".

The parameter can only be modified when the oscilloscope is deactivated (cf. C-0-0800, Oscilloscope: status word).

☞ If S-0-0000 is specified as an ID number, the trigger function is not active.

C-0-0851 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

C-0-0852, Oscilloscope, trigger threshold

Function The parameter is the comparison value for the trigger function.

Use Depending on the selected trigger edge (C-0-0853), the bit is set for "internal triggers" (C-0-0857, bit 2) when reaching the trigger condition in the status word.

Describing individual parameters, arranged according to types

Bit 8 and bit 9 first indicate whether the value of the selected trigger source is above or below the trigger threshold or the value matches the trigger threshold in the status word (C-0-0800).



The parameter can only be changed if the recording has been started (see also "C-0-08050805, Oscilloscope, control word").

Depending on the selected ID number in "C-0-0851, Oscilloscope, trigger signal", the attribute and unit adjust to the selected signal.

C-0-0852 - Attributes:

Function:	PARAMETER	**Unit:**	C-0-0860
MLC data type:	DOUBLE, 8BYTE	**PLC data type:**	LREAL
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

C-0-0853, Oscilloscope, trigger edge

Function

The parameter determines at which edge the "C-0-0857, Oscilloscope, internal trigger signal, bit 2" is triggered.

Structure

Bit	Designation/function
0	Trigger edge positive 1: Internal trigger is triggered with a positive edge
1	Trigger edge negative 1: Internal trigger is triggered with a negative edge
2	Identical trigger 1: Internal trigger is triggered if the trigger threshold and the value of the trigger source are identical

Several conditions can be combined.

Use



The parameter can only be changed if the recording has been started (see also "C-0-0805, Oscilloscope, control word").

This can activate an undesired triggering of the "internal trigger".

C-0-0853 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0x03

C-0-0854, Oscilloscope, number of measured values after trigger event

Function

The parameter determines the number of measured values that are still recorded after the trigger events (C-0-0800, bit 3 = 1) have occurred (delay function).

Describing individual parameters, arranged according to types

Use

After these measured values are recorded, the bit "delay function completed" (bit 4) is set in "C-0-0800, Oscilloscope, status word".

Afterwards, the entire recording is completed and the measured values can be read out.

C-0-0854 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8191	0

C-0-0855, Oscilloscope, trigger time stamp

Function

This parameter contains the hexadecimal coded time of the trigger event.

"09.08.2006, 11:35:55"

When the oscilloscope function starts, this parameter is set to "0".

When the trigger event is triggered, the control's current system time is stored in this parameter.

C-0-0855 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFFFFFFFF	0x00

C-0-0856, Oscilloscope, external trigger signal

Function

Describing this parameter ("C-0-0856, Oscilloscope, external trigger signal, bit 0") enables the triggering of the oscilloscope measurement with an external signal.

To do this, the trigger type in parameter "C-0-0805, Oscilloscope, control word, bit 1" must be set to "external trigger with offset measurement".

Structure

Bit	Designation/function
0	0 - No external triggering 1 - Trigger triggered for oscilloscope

C-0-0856 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

Describing individual parameters, arranged according to types

C-0-0857, Oscilloscope, internal trigger signal

Function

This parameter displays the state of the internal trigger.

When selecting "internal triggers", the external trigger source (C0-0856, bit 0) is not taken into consideration.

Structure

Bit	Designation/function
0	0 - Internal trigger not yet triggered. Comparison still active. 1 - Internal trigger triggered. Comparison successfully completed.

C-0-0857 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0858, Oscilloscope, AUX trigger path

Function

This parameter is only intended for internal use.

C-0-0858 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0859, Oscilloscope, AUX trigger

Function

This parameter is only intended for internal use.

C-0-0859 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE	**PLC data type:**	ULINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0860, Oscilloscope, default trigger

Function

This parameter is a substitute trigger signal (placeholder) if no trigger signal was defined by the user. It allows the oscilloscope to be started and stopped without a defined trigger signal.

The parameter is not relevant for the user.

Structure

Bit	Designation/function
0	0 - Substitute trigger not yet triggered 1 - Substitute trigger triggered

Describing individual parameters, arranged according to types

C-0-0860 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

C-0-0900, Device operating state

Function

This parameter indicates the operating state of the device. The operating state of the device directly derives from the operating state of the PLC.

Structure

Value	Description
RUN	The device is in operating state RUN, i.e. a valid PLC application is loaded, which is in the RUN state.
STOP	The device is in operating state STOP, i.e. a valid PLC application is loaded, which is in the STOP or DEBUG state.
RDY	The device is in operating state READY, i.e. no valid PLC application is loaded.
INIT	The device is in operating state INIT, i.e. the control is booting.

C-0-0900 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	"RUN"

C-0-0915, Number of PLC applications

Function

This parameter displays the number of the executable PLC applications.

C-0-0915 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

C-0-0916, PLC router address

Function

This parameter displays the current PLC router address.

This address information is also displayed during the connection test in IndraWorks.

C-0-0916 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	"--"

C-0-0920, Operating states of PLC applications

Function
Structure

The parameter displays the name and operating state of the PLC application.

Value	Description
RUN	The PLC application is in operating state RUN, i.e. the program code is being executed.
STOP	The PLC application is in operating state STOP, i.e. the program code is not being executed.
DEBUG	The PLC application is in operating state DEBUG, i.e. it was stopped because it reached a breakpoint. The program code is not executed further.
CYCLE	The PLC application is executed in a cycle to stop the running processes.
NONE	No application is loaded.

C-0-0920 - **Attributes:**

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	"NONE"

4.2.4 C-0-1000 - C-0-1999

C-0-1000, Command: Load basic parameters

Function

This parameter is used as a command for loading the basic parameters in the control.

Use

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading process of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading process of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1000 - **Attributes:**

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1001, Command: Restore MC- and PLC-Retain-Data

Function This parameter is used as a command to load MotionControl and PLC-RETAIN data from the storage medium (e.g. Compact Flash card) into the NVRAM area of the control.

All data saved in the NVRAM as well as values saved internally, e.g. axis position, are overwritten with values saved when the command "C-0-1002, Command: Back up MC and PLC RETAIN data).

Use This command is executed when restoring a data backup and is exclusively used internally.

Automatic storage on the storage memory is carried out every time the Motion switches from parameterization mode to operating mode (see C-0-1002).

All MotionControl and/or PLC-RETAIN data changed in the NVRAM after the storage are not saved on the storage medium. The command C-0-1002 has to be executed.

☞ After executing the command "C-0-1001 command: Restore MC and PLC retain data", the system restarts automatically to apply the new system data.

This parameter is executed by the system and must never be started manually, since it can cause a total data loss.

C-0-1001 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1002, Command: Save MC- and PLC-Retain-Data

Function This parameter is used as a command to load MotionControl and PLC-RETAIN data from the NVRAM area of the control to the storage medium (e.g. Compact Flash card).

Use The command is executed automatically every time the mode switches from parameterization to operation or if necessary it can also be triggered individually (see below).

The command can be triggered in each operation mode. However, it is recommended not to write NVRAM or PLC-RETAIN data during the execution to avoid inconsistent data. It is also recommended to stop the PLC and to switch the Motion to P2 (parameterization mode) to impede a parameter access from IndraWorks.

Execution in the parameter editor:

- Enter the binary value"0000000000000011" (=0x0003) into this parameter. This triggers the saving procedure for C-parameters.
- After the saving process is complete, the control automatically resets the parameter to "0000000000000000".

Describing individual parameters, arranged according to types

C-0-1002 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1003, Command: Restore PLC-Retain-Data

Function This parameter is used as a command to load PLC RETAIN and PLC PERSISTENT RETAIN data from the storage medium (e.g. Compact Flash card) into the NVRAM area of the control.

All PLC data data saved in the NVRAM saved internally is overwritten with values saved when the command "C-0-1002, Command: Back up MC and PLC RETAIN data) was executed last.

Use This command is executed when restoring a data backup and is exclusively used internally.

The command can be triggered in each operation mode. However, it is recommended not to write PLC-RETAIN and PLC PERSISTENT RETAIN data during the execution to avoid inconsistent data. It is also recommended to stop the PLC and to switch the Motion to P2 (parameterization mode) to impede a parameter access from IndraWorks.

Execution in the parameter editor:

- Enter the binary value"0000000000000011" (=0x0003) into this parameter. This triggers writing back RETAIN and PERSISTENT RETAIN data to the control.
- After the saving process is complete, the control automatically resets the parameter to "0000000000000000".



When executing the command, ensure that RETAIN and PERSISTENT RETAIN data match the PLC application (GUIDE may not have been changed).

This parameter is executed by the system and must never be started manually, since it can cause a total data loss.

C-0-1003 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1004, Command: Save PLC-Retain-Data

Function This parameter is used as a command to load PLC-RETAIN and PLC PERSISTENT RETAIN data from the NVRAM area of the control to the storage medium (e.g. Compact Flash card). The data is backed up in the "PlcRetain.save" file.

Use This command is executed when backing up data and is exclusively used internally.

The command "C-0-1003 command: Restore PLC retain data" is used to execute the restoration in the control.

The command can be triggered in each operation mode. However, it is recommended not to backup PLC RETAIN and PLC PERSISTENT RETAIN data during the execution to avoid inconsistent data. It is also recommended to stop the PLC and to switch the Motion to P2 (parameterization mode) to impede a parameter access from IndraWorks.

Execution in the parameter editor:

- Enter the binary value"0000000000000011" (=0x0003) into this parameter. This triggers a backup of RETAIN and PERSISTENT RETAIN data to a file.
- After the saving process is complete, the control automatically resets the parameter to "0000000000000000".

☞ This parameter is executed by the system and must never be started manually, since it can cause a total data loss.

C-0-1004 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1005, Command: Delete files on SYSTEM partition

Function

This parameter is used as a command for deleting files and directories on the SYSTEM partition (or in a corresponding SYSTEM directory) on the FW-module which were added during runtime to the firmware status as delivered or updated.

A few of the files generated during runtime which are still required for correct operation are excepted from the deletion procedure.

Use

For safety reasons, the command can only be executed in P0 when the PLC is stopped. When executing this command, the user must ensure that there is no access to files in the SYSTEM partition or SYSTEM directory, because they cannot be deleted.

☞ ... for execution on a VEP: If the FW-module consists of just one partition, the directory "...Rexroth\Controls\MLP" is equivalent to the SYSTEM partition. The sub-folders "USER" and "OEM", which are equivalent to the "USER" or "OEM" partition, are excepted from deletion by this parameter.

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This starts deleting the files.
- After the files are deleted, the control automatically resets the parameter to "0000000000000000".

C-0-1005 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1006, Command: Delete files on OEM partition

Function This parameter is also used as a command for deleting all files and directories on the OEM partition (or in a related OEM directory) on the FW-module.

☞ Then the OEM partition is deleted completely.

Use The command can be used in any phase of operation. The user of this command must ensure that when it is executed there is no access to files in the OEM partition or OEM directory because these cannot be deleted.

☞ ...for execution on a VEP: If the FW-module consists of just one partition, the directory "...Rexroth\Controls\MLP\OEM" is equivalent to the OEM partition.

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This starts deleting files on the OEM partition of the FW module.
- After the files are deleted, the control automatically resets the parameter to "0000000000000000".

C-0-1006 - **Attributes:**

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1007, Command: Delete files on USER partition

Function This parameter is also used as a command for deleting all files and directories on the USER partition (or in a related USER directory) on the FW-module.

☞ Then the USER partition is completely deleted (with the exception of a few important system files).

Use The command can be used in any phase of operation. The user of this command must ensure that when it is executed there is no access to files in the USER partition or USER directory because these cannot be deleted.

☞ ...for execution on a VEP:

If the FW-module consists of just one partition, the directory "...Rexroth\Controls\MLP\USER" is equivalent to the USER partition.

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This starts deleting files on the USER partition of the FW module.
- After the files are deleted, the control automatically resets the parameter to "0000000000000000".

C-0-1007 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1008, Command: Get function modul bus information

Function

When controller start-up begins, the addresses and types of all of the function modules connected to the PCI bus are determined.

This list is displayed as a 32-bit field in parameter "C-0-0025, Function module bus, configuration" in accordance with the individual hardware specifications.

These commands can also be used to read out the

- function modes,
- serial numbers,
- parts numbers,
- material index number and the
- operation hour counter

for all connected sercos function modules.

The command can only be activated in P2.

The data is displayed in parameter "C-0-0041, Function module bus - actual configuration".

Incorporated function modules

In MLC version 08VRS, the actual configuration of function modules is initially limited to the modules for the sercos function modules, because they can be used either as a drive or C2C interface.

C-0-1008 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1009, Command: Get extended sercos device information

Function

In the transition from phase P0 to P2, the sercos ring is scanned and the addresses of all connected sercos devices are determined.

Describing individual parameters, arranged according to types

This list is displayed in parameter "C-0-0481, List of detected sercos devices".

In addition, the command "C-0-1009, Command: Determine extended sercos device information ", the device firmware and the enabled function package for all connected devices of the drives are read out. The command can only be carried out in P2.

The data that is read is displayed in parameter "C-0-0479, Extended sercos device information".

C-0-1009 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1010, Command: Export parameter

Function

The control parameters can be exported into a file using the command parameter.



The command is only permitted for internal use.

C-0-1010 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1011, Command: Import parameter

Function

Parameters from a file can be written to the control using the command parameter.

In this case, potential import errors are listed in parameter "C-0-0114, IDN list of import errors".



The command is only permitted for internal use.

C-0-1011 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	(P2+Stop)
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

Describing individual parameters, arranged according to types

C-0-1019, Command: Restart and reset to default

Function

This parameter triggers an immediate restart of the control. During start up the command for reset to the delivery status is then executed and a new warm start of the control is carried out to accept the reset configuration.

The following files are deleted or the data is reset to default values:

- Control parameters located in the NVRAM area
- RETAIN data of the PLC
- PLC boot projects and files associated with the PLC program
- All of the control system files created during runtime (e.g. parameter or logbook files)
- All of the control system files created during runtime (e.g. parameter or logbook files)
- RoCo SRAM data and RoCo files

Those not deleted or influenced:

- All files created by the user or directories on the USER or OEM partition (or a related USER or OEM directory) are **not deleted**.

On the parameter level this is equivalent to the functionality in the section "IndraMotion MLC - Deleting Memory".

Use

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers a restart of the control.
- After rebooting, the control automatically resets the parameter to "0000000000000000".



All communication with the MLC from the fieldbus, drives, etc. is lost during the restart.

If necessary, they must be restarted.

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers a restart of the control.
- After rebooting, the control automatically resets the parameter to "0000000000000000".



The restart is executed even when the PLC is running

This parameter can be executed from a PLC user program, so the PLC must be in the "RUN" mode.

For this reason, when the command is executed the state of the PLC cannot be checked, i.e. even if the PLC is running, the control is restarted.

Before executing the command make sure that your control, including applications that are running, as well as connected fieldbusses, drives, etc. are in a condition that permits restarting.

C-0-1019 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1020, Command: Restart after firmware update

Function The parameter is used as a command to reboot the control after a firmware update and to restart the updated firmware. The parameter is automatically called up after a successful download.

☞ The command may only be used at the end of a firmware update. It may not be used for a standard control reset.

The command is only available on CML controls.

Use *Executing the command:*

- Enter the binary value "0000000000000011" (=0x0003) in the parameter. This activates the reboot in the control after the firmware update.
- After Flash programming has been successfully completed, the control automatically resets the value to "0000000000000000" again.

C-0-1020 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1021, Command: Restart

Function This parameter triggers a command for a restart (warm start) of the control.

Use *Execution in the parameter editor:*

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers a restart of the control.
- After rebooting, the control automatically resets the parameter to "0000000000000000".

☞ All communication with the control from the fieldbus, drives, etc. is lost during the restart.

If necessary, they must be restarted.

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers a restart of the control.
- After rebooting, the control automatically resets the parameter to "0000000000000000".

The restart is executed even when the PLC is running

This parameter can be executed from a PLC user program, so the PLC must be in the "RUN" mode.

For this reason, when the command is executed the state of the PLC cannot be checked, i.e. even if the PLC is running, the control is restarted.

Before executing the command make sure that your control, including applications that are running, as well as connected fieldbusses, drives, etc. are in a condition that permits restarting.

C-0-1021 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1022, Command: Activate firmware update

Function The parameter is used as a command to update firmware files after a firmware update.

The command is only valid for internal use and only available on CML controls.

Use *Executing the command:*

- Enter the binary value "0000000000000011" (=0x0003) in the parameter.

  This activates the reboot in the control after the firmware update.
- After Flash programming has been successfully completed, the control automatically resets the value to "0x00" again.

C-0-1022 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1023, Command: Apply IP configuration

Function This parameter is used as a command for importing the network settings. The following parameter values take effect:

- C-0-0200, Engineering, IP address,
- C-0-0201, Engineering, subnet mask,
- C-0-0202, Engineering, standard gateway,
- C-0-0220, sercos III Master communication, IP address, command configuration,

Describing individual parameters, arranged according to types

- C-0-0221, sercos III Master communication, subnet mask, command configuration,
- C-0-0225, sercos III C2C, IP address, command configuration,
- C-0-0226, sercos III C2C, subnet mask, command configuration,
- C-0-0230, Bridge, IP address, command configuration,
- C-0-0231, Bridge, subnet mask, command configuration,
- C-0-0232, Bridge, command configuration of assigned interfaces,
- C-0-0235, Automatic IP address generation, command configuration.

Use

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. It activates the network setting import.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. It activates the network setting import.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1023 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1024, Command: Load basic parameter of IP configuration

Function

This parameter is used as a command for loading the basic network setting parameters. The following parameter values are reset to their basic values:

- C-0-0220, sercos III Master communication, IP address, command configuration,
- C-0-0221, sercos III Master communication, subnet mask, command configuration,
- C-0-0225, sercos III C2C, IP address, command configuration,
- C-0-0226, sercos III C2C, subnet mask, command configuration,
- C-0-0230, Bridge, IP address, command configuration,
- C-0-0231, Bridge, subnet mask, command configuration,
- C-0-0232, Bridge, command configuration of assigned interfaces,
- C-0-0235, Automatic IP address generation, command configuration.

Use

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading process of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading process of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1024 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1030, Command: Clear all control errors

Function This parameter is used as a command for clearing all control and drive errors.

Use *Using the IndraWorks user interface:*

- Use **Diagnostics ▸ Clear Error** or
- the button "Clear Error" in **Error/diagnostic memory**

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1030 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

Parameter is copied to associated S-/P-parameters:

IndraDrive/ Drive:	S-0-0099
IndraDrive/ Control:	S-0-0099
HydraulicDrive/ Drive:	S-0-0099
HydraulicDrive/ Control:	S-0-0099
SercosDrive:	S-0-0099

C-0-1041, Command: Start task record

Function This parameter is used as a command for starting the TaskViewer recording.

Describing individual parameters, arranged according to types

Use When using this feature from IndraWorks:

Using the IndraWorks user interface:

- Use the button in the dialog window **Diagnostics ▸ Task Execution Viewer**

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the start-up procedure.
- After start-up is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the start-up procedure.
- After start-up is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1041 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1042, Command: Stop task record

Function This parameter is used as a command for stopping the TaskViewer recording.

Use *Using the IndraWorks user interface:*

- Use the button in the dialog window **Diagnostics ▸ Task Execution Viewer**

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the stop process.
- After the stop process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the stop process.
- After the stop process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1042 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

Describing individual parameters, arranged according to types

C-0-1050, Command: Reset parameter C-0-0413 and C-0-0414

Function

This parameter is used as a command to clear the values of parameter "C-0-0413, List maximal time slice values" and "C-0-0414, List minimal time slice values".

After the command is successfully completed, values are collected again.

Use

Using the IndraWorks user interface:

- Use "Reset Minimum / Maximum" for clearing the lists in the dialog window **Motion ▸ Cycle Times**.

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion procedure is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1050 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417

Function

This parameter is used as a command for clearing the values of parameter "C-0-0416, CPU load, maximum" and "C-0-0417, CPU load, minimum".

After the command is successfully completed, values are collected again.

Use

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

When using this feature from the fieldbus:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion procedure is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1051 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	---

C-0-1052, Command: Reset parameter C-0-0421 and C-0-0422

Function

This parameter can be used as a command for deleting the values of the parameters "C-0-0421, Motion, absolute error counter" and "C-0-0422, Motion, number of successive errors".

After the command has been executed successfully, the errors are counted starting from zero again.

Use

Using the IndraWorks user interface:

- Use "Reset error memory" in the dialog window **Motion ▸ Cycle Times**.

Execution in the parameter editor:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the deletion process.
- After the deletion process is complete, the control automatically resets the parameter to "0000000000000000".

C-0-1052 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1060, Command: Save all trace recordings

Function

This command triggers the saving of all Trace buffers on the Compact Flash card of the control.

C-0-1060 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

C-0-1061, Command: Unlock all trace buffers

Function

This command enables all buffers.

This new data can be written again on the buffers.

C-0-1061 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

C-0-1070, Command: Switch PM/OM

Function

This command starts or ends the parameterization mode depending on parameter C-0-0440, configuring PM/OM switching.

Use

When using this feature from IndraWorks MLC:

- Right-click on the "Motion" node
  - Start parameterization mode
  - Exit parameterization mode

and from the field bus:

- Enter the binary value "0000000000000011" (=16x0003) in this parameter. This triggers the start/completion of the parameterization mode.
- After the command is completed, the MLC automatically resets the parameter to "0000000000000000".

Parameterization level support

Irrespective of the control and communication phase, devices can be configured via the parameterization level.

Thus, axes can be moved further, the I/Os can continue to exchange cyclic data and the PLC program keeps running.

Thus, these devices support two modes:

Parameterization mode

- In the parameterization mode, all device parameters - that are not write-protected - can be changed. This does not apply to communication partners such as configuration, timing or user-defined data containers.
- If a device is in the parameterization mode, it remains irrespective of the communication phase.

Operating mode

- Only parameters without write protection in this mode can be changed in the operating mode.
- The parameter crosscheck is performed when switching from parameterization to operating mode.
- The adjustment of A- to S-/P-parameter is executed.

Switching the modes

- For **one** device, switching between the two modes is controlled using the parameter "A-0-0024, Axis state".
- To switch **multiple** devices, the parameter "C-0-1070, Command: PM/OM switching" executed.

  The devices are selected using "A-0-0004 Axis type, bit 15".
- To switch an axis, it has to be in the "Standstill“ state.

  The real axis has to be in the "Power off“ state.

  An axis in the parameterization mode cannot be traversed.

C-0-1070 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

4.2.5 C-0-2000 - C-0-2499

C-0-2001 to C-0-2099, point tables on the control

Each parameter from C-0-2001...2099 includes a table with data points for the cam profile.

For a detailed description, please refer to C-0-2001 ELS, point table1.

C-0-2001, ELS, point table1

Function

Each parameter from C-0-2001...2099 contains a table with data points for the cam profile.

The control supports point tables with 3 to 1024 data points.



The table's individual data points are interconnected using a cubic spline interpolation.

Structure

Each parameter is structured as follows:

- The data point for ρ = 0 is the first element in the table.
- The data point for ρ = 360° is the last element in the table.
- The actual cam table values are percentage values. They can range between -799.999999% to 799.999999%.
- A value of 100% provides a position which corresponds to the enabled distance. Using the positioned determined in this manner, the slave axis's position is determined.

Use

When using the table for a motion step of the operation modes MotionProfile/FlexProfile, the table of the master axis's initial phase for this step applies up to the master axis's initial phase for the following step.

C-0-2001 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-799,999999	799,999999	---

C-0-2100, List of all backup operation C-parameters

Function

This list includes all C-parameters to be considered when backing up parameters. It is entered in the ID number format.

The entries are sorted by description and their relation and not by ID number or alphabetically.

C-parameters are stored in the order of these entries.

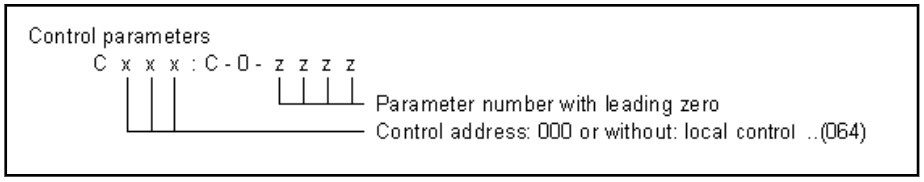


Fig. 4-133: Structure of a C-parameter

Examples:

C000: C-0-0023 - local control; parameter C-0-0023

or

C-0-0023 - local control; parameter C-0-0023.

C-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x2 0000 0000	0x2 0000 0FFF	---

C-0-2480, Configured kinematic number

Robot-Control V1: +, Robot-Control V2: +

Function This parameter indicates the number of the currently configured kinermatics.

C-0-2480 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-2482, List of non-linked axes

Robot-Control V1: +, Robot-Control V2: +

Function This list parameter displays the axes that are not assigned to a kinematics yet.

If no kinematics is configured, this list corresponds to parameter "C-0-0483, List of configured axes".

The axes are assigned to the kinematics using parameter "K-0-0008, Axis configuration list".

 An axis can only be assigned to one kinematics.

C-0-2482 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-2483, List of configured kinematics

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter indicates the configured kinematics of the system.

Use Example:

3 kinematics (kinematics 1, 2 and 3) are configured in the system.

C-0-2483 indicates:

Element	Value	Comment
1	1	Kinematics 1 is configured
2	2	Kinematics 2 is configured
3	3	Kinematics 3 is configured

C-0-2483 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

C-0-2484, Kinematic configuration list

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter defines the kinematics system. It configures the kinematics. Only K-parameters of kinematics configured in this parameter can be accessed.

The axes are assigned to the kinematics via the parameter "K-0-0008, Axes configuration list" (example K01: K-0-0008).

Structure Valid values of a kinematic configuration:

Value	Comment
0	No kinematic mechanism configured
1	Robot Control V1 kinematics configuration
2	Robot Control V2 kinematics configuration

Use If Robot Control V1 is used, the list may not have any gaps with unconfigured kinematics. This is checked when switching to phase 4.

If Robot Control V2 is used, gaps are allowed.

Otherwise, parameter "C-0-2484, Kinematics configuration list" is entered into parameter "C-0-0111, List of all invalid C-parameters" and an incorrect configuration is displayed (F0160024, Error in cross-check of C-parameters).

Writing on the parameters "C-0-2484, Configuration list of the kinematics" updates the parameters "C-0-2480, Configured number of kinematics" and "C-0-2483, List of the configured kinematics" .

Example A (Robot Control V1):

Three kinematics are to be configured (version 04V12 and higher).

C-0-2484 displays:

Element	Value	Comment
1	1	Kinematics 1 is configured
2	1	Kinematics 2 is configured
3	1	Kinematics 3 is configured
4	0	No kinematics 4 used/required

Example B (Robot Control V2):

Three kinematics are to be configured (version 13V10 and higher).

C-0-2484 displays:

Element	Value	Comment
3	0	No kinematics used/required
4	2	Kinematics 3 is configured
5	0	No kinematics used/required

C-0-2484 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	2	0

C-0-2499, Touch probe, IDN list signal selection

Function

This parameter contains a list of ident numbers of the parameters whose current state variable (measured value) can be stored using the switching signal of a touch probe.

The measured value is saved in a parameter and is thus available for the machine or system control.

C-0-2499 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

4.3 Kinematic parameters (K-parameters)

4.3.1 Kinematic Parameters, General Information

The K-parameters describe the kinematic functions supported by the following controls:

- IndraMotion MLC L25, L45, L65

The following parameters exist only once for each kinematics:

The description contains the specification whether the parameter is supported "+" or not "-" in Robot Control V1 or Robot Control V2.

See also "Parameters of one kinematics" on page 67.

4.3.2 K-0-0000 - K-0-0999

K-0-0000, Dummy, K-parameter

Robot-Control V1: +, **Robot-Control V2:** +

Function A parameter serves as a placeholder; it does not have a function. A parameter can be described and read cyclically.

Use Measure down time for writing and reading.

K-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0x00

K-0-0001, Logic kinematic number

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter shows the actual logical kinematics number.

K-0-0001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	4	0

K-0-0002, Kinematic name

Robot-Control V1: +, **Robot-Control V2:** +

Function The name of the kinematics (e.g. Robi_1) is written in this parameter.

A global variable of type AXIS_GROUP_REF is automatically created with this name.



The following restrictions apply:

- maximum of 12 characters,
- A...Z, a...z, 0..9, '_'
- first character must be a letter,
- "Robi_1" is identical to "ROBI_1".

K-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Kin"

K-0-0003, Maximum path velocity

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V1

Maximum programmable motion velocity in machine coordinates (MCS) at the Tool Center Point (TCP).

Depending on the parameter K-0-0054, the entry is made in mm/s or inch/s.

Determining a reasonable maximum path velocity depends on the resolution of the measuring system, the minimum programmed point distance, the robot mechanics and the sample time of the position control loop (clock starting time).

Robot Control V2

Maximum programmable path velocity in machine coordinates (MCS) at the Tool Center Point (TCP).

Depending on parameter K-0-0054, the entry is made in mm/s or in/s.

The parameter limits the maximum path velocity of the kinematics in the Linear and Circular motion types.

No limit is set in the Motion type PTP .

When the parameter value is reached, the warning E02C08CF is displayed. It is deleted when the value is undershot.

K-0-0003 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	99999.0	25.0

K-0-0004, Reserved

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter is reserved for internal applications.

K-0-0004 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	FLASH	**Editability:**	P0, P2

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	2000	2000

K-0-0005, Software limit switch, positive, MCS

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V1

This parameter determines the values of the positive software limit switch in machine coordinates (MCS).

Depending on the parameter K-0-0054, the entry is made in millimeters [mm] or inches [in] or degrees.

Only effective in jog mode.

Due to the kinematics, an internal travel range limit can be reached when traversing in machine coordinates (MCS) in automatic or manual mode.

The motion is immediately stopped and "travel range limit reached" is displayed in the diagnostic error mode.

It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Robot Control V2

This parameter determines the values of the positive software limit switch in machine coordinates (MCS).

Depending on the parameter K-0-0054, the entry is made in millimeters [mm] or inches [in] or degrees.

K-0-0005 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-999999.0	999999.0	999999.0

K-0-0006, Software limit switch, negative, MCS

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V1

This parameter determines the values of the negative software limit switch in machine coordinates (MCS).

Depending on the parameter K-0-0054, the entry is made in millimeters [mm] or inches [in] or degrees.

Only effective in jog mode.

Due to the kinematics, an internal travel range limit can be reached when traversing in machine coordinates (MCS) in automatic or manual mode.

The motion is immediately stopped and "travel range limit reached" is displayed in the diagnostic error mode.

It can also be written on this parameter in phase 4. The new value is only applied after the next phase switching of the control from P2 to BB.

Robot Control V2

This parameter determines the values of the negative software limit switch in machine coordinates (MCS).

Depending on the parameter K-0-0054, the entry is made in millimeters [mm] or inches [in] or degrees.

K-0-0006 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	-999999.0

K-0-0007, Axis number of kinematics

Robot-Control V1: +, Robot-Control V2: +

Function

This parameter contains the actual number of axes of the kinematics.

The value results from "K-0-0008, Axes configuration list".

It contains the sum of all there configured axes and belts.

Parameter "K-0-0070, Belt number of kinematics" contains only the sum of the belts.

K-0-0007 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

K-0-0008, Axis configuration list

Robot-Control V1: +, Robot-Control V2: +

Function

This parameter configures the axes for the kinematics.

Structure

The parameter is a list parameter with the following triple structure:

- Element 1: Axis configuration of kinematic axis 1
- Element 2: Control number
- Element 3: Assigned axis for kinematic axis 1
- Element 4: Axis configuration of kinematic axis 2
- Element 5: Control number
- Element 6: Assigned axis for kinematic axis 2
- ...

The element number must be even.

Value	Comment
0	No axis configured
8	Positioning axis configured

Describing individual parameters, arranged according to types

Value	Comment
16	Orientation axis configured
32	Belt axis configured

Tab. 4-115: Valid values of an axis configuration

Value	Comment
0	Individual control
1-64	Control number in C2C link

Tab. 4-116: Valid values for the control number

Use

Structure of the triple list

The list may not contain any gaps.

One positioning axis has to be at least assigned to a kinematics.

Orientation axes have be located after the positioning axes.

Belt axes have to be located after positioning axes and orientation axes.

Based on the set parameter "K-0-0031 Transformation scheme," a different minimum number of positioning and orientation axes are required (see desired transformation description).

A maximum of four belt axes may be defined.

The triple list may configure a maximum total of 16 axes.

Assignment assistance

Each axis may be assigned to at most one kinematics as positioning or orientation axis.

Parameter "C-0-2482, List of non-linked axes ", lists the axes not yet assigned to a kinematics.

Kinematic axes configured as belt axes do not affect the parameter "C-0-2482, List of non-linked axes."

Belt axes can be selected from "C-0-0483, List of configured axes" and can be assigned to several kinematics.

Influence on other parameters

The number of triple entries in the list determines the parameter "K-0-0007, Axis number of kinematics."

The number of configured belt axes in the list determines the parameter "K-0-0070, Belt number of kinematics."

☞ If "A-0-0059, Scaling type for position data " is set to modulo format for kinematic axes, it is also checked whether the "A-0-0045, Modulo value" is greater than zero and an integer.

With a Robot Control V2 kinematics, the system additionally checks if the scaling of the assigned axes is permissible.

If this is not the case, parameter "K-0-0008, Axis configuration list" is entered into parameter "K-0-0011, List of all invalid K-parameters" and an incorrect configuration is displayed (F0160040, Error in cross-check of K-parameters and/or F22B0024, Axis scaling is incorrect for the transformation).

Example:

The kinematics uses the transformation scheme 10 (SCARA) with four axes.

Axes 1, 2 and 3 are positioning axes.

Axis 4 is an orientation axis.

K-0-0008 displays:

Element	Value	Comment
1	8	Kinematic axis 1: Positioning axis
2	0	Control number 0: Individual control
3	1	Axis with logic axis number 1 assigned
4	8	Kinematic axis 2: Positioning axis
5	0	Control number 0: Individual control
6	2	Axis with logic axis number 2 assigned
7	8	Kinematic axis 3: Positioning axis
8	0	Control number 0: Individual control
9	3	Axis with logic axis number 3 assigned
10	16	Kinematic axis 4: Orientation axis
11	0	Control number 0: Individual control
12	4	Axis with logic axis number 4 assigned

The following axis types are available for positioning and orientation axes (see C-0-0484):

- Real axis
- Virtual axis
- controller axis.

For belt axes, the following are also available:

- encoder axis and
- link axis (cross link sercos II).

K-0-0008 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	64	0

K-0-0009, Osci: list of all K-parameters that can be oscilloscoped

Robot-Control V1: +, Robot-Control V2: +

Function

This parameter contains the list of all K parameters which can be oscilloscoped.

K-0-0009 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-0010, List of all K-parameters

Robot-Control V1: +, **Robot-Control V2:** +

Function This list includes all K-parameters. The entry is made in ID number format.

The entries are sorted by description and their relation and not by ID number or alphabetically.

K-parameters are stored in the order of these entries.

The ID number format is as follows:

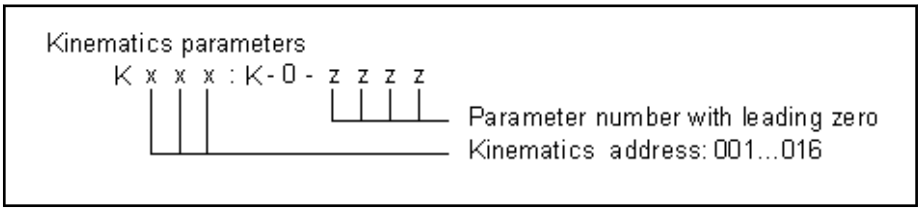


Fig. 4-134: K-parameter structure

Example:

K001: K-0-0002 - Kinematics 1; parameter K-0-0002.

K-0-0010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x2B00000000	0x2B00000FFF	---

K-0-0011, List of all invalid K-parameters

Robot-Control V1: +, **Robot-Control V2:** +

Function This list displays all invalid K-parameters in the result

- of a checksum test, e.g. after a firmware update, or
- a plausibility test, e.g. in the result of an illegal operation mode.

The entry is made in ID number format.

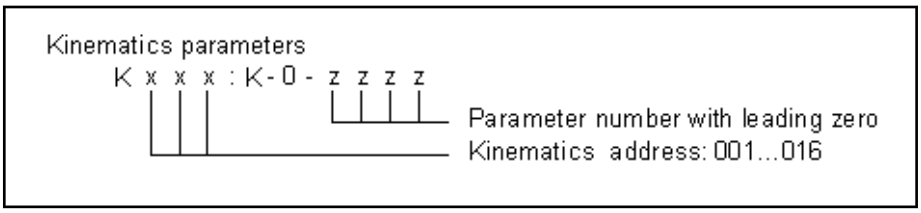


Fig. 4-135: K-parameter structure

Use K001: K-0-0008 - Kinematics 1; parameter K-0-0008.

K-0-0011 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN

Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x2B00000000	0x2B00000FFF	---

K-0-0012, Checksum of all K-parameters

Robot-Control V1: +, **Robot-Control V2:** +

Function When reading this parameter the checksum is generated by all K parameter values the IDNs of which are listed in parameter "K-0-0013, IDN list of checksum K parameter".

K-0-0012 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-0013, IDN list of checksum K-parameters

Robot-Control V1: +, **Robot-Control V2:** +

Function The parameter's ID numbers whose checksum is to be formed are entered in this parameter.

The checksum formation is triggered when the "K-0-0012, Checksum of all C-parameters" is read out.

In the default state, no ID numbers are entered in K-0-0013.

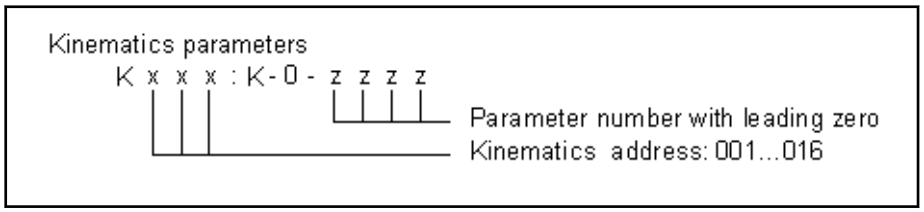


Fig. 4-136: Structure of a K-parameter

Use K001: K-0-0008 - Kinematics 1; parameter K-0-0008.

K-0-0013 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	4095	---

K-0-0014, Path acceleration, change time

Robot-Control V1: +, **Robot-Control V2:** -

Describing individual parameters, arranged according to types

Function

This parameter is only effective with the RCL commands MOVE LINEAR and MOVE CIRCULAR in the block transition mode PROGR_SLOPE.

In the block transition mode BLOCK_SLOPE, a jerk limitation can be programmed using the RCL keyword "J".

The change time only affects the acceleration, but not the deceleration.

The deceleration change time is set using parameter K-0-0015.



The deceleration change time specified here is the time until the acceleration/ braking deceleration/ programmed in the RCL program is to be reached.

We distinguish 3 movement forms:

- Acceleration in rectangle mode:

  K-0-0014 and K-0-0015 are 0.

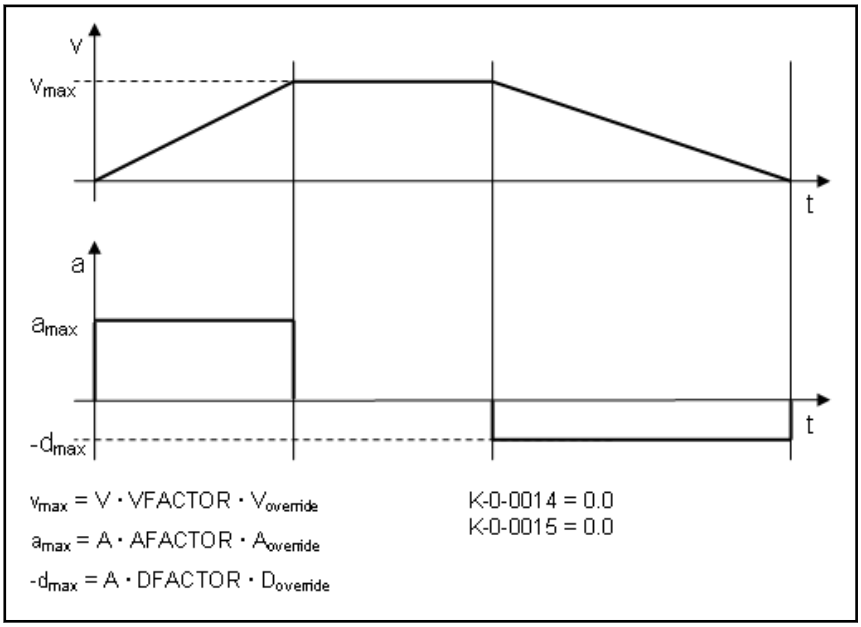


Fig. 4-137: Acceleration/deceleration in rectangle mode

  The resulting jerk j is mathematically infinite.

- Acceleration in trapezoid mode:

  K-0-0014 and/or K-0-0015 are greater or equal to the sercos cycle time (see also C-0-0400). The programmed acceleration must be constantly available at a certain time to reach the programmed velocity.

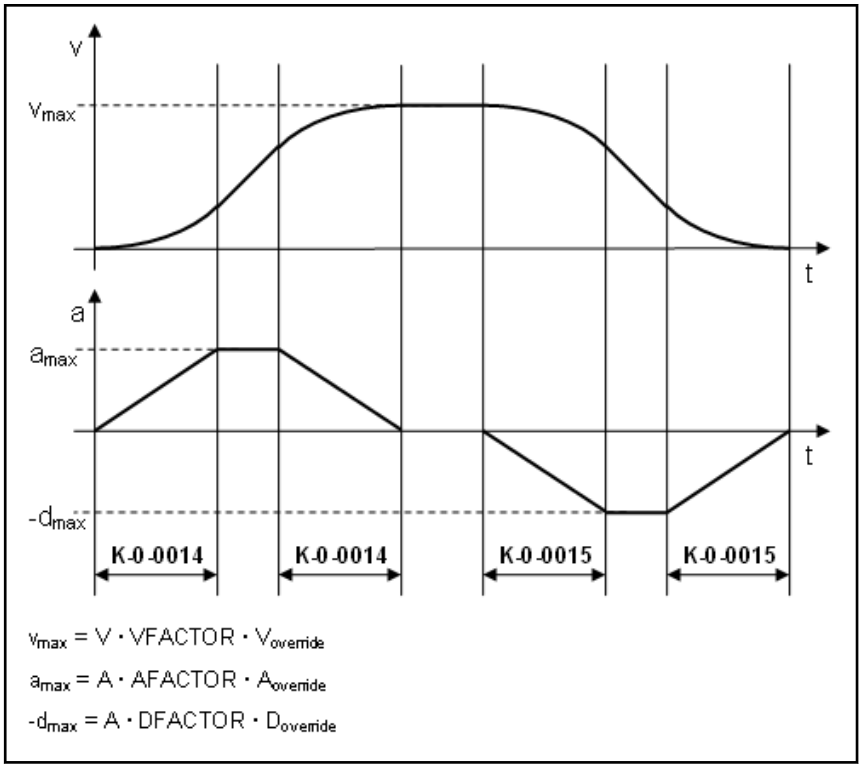


Fig. 4-138: Acceleration/deceleration in trapezoid mode

The resulting jerk j is $j = \frac{a_{max}}{K-0-0014}$.

- Acceleration in triangle mode:

  The times specified in K-0-0014 and K-0-0015 cannot be maintained to reach the programmed acceleration.

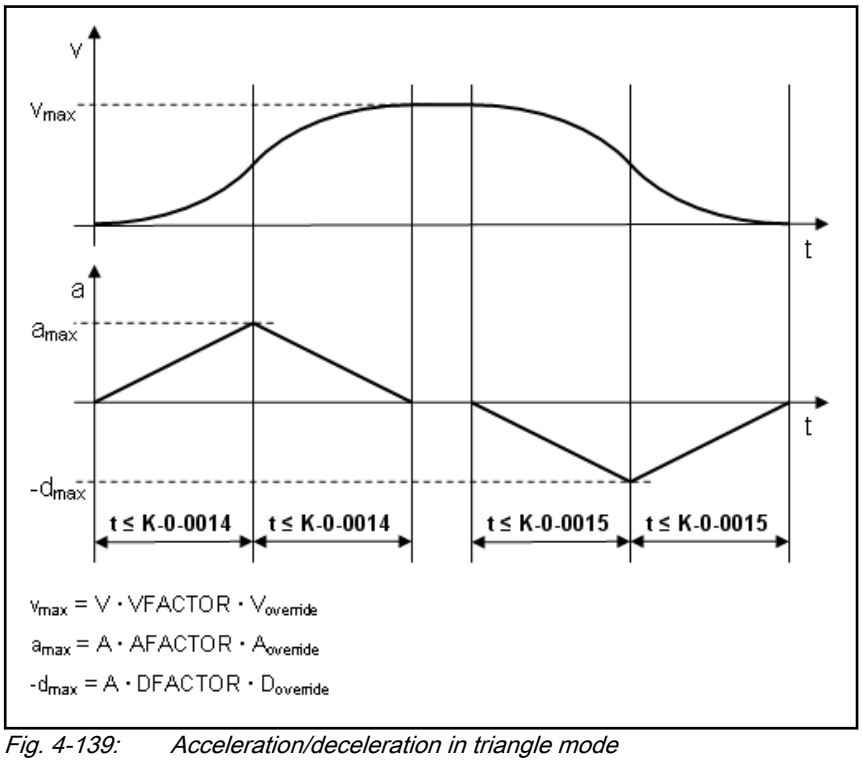


Fig. 4-139: Acceleration/deceleration in triangle mode

Describing individual parameters, arranged according to types

The resulting jerk j is $j = \frac{a_{max}}{t}$.

Use The greater the change times, the smoother the motion profile. If the programmed acceleration/deceleration value is too large, the path planning is switched over to the aforementioned triangle mode.



The greater the programmed acceleration and the smaller the acceleration change time, the greater the jerk.

Low velocities can result in the very small acceleration change time t in triangle mode, which, in turn, produces a large jerk.

K-0-0014 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0

K-0-0015, Path deceleration, change time

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is only effective with the RCL commands MOVE LINEAR and MOVE CIRCULAR in the block transition mode PROGR_SLOPE.

In the block transition mode BLOCK_SLOPE, a jerk limitation can be programmed using the RCL keyword "J".

The change time only affects the deceleration, but not the acceleration.

The acceleration change time is set using parameter K-0-0014.



The deceleration change time specified here is the time until the acceleration/ braking deceleration/ programmed in the RCL program is to be reached.

We distinguish 3 movement forms:

- Acceleration in rectangle mode:

  K-0-0014 and K-0-0015 are 0.

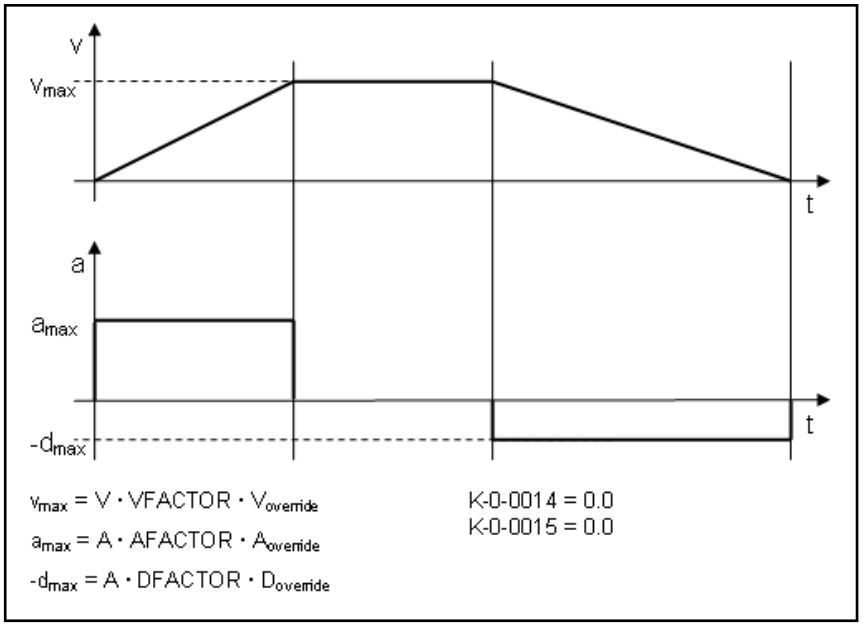


Fig. 4-140: Acceleration/deceleration in rectangle mode

The resulting jerk j is mathematically infinite.

- Acceleration in trapezoid mode:

  K-0-0014 and/or K-0-0015 are greater or equal to the sercos cycle time (see also C-0-0400). The programmed acceleration must be constantly available at a certain time to reach the programmed velocity.

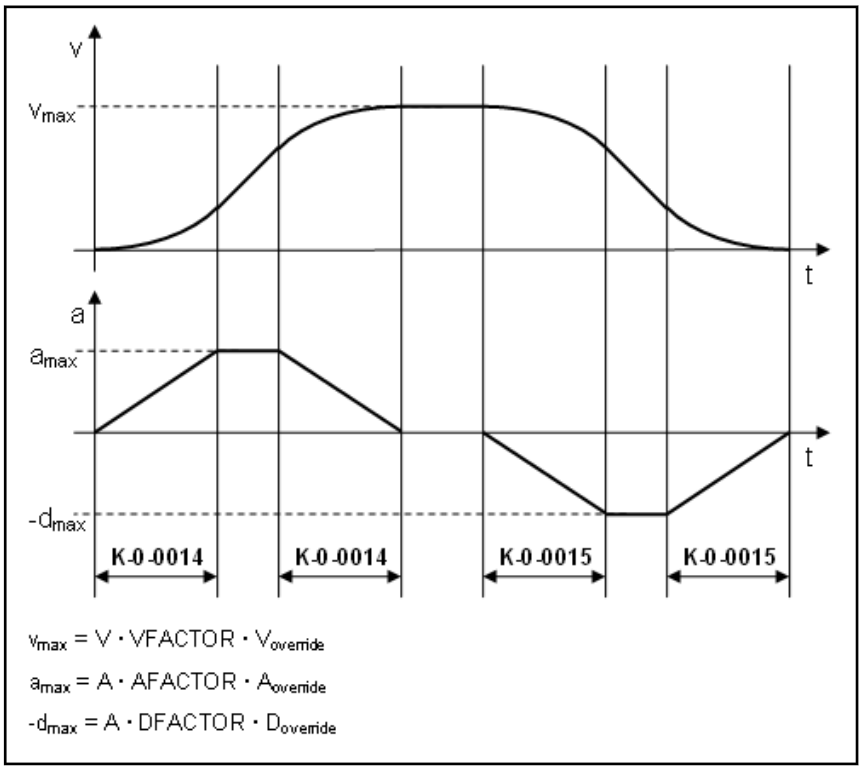


Fig. 4-141: Acceleration/deceleration in trapezoid mode

The resulting jerk j is $j = \frac{d_{max}}{K-0-0015}$.

Describing individual parameters, arranged according to types

- Acceleration in triangle mode:

  The times specified in K-0-0014 and K-0-0015 cannot be maintained to reach the programmed acceleration.

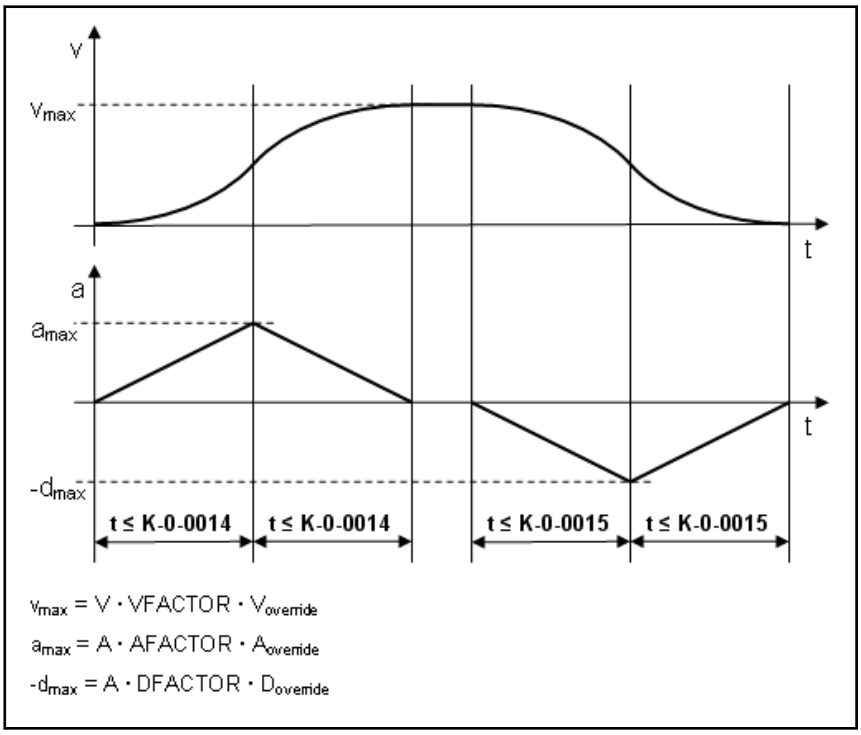


Fig. 4-142: Acceleration/deceleration in triangle mode

The resulting jerk j is $j = \frac{d_{max}}{t}$.

Use The greater the change times, the smoother the motion profile. If the programmed acceleration/deceleration value is too large, the path planning is switched over to the aforementioned triangle mode.

☞ The greater the programmed acceleration and the smaller the acceleration change time, the greater the jerk.

Low velocities can result in the very small acceleration change time t in triangle mode, which, in turn, produces a large jerk.

K-0-0015 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0

K-0-0016, Project identification number

Robot-Control V1: +, **Robot-Control V2:** +

Function IndraWorks entered a series of unique characters in this parameter to identify worldwide the project.

This series of characters is one to one for each project.

Describing individual parameters, arranged according to types

This parameter has no influence on the functions of the Motion Logic Control.



This parameter is for internal purposes only.

K-0-0016 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Project ID number"

K-0-0019, Kinematic type

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter indicates the kinematic type.

Structure

Bit	Content	Bit name
2..0	001: Robot Control V1 010: Robot Control V2	Kinematic type
31..3	Reserved	

Tab. 4-117: K-0-0019 Kinematic type

K-0-0019 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0020, Kinematic diagnostic message

Robot-Control V1: +, **Robot-Control V2:** +

Function

These parameters contain the current diagnostic message for the kinematic (message, warning or error).

If bit 8 or bit 9 of the "A-0-0021, Kinematic status" parameter is set to 1, this parameter contains either the warning text (bit 8) or the error text (bit 9).

From the perspective of the PLC, this information is available to the kinematic "*" as

- KinData[*].dwKinStatus_i.8= TRUE, diagnostic message in K-0-0020 is a warning text or
- KinData[*].dwKinStatus_i.8= TRUE, diagnostic message in K-0-0020 is an error text.



If no error or warning has been reported in the kinematics, the current kinematic state is displayed as text.

K-0-0020 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING

Describing individual parameters, arranged according to types

Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"No messages now available"

K-0-0021, Kinematic status

Robot-Control V1: +, Robot-Control V2: +

Function

This parameter describes the current status of the kinematics.

This is internal system information that is triggered via PLC function blocks for example. The information does not include the state of the Kinematic state machine.

Structure

Robot Control V1

Bit	Content	Bit name
2...0	001 - Automatic 010 - Manual	Kin_OpMode_Auto Kin_OpMode_Manual
4..3	Jog coordinate system 00 - ACS 01 - MCS original 10 - MCS workpiece 11 - MCS tool	Kin_JogCoord1 (Bit 3) Kin_JogCoord2 (Bit 4)
5	All kinematic axes are in standstill. (Belt axes are not considered)	Kin_StandStill
6	Command position = actual position The programmed end position is reached.	Kin_InPosition
7	Belt-synchronous	Kin_BeltSynchronous
8	Warning	Kin_Warning
9	Error	Kin_Error
10	Homing required; not all axes are referenced.	Kin_NotHomed
12	Transformed machine coordinates are invalid	Kin_TrafoValuesInvalid
13	Operating mode MANUAL_JOG is enabled KinData[].stJogCom_q.enJogCmdVel ≠ KIN_JOG_STOP	Kin_JogEnabled
14	All axes are ready for operation (AH or AF)	Kin_DrivesOn
15	Feed enabled Enabled for traversing motions.	Kin_FeedEnabled
16	Block processing enabled Processing the next block enabled	Kin_BlockEnabled
17	Error reaction enabled	Kin_ErrorReaction

Bit	Content	Bit name
19..18	Jog modes 00 - small steps 01 - big steps 10 - slow 11 - fast	Kin_JogMode1 (bit 18) Kin_JogMode2 (bit 19)
21	Program selected	Kin_ProgSelected
23	Reset enabled	Kin_ResetActive
24	Program ended	Kin_ProgEnded
25	Program started	Kin_ProgStarted
26	Program: PAUSE command enabled	Kin_ProgPaused
28	Spline is calculated for blending motion	
29	Spline is valid	

Tab. 4-118: K-0-0021 Kinematic status

Robot Control V2

Bit	Content	Bit name
5	All kinematic axes are in standstill. (Belt axes are not considered)	Kin_StandStill
6	Command position = actual position The programmed end position is reached.	Kin_InPosition
7	Belt-synchronous	Kin_BeltSynchronous
8	Warning	Kin_Warning
9	Error	Kin_Error
10	Homing required; not all axes are referenced.	Kin_NotHomed
11	Blending	Kin_Blending
14	All axes are ready for operation (AH or AF)	Kin_DrivesOn
17	Error reaction enabled	Kin_ErrorReaction
20	Fully belt-synchronous	Kin_FullyBeltSynchronous
22	Waiting for belt-synchronous start condition	Kin_WaitBeltStartCondition
28	Spline is calculated for blending motion	
29	Spline is valid	

Tab. 4-119: K-0-0021 Kinematic status

Use

Robot Control V1

Bit 5: All kinematic axes are in standstill

This bit signals that the axes positioned by the kinematics are in standstill. This means that the velocity is zero.

This bit differs from Kis_Standstill (see parameter K-0-0022) which refers to the kinematics state machine.

Bit 8: Warning

Describing individual parameters, arranged according to types

If an incorrect state is detected which still permits the correct operation, a warning is output.

If they are ignored, some warnings cause an error.

Example:

The programmed path velocity cannot be reached due to the maximum velocity of one or more axes.

Bit 9: Error

If an incorrect state detected which does not allow any correct operation any longer, an error is output.

Example:

The programmed position is located beyond the traversing limit of one or more axes.

Bit 12: Transformed machine coordinates are invalid

The current machine coordinates for the kinematics indicated in KinData are invalid. For example, this is the case if not all of the axes are assigned to the kinematics or if there is an error in the transformation.

Bit 17: Error reaction active

When errors with error reaction capability occur (F0 errors do not have error reaction capability), all of the axes assigned to the axes are stopped as quickly as possible keeping the programmed path.

Bit 17 is deleted when all axes are stopped.

Bit 26: Program: PAUSE command enabled

In the robot program, a PAUSE command is enabled (see PAUSE command).

Bit 28: Spline is calculated for blending motion

The bit is active until a spline is calculated for a blending motion with CONT_SLOPE.

Bit 29: Spline is valid

The bit is active if the spline (to blend with CONT_SLOPE) of the currently selected motion command is valid.

Robot Control V2

Bit 5: All kinematic axes are in standstill

This bit signals that the axes positioned by the kinematics are in standstill (A-0-0021, bit 5). The standstill window A-0-0220 is taken into consideration).

Bit 6: The programmed end position is reached

No active motion command available.

Bit 7: Belt-synchronous

Partially or fully-synchronous traversing to belt.

Bit 8: Warning

That is the reason why a warning is reported.

Bit 9: Error

That is the reason why an error is reported.

Bit 10: Homing required

At least one kinematic axis is not referenced.

Bit 11: Blending

Blending is active.

Bit 14: All axes are ready for operation

All kinematic axes are ready for operation (AH or AF).

Bit 17: Error reaction active

Currently, an error reaction is active.

Bit 20: Fully belt-synchronous

Fully-synchronous traversing to belt.

Bit 22: Waiting for start condition (belt-synchronous)

Waiting for the belt-synchronous start condition.

Bit 28: Spline is calculated for blending motion

Currently, a spline for the blending motion is calculated.

Bit 29: Spline is valid

The spline calculated for the blending motion is valid. The bit remains active until the spline has been travelled.

K-0-0021 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

K-0-0022, Extended kinematic status

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter uses several status bits to describe the current state of the kinematic state machine . Each state is assigned to a status bit combination in the parameter K-0-0022.

Structure

Robot Control V2

	Kinematic state machine is in
Bit 0: Kis_Errorstop	"Errorstop" or "Errorstop Stopping"
Bit 1: Kis_Stopping	"Errorstop Stopping" or "Stopping"
Bit 3: Kis_Incomplete	"Standstill incomplete"
Bit 7: Kis_StandStill	"Standstill Complete" or "Standstill Incomplete"
Bit 10: Kis_ManualMotion	"Manual Motion"
Bit 12: Kis_GroupMoving	"Group Moving"

Robot Control V1

The kinematic state machine is explained in the following figure:

Describing individual parameters, arranged according to types

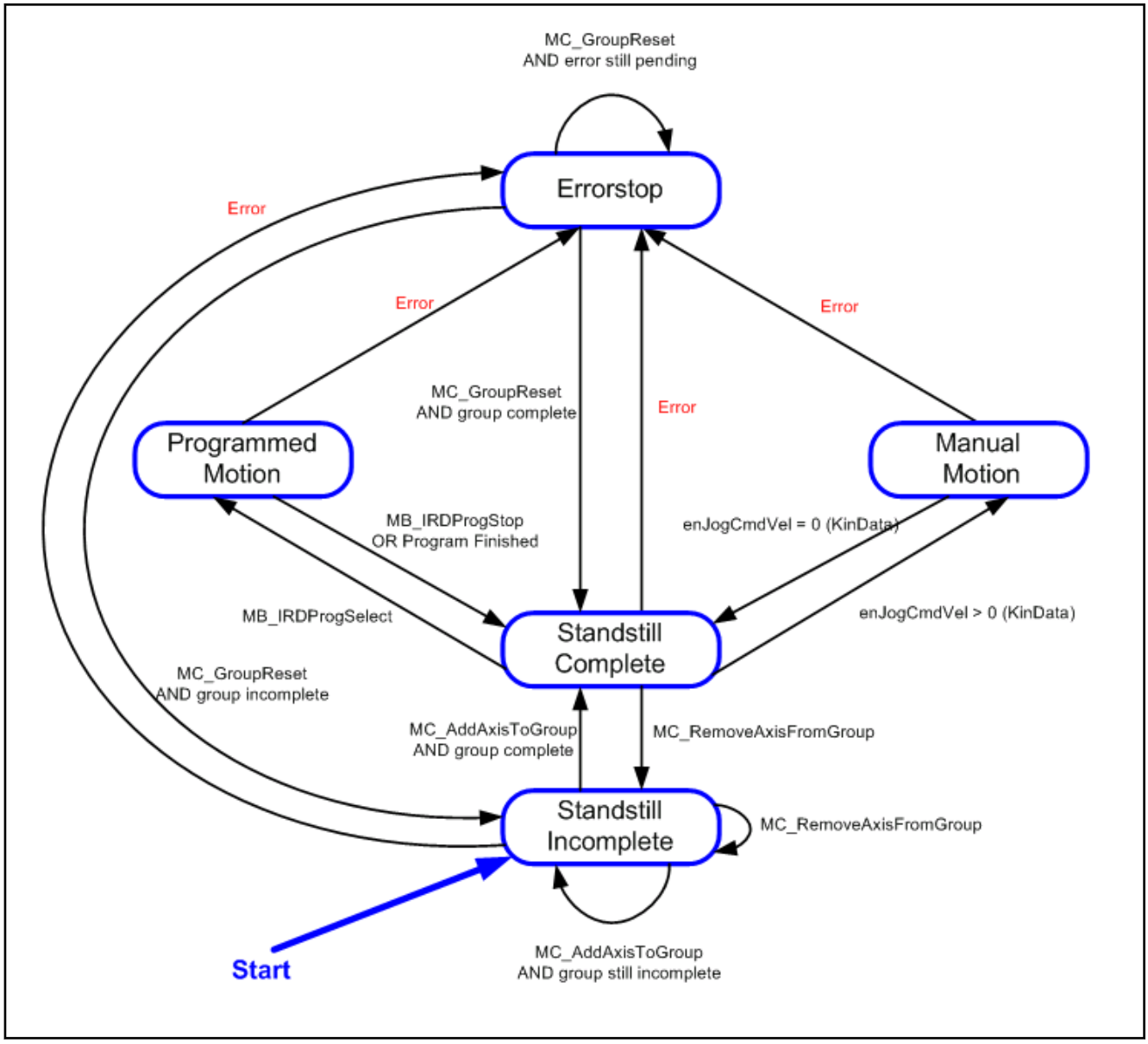


Fig. 4-143: Kinematic state machine

"Programmed Motion" has the following substates:

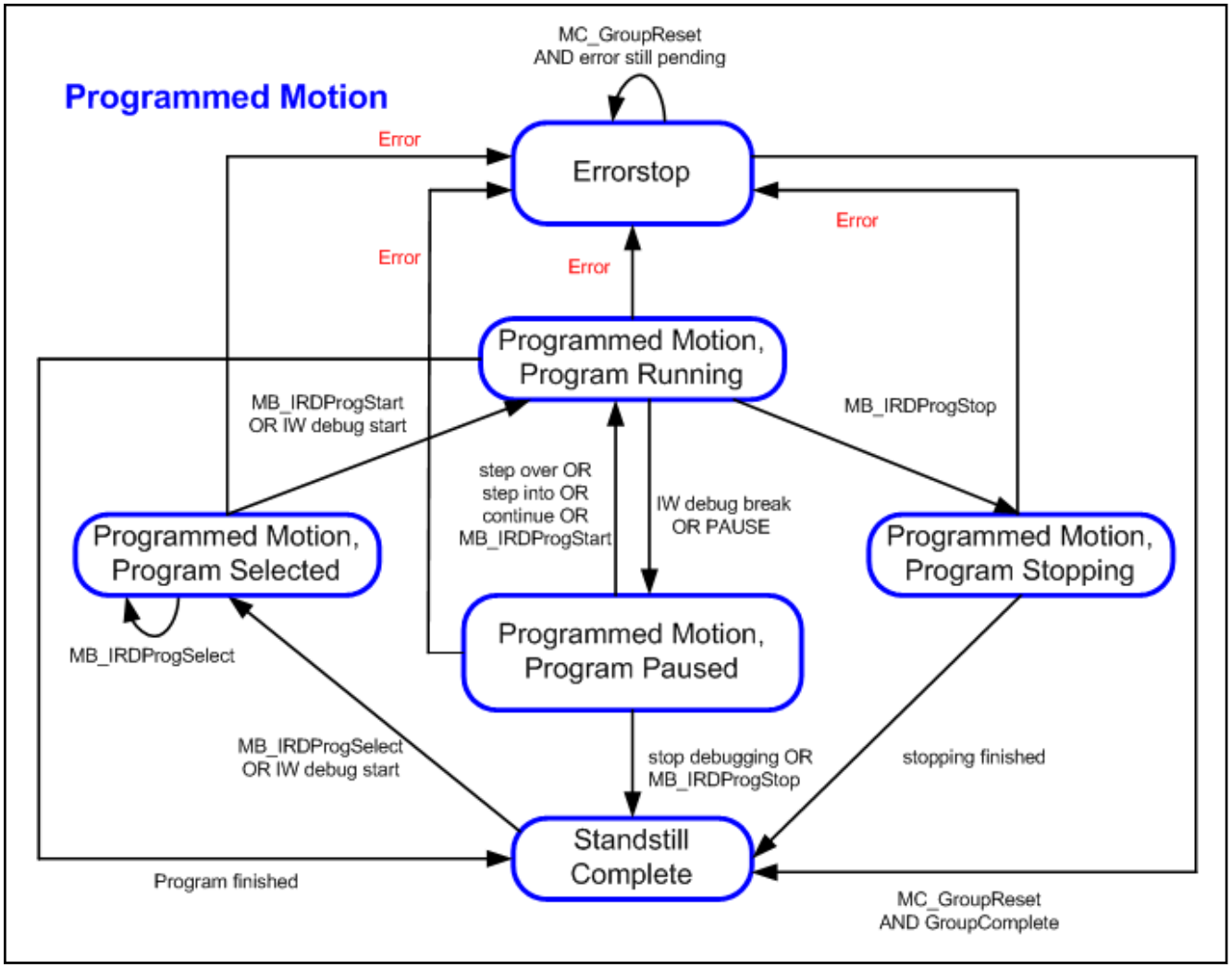


Fig. 4-144: "Programmed Motion" state machine

"Errorstop" state

The "Errorstop" state is reached when an error occurs while the kinematics is running. The axes remain in the "Coordinated Motion" state and remain assigned to the kinematics. Except for axes that have caused an error or that are currently in error state.

The "Errorstop" state can be reset via the MB_GroupReset function block or the command parameter "C-0-1030, Command: Clear all control errors". Afterwards, it is switched to the "Standstill Complete" state for complete kinematics or to the "Standstill incomplete" state for incomplete kinematics.

Bit field definition

In parameter K-0-0022, the following bits are available:

Bit	Content	Name of the bit
0	Kinematic is in "error stop"	Kis_Errorstop
1	Kinematic is "stopping"	Kis_Stopping
3	Not all axes are assigned to the kinematic (incomplete)	Kis_Incomplete
5	Kinematic is in "programmed motion"	Kis_ProgrammedMotion
7	Kinematic is in "StandStill"	Kis_StandStill

Describing individual parameters, arranged according to types

Bit	Content	Name of the bit
8	Program is selected	Kis_ProgramSelected
9	Kinematic is enabled (running)	Kis_Running
10	Kinematic is in jog status KinData[].stJogCom_q.enJogCmdVel ≠ KIN_JOG_STOP	Kis_ManualMotion
11	Kinematic is in "Pause"	Kis_ProgramPaused

Tab. 4-120: K-0-0022 Extended kinematics status

Bit assignment/state

The assignment between the outlined states and their corresponding bits is shown in the following table.

1 : Bit set

0 : Bit not set

x : Bit irrelevant for state

State	Bits 12...8	Bits 7...4	Bits 3...0
Standstill incomplete	00000	1x0x	1x00
Standstill complete	00000	1x0x	0x00
Programmed Motion, program selected	00001	0x1x	0x00
Programmed Motion, program running	00010	0x1x	0x00
Programmed Motion, program stopping	00000	0x1x	0x10
Programmed Motion, program paused	01000	0x1x	0x00
Errorstop	00000	0x0x	0x01
Manual Motion	00100	0x0x	0x00
GroupMoving	10000	0x0x	0x00

Tab. 4-121: Assigning kinematic state to status bits

K-0-0022 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

K-0-0023, Kinematic diagnostic number

Robot-Control V1: +, **Robot-Control V2:** +

Function

If bits 8 or 9 of parameter "K-0-0021, Kinematic status" are set, the current diagnostic number can be read this parameter.

K-0-0023 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	0

K-0-0031, Transformation scheme

Robot-Control V1: +, Robot-Control V2: +

Function

Robot Control V2

The transformation scheme is set in this parameter.

More settings for the transformation scheme can be selected in the parameters K-0-0040 and K-0-0041.

Robot Control V1

This parameter describes the scheme used to couple the kinematic axes mechanically.

It identifies how pivot angles or axis positions in Cartesian coordinates are to be transformed.

The meaning of the individual values of parameter "K-0-0040, Transformation, lengths of the mechanics " and "K-0-0041, Transformation, factors" depends on this set transformation scheme.

More specific information can be found in the special transformation documentation.

Use

Transformation scheme	Name	V1	V2
0	Cartesian	X	X
7	2-axis delta with 1 optional orientation axis	X	X
9	3-axis Scara with 1 optional orientation axis	X	X
10	4-axis Scara with 1 optional orientation axis	X	X
12	2-axis parallelogram	X	X
13	Inverted 2-axis parallelogram	X	X
18	Belt kinematics	X	X
19	2-axis parallelogram V1	X	X
20	3-axis delta with 1 optional orientation axis	X	X
21	2-axis parallelogram V2	X	X
26	Robot with offset wrist with 6 (7) axes	X	
27	Robot with offset wrist with 6 axes + 3 linear axes	X	
29	2-axis delta with rotary and translatory axis	X	
30	Adabot	X	
32	2-axis delta with asymmetric TCP	X	
38	3-axis twisting crane		X
39	2-axis flex stamper		X
40	3-axis delta with linear axes with 1 optional orientation axis		X
45	2-axis delta slide		X
46	3-axis parallelogram V3		

Describing individual parameters, arranged according to types

Transformation scheme	Name	V1	V2
61	4-axis Speedpicker		X
100	User-defined transformation	X	X
111	Extended user-defined transformation		X

V1 Robot Control V1
V2 Robot Control V2

Tab. 4-122: Overview of mechanic tranformations

☞ This parameter must be set when commissioning according to DCC service specifications.

When switching after phase 4, a check is made to see if enough axes are configured for the transformation scheme in parameter "K-0-0008, Axis configuration list."

If this not the case, this parameter is entered in parameter "K-0-0011, List of all invalid K-parameters" and

an incorrect configuration is displayed ("F0160040, Error in cross-check K-parameters").

The kinematics wizard does not check any parameters for the user-defined transformation scheme.

K-0-0031 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	9999	0

K-0-0032, Referencing of axes, command configuration

Robot-Control V1: +, **Robot-Control V2:** -

Function

A presetting to reference all kinematic axes can be set for various robot types.

Referencing all axes:

- 0 - no, default setting
- 1 - yes, mandatory for certain transformations

☞ This parameter must be set when commissioning according to DCC service specifications.

K-0-0032 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1	0

Describing individual parameters, arranged according to types

K-0-0033, IPOS, update at coordinate change

Robot-Control V1: +, **Robot-Control V2:** -

Function

A presetting can be made for IPOS updater at coordinate change for various robot types.

IPOS, update at coordinate change:

- 0 - no, default setting,
- 1 - yes, mandatory for certain transformations

This parameter must be set when commissioning according to DCC service specifications.

K-0-0033 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	1	0

K-0-0034, Maximum path acceleration (bipolar)

Robot-Control V1: -, **Robot-Control V2:** +

Function

Maximum programmable path acceleration in machine coordinates (MCS) at the Tool Center Point (TCP).

Depending on the parameter K-0-0054, the entry is made in mm/s or in/s.

The parameters limits the maximum path acceleration of the kinematics in the Motion types Linear and Circular.

No limit is set in the Motion type PTP.

If the parameter value is reached, the warning E02C08CE is reported and reset if fallen below.

K-0-0034 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0

K-0-0035, Maximum path jerk (bipolar)

Robot-Control V1: -, **Robot-Control V2:** +

Function

Maximum programmable path jerk in machine coordinates (MCS) at the Tool Center Point (TCP).

Depending on parameter K-0-0054, the entry is made in mm/s³ or in/s³.

The parameters limits the maximum path jerk of the kinematics in the Motion types Linear and Circular. In Motion type PTP the jerk is not limited by this parameter.

If the parameter value is reached, the warning E02C08CD is reported and reset if fallen below.

Describing individual parameters, arranged according to types

K-0-0035 - Attributes:				
	Function:	PARAMETER	**Unit:**	K-0-0054
	MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
	Memory:	FLASH	**Editability:**	P0, P2
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	0.0

K-0-0036, MCS axis monitoring

Robot-Control V1: +, **Robot-Control V2:** -

Function

Axis monitoring can be configured for various robot types (monitoring the axis velocity in the machine coordinate system (MCS)).

Use

Axis monitoring:

- 0 = No monitoring
- 1 = Monitoring with motion abort.
- 2 = Only in manual mode, monitoring with limitation of axis velocities. No monitoring in automatic mode.
- 3 = Do not use this setting.
- 4 = In manual and automatic mode, monitoring with limitation of axis velocities. The limitation applies for the complete motion.
- 5 = Continuous monitoring of the axis velocity during linear motion.

Please note the following:

- The high job velocities set in parameter A-0-0083 are monitored in manual mode. In Automatic mode, the maximum axis velocities are monitored.

  ```
  MIN {|A-0-0032| V |A-0-0033|}
  ```

- If the axis limitation occurs during the motion, the velocity at the TCP does not match the programmed velocity.
- If the axis limitation occurs, there are path inaccuracies.

K-0-0036 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
	Memory:	FLASH	**Editability:**	P0, P2
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	5	5

K-0-0040, Transformation, lengths of the mechanics

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V2

In this parameters, the lengths for the transformation scheme in parameter K-0-0031 are configured.

The meaning of the individual values depends on the set K-0-0031, Transformation scheme.

Robot Control V1

Lengths required to transform axis positions into Cartesian coordinates are configured in this parameter.

The meaning of the individual values depends on the set "K-0-0031, Transformation scheme".

More specific information can be found in the special transformation documentation.

☞ When switching to phase 4, the values are checked depending on parameter "K-0-0031, Transformation scheme". (For transformation scheme SCARA, it is checked for example whether the first two lengths are not equal to zero.)

If an error occurs when the values are checked,

- this parameter is entered in the parameter "K-0-0011, List of all invalid K-parameters" and
- an incorrect configuration is displayed (F0160040).

K-0-0040 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-999999.0	999999.0	0.0

K-0-0041, Transformation, factors

Robot-Control V1: +, Robot-Control V2: +

Function

Robot Control V2

This parameter configures the factors for the transformation scheme in parameter K-0-0031.

The meaning of the individual values depends on the transformation scheme set in K-0-0031.

Robot Control V1

Factors required to transform axis positions to Cartesian coordinates are configured in this parameter.

The meaning of the individual values depends on the set "K-0-0031, Transformation scheme". More specific information can be found in the special transformation documentation.

☞ When switching to phase 4, the values are checked depending on parameter "K-0-0031, Transformation scheme".

If an error occurs when the values are checked,

- the parameter "K-0-0041, Transformation factors" is entered in the parameter "K-0-0011, List of all invalid K-parameters" and
- an incorrect configuration is displayed (F0160040 or F22B0024).

K-0-0041 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+

Describing individual parameters, arranged according to types

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	0.0

K-0-0042, Offset of BCS system

Robot-Control V1: +, **Robot-Control V2:** +

Function In this parameter, the offset and the rotation of the basic coordinate system (BCS) with regard to the machine coordinate system (MCS) is selected.

The values are always specified in the machine coordinate system.

Structure This parameter is a list parameter with six values:

Element	Description
1	Displacement in Cartesian x-direction [in millimeters or inches (see K-0-0054)]
2	Displacement in Cartesian y-direction [in millimeters or inches (see K-0-0054)]
3	Displacement in Cartesian z-direction [in millimeters or inches (see K-0-0054)]
4	Rotation along the Cartesian x-axis [in degrees] (see note)
5	Rotation along the Cartesian y-axis [in degrees] (see note)
6	Rotation along the Cartesian z-axis [in degrees] (see note)

Use The first three values indicate the position of the coordinate system origin from the perspective of the machine coordinate system. The elements 4 to 6 indicate the rotation of the coordinate system.



The rotation of the basic coordinate system is only possible in degrees of freedom supported by the transformation scheme.

For example, the scara transformation scheme only contains the degree of freedom by the Z-axis as orientation. Only a rotation of the basic coordinate system by the Z-axis is possible.

K-0-0042 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	0.0

K-0-0043, Assignment list of workpiece coordinates

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter describes which robot coordinate affects which displacement/ rotation of the product coordinate system (PCS).

If the kinematics is provided with less than six degrees of freedom, not all displacements/rotations of the product coordinate system (PCS) are compensated. Using this parameter, it is reported to the control

- which of the six general workpiece coordinates from the mechanics are considered
- which robot coordinate corresponds to which product coordinate

Structure

This parameter is a list parameter with six values.

Element	Description
1	Robot coordinate including the displacement in Cartesian x-direction
2	Robot coordinate including the displacement in Cartesian y-direction
3	Robot coordinate including the displacement in Cartesian z-direction
4	Robot coordinate including the rotation along the Cartesian x-axis
5	Robot coordinate including the rotation along the Cartesian y-axis
6	Robot coordinate including the rotation along the Cartesian z-axis

☞ If a rotation is mechanically impossible, 0 has to be entered in the respective element.

☞ The coordinate system can only be rotated for particular transformation schemes (see K-0-0031). This is documented in the corresponding descriptions (no information on the rotation of the coordinate system means that this option is not supported with this particular transformation scheme).

Use

Example:

4-axis Scara

A 4-axis Scara can traverse in x-, y-, z- direction and rotate along the z-axis. Thus, the following assignment results for the parameter K-0-0043:

K-0-0043 assignment at a 4-axis Scara

Element	Value	Description
1	1	The first axis of the kinematics is used for displacement in x-direction
2	2	The second axis of the kinematics K-0-0042 is used for displacement in y-direction
3	3	The third axis of the kinematics K-0-0042 is used for displacement in z-direction
4	0	Rotation of the workpiece along the x-axis is mechanically not possible
5	0	Rotation of the workpiece along the y-axis is mechanically not possible
6	4	The fourth axis of the kinematics is used for rotating the product coordinate system (PCS) in z-direction

Tab. 4-123: K-0-0043 assignment at a 4-axis Scara

Describing individual parameters, arranged according to types

K-0-0043 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

K-0-0045, Tool selection

Robot-Control V1: +, **Robot-Control V2:** -

Function

The parameter enables the tool by entering the name as string in phase BB.

The name has to be configured with the corresponding coordinate values in the TOOLS.DAT file.

This allows the use of a tool coordinate system in the PLC without using the TOOL command in the RCL.

K-0-0045 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	" "

K-0-0050, Distance units MCS

Robot-Control V1: +, **Robot-Control V2:** +

Function

The distance and orientation units for each element of a list parameter in the machine coordinate system (MCS) are separated by a command and saved in this text parameter.

- Only legible entries are automatically determined.
- One entry (with comma separator) for each coordinate axis (x, y, z, alpha, beta, gamma),
- depending on the transformation type K-0-0031 and the axes used K-0-0008.
  - For x, y, z-axes: mm or inch (see K-0-0054)
  - For alpha, beta, gamma: Degrees

Use

Examples

1. Cartesian robot with X, Y, Z, C

   K-0-0050 = mm,mm,mm,degree or inch,inch,inch,degree (see K-0-0054)

2. Scara with lifting and rotating spindle (X, Y, Z, C)

   K-0-0050 = mm,mm,mm,degree or inch,inch,inch,degree (see K-0-0054)

3. Cartesian robot with X, Y, Z, C, B

   K-0-0050 = mm,mm,mm,degree, degree or inch,inch,inch,degree, degree (see K-0-0054)

4. Cartesian robot with X, Y, C

   K-0-0050 = mm,mm,degree or inch,inch,degree (see K-0-0054)

5. Delta with C-axis and 2 belts

   K-0-0050 = mm,mm,mm,degree or inch,inch,inch,degree (see K-0-0054)



The belts are not included in the lists for the machine coordinate system (MCS).

K-0-0050 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"not available"

K-0-0051, Velocity units MCS

Robot-Control V1: +, **Robot-Control V2:** +

Function

The velocity units for each element of a list parameter in the world coordinate system are separated with a command and saved in this text parameter.

- Only legible entries are automatically determined.
- One entry (with comma separator) for each coordinate axis (x, y, z, alpha, beta, gamma),
- depending on the transformation type K-0-0031 and the axes used K-0-0008.
  - For x, y, z-axes: mm/s or in/s (see K-0-0054)
  - For alpha, beta, gamma: Degree/s

Use

Examples

1. Cartesian robot with X, Y, Z, C

   K-0-0051 = mm/s, mm/s, mm/s, degree/s or inch/s, inch/s, inch/s, degree/s (see K-0-0054)

2. Scara with lifting and rotating spindle (X, Y, Z, C)

   K-0-0051 = mm/s, mm/s, mm/s, degree/s or inch/s, inch/s, inch/s, degree/s (see K-0-0054)

3. Cartesian robot with X, Y, Z, C, B

   K-0-0051 = mm/s, mm/s, mm/s, degree/s, degree/s or inch/s, inch/s, inch/s, degree/s, degree/s (see K-0-0054)

4. Cartesian robot with X, Y, C

   K-0-0051 = mm/s, mm/s, degree/s or inch/s, inch/s, degree/s (see K-0-0054)

5. Delta with C-axis and 2 belts

   K-0-0051 = mm/s, mm/s, mm/s, degree/s or inch/s, inch/s, inch/s, degree/s (see K-0-0054)



The belts are not included in the lists for the machine coordinate system (MCS).

Describing individual parameters, arranged according to types

K-0-0051 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"not available"

K-0-0052, Acceleration units MCS

Robot-Control V1: +, Robot-Control V2: +

Function

The acceleration or deceleration units for each element of a list parameter in the world coordinate system are separated with a command and saved in this text parameter.

- Only legible entries are automatically determined.
- One entry (with comma separator) for each coordinate axis (x, y, z, alpha, beta, gamma),
- depending on the transformation type K-0-0031 and the axes used K-0-0008.
  - For x, y, z-axes: mm/s^2 or inch/s^2
  - For alpha, beta, gamma: degree/s^2

Use

Examples

1. Cartesian robot with X, Y, Z, C

   K-0-0052 = mm/s^2, mm/s^2, mm/s^2, degree/s^2 or inch/s^2, inch/s^2, inch/s^2, degree/s^2" (see K-0-0054)
2. Scara with lifting and rotating spindle (X, Y, Z, C)

   K-0-0052 = mm/s^2, mm/s^2, mm/s^2, degree/s^2 or inch/s^2, inch/s^2, inch/s^2, degree/s^2" (see K-0-0054)
3. Cartesian robot with X, Y, Z, C, B

   K-0-0052 = mm/s2, mm/s^2, mm/s^2, degree/s^2, degree/s^2 or inch/s^2, inch/s^2, inch/s^2, degree/s^2, degree/s^2 (see K-0-0054)
4. Cartesian robot with X, Y, C

   K-0-0052 = mm/s^2, mm/s^2, degree/s^2 or inch/s^2, inch/s^2, degree/s^2 (see K-0-0054)
5. Delta with C-axis and 2 belts

   K-0-0052 = mm/s^2 ,mm/s^2, mm/s^2, degree/s^2, or inch/s^2, inch/s^2, inch/s^2, degree/s^2 (see K-0-0054)



The belts are not included in the lists for the machine coordinate system (MCS).

K-0-0052 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"not available"

K-0-0053, Jerk units MCS

Robot-Control V1: +, **Robot-Control V2:** +

Function

The jerk units for each element of a list parameter in the world coordinate system are separated with a command and saved in this text parameter.

- Only legible entries are automatically determined.
- One entry (with comma separator) for each coordinate axis (x, y, z, alpha, beta, gamma),
- depending on the transformation type K-0-0031 and the axes used K-0-0008.
  - For x, y, z-axes: mm/s^3 or inch/s^3
  - For alpha, beta, gamma: degree/s^3

Use

Examples

1. Cartesian robot with X, Y, Z, C

   K-0-0053 = mm/s^3, mm/s^3, mm/s^3, degree/s^3 or inch/s^3, inch/s^3, inch/s^3, degree/s^3 (see K-0-0054)

2. Scara with lifting and rotating spindle (X, Y, Z, C)

   K-0-0053 = mm/s^3, mm/s^3, mm/s^3, degree/s^3 or inch/s^3, inch/s^3, inch/s^3, degree/s^3 (see K-0-0054)

3. Cartesian robot with X, Y, Z, C, B

   K-0-0053 = mm/s^3, mm/s^3, mm/s^3, degree/s^3, degree/s^3 or inch/s^3, inch/s^3, inch/s^3, degree/s^3, degree/s^3 (see K-0-0054)

4. Cartesian robot with X, Y, C

   K-0-0053 = mm/s^3, mm/s^3, degree/s^3 or inch/s^3, inch/s^3, degree/s^3 (see K-0-0054)

5. Delta with C-axis and 2 belts

   K-0-0053 = mm/s^3, mm/s^3, mm/s^3, degree/s^3 or inch/s^3, inch/s^3, inch/s^3, degree/s^3 (see K-0-0054)



The belts are not included in the lists for the machine coordinate system (MCS).

K-0-0053 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"not available"

K-0-0054, Measuring unit for kinematic data

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter determines the scaling unit of the kinematics.

Structure

The following settings can be made:

Describing individual parameters, arranged according to types

Bit	Name/function
0	**Unit** 0: millimeter [mm] 1: inch [in]
15..1	**Reserved**

K-0-0054 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x0000	0xFFFF	0x0000

K-0-0070, Belt number of kinematics

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter contains the current number of belts of the kinematics.

The value results from "K-0-0008, Axes configuration list". It only contains the sum of there configured belts.

The parameter "K-0-0007, Axis number of kinematics" contains the sum of all axes and belts.

K-0-0070 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	8	0

K-0-0071, Coupling factors, belt 1

Robot-Control V1: +, **Robot-Control V2:** -

Function

The belt coupling factors specify how belt position changes of the first belt affect coordinate changes in the program sections between SYNCHRON and SYNCHRON_END.

Structure

These parameter values are only important if at least a value of 1 is written in the parameter "K-0-0070, Belt number of kinematics".

This is a list parameter. One element in the list is responsible for each coordinate.

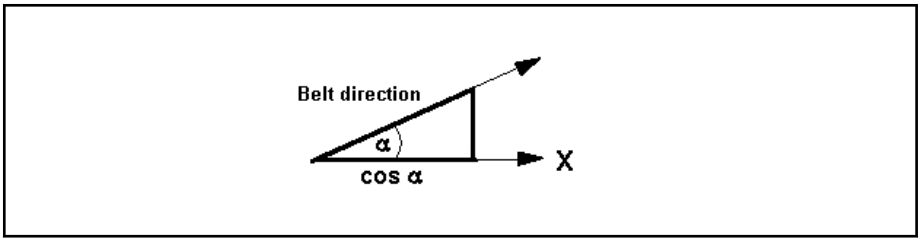


Fig. 4-145: Phase: Belt direction/axis

The value for a coordinate corresponds to the cosine value (cos a) of the phase between the belt and the respective coordinates.

Use

The assignment of the coordinates to the spatial direction does generally depend on the parameter "K-0-0031, Transformation scheme". Generally, the first coordinate is assigned to the x-direction, the second coordinate to the y-direction and the third coordinate to the z-direction. The following examples are based on this definition.

Example 1:

The belt is exactly parallel to the x-axis. Increasing belt values cause the part on the belt moving in positive x-direction.

K-0-0071 displays:

Element	Value	Comment
1	1.000000	Cos (0 degrees)
2	0.000000	Cos (90 degrees)
3	0.000000	Cos (90 degrees)

Example 2:

The belt is exactly parallel to the y-axis. Increasing belt values cause the part on the belt moving in negative y-direction.

K-0-0071 displays:

Element	Value	Comment
1	0.000000	Cos (90 degrees)
2	-1.000000	Cos (180 degrees)
3	0.000000	Cos (90 degrees)

Example 3:

The belt and the x-axis are in an angle of 30 degrees to each other; the belt and the y-axis in an angle of 60 degrees. Increasing belt values cause the part on the belt moving in positive x-direction and in positive y-direction.

K-0-0071 displays:

Element	Value	Comment
1	0.866025	Cos (30 degrees)
2	0.500000	Cos (60 degrees)
3	0.000000	Cos (90 degrees)



The root from the sum of the square of the cosine values has to be as exactly 1 as possible.

If the value is higher than 1, it corresponds to a length elongation in belt direction. If the value is smaller than 1, there is a length compression.

K-0-0071 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	0.0

K-0-0072, Coupling factors, belt 2

Robot-Control V1: +, **Robot-Control V2:** -

Function

The belt coupling factors specify how belt position changes of the second belt affect coordinate changes in the program sections between SYNCHRON and SYNCHRON_END.

These parameter values are only important if at least a value of 2 is written in the parameter "K-0-0070, Belt number of kinematics".

The parameter structure corresponds to the structure of the parameter "K-0-0071, Coupling factors, belt 1".

K-0-0072 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	0.0

K-0-0073, Coupling factors, belt 3

Robot-Control V1: +, **Robot-Control V2:** -

Function

The belt coupling factors specify how belt position changes of the third belt affect coordinate changes in the program sections between SYNCHRON and SYNCHRON_END.

These parameter values are only important if at least a value of 3 is written in the parameter "K-0-0070, Belt number of kinematics".

The parameter structure corresponds to the structure of the parameter "K-0-0071, Coupling factors, belt 1".

K-0-0073 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	-999999.0	999999.0	0.0

K-0-0074, Coupling factors, belt 4

Robot-Control V1: +, **Robot-Control V2:** -

Function

The belt coupling factors specify how belt position changes of the fourth belt affect coordinate changes in the program sections between SYNCHRON and SYNCHRON_END.

These parameter values are only important if at least a value of 4 is written in the parameter "K-0-0070, Belt number of kinematics".

The parameter structure corresponds to the structure of the parameter "K-0-0071, Coupling factors, belt 1".

Describing individual parameters, arranged according to types

K-0-0074 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
	Memory:	FLASH	**Editability:**	P0, P2
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-999999.0	999999.0	0.0

K-0-0080, Jogging, distance short in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter provides the short distance for the incremental jogging in the machine coordinate system (MCS).



It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- List parameter:

  One entry for every coordinate axis (e.g. x, y, z, alpha, beta, gamma),
- Unit:

  Depends on the transformation type K-0-0031 and the axes used (see K-0-0008).

  The units are stored in K-0-0050.

  Example:

  for x, y, z in millimeters [mm] or inches [in] (see K-0-0054),

  for alpha, beta, gamma in degrees.
- Value range: >0.0 (floating point number)
- Default: 1.0 mm or inch or degree.

Use

The robot control uses this parameter for the incremental axis jogging in the machine coordinate system (MCS).

The PLC program can use the jog bits (KinData[1].stJogCmd_q) to enable the incremental jogging in the machine coordinate system (MCS) with short distance:

E.g. incremental jogging in the MCS with short distance of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_ORIGIN_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_SMALL;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

- The short distance to jog the axis is written in K-0-0080.
- The maximum velocity is written in K-0-0083 (always high for incremental jogging)
- The maximum acceleration is written in K-0-0084
- The maximum deceleration is written in K-0-0085
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

Describing individual parameters, arranged according to types

The jog motion can be prematurely completed by setting enJogMode = KIN_JOG_STOP.

Program:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

K-0-0080 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	1.0

K-0-0081, Jogging, distance long in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter provides the long distance for the incremental jogging in the machine coordinate system (MCS).



It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- List parameter:

  One entry for every coordinate axis (e.g. x, y, z, alpha, beta, gamma),
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0050.

  Example:

  for x, y, z in millimeters [mm] or inches [in] (see K-0-0054),

  for alpha, beta, gamma in degrees.
- Value range: >0.0 (floating point number)
- Default: 10.0 mm or inch or degree.

Use

The robot control uses this parameter for the incremental axis jogging in the machine coordinate system (MCS).

The PLC program can use the jog bits (KinData[1].stJogCmd_q) to enable the incremental jogging in the machine coordinate system (MCS) with long distance:

E.g. incremental jogging in the MCS with long distance of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_ORIGN_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_LARGE;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

- The long distance to jog the axis is written in K-0-0081
- The maximum velocity is written in K-0-0083 (always high for incremental jogging)
- The maximum acceleration is written in K-0-0084

- The maximum deceleration is written in K-0-0085
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

The jog motion can be prematurely completed by setting enJogMode = KIN_JOG_STOP

Program:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

K-0-0081 - Attributes:				
	Function:	PARAMETER	**Unit:**	K-0-0054
	MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-
		Minimum value	**Maximum value**	**Default value**
	Common:	0.001	2147483647.0	10.0

K-0-0082, Jogging, velocity low in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter provides the slow velocity for continuous jogging in the machine coordinate system (MCS).



It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- List parameter:

  One entry for each coordinate axis (x, y, z, alpha, beta, gamma)
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0051.

  Example:

  for x, y, z in mm/s or in/s (see K-0-0054),

  for alpha, beta, gamma in degrees/s.
- Value range: >0.0 (floating point number)
- Default: 10.0 mm/s or in/s or degree/s

Use

The robot control uses this parameter for the continuous axis jogging in the machine coordinate system (MCS).

The PLC program can use the jog bits (KinData[1].stJogCmd_q) to enable the continuous jogging in the machine coordinate system (MCS) at low velocity:

E.g. continuous jogging in the MCS at low velocity of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_ORIGIN_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_SLOW;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

Describing individual parameters, arranged according to types

- The low velocity is written in K-0-0082
- The maximum acceleration is written in K-0-0084
- The maximum deceleration is written in K-0-0085
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

The continuous jogging can be completed with two different methods:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

and/or

```
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 0; (*no axis in pos.*)
```

K-0-0082 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	10.0

K-0-0083, Jogging, velocity high in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter provides the fast velocity for continuous jogging in the machine coordinate system (MCS).



It can also be written on this parameter in phase 4. The new value is applied at the next jog command. It is not possible to change the parameter for the active jog command.

Structure

- List parameter:

  One entry for every coordinate axis (x, y, z, alpha, beta, gamma).
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0051.

  Example:

  for x, y, z in mm/s or in/s (see K-0-0054),

  for alpha, beta, gamma in degrees/s.
- Value range: >0.0 (floating point number)
- Default: 25.0 mm/s or in/s or degree/s.

Use

The robot control uses this parameter for the continuous axis jogging in the machine coordinate system (MCS).

The PLC program can use the jog bits (KinData[1].stJogCmd_q) to enable the continuous jogging in the machine coordinate system (MCS) at fast velocity:

Describing individual parameters, arranged according to types

E.g. continuous jogging in the MCS at fast velocity of the 3rd axis in positive direction:

```
KinData[1].stJogCmd_q.enJogCmdCoordSys := KIN_CORD_SYS_ORIGN_COORD;
KinData[1].stJogCmd_q.enJogMode :=        KIN_JOG_STEP_FAST;
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 4; (*3. bit for 3.axis of kinematics or group*)
```

- The high velocity is written in K-0-0083
- The maximum acceleration is written in K-0-0084
- The maximum deceleration is written in K-0-0085
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

The continuous jogging can be completed with two different methods:

```
KinData[1].stJogCmd_q.enJogMode := KIN_JOG_STOP;
```

and/or

```
KinData[1].stJogCmd_q.wJogCmdNegative := 0; (*no axis in neg.*)
KinData[1].stJogCmd_q.wJogCmdPositive := 0; (*no axis in pos.*)
```

K-0-0083 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.001	2147483647.0	25.0

K-0-0084, Jogging, acceleration in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

The acceleration for jogging (incremental and continuous) in the machine coordinate system (MCS) is stored in this parameter.



The parameter can also be written on this parameter in phase 4. Changes are only applied in case of phase switching from phase 2 to phase 4.

Structure

- List parameter:

  One entry for every coordinate axis (x, y, z, alpha, beta, gamma),
- Unit:

  Depends on the transformation type K-0-0031 and the axis, see K-0-0008.

  The units are stored in K-0-0052.

  Example:

  for x, y, z in mm/s^2 or in/s^2 (see K-0-0054),

  for alpha, beta, gamma in Grad/s^2.
- Value range: >0.0 (floating point number)
- Default: 370 mm/s^2 or in/s^2 or degree/s^2.

Describing individual parameters, arranged according to types

Use The robot control uses this parameter for jogging (incremental and continuous) in the machine coordinate system (MCS).

- The maximum deceleration is written in K-0-0085
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

Acceleration A-0-0084 and deceleration A-0-0085 are valid for axis jogging (axis coordinate system (ACS)).

K-0-0084 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.001	2147483647.0	370.0

K-0-0085, Jogging, deceleration in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function The deceleration for jogging (incremental and continuous) in the machine coordinate system (MCS) is stored in this parameter.



The parameter can also be written on this parameter in phase 4. Changes are only applied in case of phase switching from phase 2 to phase 4.

Structure

- List parameter:

  One entry for every coordinate axis (x, y, z, alpha, beta, gamma).
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0052.

  Example:

  for x, y, z in mm/s^2 or in/s^2 (see K-0-0054),

  for alpha, beta, gamma in Grad/s^2.
- Value range: ≥ 0.0 (floating point number)
- Default: 370 mm/s^2 or in/s^2 or degree/s^2.

Use The Robot Control uses this parameter for jogging (incremental and continuous) in the machine coordinate system (MCS).

- The maximum acceleration is written in K-0-0084
- The maximum jerk for acceleration is written in K-0-0086
- The maximum deceleration jerk is written in K-0-0087

Acceleration A-0-0084 and deceleration A-0-0085 are valid for axis jogging (axis coordinate system (ACS)).

K-0-0085 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.001	2147483647.0	370.0

K-0-0086, Jogging, acceleration jerk in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter stores the maximum acceleration jerk to jog (incremental and continuous) in the machine coordinate system (indirect definition of the acceleration change time).

☞ The parameter can also be written on this parameter in phase 4. Changes are only applied in case of phase switching from phase 2 to phase 4.

Structure

- List parameter:

  One entry for each coordinate axis (x, y, z, alpha, beta, gamma)
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0053.

  Example:

  for x, y, z in mm/s³ or in/s³ (see K-0-0054),

  for alpha, beta, gamma in degree/s³.
- Value range: ≥ 0.0 (floating point number)
- Default: 0.0 (no jerk limitation).

Use

The robot control uses this parameter for jogging (incremental and continuous) in the machine coordinate system (MCS).

Off $\Delta a = j * t$ The acceleration time can be calculated from $t = \frac{\Delta a}{j}$ or $t = \frac{K-0-0084}{K-0-0086}$.

The maximum deceleration jerk in the machine coordinate system (MCS) is written in K-0-0087.

The jerk limit values for jogging axis-by-axis are specified in A-0-0086 and A-0-0087.

K-0-0086 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0

K-0-0087, Jogging, deceleration jerk in MCS

Robot-Control V1: +, **Robot-Control V2:** -

Describing individual parameters, arranged according to types

Function The maximum deceleration jerk for jogging (incremental and continuous) in the machine coordinate system (MCS) is stored in this parameter (indirect definition of the deceleration change time)



The parameter can also be written on this parameter in phase 4. Changes are only applied in case of phase switching from phase 2 to phase 4.

Structure

- List parameter:

  One entry for every coordinate axis (x, y, z, alpha, beta, gamma).
- Unit:

  Depends on the transformation type K-0-0031 and the axis (see K-0-0008).

  The units are stored in K-0-0053.

  Example:

  for x, y, z in mm/s^3 or in/s^3 (see K-0-0054),

  for alpha, beta, gamma in degree/s^3.
- Value range: ≥ 0.0 (floating point number)
- Default: 0.0 (no jerk limitation).

Use The robot control uses this parameter for jogging (incremental and continuous) in the machine coordinate system (MCS).

Off $\Delta a = j * t$ The deceleration time can be calculated from $t = \frac{\Delta a}{j}$ or $t = \frac{K-0-0085}{K-0-0087}$.

The maximum acceleration jerk in the machine coordinate system (MCS) is written in K-0-0086.

The jerk limit values for jogging axis-by-axis are specified in A-0-0086 and A-0-0087.

K-0-0087 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	2147483647.0	0.0

K-0-0096, Peak value of command buffer size

Robot-Control V1: -, **Robot-Control V2:** +

Function This parameter shows the maximum value of the command buffer size that has been reached. By writing smaller values, the value can be reset.

K-0-0096 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-0097, Maximum command buffer size

Robot-Control V1: -, **Robot-Control V2:** +

Function This parameters specifies the maximum number of commands that can simultaneously be saved in the block buffer.

K-0-0097 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	1	128	16

K-0-0098, Current command buffer size

Robot-Control V1: -, **Robot-Control V2:** +

Function This parameter shows the current number of commands in the block buffer.

K-0-0098 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-0099, Kinematic configuration

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter configures the behavior of the kinematics.

Structure

Bit	Name/function
0	Enables automatic switching from CONT_SLOPE to BLOCK_SLOPE
1	Enables the axis modulo of each belt axis as belt modulo
2	Enables the complete radius to blend with BLOCK_SLOPE
3	Enables the option to be synchronous with multiple belts at the same time
4	Enables the option that more than two commands can be active simultaneously in BLOCK_SLOPE
5	Disables all scaling checks of the kinematic axes
6	Enables the adaptive interpolation for belt-synchronous motions
7..31	Reserved

Use **Bit 0: Enables automatic switching from CONT_SLOPE to BLOCK_SLOPE**

If the automatic switching is active, it is switched to the blending method BLOCK_SLOPE if blending with CONT_SLOPE failed.

Describing individual parameters, arranged according to types

Bit 1: Enables the axis modulo of each belt axis as belt modulo

If bit 1 is set, the axis modulo of each belt axis is used as belt module value. Ensure that the belt operating range can be max. belt module/2.

Bit 2: Enables the complete radius to blend with BLOCK_SLOPE

If bit 2 is set, the blending radius for BLOCK_SLOPE is not limited anymore to the minimum of radius and path distance/2 of the shorter block.

Bit 3: Enables the option to be synchronous with multiple belts at the same time

If bit 3 is set, simultaneous synchronous operation on several belts is possible. The belts have to be linearly independent, i.e. twisted in an angle of 90 degrees with respect to one another.

Bit 4: Enables the option that more than two command can be active in BLOCK_SLOPE simultaneously

If bit 4 is set, more than two commands can be active in BLOCK_SLOPE simultaneously. Thus, more than 2 commands are blended. A third command is also started if it is in the blending radius and if the first command has not been completed yet. Please note that the resulting path is undefined due to blending of more than two commands. For example, two blocks working in opposite directions can cancel each other.

Bit5: Disables all scaling checks of the kinematic axes

If bit 5 is set, all scaling checks of the kinematic axes are disabled. The axis scaling does not have to match the transformation. It is possible to use non-translatory scaled axes for linear belts.

⚠ CAUTION **Unexpected axis motions**

Disabling the scaling check can result in unexpected axis motions.

Bit6: Enables the adaptive interpolation for belt-synchronous motions

If bit 6 is set, belt-synchronous motions, adaptively interpolated if required (that is waiting and standstill times of the kinematics until the fully synchronous end point of a motion of the belt-synchronous workspace is reached) can be omitted. The fully synchronous end point is reached by the kinematics at the same time as soon as it reached the belt-synchronous workspace. The interpolation of the belt-synchronous motion depends on the fully synchronous end point.

K-0-0099 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFFFFFFFF	0x00

K-0-0100, Current position, Cartesian Machine Coordinate System

Robot-Control V1: +, **Robot-Control V2:** +

Function The parameter indicates the current position of the kinematics in the machine coordinaten system (MCS).

The current position consists of a list of Cartesian coordinates, the orientation and the belt counters, depending on the transformation scheme (K-0-0031) and the axis configuration (K-0-0008).

K-0-0100 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0102, Current path velocity

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current path velocity of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

The unit is mm/s or in/s (see K-0-0054).

K-0-0102 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0103, Current path acceleration

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current path acceleration of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

The unit is mm/s^2 or in/s^2.

K-0-0103 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0104, Current path jerk

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current path jerk of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

Describing individual parameters, arranged according to types

The unit is mm/s³ or in/s³.

K-0-0104 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0105, Actual position, Cartesian Workpiece Coordinates

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-0105 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0106, Coordinate values of tool

Robot-Control V1: +, **Robot-Control V2:** -

Function The parameter indicates the coordinate values of the active tool, the three translations X, Y Z and the three rotations O1, O2, O3.

K-0-0106 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0.0

K-0-0107, Coordinate values of workpiece

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-0107 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0121 to K-0-0136, Coordinate Names

Robot Control V1: +, **Robot Control V2:** -

Describing individual parameters, arranged according to types

The parameters K-0-0121 ... 0136 contain the names of the individual coordinates. The text does not provide any functional meaning.

For a uniform and detailed description, refer to "K-0-0121, Coordinate name C1".

K-0-0121, Coordinate name C1

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter contains the name of the first coordinate of the world coordinate system of the kinematics.



The following restrictions apply:

- maximum of 12 characters
- A...Z, a...z, 0..9, '_'
- first character must be a letter
- "K_1" is identical to "k_1"; upper-case and lower-case letters are not differentiated.

K-0-0121 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"K1"

K-0-0140, Tool name

Robot-Control V1: +, **Robot-Control V2:** -

Function

The parameter indicates the name of the active tool coordinate system. "none active" is displayed after startup.

K-0-0140 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	" "

K-0-0141, Workpiece name

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter is reserved and has no functionality.

K-0-0141 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0150, Interpolated command position

Robot-Control V1: +, **Robot-Control V2:** +

Function

The parameter indicates the current interpolated command position of the kinematics in the machine coordinate system (MCS).

Depending on the transformation scheme (K-0-0031) and the axis configuration (K-0-0008), the current position consists of a list of Cartesian world coordinates, the orientation, and the belt counters.

K-0-0150 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0152, Interpolated path velocity

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current interpolated path velocity of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

The unit is mm/s or in/s (see K-0-0054).

K-0-0152 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0153, Interpolated path acceleration

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current interpolated path acceleration of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

The unit is mm/s^2 or in/s^2.

K-0-0153 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0154, Interpolated path jerk

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter provides the current interpolated path jerk of the kinematics at the TCP.

Only the positioning axes and not the orientation and belt axes are considered.

The unit is mm/s^3 or in/s^3.

K-0-0154 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0155, Safe zones on/off

Robot-Control V1: +, **Robot-Control V2:** -

Function

This parameter specifies which of the 32 safe zones are enabled or disabled.

Structure

Bit	Content
0	Enabling the 1st safe zone
1	Enabling the 2nd safe zone
...	...
31	Enabling the 32nd safe zone

Tab. 4-124: K-0-0155 Safe zones on/off

Use

Parameter K-0-0155 can be directly modified in P4 (BB RUN). Switching to P2 and back to BB is not necessary.

When running a RCL program, it must still be remembered that enabling/disabling the safe zones can be delayed, since safe zones are checked during the block preparation.

Example:

K-0-0155: 0000 0000 0000 0000 0000 0000 0000 0100 ; the 3rd safe zone is enabled.

K-0-0155 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	0xFFFFFFFF	0

K-0-0156, Safe zone 1 min. point

Robot-Control V1: +, **Robot-Control V2:** -

Describing individual parameters, arranged according to types

Function This parameter determines the minimum point of the 1st safe zone.

A cuboid safe zone is determined with the maximum point from K-0-0157.

Structure The parameter is a list parameter with the following structure:

- Element 1: Position of the 1st axis
- Element 2: Position of the 2nd axis
- Element 3: Position of the 3rd axis

Use The parameter can be directly modified in P4 (BB RUN). Switching to P2 is not necessary.

If an RCL program is running, note that the changes in the safe zone can be delayed since the safe zone check is executed in the block preparation.

In addition, the maximum point has to be greater than the minimum point, since the safe zone check is otherwise disabled.

K-0-0156 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-9999,990	9999,990	0,000

K-0-0157, Safe zone 1 max. point

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter determines the maximum point of the 1st safe zone.

A cuboid safe zone is determined with the maximum point from K-0-0156.

Structure The parameter is a list parameter with the following structure:

- Element 1: Position of the 1st axis
- Element 2: Position of the 2nd axis
- Element 3: Position of the 3rd axis

Use The parameter can be directly modified in P4 (BB RUN). Switching to P2 is not necessary.

If an RCL program is running, note that the changes in the safe zone can be delayed since the safe zone check is executed in the block preparation.

In addition, the maximum point has to be greater than the minimum point, since the safe zone check is otherwise disabled.

K-0-0157 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-9999,990	9999,990	0,000

K-0-0156/K-0-0157 Zone of protection1 Min./Max. Point up to K-0-0218/K-0-0219 Zone of protection32 Min./Max. Point

Robot Control V1: +, **Robot Control V2:**-

Describing individual parameters, arranged according to types

Function: Zone sof protection can define areas blocked for the robot motion. 32 zones of protection are available for each kinematics.

Functional description:

A motion command in the RCL program consists of a starting point A and the programmed end point B.

In the block preparation, a linear distance AB is interpolated from the points A and B. It is checked additionally, whether the distance AB has one intersection or one boundary point in common with one side of the zone of protection. This is checked for each motion command and for all workspaces assigned to the kinematics.

If the block preparation identifies a violation of a zone of protection in the next block, the kinematics is traveled up to the next starting point of the incorrect block and then, the RCL program is aborted.

The error message "F12C0433, Workspace violation" is also output.

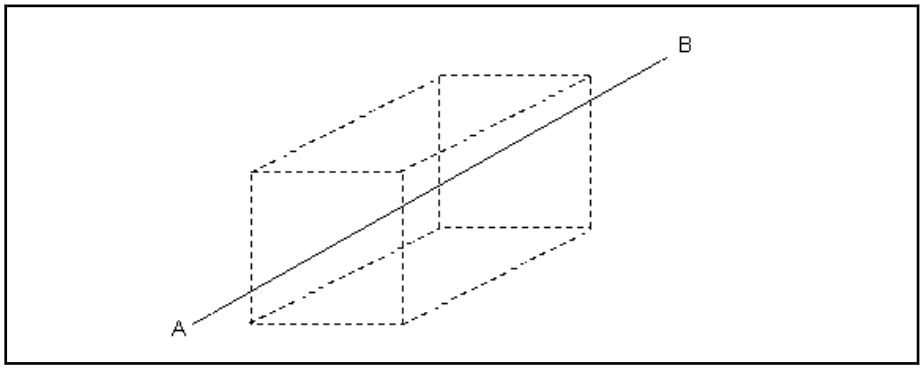


Fig. 4-146: Zone of protection with minimum point (A) and maximum point (B)

Conditions:

When programming the zones of protection, the following has to be considered:

- Each kinematics only considers its individual zones of protection.
- The zones of protection consider only the TCP of the robot, not the mechanics.
- In case of the PTP interpolation, the monitoring of the zones of protection is strictly restricted since the distance to be traveled in not defined. Deviations from the linear distance AB are not detected.
- In case of a CIRCULAR interpolation, the monitoring of the zones of protection is strictly restricted. The checking of the zones of protection is restricted on the linear distance AB as well. The circular path and the programmed intermediate point are not checked.
- When blending with VIA or APPROX, deviations from the linear distance AB are not detected. Deviations due to blending radii are not considered.
- The zones of protection monitoring is only effective in Automatic mode. The zones of protection are not monitored in Manual mode.
- In case of a belt-synchronous travel motion, the belt-synchronous motion part is not considered when checking the zones of protection.
- Since the zones of protection are checked in the block preparation, zones of protection cannot be dynamically adapted. A change of the zones of protection becomes only effective if the block buffer was processed. Therefore, a change or activation/deactivation of a zone of protection can delay when the RCL program is running.

Describing individual parameters, arranged according to types

- The maximum point must be larger than the minimum point, since the zone of protection check would otherwise become inactive.

Usage:

The activation and adaptation of the zone of protection is executed via the parameters K-0-0155 to K-0-0219.

The K-parameters can be switched via the respective PLC functions blocks or directly via the parameter editor to P4 (BB RUN).

Switching to P2 is not necessary.

The parameter K-0-0155 activates the checking of the zones of protection (from bit 1 for 1st zone of protection up to bit 32 for 32nd zone of protection).

Example: K-0-0155 0000 0000 0000 0000 0000 0000 0000 0100 ≡ decimal: 4 ⇒ zone of protection 3 is active.

The following parameters K-0-0156 to K-0-0219 can be used to specify the maximum and minimum points by which cuboids are defined as zones of protection.

Example: K-0-0156 minimum point zone of protection 1 (0, 0, 0),

K-0-0157 maximum point zone of protection 1 (20, 10, 10),

K-0-0158 minimum point zone of protection 2 (…,…,…)

K-0-0159 maximum point zone of protection 2 (…,…,…)

....

K-0-0219 maximum point of zone of protection 32 (…,…,…)

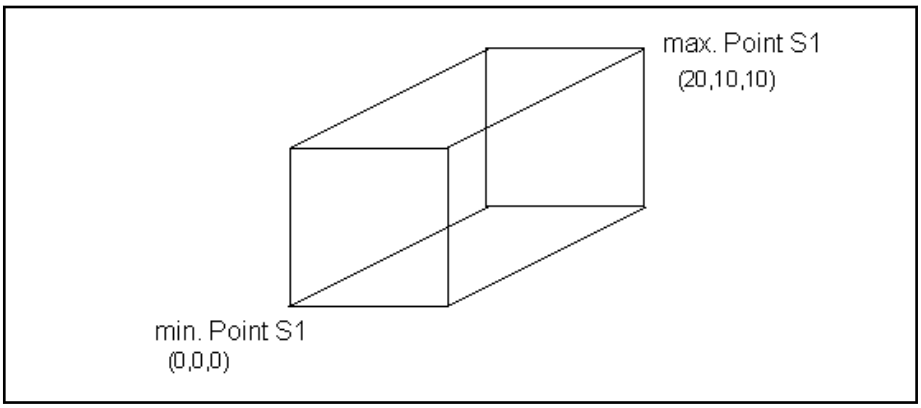


Fig. 4-147: Maximum and minimum point of zone of protection 1

K-0-0220, File transfer name

Robot-Control V1: +, **Robot-Control V2:** -

Function

The name of the RCL program is written in this parameter. It can be copied using the command parameters K-0-1060 and K-0-1061.

If "<Filename>.*" is specified as name, all files with the same program name - irrespective of the extension - are copied when executing one of the mentioned command parameters.

If the program name is specified as "*.*", all files are copied when executing one of the mentioned command parameters.

If "*.<extension>" is entered as name, all files with the same file extension ("*.DAT") - irrespective of the file name - are copied when executing one of the mentioned command parameters.

All other combinations are not supported.

Describing individual parameters, arranged according to types

The following restrictions apply:

- maximum of 12 characters
- A...Z, a...z, 0..9, '_' '.' '*'
- first character must be a letter
- "Robi_1" is identical to "ROBI_1"

K-0-0220 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xff	"Prog1"

K-0-0221, File name to be compiled

Robot-Control V1: +, **Robot-Control V2:** -

Function

The name of the QLL file to be compiled is in this parameter.

A suffix, i.e. .qll, is automatically removed. The suffix .QLL is always added internally.

If a compiler process is started using the command parameter K-0-1062, the QLL file specified in K-0-0221 is compiled.

The following restrictions apply:

- a maximum of 12 characters with suffix
- a maximum of 8 characters without suffix
- only A...Z, a...z, 0..9, '_' '.' are permissible
- the first character must be a letter
- upper-case and lower-case letters are not differentiated, "Robi_1" and "ROBI_1" are identical

K-0-0221 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xff	"Prog1"

K-0-0223, Selection of error reaction

Robot-Control V1: -, **Robot-Control V2:** +

Function

This parameter can be used to determine the behavior of the kinematics in case of an error.

Describing individual parameters, arranged according to types

Structure

Bit	Name/function
0	0: The limit values of the active command are used 1: The limit values of the parameters K-0-0224, Emergency deceleration, and K-0-0225, Emergency jerk, are used
1..31	Reserved

Use

Bit0= 0: The limit values of the active command are used

In case of an error, the kinematics stops with the limit values of the active command. If a different command becomes active during an error reaction (e.g. by blending), the limit values of the new active command are used.

Bit0= 1: The limit values of the parameters K-0-0224, Emergency deceleration, and K-0-0225, Emergency jerk, are used

In case of an error, the kinematics stops with the limit values of the parameters K-0-0224, Emergency deceleration, and K-0-0225, Emergency jerk. These limit values are only used if they are higher than currently active command. The emergency deceleration and the emergency jerk are considered separately: If the programmed deceleration is lower than the emergency deceleration, the emergency deceleration is used. If the programmed jerk is higher than the emergency jerk, the programmed jerk is used.

K-0-0223 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

K-0-0224, Emergency halt deceleration

Robot-Control V1: -, Robot-Control V2: +

Function

The parameter determines the emergency deceleration. The parameter is only applied if bit 0 is set in the parameter K-0-0223, Selection of error reaction.

K-0-0224 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	+

	Minimum value	Maximum value	Default value
Common:	0.01	999999.0	1000.0

K-0-0225, Emergency halt jerk

Robot-Control V1: -, Robot-Control V2: +

Function

The parameter determines the emergency jerk. The parameter is only applied if bit 0 is set in the parameter K-0-0223, Selection of error reaction.

K-0-0225 - Attributes:

Function:	PARAMETER	**Unit:**	K-0-0054
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB, PM
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	+	**Probe:**	+

	Minimum value	**Maximum value**	**Default value**
Common:	1.0	999999.0	10000.0

K-0-0240, Feedrate override

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V2

The command velocity at runtime can be changed percentaged to the programmed value using this parameter.

A value of 100% indicates that the programmed velocity is used to traverse the axes.

The percentage value can be set in a range from 0% to 600%.

☞ In case of 0%, the axes stop without changing the state of the kinematic state machine.

Robot Control V1

The command velocity at runtime can be changed percentaged to the programmed value using this parameter.

A value of 100% indicates that the programmed velocity is used to traverse the axes.

The percentage value can be set in a range from 0% to 600%.

☞ In case of 0%, the axes stop without changing the state of the kinematic state machine.

☞ As long as the VFIX command is active in the RCL program, this parameter does not have any effect

K-0-0240 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.0	600.0	100.0

K-0-0241, Feedrate override control word

Robot-Control V1: +, **Robot-Control V2:** +

Function

This parameter controls the feed rate override.

Structure

Bit	Name/function
0	Reserved
1	**Bit 1 = 0:** Feed rate override in K-0-0240 is active **Bit 1 = 1:** Feed Halt, the value in K-0-0240 is retained.
15..2	Reserved

Use

Bit 1:

Feed halt becomes active by setting bit 1.

Describing individual parameters, arranged according to types

K-0-0241 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-0242, Acceleration override

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V2

The acceleration at runtime can be changed in percentage to the programmed value using this parameter.

A value of 100% means that the axes travel at the specified (programmed) acceleration.

The percentage can be set at a range from 1% to 600%.



Setting of K-0-0242 if active in the block preparation, thus, not immediately.

Robot Control V1

The acceleration at runtime can be changed in percentage to the programmed value using this parameter.

A value of 100% means that the axes travel at the specified (programmed) acceleration.

The percentage can be set at a range from 1% to 600%.



Setting of K-0-0242 if active in the block preparation, thus, not immediately.



As long as the AFIX command is active in the RCL program, this parameter does not become active

K-0-0242 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.01	600.0	100.0

K-0-0243, Deceleration override

Robot-Control V1: +, **Robot-Control V2:** +

Function

Robot Control V2

The deceleration at runtime can be changed in percentage to the programmed value using this parameter.

A value of 100% means that the axes travel at the specified (programmed) deceleration.

The percentage can be set at a range from 1% to 600%.

☞ Setting of K-0-0243 if active in the block preparation, thus, not immediately.

Smaller values in K-0-0243 result in deceleration distances that are too long.

Robot Control V1

The deceleration at runtime can be changed in percentage to the programmed value using this parameter.

A value of 100% means that the axes travel at the specified (programmed) deceleration.

The percentage can be set at a range from 1% to 600%.

☞ Setting of K-0-0243 if active in the block preparation, thus, not immediately.

Smaller values in K-0-0243 result in deceleration distances that are too long.

☞ If the blending function PROGR_SLOPE is active in the RCL program, sudden stopping can occur in case of braking distances that are too short.

The deceleration at runtime can be changed in percentage to the programmed value using this parameter.

A value of 100% means that the axes travel at the specified (programmed) deceleration.

The percentage can be set at a range from 1% to 600%.

☞ Setting of K-0-0243 if active in the block preparation, thus, not immediately.

Smaller values in K-0-0243 result in deceleration distances that are too long.

K-0-0243 - Attributes:

Function:	PARAMETER	**Unit:**	%
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0.01	600.0	100.0

K-0-0250, Continuous slope lead time

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter specifies the lead time to calculate the blending motion for CONT_SLOPE.

Use The lead distance results from the lead time and the path velocity.

If late blending is enabled due to a late issuing of a traversing command, the current position is saved.

If the turn off point (lead distance + saved current position) is exceeded at the end of the blending motion calculation, an error is output.

If the turn off point is not exceeded, the blending motion (of the blending radius is big enough) is started at the turn off point.

Describing individual parameters, arranged according to types

K-0-0250 - Attributes:

Function:	PARAMETER	**Unit:**	ms
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0.0	2147483647.0	100.0

4.3.3 K-0-1000 - K-0-1999

K-0-1000, Command: Load basic kinematic parameters

Robot-Control V1: +, **Robot-Control V2:** +

Function This parameter is used as a command to load the basic kinematic parameters.

Use *From IndraWorks MLC:*

- Wizard "initial commissioning" in the **context menu of the kinematics ▸ Initial Commissioning ▸ Step 1: Load Basic Parameters...**
- "Load Basic Parameters" button in the **context menu of the kinematics ▸ Parameter ▸ Load Basic Parameters...**.

From the field bus:

- Enter the binary value "0000000000000011" (=16#0003) into the parameter (K-0-1000).

  This activates the loading of the basic parameters of the kinematics.
- After the loading , the MLC automatically resets the parameter to "16#00".

K-0-1000 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, PM
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0x03	0x00

K-0-1060, Command: Load file from CF

Robot-Control V1: +, **Robot-Control V2:** -

Function This command parameter copies the file(s) specified in parameter K-0-0220 from the Compact Flash card to the control's internal memory.

The file source directories "<User-Partition> / RC_Files" are specified on the Compact Flash.

Use

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the copying process.
- After the copy process is complete, the control automatically resets the parameter to "0000000000000000".

K-0-1060 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+

Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x3	0x00

K-0-1061, Command: Save file to CF

Robot-Control V1: +, **Robot-Control V2:** -

Function This command parameter copies the file(s) specified in parameter K-0-0220 from the control's internal memory to the Compact Flash card.

The file target directories "<User-Partition> / RC_Files" are specified on the Compact Flash.

Use
- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the copying process.
- After the copy process is complete, the control automatically resets the parameter to "0000000000000000".

K-0-1061 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x3	0x00

K-0-1062, Command: Compile file to MLC

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter compiles the QLL file specified in parameter K-0-0221.



The QLL file to be compiled must be saved in the SRAM/RAM.

The QLL file is loaded in the SRAM/RAM using parameter K-0-1060.

Use
- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the compile process.
- After the compile process is complete, the MLC automatically resets the parameter to "0000000000000000".

K-0-1062 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0x03	0x00

4.3.4 K-0-2000 - K-0-2499

K-0-2100, List of all backup operation K-parameters

Robot-Control V1: +, **Robot-Control V2:** +

Describing individual parameters, arranged according to types

Function All K-parameters that have to be considering during parameter backup are listed in this list. The entry is made in ID number format.

The entries are sorted by description and their relation and not by ID number or alphabetically.

K-parameters are stored in the order of these entries.

The ID number format is as follows:

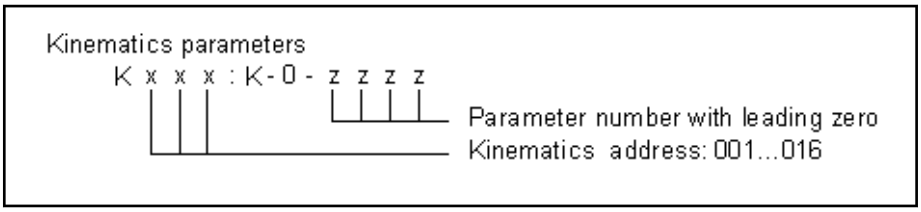


Fig. 4-148: K-parameter structure

Example:

K001: K-0-0002 - Kinematics 1; parameter K-0-0002.

K-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x2B 0000 0000	0x2B 0000 0FFF	---

K-0-2200, Programmed position 1 (active)

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2200 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-2201, Programmed position 2 (active)

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2201 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

Describing individual parameters, arranged according to types

K-0-2202, Type of actively programmed position

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2202 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-2203, Interpolation type

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2203 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-2204, Currently active QLL file name

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2204 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

K-0-2205, Currently active line number

Robot-Control V1: +, **Robot-Control V2:** -

Function This parameter is reserved and has no functionality.

K-0-2205 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

Describing individual parameters, arranged according to types

K-0-2300, PLC bit input (RCL)

Robot-Control V1: +, **Robot-Control V2:** -

Function The parameter indicates the bit inputs that are transferred from RCL toward the PLC.

K-0-2300 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-2301, PLC integer input (RCL)

Robot-Control V1: +, **Robot-Control V2:** -

Function The parameter indicates the integer inputs that are transferred from RCL toward the PLC.

K-0-2301 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of UDINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

K-0-2302, PLC floating point input (RCL)

Robot-Control V1: +, **Robot-Control V2:** -

Function The parameter indicates the floating point inputs that are transferred from RCL toward the PLC.

K-0-2302 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.4 Touch probe parameters (M-parameters)

4.4.1 Touch Probe Parameters, General Information

The M-parameters represent the data set for one touch probe function.



The following controls support this parameter type:

- IndraLogic XLC L25, L45, L65 with onboard sercos III bus,
- IndraMotion MLC L25, L45, L65

Describing individual parameters, arranged according to types

4.4.2 M-0-0000, Dummy, M-parameter

Function A parameter serves as a placeholder; it does not have a function. A parameter can be described and read cyclically.

Use Measure down time for writing and reading.

M-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.3 M-0-0001, Logic touch probe number

Function The logical probe number can be read from this parameter. The number can deviate from the number of the input that is connected to the probe and can have values ranging from 1 to 100.

M-0-0001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.4 M-0-0002, Touch probe name

Function The descriptive text for the instance of the touch probe function can be saved in this parameter.

The text does not provide any functional meaning.

M-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"TouchProbe$I"

4.4.5 M-0-0005, Input selection

Function By means of this probe, the digital input is selected that is to deliver the trigger signal for the probe function.

It is possible to assign the same input to various instances of the probe function so that different parameters can be simultaneously registered by means of one trigger signal.

IndraMotion MLC L25 / IndraLogic XLC L25

- Input 110..117 (digital inputs), 120..127(free configurable digital inputs) - fast I/O 1

Describing individual parameters, arranged according to types

- Input 210..217 (digital inputs), 220..227(free configurable digital inputs) - fast I/O 2

IndraMotion MLC L45/L65 / IndraLogic XLC L45/L65

- Input 1..8 - onboard module
- Input 110..117 (digital inputs), 120..127(free configurable digital inputs) - fast I/O 1
- Input 210..217 (digital inputs), 220..227(free configurable digital inputs) - fast I/O 2
- Input 310..317 (digital inputs), 320..327(free configurable digital inputs) - fast I/O 3
- Input 410..417 (digital inputs), 420..427(free configurable digital inputs) - fast I/O 4



1xx always represents the fast I/O module first found, not the PSI slot, 2xx represents the second fast I/O module, etc.

M-0-0005 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	1	427	1

4.4.6 M-0-0006, Signal selection

Function

Here, the selection of the parameter is carried out, whose current value for a signal edge is to be stored at the assigned input.

When selecting a parameter, the parameters for the measured values

- M-0-0130, Measured value, positive edge,
- M-0-0131, Measured value, negative edge and
- M-0-0132, Difference value

as well as the parameters for the expectation window limits

- M-0-0202, Starting position of the expectation window, positive edge,
- M-0-0203, End position of the expectation window, positive edge,
- M-0-0204, Starting position of the expectation window, negative edge and
- M-0-0205, End position of the expectation window, negative edge

automatically adopt the selected parameter's data type and unit.

If the signal selection is changed on applied enable, the enable signal is automatically reset.



The IDN of the selectable parameters are listed in "C-2499-2499, Probe, IDN list signal selection".

Axis parameters can only be selected for axes that are actually provided.

See also Functional Description"Touch Probe Function".

Describing individual parameters, arranged according to types

Use

The readability of the selected parameters is only checked when the control unit is in operation mode. IDNs of non-readable parameters are not accepted.

If the control unit is in P0/P2, the IDN is checked only. It cannot be determined, whether the axis the parameter belongs to is actually existing. The reading check is carried out

- with an activated touch probe function if the operation mode is switched or,
- if the control unit is in operation mode - as soon as the touch probe function is activated.

If the selected parameter cannot be read, the signal source is reset.

M-0-0006 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.7 M-0-0007, Control word

Function

By means of this parameter the probe function can be configured.

The settings affect

- the activation of the signal edges,
- switching the measured value acquisition mode,
- the activation of the time stamp recording,
- the activation of the expectation window,
- the activation of the marker failure monitoring
- and the difference measurement mode.

Structure

Bit	Values/function
0	Activation of positive edge **0**: positive edge not activated **1**: positive edge activated
1	Activation of negative edge **0**: negative edge not activated **1**: negative edge activated
2	Enable mode **0**: single measurement ➔ after every measurement, the enable signal for the probe must be deleted and reset in order to enable another measurement. The measuring results are maintained until the next enable signal is applied. **1**: continuous measurement ➔ the measurements are continuously carried out for as long as the enable signal for the probe is set.
3	Enable time stamp **0**: the time stamp is not registered **1**: the time stamp is registered

Describing individual parameters, arranged according to types

Bit	Values/function
4	Activation of the probe window, positive edge **0**: unrestricted range of measurement **1**: range of measurement restricted to probe window (reserved)
5	Activation of the probe window, negative edge **0**: unrestricted range of measurement **1**: range of measurement restricted to probe window
6	Marker monitoring **0**: not activated **1**: activated
7	Extended difference measurement **0**: not activated **1**: activated
9, 8	Edge determination for extended difference measurement **00**: difference from negative to negative edge **01**: difference from positive to negative edge **10**: difference from negative to positive edge **11**: difference from positive to positive edge
10 - 11	Interpolation of the measured values **00**: interpolation is not carried out The measured value corresponds to the current value at the point of time when the edge is at the input. **01**: The measured value is interpolated in linear form from the current value and the subsequent value. **10**: The measured value is determined from 3 values by means of cubic spline interpolation. **11**: The measured value is determined from 4 values by means of cubic spline interpolation.
31 - 12	(reserved)

☞ "Positive edge" means that the level at the probe input moves from 0 V to +24 V.

"Negative edge" means that the level at the probe input moves from +24 V to 0 V.

Even with the expectation window activated, the restriction of the measurement range is only effective if the start and end position of the expectation window are not identical.

See also Functional Description"Touch Probe Function".

M-0-0007 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.8 M-0-0009, Osci: list of all M-parameters that can be oscilloscoped

Function This parameter contains the list of all M parameters which can be oscilloscoped.

M-0-0009 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.9 M-0-0010, List of all M-parameters

Function This list includes all M parameters. The entry is made in ID number format.

The entries are sorted according to identity number in ascending order.

Structure Following is the identity number format:

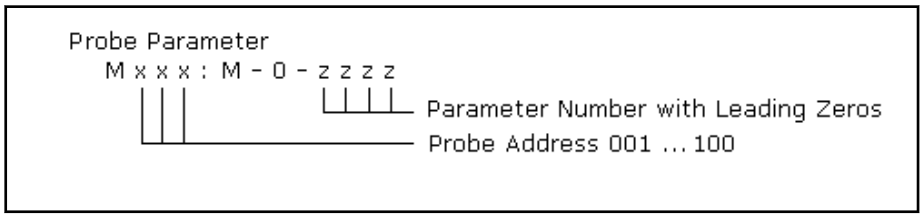


Fig. 4-149: Identity number format

Use M001: M-0-0002 - Probe 1; Parameter M-0-0002.

M-0-0010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.10 M-0-0016, Project identification number

Function IndraWorks entered a series of unique characters in this parameter to identify worldwide the project. This series of characters is one to one for each project.

This parameter has no influence on the functions of the Motion Logic Control.



This parameter is for internal purposes only.

M-0-0016 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Project ID number"

4.4.11 M-0-0021, Status word

Function

This parameter indicates the status of the measured value acquisition in the current cycle.

The status parameter includes information on the

- the availability of newly measured values,
- the exceedance of the marker failure threshold,
- and the overflow of touch probe events.

The parameter is reset with each touch probe enabling.

Structure

Bit	Name/function
0	Measured value at positive edge **0**: no new measured value available **1**: a new value was determined
1	Measured value at negative edge **0**: no new measured value available **1**: a new value was determined
2	Difference value calculation **0**: no new difference value available **1**: a new difference value was determined
3	Status of the marker failure monitoring **0**: marker failure threshold not exceeded **1**: marker failure threshold exceeded
4	Event overflow at positive edges **0**: all positive edges could be detected **1**: Various positive edges were detected in one sercos cycle, but only the first was processed.
5	Event overflow at negative edges **0**: all negative edges were detected **1**: Various negative edges were detected in one sercos cycle, but only the first was processed.
15 - 6	(reserved)

☞ The status of the marker failure monitoring is set in relation to the parameterized limit value for the marker failure "M-0-0224, Number of marker failures, positive edge, touch probe". It is reset as soon as the expectation window has been passed without marker failure.

If the maximum number of the marker failures is parameterized with "0", exceeding the limit value is not monitored.

Also refer to the Functional Description"Touch Probe Function".

M-0-0021 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.12 M-0-0024, Command: Activation

Function The touch probe function is enabled using this input.



The touch probe function can only be enabled if the touch probe function is activated.

The parameter's data type and unit are only adapted for the measured values and the expectation window limits if the touch probe function is activated.

The touch probe function can only be activated if the values of parameter C-0-0400 and C-0-0503 are identical.

M-0-0024 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.13 M-0-0130, Measured value, positive edge

Function In this parameter, the value of the selected parameter ("M-0-0006, signal selection touch probe") is saved at the time of the positive edge at the entrance of the touch probe. When the release is granted, the measurement value is deleted.

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",
- Activating the positive edge by setting bit 0 in parameter "M-0-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".



The counter for the measured values (parameter "M-0-0409, Counter of measured values, positive edge") is incremented in the same cycle in which the measured value is output.

M-0-0130 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.14 M-0-0131, Measured value, negative edge

Function In this parameter, the value of the selected parameter ("M-0-0006, Signal selection") is saved at the time of the negative edge at the entrance of the touch probe. When the release is granted, the measurement value is deleted.

Use
- Activating the probe function through parameter "M-0-0024, Command: Activation",
- Activating the negative edge by setting bit 1 in parameter "M1-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".



The counter for the measured values (parameter "M-0-0410, Counter of measured values, negative edge") is incremented in the same cycle in which the measured value is output.

M-0-0131 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.15 M-0-0132, Difference value

Function In this parameter, the difference value of two measured values is saved.

For a normal difference measurement, the difference value is the difference between the last measured value with a positive edge and the last measured value with a negative edge.

If an extended difference measurement is configured, various combinations are possible:
- Latest measured value at a positive edge - Latest measured value at a negative edge
- Latest measured value at a positive edge - Penultimate measured value at a positive edge
- Latest measured value at a negative edge - Latest measured value at a positive edge
- Latest measured value at a negative edge - Penultimate measured value at a negative edge

Since a difference value is not formed with each new measured value, there is a separate counter "M-0-0411, Counter of difference values" for measuring differences.

The difference value is deleted with each release.

Use
- Enabling the touch probe function through parameter "M-0-0024, Command: Activation",
- Enabling at least one negative edge by setting bit 1 to bit 0 in the parameter "M1-0007, Control word",

- Enable signal by setting "M-0-0405, Enabling".

M-0-0132 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.16 M-0-0133, Time difference

Function

The time difference between two probe edges is saved in this parameter in the unit micro seconds.

In case of regular differential measurement, it is the time difference between the last positive and the last negative edge.

If an extended difference measurement is configured, various combinations are possible:

- Time difference between the last positive and the last negative edge
- Time difference between the last positive and the next to last positive edge
- Time difference between the last negative and the last positive edge
- Time difference between the last negative and the next to last negative edge

Since a time difference value is not formed with each new measured value, there is a separate counter "M-0-0411, Counter of difference values probes".

The time difference value is deleted with each release.

Use

- Activating the probe function through parameter "M-0-0024, Probe activation"
- Activating at least one edge by setting bit 1 to bit 0 in parameter "M1-0007, Control parameter probe"
- Apply enable signal by setting "M-0-0405, Enabling probe"

M-0-0133 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE	**PLC data type:**	ULINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.17 M-0-0140, Time stamp, positive edge

Function

The time stamp of the last positive edge of the probe is saved in this parameter. The time stamp refers to the time interval between the edge and the start of the sercos cycle in which the edge was found. The time interval is represented in micro seconds.

The value is deleted with each release.

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",

Describing individual parameters, arranged according to types

- Activating the positive edge by setting bit 0 in parameter "M-0-0007, Control word",
- Activating the time stamp recording by setting bit 3 in parameter "M1-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".

M-0-0140 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE	**PLC data type:**	ULINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.18 M-0-0141, Time stamp, negative edge

Function

The time stamp of the last negative edge of the probe is saved in this parameter. The time stamp refers to the time interval between the edge and the start of the sercos cycle in which the edge was found. The time interval is represented in micro seconds.

The value is deleted with each release.

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",
- Activating the negative edge by setting bit 1 in parameter "M1-0007, Control word",
- Activating the time stamp recording by setting bit 3 in parameter "M1-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".

M-0-0141 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE	**PLC data type:**	ULINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.4.19 M-0-0200, Dead-time compensation, positive edge

Function

The value of this parameter defines the reaction time to be compensated for the positive edge (output in µs).

Time delays arising through I/Os or through the sensor used can be compensated



The reaction time can have a maximum value of 128 cycles.

M-0-0200 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0	100000	---

4.4.20 M-0-0201, Dead-time compensation, negative edge

Function The value of this parameter defines the reaction time to be compensated for the negative edge (output in µs).

Time delays arising through I/Os or through the sensor used can be compensated

The reaction time can have a maximum value of 128 cycles.

M-0-0201 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE	**PLC data type:**	DINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	100000	---

4.4.21 M-0-0202, Starting position of the expectation window, positive edge

Function This parameter determines the lower limit value of the expectation window for the measured value acquisition of the positive edge. The expectation window restricts the range where touch probe signal edges cause a measured value acquisition.

In order to activate the measurement with the expectation window, bit 5 must be set in parameter "M-0-0007, Control word".



If the value of the start position of the expectation window is higher than that of the end position, the expectation window exceeds the modulo value.

The expectation window can only be used if modulo format is parameterized for the selected axis (cf. "A-0-0045, Modulo value").

M-0-0202 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.22 M-0-0203, End position of the expectation window, positive edge

Function This parameter determines the upper limit value of the expectation window for the measured value acquisition. The expectation window restricts the range where touch probe signal edges cause a measured value acquisition.

In order to activate the measurement with the expectation window, bit 5 must be set in parameter "M-0-0007, Control word".

Describing individual parameters, arranged according to types

If the value of the end position of the expectation window is smaller than that of the start position, the expectation window exceeds the modulo value.

The expectation window can only be used if modulo format is parameterized for the selected axis (cf. "A-0-0045, Modulo value").

M-0-0203 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.23 M-0-0204, Starting position of the expectation window, negative edge

Function

This parameter determines the lower limit value of the expectation window for the measured value acquisition of the negative edge. The expectation window restricts the range where touch probe signal edges cause a measured value acquisition.

In order to activate the measurement with the expectation window, bit 5 must be set in parameter "M-0-0007, Control word".

If the value of the start position of the expectation window is higher than that of the end position, the expectation window exceeds the modulo value.

The expectation window can only be used if modulo format is parameterized for the selected axis (cf. "A-0-0045, Modulo value").

M-0-0204 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.24 M-0-0205, End position of the expectation window, negative edge

Function

This parameter determines the upper limit value of the expectation window for measured value acquisition of the negative edge. The expectation window restricts the range where touch probe signal edges cause a measured value acquisition.

In order to activate the measurement with the expectation window, bit 5 must be set in parameter "M-0-0007, Control word".

If the value of the end position of the expectation window is smaller than that of the start position, the expectation window exceeds the modulo value.

The expectation window can only be used if modulo format is parameterized for the selected axis (cf. "A-0-0045, Modulo value").

M-0-0205 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE	**PLC data type:**	REAL
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	-2147483647.0	2147483647.0	0.0

4.4.25 M-0-0206, Maximum number of marker failures

Function

This parameter is used to define the registration threshold for the registered number of marker failures.

If the limit value is set to "0", exceeding the limit value is not monitored.

The number of marker failures completed consecutively is displayed in parameter "M-0-0224, Number of marker failures, positive edge".

If the number of marker failures reaches the specified limit value, bit 3 of "M-0-0021, Status word" is set.

M-0-0206 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.26 M-0-0224, Number of marker failures, positive edge

Function

There is the option to define an expectation window for the touch probe where the touch probe edges must be located in order to be evaluated.

When the "expectation window" is active, a "marker failure monitoring" can be activated in "M-0-0007, Control word". This marker failure monitoring registers the passing of the expectation window for the positive edge without a marker been registered, and increments the value of "M-0-0224, Number of marker failures, positive edge, touch probe".

The content of the parameter is reset to "0" if

- an edge has been registered when passing the expectation window,
- the marker failure monitoring has been deactivated by resetting bit 6 in "M-0-0007 Control word",
- the touch probe function is enabled in "M-0-0405, Enabling" touch probe 1.



The edges activated in "M-0-0007, Control word" are called markers.

A marker error is present as soon as the expectation window has been passed and an activated edge has not been registered.

Marker failure monitoring is only possible if modulo format is set for the selected axis (cf. "A-0-0045, Modulo value").

See also Functional Description"Touch Probe Function".

Describing individual parameters, arranged according to types

M-0-0224 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.27 M-0-0225, Number of marker failures, negative edge

Function

There is the option to define an expectation window for the touch probe where the touch probe edges must be located in order to be evaluated.

When the "expectation window" is active, a "marker failure monitoring" can be activated in "M-0-0007, Control word". This marker failure monitoring registers the passing of the expectation window for the negative edge without a marker been registered, and increments the value of "M-0-0224, Number of marker failures, positive edge, touch probe".

The content of the parameter is reset to "0" if

- an edge has been registered when passing the expectation window,
- the marker failure monitoring has been deactivated by resetting bit 6 in "M-0-0007 Control word",
- the touch probe function is enabled in "M-0-0405, Enabling" touch probe 1.



The edges activated in "M-0-0007, Control word" are called markers.

A marker error is present as soon as the expectation window has been passed and an activated edge has not been registered.

Marker failure monitoring is only possible if modulo format is set for the selected axis (cf. "A-0-0045, Modulo value").

See also Functional Description"Touch Probe Function".

M-0-0225 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.28 M-0-0401, Input status

Function

The switching status of the probe input signal is indicated in this parameter.

M-0-0401 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0	1	0

4.4.29 M-0-0405, Enabling

Function By means of this parameter the enable signal of the measurement with the probe is applied. From the point of time of the enabling the signal edges are registered at the assigned input and the parameter values are recorded.



The touch probe function can only be enabled if the values of parameter C-0-0400 and C-0-0503 are identical.

Structure

Value	Release of the touch probe	Comment
0	No	
1	Yes	

Tab. 4-125: Relevant bits of M-0-0405, Enabling

Use As soon as the enabling signal is applied, the following parameters are deleted:

- M-0-0021, Status word,
- M-0-0130, Measured value, positive edge,
- M-0-0131, Measured value, negative edge,
- M-0-0132, Difference value
- M-0-0140, Timestamp, positive edge,
- M-0-0141, Timestamp, negative edge,
- M-0-0224, Number of marker failures, positive edge.
- M-0-0225, Number of marker failures, negative edge,
- M-0-0409, Counter of measured values, positive edge,
- M-0-0410, Counter of measured values, negative edge,
- M-0-0411, Counter of difference values.



If single measurement is parameterized and no edge is activated, the enable signal is reset immediately, as the condition "every activated edge has been registered once" it is fulfilled.

M-0-0405 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1	---

4.4.30 M-0-0409, Counter of measured values, positive edge

Function In this parameter, the number of measurements which were triggered by positive signal edges at the selected entrance is displayed. With every release, the counter is set to "0".

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",

Describing individual parameters, arranged according to types

- Activating the positive edge by setting bit 0 in parameter "M-0-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".

M-0-0409 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.31 M-0-0410, Counter of measured values, negative edge

Function

In this parameter, the number of measurements which were triggered by negative signal edges at the selected entrance is displayed. With every release, the counter is set to "0".

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",
- Activating the negative edge by setting bit 1 in parameter "M1-0007, Control word",
- Apply enable signal by setting "M-0-0405, Enabling".

M-0-0410 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.32 M-0-0411, Counter of difference values

Function

This parameter indicates the number of the registered difference values.

If the extended difference measurement is activated by setting bit 11 of parameter "M-0-0007, Control word", the difference is not calculated each time a measured value is output. Instead, the difference is only calculated if the edge matches the configured "difference to" edge.

With every release, the counter is set to 0.

Use

- Activating the probe function through parameter "M-0-0024, Command: Activation",
- Activating the negative edge by setting bit 1 in parameter "M1-0007, Control word"
- Apply enable signal by setting "M-0-0405, Enabling".

M-0-0411 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0	65535	---

4.4.33 M-0-1000, Command: Load basic touch probe parameters

Function This parameter is used as a command to load the basic parameters of the touch probe instance.

Use *Execution in the parameter editor:*

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- When the loading is complete, the control automatically resets the parameter to "0000000000000000".

M-0-1000 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, (P2+Stop)
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	0x3	0

4.4.34 M-0-2100, List of all backup operation M-parameters

Function This list includes all M-parameters to be considered when backing up parameters. It is entered in the ID number format.

The entries are sorted according to identity number in ascending order.

Structure The ID number format is as follows:

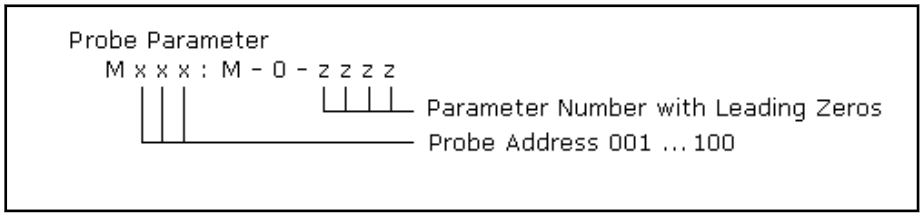


Fig. 4-150: ID number format

Use M0001: M-0-0002 - Probe 1; Parameter M-0-0002.

M-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x2D 0000 0000	0x2D 0000 0FFF	---

Describing individual parameters, arranged according to types

4.5 Programmable limit switch parameters (N-parameters)

4.5.1 Overview: Programmable limit switches PLS (CFL01.1-N1), N-parameters

☞ This programmable limit switch can only be used for IndraMotion MLC L25, L45, L65.

The following table shows the substitution of the C-parameters for the four possible programmable limit switches PLS (CFL01.1-N1) by N-parameters.

The N-parameters display the data set for one programmable limit switch each.

Addressing takes place as for axes and controls:

N001...N004 for the respective programmable limit switch and the desired parameter, instead of

C-0-0325 now **N002: N-0-0300**.

N-parameters	Previous parameterization using C-parameters			
	PLS01	PLS02	PLS03	PLS04
N-0-0001, Logical switch track number	-	-	-	-
N-0-0002, Switch track name	-	-	-	-
N-0-0009, Osci: list of all N-parameters that can be oscilloscoped	-	-	-	-
N-0-0010, List of all N-parameters	-	-	-	-
N-0-0016, Project identification number	-	-	-	-
N-0-0300, Control word	C-0-0300	**C-0-0325**	C-0-0350	C-0-0375
N-0-0302, Signal selection	C-0-0302	C-0-0327	C-0-0352	C-0-0377
N-0-0303, Control signals	C-0-0303	C-0-0328	C-0-0353	C-0-0378
N-0-0304, Outputs	C-0-0304	C-0-0329	C-0-0354	C-0-0379
N-0-0305, Internal registers	C-0-0305	C-0-0330	C-0-0355	C-0-0380
N-0-0307, Reference axis configuration	C-0-0307	C-0-0332	C-0-0357	C-0-0382
N-0-0308, Reference axis position, additive	C-0-0308	C-0-0333	C-0-0358	C-0-0383
N-0-0309, Reference axis definition	C-0-0309	C-0-0334	C-0-0359	C-0-0384
N-0-0310, Hysteresis	C-0-0310	C-0-0335	C-0-0360	C-0-0385
N-0-0311, Lead time when switching on	C-0-0311	C-0-0336	C-0-0361	C-0-0386
N-0-0312, Lead time when switching off	C-0-0312	C-0-0337	C-0-0362	C-0-0387
N-0-0313, Switch track number	C-0-0313	C-0-0338	C-0-0363	C-0-0388
N-0-0314, Switch-on position of switch track	C-0-0314	C-0-0339	C-0-0364	C-0-0389
N-0-0315, Switch-off position of switch track	C-0-0315	C-0-0340	C-0-0365	C-0-0390
N-0-0316, Command: Initialize switch track	C-0-0316	C-0-0341	C-0-0366	C-0-0391
N-0-0317, Command: Activate switch track	C-0-0317	C-0-0342	C-0-0367	C-0-0392
N-0-0318, Output mode	C-0-0318	C-0-0343	C-0-0368	C-0-0393

Describing individual parameters, arranged according to types

N-parameters	Previous parameterization using C-parameters			
N-0-0319, Switch-on duration	C-0-0319	C-0-0344	C-0-0369	C-0-0394
N-0-1000, Command: Load basic PLS parameters				
N-0-2100, list of all backup operation N-parameters				

Tab. 4-126: Parameter comparison

4.5.2 N-0-0000, Dummy, N-parameter

Function A-parameter serves as a placeholder; it does not have a function. It can be written and read cyclically.

Use Measure dead time for writing and reading.

N-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	NVRAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.5.3 N-0-0001, Logical switch track number

Function The parameter contains the logical PLS number (programmable limit switch).

N-0-0001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	4	0

4.5.4 N-0-0002, Switch track name

Function A descriptive text for the instance of the programmable limit switch (PLS) can be saved in this parameter.

The text does not provide any functional meaning.

N-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	NVRAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"PLS_name"

4.5.5 N-0-0009, Osci: list of all N-parameters that can be oscilloscoped

Function This parameter contains the list of all N parameters which can be oscilloscoped.

Describing individual parameters, arranged according to types

N-0-0009 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
	Memory:	NVRAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.5.6 N-0-0010, List of all N-parameters

Function This list includes all N-parameters. The entry is made in ID number format.

The entries are sorted according to identity number in ascending order.

Structure The ID number format is as follows:

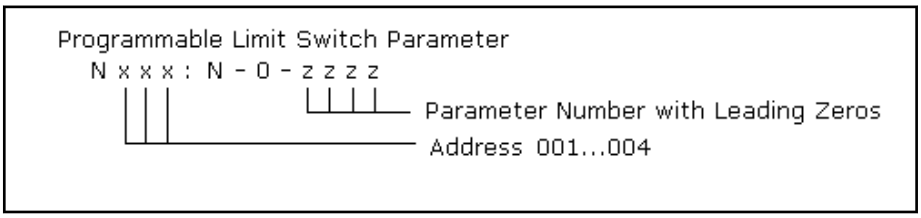


Fig. 4-151: ID number format

Use N001: N-0-0002 - Programmable limit switch 1; Parameter N-0-0002.

N-0-0010 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
	Memory:	RAM	**Editability:**	READ_ONLY
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	-
	Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.5.7 N-0-0016, Project identification number

Function IndraWorks generates a unique character string in this parameter for the global identification of the project.

The character string is unique for each project.

This parameter is only intended for internal use.

N-0-0016 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
	Memory:	FLASH	**Editability:**	P0, P2, BB
	Direct access:	--	**MinMax check:**	-
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Project ID number"

4.5.8 N-0-0300, Control word

Function Control word for the current programmable limit switch module on the control's module bus.

Describing individual parameters, arranged according to types

Structure

Bit	Designation/function
1..0	**Output control** 0 0: deactivated. 0 1: activated: When an output is overloaded, an error of error class 'F0' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
3..2	**Voltage control** 0 0: deactivated. 0 1: activated: In case of undercurrent on the function module, an error of error class 'FO' is generated. 1 0: activated: When an output is overloaded, an error of error class 'F5' is generated.
4	**Function module** 0: deactivated, 1: activated.
5	**Command function** N-0-0316 0: Initialize switch track. 1: Initialize and activate switch track.

Tab. 4-127: Relevant bits in the control word

Use When changing from a lower to a higher phase, the control word is checked against parameter "C-0-0025, Function module bus, configuration". If there is no programmable limit switch module 'CFL01.1-N1' on the module bus and if bit 4 is set in the control word, the error "F0160024, Error in cross-check C-parameters" is generated.

N-0-0300 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	NVRAM	**Editability:**	(P2+Stop)
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x05

4.5.9 N-0-0302, Signal selection

Function This parameter is used to diagnose the current programmable limit switch.

This parameter can be used to read out the bytes "Source_0.y" (low byte, y: bit 0...7) and "Source_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the current programmable limit switch module.

Describing individual parameters, arranged according to types

Structure

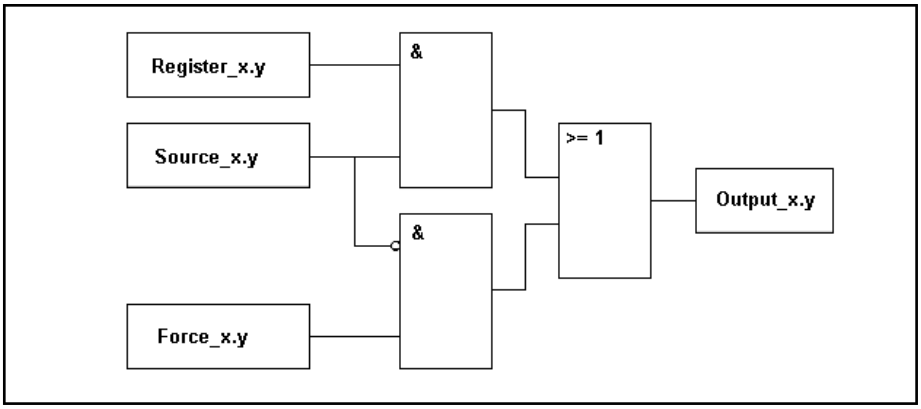


Fig. 4-152: Output control logic

Use The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Source_0.y" and "Source_1.y" are cleared. These bytes can be used to define the signal source for each of the programmable limit switch's outputs.

N-0-0302 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.5.10 N-0-0303, Control signals

Function The parameter control signal is used to diagnose the current programmable limit switch.

This parameter can be used to read out the bytes "Force_0.y" (low byte, y: bit 0...7) and "Force_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the current programmable limit switch module.

Structure

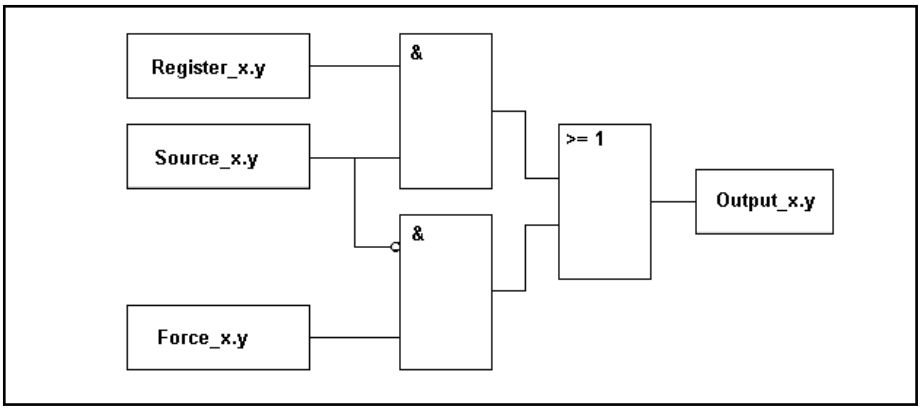


Fig. 4-153: Output control logic

Use The bytes "Force_0.y" and "Force_1.y" in the structure "ML_PLSDATA_SM" can or must be written in the PLC program.

When switching the control on and when resetting the PLC program, the bytes "Force_0.y" and "Force_1.y" are cleared. These bytes can be used to

override each of the programmable limit switch's outputs, depending on the content of the bytes "Source_0.y" and "Source_1.y" - the defined signal source.

N-0-0303 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.5.11 N-0-0304, Outputs

Function This parameter is used to diagnose the current programmable limit switch. This parameter can be used to read out the bytes "Output_0.y" (low byte, y: bit 0...7) and "Output_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the current programmable limit switch module.

Structure

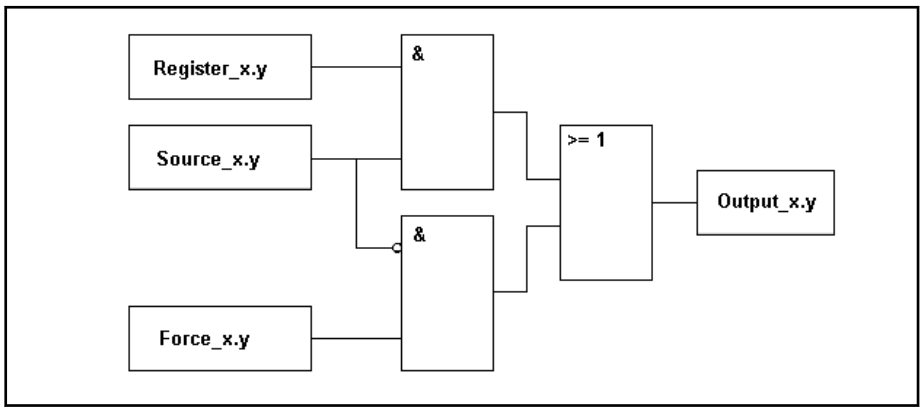


Fig. 4-154: Output control logic

Use The bytes "Source_0.y" and "Source_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The control cyclically updates the bytes in operating mode. In operation mode, the function module's output signals can be processed in the PLC.

N-0-0304 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.5.12 N-0-0305, Internal registers

Function This parameter is used to diagnose the current programmable limit switch.

This parameter can be used to read out the bytes "Register_0.y" (low byte, y: bit 0...7) and "Register_1.y" (high byte, y: bit 0...7) from the structure field "PlsData[]" for the current programmable limit switch module.

Describing individual parameters, arranged according to types

Structure

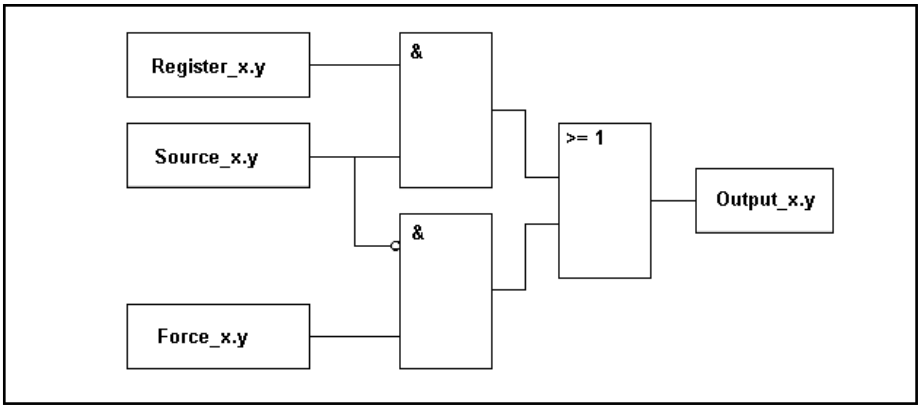


Fig. 4-155: Output control logic

Use

The bytes "Register_0.y" and "Register_1.y" in the structure "ML_PLSDATA_SM" can only be read in the PLC program.

The bytes display the programmable limit switch's internal state and are cyclically updated by the control in operating mode. In operating mode, the programmable limit switch's output signals can be processed in the PLC.

N-0-0305 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.5.13 N-0-0307, Reference axis configuration

Function

Of the axes configured and activated in the control, up to eight of them can be selected for the programmable limit switch in this parameter.

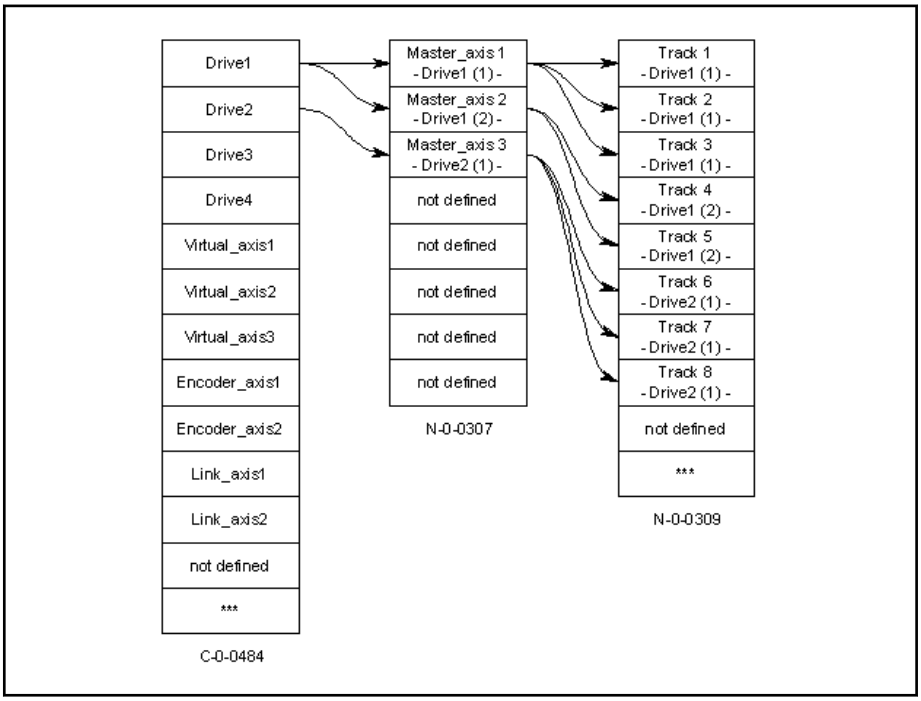


Fig. 4-156: Configuration and definition of reference axes

Describing individual parameters, arranged according to types

Structure

The position and velocity of the selected axes are cyclically transmitted to the programmable limit switch in operation mode.

The reference axes are configured in parameterization mode. A single axis can be configured as a reference axis more than once. This allows switch tracks with a different position offset to be operated by the same axis.

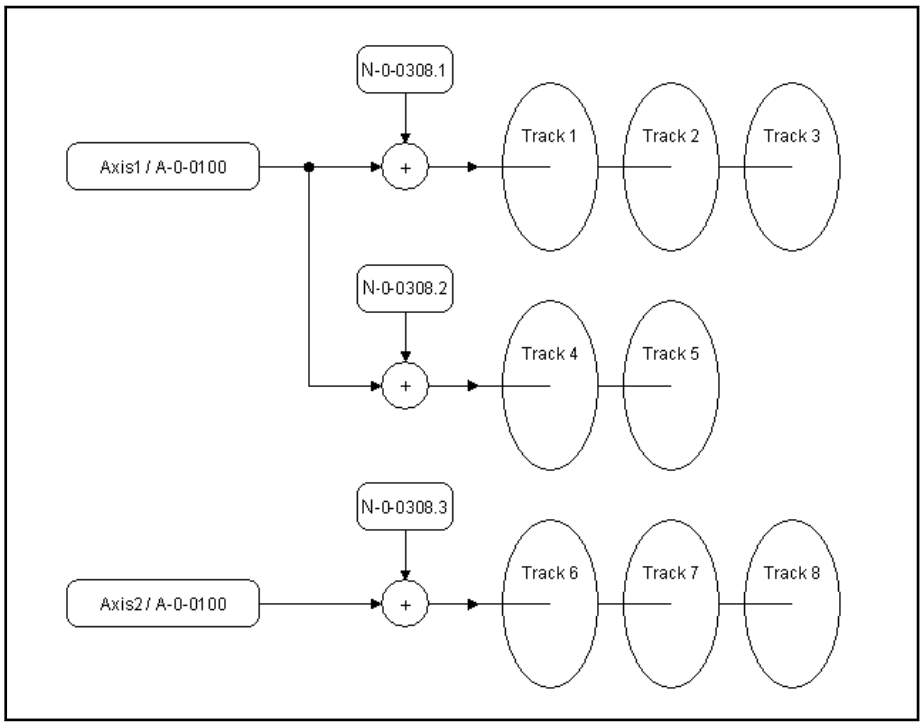


Fig. 4-157: Position offset

Use

When switching from a lower to a higher phase, the reference axis configuration is checked against parameter "C-0-0484, Axes configuration list" and parameter "A-0-0024, Axis condition" of the respective axis. The error "F0160024, Error in cross-check C-parameters" is generated if one of the selected axes is deactivated or not configured.

N-0-0307 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	64	0

4.5.14 N-0-0308, Reference axis position, additive

Function

This parameter is used to move the position of the connected switch track relative to the position of the reference axis.

The position offset is entered in the input unit of the reference axis.

Describing individual parameters, arranged according to types

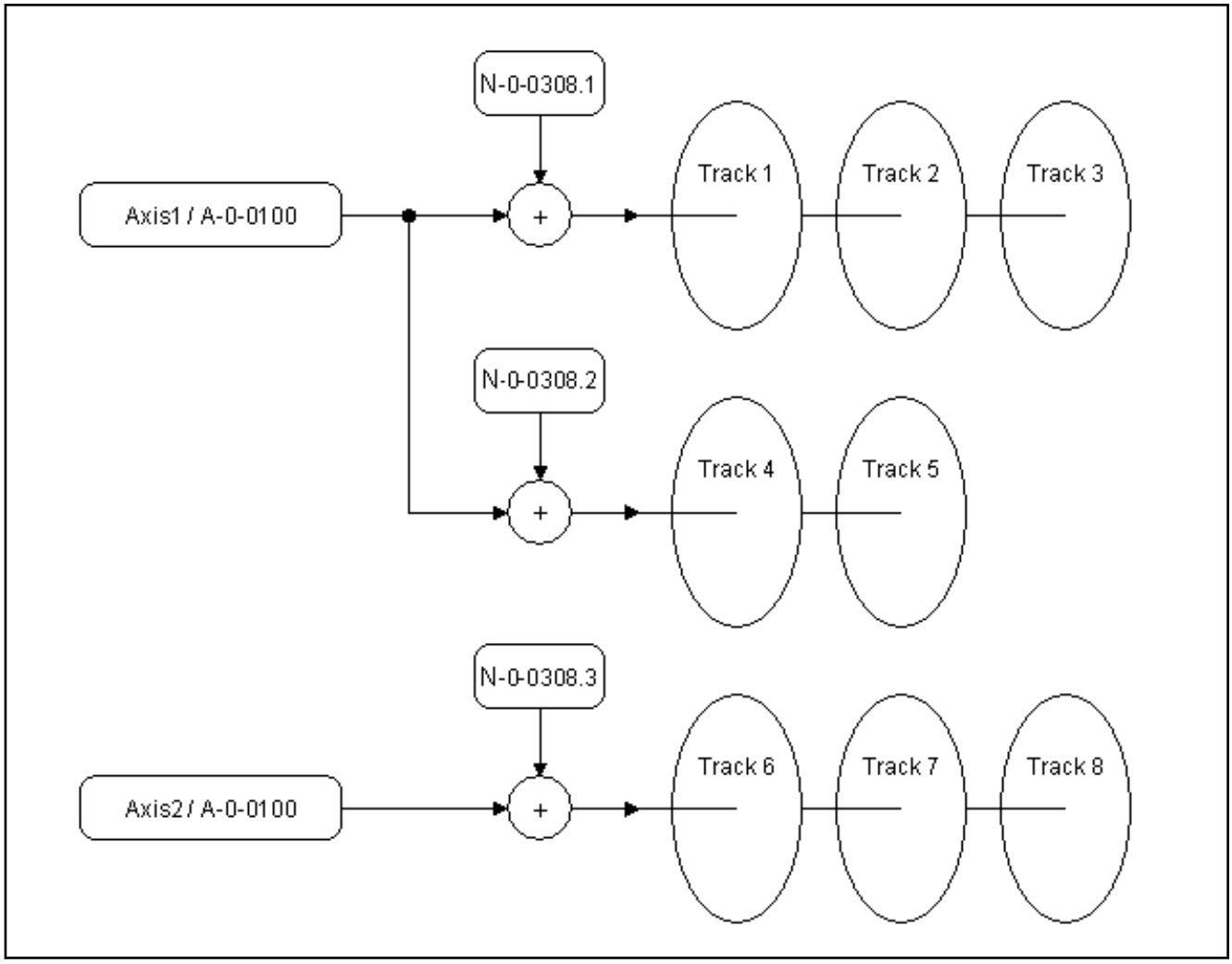


Fig. 4-158: Position offset

Use The position offset is cyclically transmitted to the programmable limit switch module and added to the switch track position after the hysteresis is calculated. As a result, a change to the position offset is active in its unmodified form.

$$X_{PLS} = \frac{(X_{MA} + \langle \text{N-0-0308} \rangle) \bmod \langle \text{A-0-0045} \rangle}{\langle \text{A-0-0045} \rangle} * 2^{16}$$

PLS Programmable limit switch
MA Master axis (reference axis)

Fig. 4-159: Mapping function

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

N-0-0308 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-

Describing individual parameters, arranged according to types

Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

4.5.15 N-0-0309, Reference axis definition

Function This parameter is used to define the reference axis for each switch track. All reference axes configured in parameter "N-0-0307, Reference axis configuration" are available for selection.

In addition to the position and velocity of the selected reference axis, the position offset, parameter "N-0-0308, Reference axis position, additive", is assigned to the respective switch track.

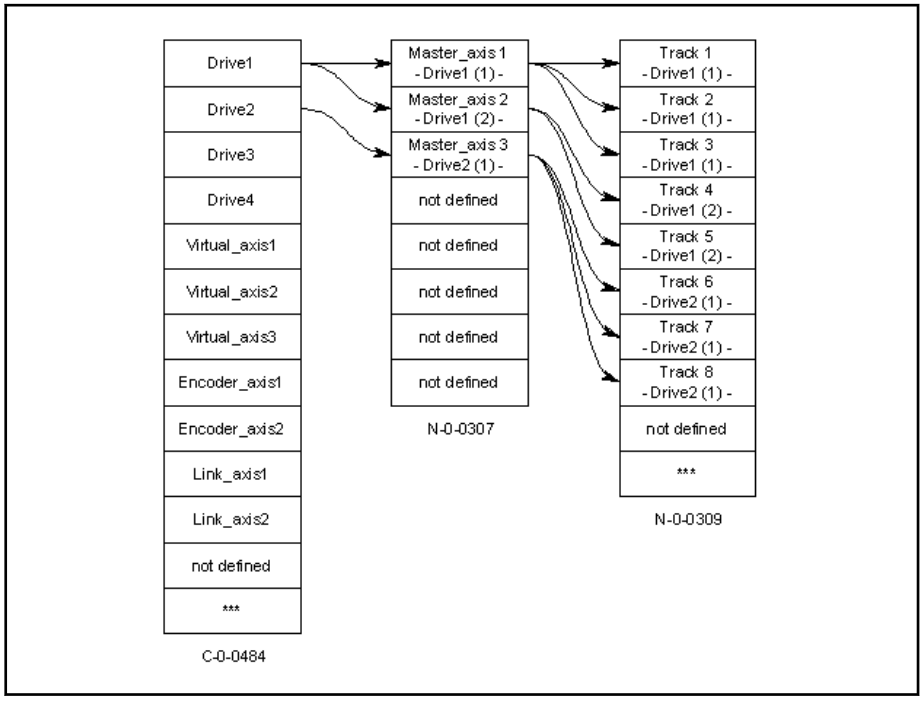


Fig. 4-160: Configuration and definition of reference axes

Use When switching from a lower to a higher phase, the reference axis definition is checked against parameter "N-0-0307, Reference axis configuration".

The error "F0160024, Error in cross-check C-parameter" is generated if one of the selected reference axes is deactivated or not configured.

N-0-0309 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

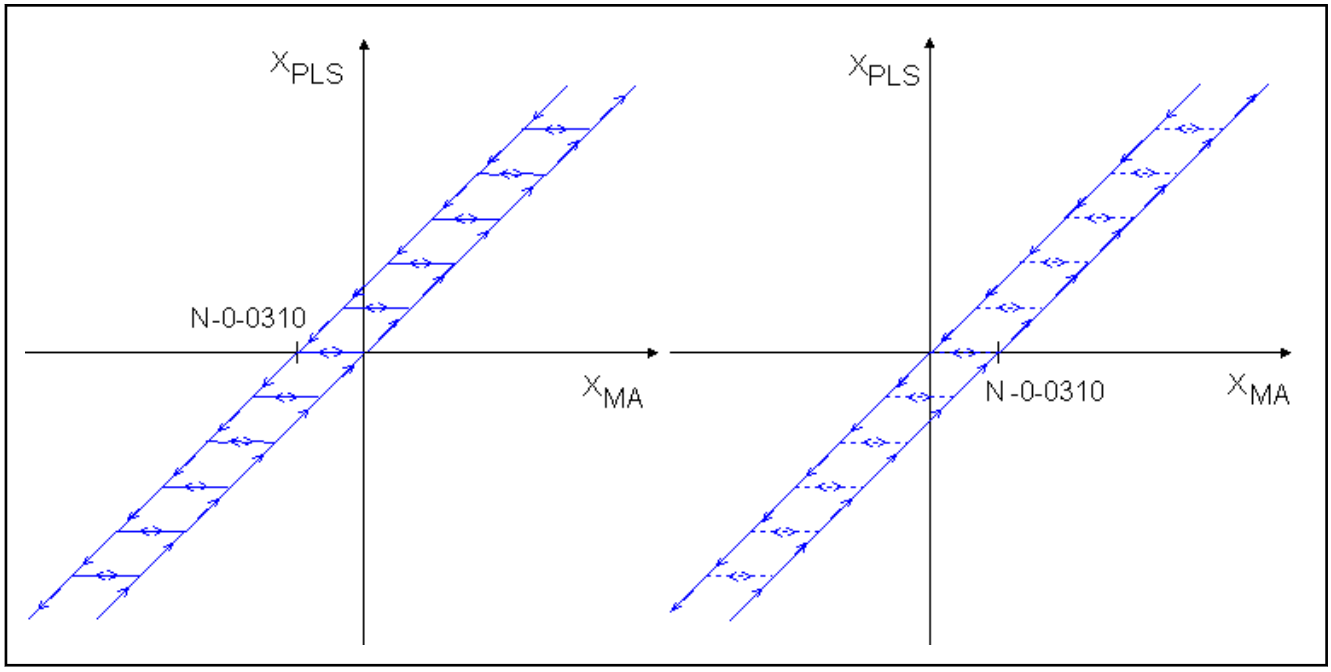
	Minimum value	**Maximum value**	**Default value**
Common:	0	8	0

4.5.16 N-0-0310, Hysteresis

Function This list of parameters is used to define a position hysteresis for each switch track.

The hysteresis functions direction-dependently, see figure:

Describing individual parameters, arranged according to types



X_{MA} Reference axis position
X_{PLS} Switch track position

Fig. 4-161: Negative and positive hysteresis

Use The position hysteresis is entered in the input unit of the reference axis.

The hysteresis serves to compensate position fluctuations. The fluctuations can cause the output on the programmable limit switch to jitter.

If a real axis comes to a standstill, the position controller moves. The velocity of this movement multiplied by the dead time to be compensated equals the standstill fluctuation.

If there is a delay with an axis, extrapolation errors occur. Half of the delay multiplied by the dead time to be compensated squared equals the extrapolation error.

$$H_{PLS} = \frac{H_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

MA Master axis (reference axis)
PLS Switch track

Fig. 4-162:

☞ The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

N-0-0310 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

4.5.17 N-0-0311, Lead time when switching on

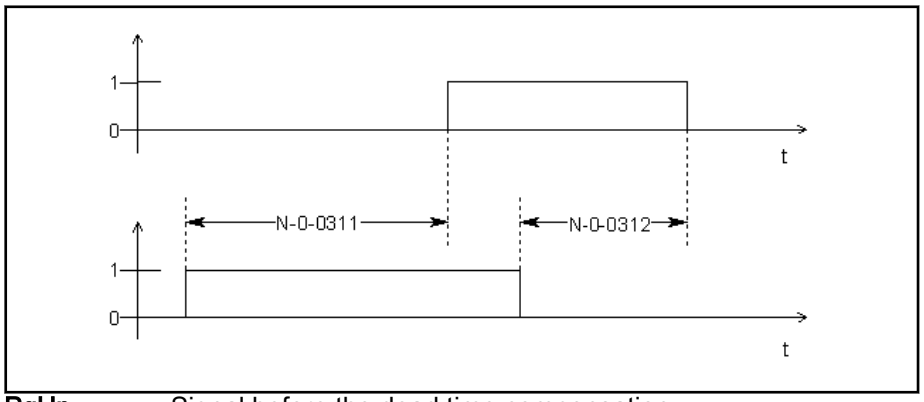
Function

A) For state-controlled outputs

This parameter is used to define the dead time compensation for state-controlled outputs (see "N-0-0318, Output mode") when switching on an output on the programmable limit switch.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-163: Dead time compensation (state-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PIS} = (X_{PIS} + (V_{PIS} * \langle \text{N-0-0311} \rangle)) \bmod 2^{16}$$

Fig. 4-164: Extrapolation function for switching on an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

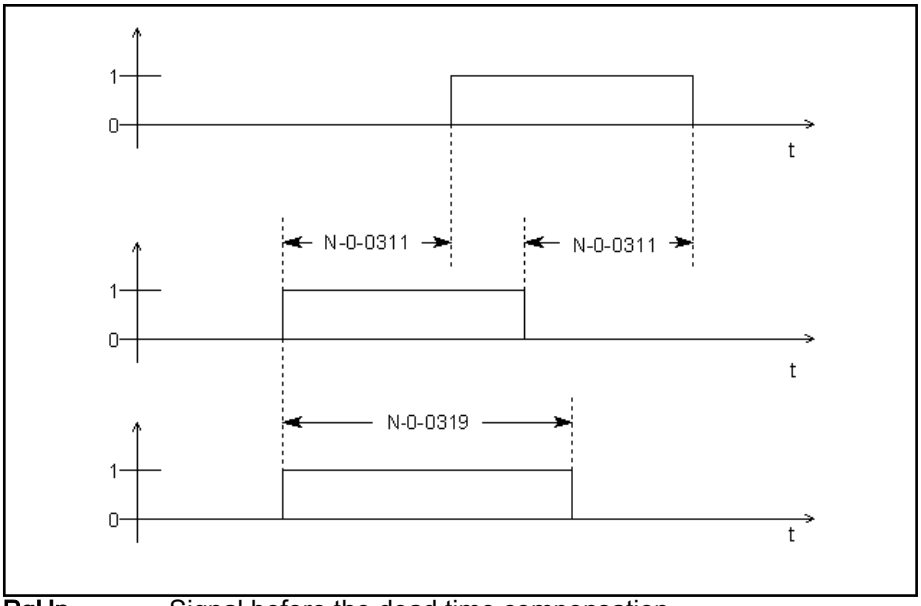
B) For time-controlled outputs

This parameter is used to define the dead time compensation for time-controlled outputs (see "N-0-0318, Output mode") when switching on and off outputs.

The programmable limit switch operates with a cycle time of 125 µs.

The programmable limit switch can compensate for the delay or switching time of the connected device within this time grid.

Describing individual parameters, arranged according to types



PgUp Signal before the dead time compensation
Center Extrapolated trigger signal
PgDn Time-controlled output signal

Fig. 4-165: Dead time compensation (time-controlled)

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \langle \text{N-0-0311} \rangle)) \bmod 2^{16}$$

Fig. 4-166: Extrapolation function for switching on an output

The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

N-0-0311 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

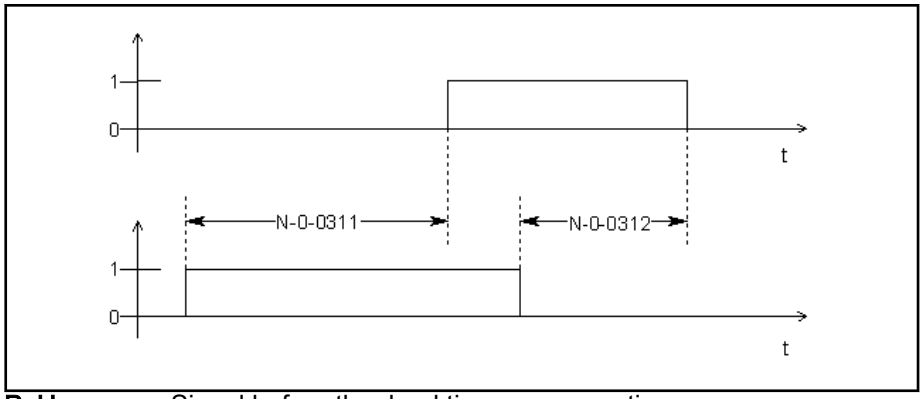
	Minimum value	Maximum value	Default value
Common:	0	1000000	0

4.5.18 N-0-0312, Lead time when switching off

Function

This parameter is used to control the dead time compensation when switching off an output on the programmable limit switch. The parameter only functions if the output is operated in a time-controlled manner (see "N-0-0318, Output mode").

The programmable limit switch operates with a cycle time of 125 µs. The programmable limit switch can compensate for the delay or switching time of the connected device within this time period.



PgUp Signal before the dead time compensation
PgDn Extrapolated output signal

Fig. 4-167: Dead time compensation (state-controlled)

Use

The dead time compensation extrapolates the switch track position by the switch track's current velocity. Therefore, when the switch track accelerates and has delays, extrapolation errors occur.

$$XC_{PLS} = (X_{PLS} + (V_{PLS} * \langle \text{N-0-0312} \rangle)) \bmod 2^{16}$$

Fig. 4-168: Extrapolation function for switching off an output

The dead time compensation can be set separately for switching on and off an output. As a result, devices can be optimally controlled with various switching times.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

☞ The parameter "C-0-0311, PLS Nr.1, lead time when switching on" (see "N-0-0318, PLS Nr.1, output mode") is only effective if an output functions in a time-controlled manner.

N-0-0312 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	1000000	0

4.5.19 N-0-0313, Switch track number

Function This parameter is used to activate up to 64 switches and assign the 16 switch tracks.

Structure The list has 64 possible spots (switches) that are assigned with "0" after initialization (no switch track is assigned).

If only one swítch is activated and assigned one of the 16 switch tracks, the number of the switch track is available in place of "0".

Describing individual parameters, arranged according to types

N-0-0313 - Attributes:				
	Function:	PARAMETER	**Unit:**	--
	MLC data type:	UINT_DEC, 2BYTE_VAR	**PLC data type:**	ARRAY of UINT
	Memory:	NVRAM	**Editability:**	P2, BB
	Direct access:	--	**MinMax check:**	+
	Var. data type:	-	**Var. min/max value:**	+
	Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0	16	0

4.5.20 N-0-0314, Switch-on position of switch track

Function

This parameter and parameter "N-0-0315, Switch-off position of switch track" are used to define a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-169: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

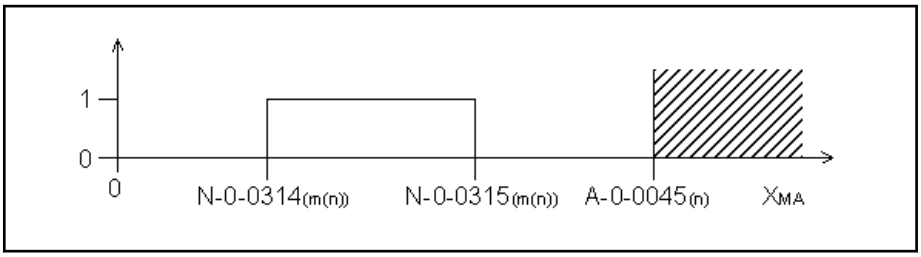


Fig. 4-170: Switch-on position less than switch-off position

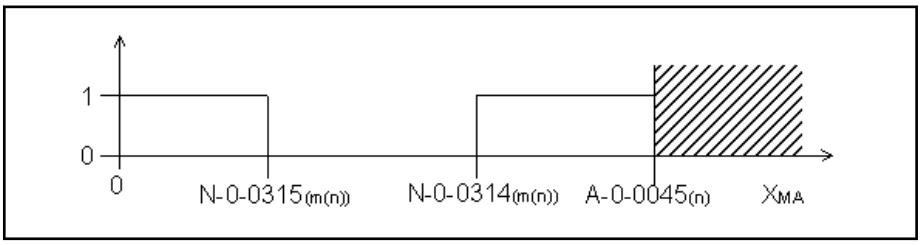


Fig. 4-171: Switch-on position greater than switch-off position

The parameter "N-0-0313, Switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

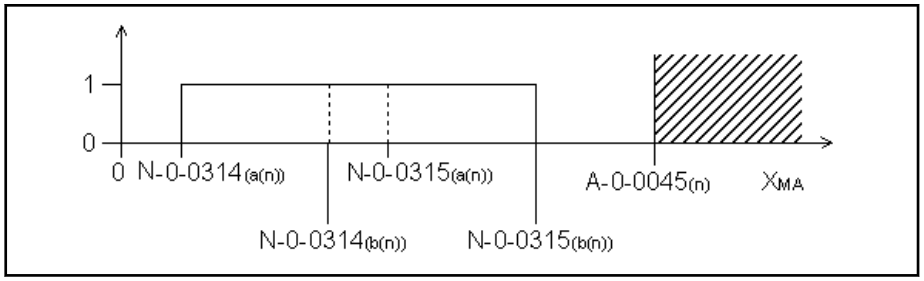


Fig. 4-172: Overlapping switches

N-0-0314 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

4.5.21 N-0-0315, Switch-off position of switch track

Function

This parameter and parameter "N-0-0314, Switch-on position of switch track" are used to define a switch's position on the switch track.

The switch-on position of switch track is entered in the input unit of the switch track.

$$X_{PIS} = \frac{X_{MA} \bmod \langle A\text{-}0\text{-}0045 \rangle}{\langle A\text{-}0\text{-}0045 \rangle} * 2^{16}$$

Fig. 4-173: Mapping function

The parameter "A-0-0045, Modulo value" is also used for axes with scaling in absolute format in the mapping functions for the programmable limit switch.

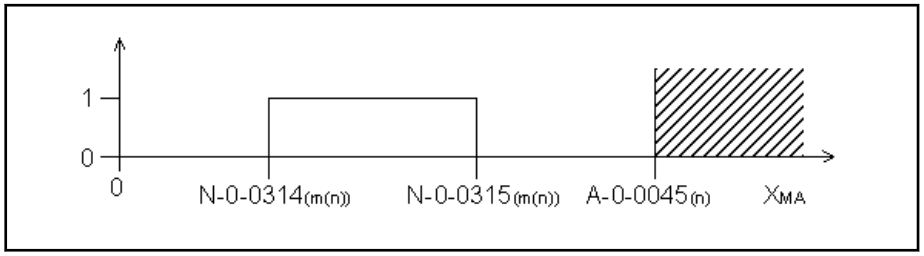


Fig. 4-174: Switch-on position less than switch-off position

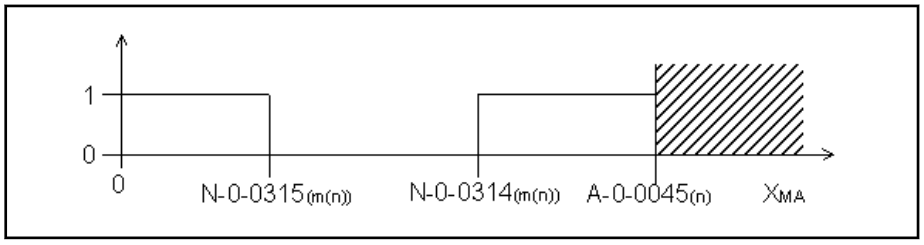


Fig. 4-175: Switch-on position greater than switch-off position

The parameter "N-0-0313, Switch track numbers" is used to assign several switches to one switch track. If the assignments of these switches overlap, an individual switch is established on the switch track.

Describing individual parameters, arranged according to types

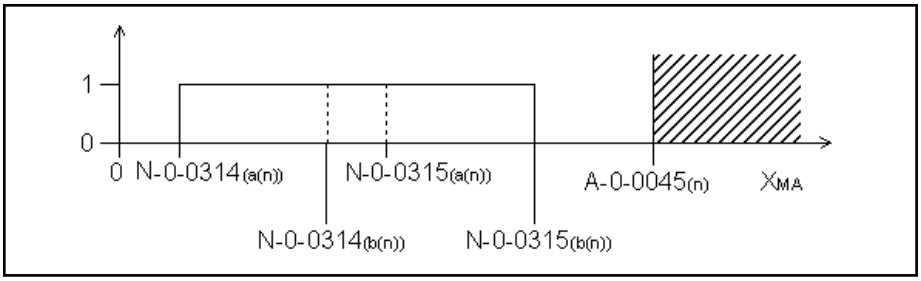


Fig. 4-176: Overlapping switches

N-0-0315 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	FLOAT, 4BYTE_VAR	**PLC data type:**	ARRAY of REAL
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0.0

4.5.22 N-0-0316, Command: Initialize switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode.

The passive group in the following parameters is reinitialized using this command

- N-0-0311, Lead time when switching on,
- N-0-0312, Lead time when switching off,
- N-0-0313, Switch track number,
- N-0-0314, Switch-on position of switch track,
- N-0-0315, Switch-off position of switch track,
- N-0-0318, Output mode,
- N-0-0319, Switch-on duration.

Use

The initialized switch track group is immediately activated, depending on the setting in the "N-0-0300, Control word, bit 5= 1".

The switch track group can be switched at all times using the command "N-0-0317, Command: Activate switch track".



When switching on the operation mode, the two switch track groups are initialized identically.

N-0-0316 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	0

4.5.23 N-0-0317, Command: Activate switch track

Function

Two groups of switch tracks are implemented in the programmable limit switch module. One of the two groups is active in the operating mode. The passive group is activated using the command. The active group is simultaneously deactivated.

The passive switch track group can then be reinitialized with "N-0-0316, Command: Initialize switch track".

When the operation mode is switched on, the first switch track group is activated.

N-0-0317 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

4.5.24 N-0-0318, Output mode

Function

When switching from a lower to a higher phase, this parameter is checked against parameter "N-0-0309, Reference axis definition".

If no reference axis was defined for the switch track and the output is activated (direction of motion ≠ zero), the error "F0160024, Error in cross-check C-parameters" is generated.

Structure

Bit	Designation/function
1..0	**Direction of movement** 0 0: deactivated: The internal output is deactivated. 0 1: activated depending on direction: The switch track's sampling signal is used for movement in the positive direction. 1 0: activated depending on direction: The switch track's sampling signal is used for movement in the negative direction. 1 1: activated independent of the direction The switch track's sampling signal is used irrespective of the motion direction.
2	**Control mode** 0: state-controlled: The switch track's sampling signal controls the register bit of the programmable limit switch. 1: time-controlled: The switch track's sampling signal controls the pulse generator's clock input. The pulse generator controls the register bit of the programmable limit switch.

Tab. 4-128: Relevant bits in the parameter

Use

This parameter is used to control the internal register of the programmable limit switch (register_0 and register_1), depending on the direction of movement (forward and/or backward) of the reference axis.

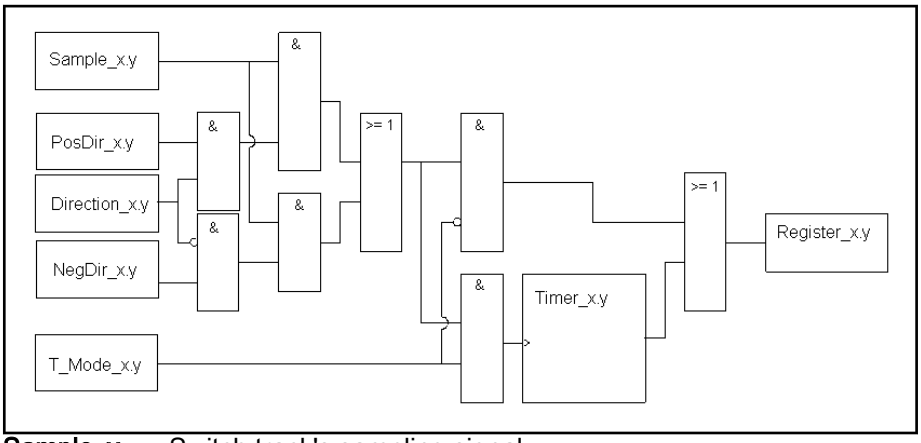
A register bit can be operated directly (state-controlled) or by a pulse generator (time-controlled).

Describing individual parameters, arranged according to types

The control mode influences the dead time compensation (see parameter "N-0-0311, Lead time when switching on" and "N-0-0312, Lead time when switching off").

The pulse duration in time-controlled mode can be defined in parameter "N-0-0319, Switch-on duration".

☞ The physical outputs of the programmable limit switch can be overridden from the PLC program (see parameter "N-0-0303, Control signal").



Sample_x Switch track's sampling signal
PosDir_x Active in positive movement direction
Direction_x Current movement direction
NegDir_x Active in positive movement direction
T_Mode_x Time-controlled mode
Register_x Internal register
Fig. 4-177: Output control

N-0-0318 - Attributes:

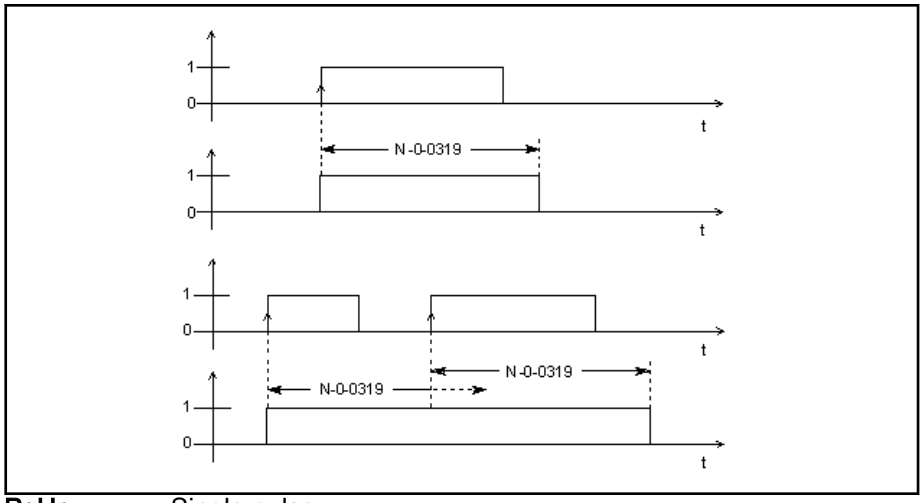
Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 2BYTE_VAR	**PLC data type:**	ARRAY of WORD
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0

4.5.25 N-0-0319, Switch-on duration

Function This parameter is used to define the pulse duration in time-controlled mode (see parameter "N-0-0318, Output mode").

The programmable limit switch operates with a cycle time of 125 µs. Within this time period, the programmable limit switch can generate pulses with a maximum duration of one second.



PgUp Single pulse
PgDn Extended pulse

Fig. 4-178: Pulse generator

Use The pulse generator is started by a rising edge at the clock input. The pulse generator is reset and restarted with each additional rising edge. This extends the output pulse for active pulse generators.

☞ The programmable limit switch only accepts time specifications within the internal time period of 125 µs.

N-0-0319 - Attributes:

Function:	PARAMETER	**Unit:**	µs
MLC data type:	INT_DEC, 4BYTE_VAR	**PLC data type:**	ARRAY of DINT
Memory:	NVRAM	**Editability:**	P2, BB
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	+
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	125	1000000	125

4.5.26 N-0-1000, Command: Load basic PLS parameters

Function This parameter is used as a command to load the basic parameters of the programmable limit switch instance.

Use *Execution in the parameter editor:*

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- When the loading is complete, the control automatically resets the parameter to "0000000000000000".

N-0-1000 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, (P2+Stop)

Describing individual parameters, arranged according to types

Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0	0x3	0

4.5.27 N-0-2100, List of all backup operation N-parameters

Function This list includes all N-parameters to be considered when backing up parameters. It is entered in the ID number format.

The entries are sorted according to identity number in ascending order.

Structure The ID number format is as follows:

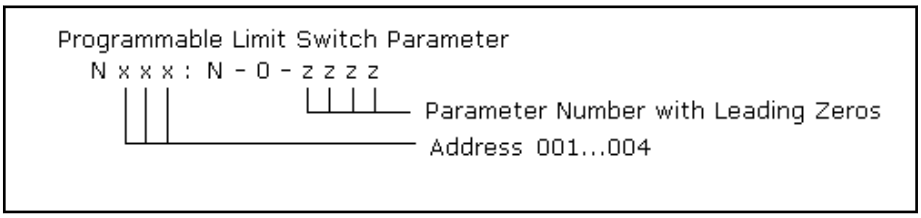


Fig. 4-179: ID number format

Use N001: N-0-0002 - Programmable limit switch 1; Parameter N-0-0002.

N-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x2E 0000 0000	0x2E 0000 0FFF	---

4.6 Oscilloscope parameters (O-parameters)

4.6.1 Oscilloscope Parameters, General Information

The O-parameters display the data set for each oscilloscope channel.

Addressing takes place as for axes and controls:

O001...O016 for the respective oscilloscope channel

and the desired parameter,

O002: O-0-0010, List of all parameters that can be oscilloscoped, channel 2.



The following controls support this parameter type:

- IndraLogic XLC L25, L45, L65 with onboard sercos III bus,
- IndraMotion MLC L25, L45, L65

4.6.2 O-0-0000, Dummy, O-parameter

Function A-parameter serves as a placeholder; it does not have a function. The parameter can be written and read cyclically.

Use Measure dead time for writing and reading.

O-0-0000 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	P0, P2, BB
Direct access:	RW	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.6.3 O-0-0001, Logical channel number

Function The logical channel number of the selected instance can be read from this parameter.

O-0-0001 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 2BYTE	**PLC data type:**	UINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	---	---	---

4.6.4 O-0-0002, Channel name

Function This parameter contains the channel's name.

The name contains

- the channel number,
- the configured IDN and
- names of the configured IDN.

Example:

Channel2: A002:A-0-0100, Actual position value

O-0-0002 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	**Maximum value**	**Default value**
Common:	0x00	0xFF	"Channel_name"

4.6.5 O-0-0003, Signal selection

Function The IDN entered in this parameter determines the signal that is to be recorded by the channel.

Use Only IDNs included in the list "C-0-0803, Signal selection list" are allowed.

The measuring channel is deactivated with the entry "0" or "C-0-0000".

After the recording is completed, the recorded measured values are in parameter "O-0-0004, Measured value list".

Describing individual parameters, arranged according to types

O-0-0003 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE	**PLC data type:**	MB_IDN
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	RO	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.6 O-0-0004, Measured value list

Function The measured values from the channel of the oscilloscope function are saved in this parameter in a chronological, consecutive order. The oldest measured value is the first element in the measured value list.

Use The signal defined by the IDN entered in "O-0-003, Signal selection" is recorded.



Attribute, unit, etc. are automatically adjusted to the selected signal.

O-0-0004 - Attributes:

Function:	PARAMETER	**Unit:**	O-0-0003
MLC data type:	DOUBLE, 8BYTE_VAR	**PLC data type:**	ARRAY of LREAL
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.7 O-0-0005, AUX signal path

Function This parameter is only intended for internal use.

O-0-0005 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.8 O-0-0006, AUX signal

Function This parameter is only intended for internal use.

O-0-0006 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_HEX, 8BYTE	**PLC data type:**	ULINT
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	-
Var. data type:	+	**Var. min/max value:**	-
Oscilloscope:	+	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.9 O-0-0007, List index

Function The number entered into this parameter is used as index for list parameters.

The first list element is the index 0.

If no list parameter is entered into the parameter O-0-0003, the parameter O-0-0007 is ignored.

O-0-0007 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	UINT_DEC, 4BYTE	**PLC data type:**	UDINT
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.10 O-0-0009, Osci: list of all O-parameters that can be oscilloscoped

Function This parameter contains the list of all O-parameters which can be oscilloscoped.

O-0-0009 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	---

4.6.11 O-0-0010, List of all O-parameters

Function This list includes all O-parameters. The entry is made in ID number format.

The entries are sorted by meaning and how they relate to each other and not by ID number or alphabetically.

O-parameters are stored in the order of these entries.

Structure The ID number format is as follows:

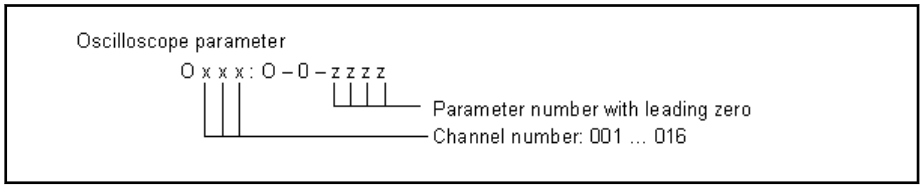


Fig. 4-180: ID number format for an O-parameter

Use O001:O-0-0002 - Channel 1; Parameter O-0-0002.

O-0-0010 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0x2F00000000	0x2F00000FFF	---

4.6.12 O-0-0016, Project identification number

Function IndraWorks generates a unique character string in this parameter for the global identification of the project.

The character string is unique for each project.

This parameter is only intended for internal use.

O-0-0016 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	TEXT, 1BYTE_VAR	**PLC data type:**	STRING
Memory:	FLASH	**Editability:**	P0, P2, BB
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x00	0xFF	"Project ID number"

4.6.13 O-0-0021, Channel status

Function This parameter describes the current value of the channel status.

O-0-0021 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	BINARY, 4BYTE	**PLC data type:**	DWORD
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	RO	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	---	---	0x00

4.6.14 O-0-1000, Command: Load basic oscilloscope parameters

Function This parameter is used as a command to load the basic parameters of the oscilloscope channel.

Use *Execution in the parameter editor:*

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- After the loading process is complete, the control automatically resets the parameter to "0000000000000000".

When using the parameter, e.g. from the PLC:

- Enter the binary value "0000000000000011" (=0x0003) in this parameter. This triggers the loading of the basic parameters.
- After loading, the control automatically resets the parameter to "0000000000000000".

O-0-1000 - Attributes:

Function:	COMMAND	**Unit:**	--
MLC data type:	BINARY, 2BYTE	**PLC data type:**	WORD
Memory:	RAM	**Editability:**	P0, (P2+Stop)
Direct access:	--	**MinMax check:**	+
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

Describing individual parameters, arranged according to types

	Minimum value	Maximum value	Default value
Common:	0	0x3	0

4.6.15 O-0-2100, List of all backup operation O-parameters

Function This list includes all O-parameters to be considered when backing up parameters. It is entered in the ID number format.

The entries are sorted by description and their relation and not by ID number or alphabetically.

O-parameters are stored in the order of these entries.

Structure The ID number format is as follows:

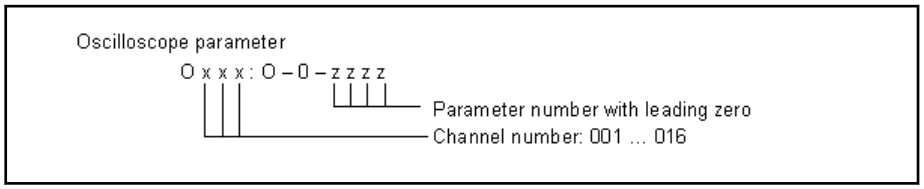


Fig. 4-181: ID number format for an O-parameter

Use O001:O-0-0002 - Channel 1; Parameter O-0-0002.

O-0-2100 - Attributes:

Function:	PARAMETER	**Unit:**	--
MLC data type:	MLC_IDN, 8BYTE_VAR	**PLC data type:**	ARRAY of MB_IDN
Memory:	RAM	**Editability:**	READ_ONLY
Direct access:	--	**MinMax check:**	-
Var. data type:	-	**Var. min/max value:**	-
Oscilloscope:	-	**Probe:**	-

	Minimum value	Maximum value	Default value
Common:	0x2F 0000 0000	0x2F 0000 0FFF	---

5 A-/C-parameters cover S-/P-parameters

5.1 IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Control)

5.1.1 General Information

☞ The information to be transferred from the A- and C-parameters differ for the drive types **IndraDrive**, **SercosDrive** and **HydraulicDrive** with regard to the location of the motion sequence calculation:

- IndraDrive, calculation in the drive, page 760,
- IndraDrive, calculation in the control, page 757,
- SercosDrive, calculation in the Control, page 766,
- HydraulicDrive, calculation in the drive, page 772,
- HydraulicDrive, calculation in the control, page 769,

- **Ident**_xyz means bit-identical copy of the source parameter on the target parameter,
- **Used**_xyz means that at least one bit of the target parameter is affected.

☞ For axes without position feedback (Open Loop), the data transfer is omitted for a part of the A-parameters to the S-/P-parameters, since these are not available.

The parameters are available in the image for the control interpolator and for import and export.

The parameters are highlighted in the following tables and explained in the key.

5.1.2 IndraDrive, Calculation in the Control, A-0-0000 - A-0-0499

IDN, parameter name	Ident_IDC	Used_IDC
A-0-0002, Axis name	S-0-0142	S-0-0142
A-0-0007, Axis configuration	-	S-0-0032, S-0-0033, S-0-0034
A-0-0021, Axis status	-	AT configuration
A-0-0022, Extended axis status	-	AT configuration
A-0-0023, Axis diagnostic number	-	S-0-0390
A-0-0024, Axis state	-	S-0-0139
A-0-0028, Travel range limit switch	P-0-0090	P-0-0090
A-0-0029, Position polarities	S-0-0055	S-0-0055
A-0-0030, Position limit value, positive	S-0-0049	S-0-0049
A-0-0031, Position limit value, negative	S-0-0050	S-0-0050
A-0-0032, Velocity limit value, positive	S-0-0038, S-0-0091	S-0-0038, S-0-0091

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDC	Used_IDC
A-0-0033, Velocity limit value, negative	S-0-0039, S-0-0091	S-0-0039, S-0-0091
A-0-0034, Acceleration limit value, bipolar	S-0-0138	S-0-0138, P-0-1203, P-0-1213
A-0-0038, Torque/force limit value, bipolar	S-0-0092, S-0-0082, S-0-0083	S-0-0092, S-0-0082, S-0-0083
A-0-0045, Modulo value	S-0-0103	S-0-0103
A-0-0048, Velocity polarities	S-0-0043	S-0-0043
A-0-0049, Torque-/force polarities	S-0-0085	S-0-0085
A-0-0050, Scaling type for torque/force data	S-0-0086	S-0-0086
A-0-0051, Scaling factor for torque/force data	S-0-0093	S-0-0093
A-0-0052, Scaling exponent for torque/force data	S-0-0094	S-0-0094
A-0-0053, Scaling type for acceleration data	S-0-0160	S-0-0160
A-0-0054, Scaling factor for acceleration data	S-0-0161	S-0-0161
A-0-0055, Scaling exponent for acceleration data	S-0-0162	S-0-0162
A-0-0056, Scaling type for velocity data	S-0-0044	S-0-0044
A-0-0057, Scaling factor for velocity data	S-0-0045	S-0-0045
A-0-0058, Scaling exponent for velocity data	S-0-0046	S-0-0046
A-0-0059, Scaling type for position data [1)]	S-0-0076	S-0-0076
A-0-0060, Scaling factor for translatory position data	S-0-0077	S-0-0077
A-0-0061, Scaling exponent for translatory position data	S-0-0078	S-0-0078
A-0-0062, Position resolution, rotatory	S-0-0079	S-0-0079
A-0-0063, Scaling type for temperature data	S-0-0208	S-0-0208
A-0-0064, Torque/Force reference value	S-0-0111, P-0-0051	S-0-0111, P-0-0051
A-0-0100, Actual position value	S-0-0051	S-0-0051
A-0-0101, Actual position value, 8 bytes	S-0-0051	S-0-0051
A-0-0102, Actual velocity value	S-0-0040	S-0-0040
A-0-0103, Actual acceleration value	S-0-0164	S-0-0164
A-0-0110, Actual torque/force value	S-0-0084	S-0-0084
A-0-0221, Torque/force window	-	S-0-0826
A-0-0242, Position control, synchronization acceleration [2)]	P-0-0142	P-0-0142
A-0-0243, Position control, synchronization velocity [2)]	P-0-0143	P-0-0143

[1)] In A-0-0059, no synchronization is performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

[2)] For an axis without position feedback (open loop), the drive parameter is not available for this axis parameter. Thus, no synchronization is performed.

A-/C-parameters cover S-/P-parameters

5.1.3 IndraDrive, Calculation in the Control, A-0-0500 - A-0-2999

IDN, parameter name	Ident_IDC	Used_IDC
A-0-0500, Configuration of user-defined command value A	S-0-0024	S-0-0024
A-0-0502, Configuration of user-defined command value B	S-0-0024	S-0-0024
A-0-0504, Configuration of user-defined command value C	S-0-0024	S-0-0024
A-0-0506, Configuration of user-defined command value D	S-0-0024	S-0-0024
A-0-0508, Configuration of user-defined command value E	S-0-0024	S-0-0024
A-0-0510, Reserved	S-0-0024	S-0-0024
A-0-0520, Configuration of actual user-defined value A	S-0-0016	S-0-0016
A-0-0522, Configuration of actual user-defined value B	S-0-0016	S-0-0016
A-0-0524, Configuration of actual user-defined value C	S-0-0016	S-0-0016
A-0-0526, Configuration of actual user-defined value D	S-0-0016	S-0-0016
A-0-0527, Container of actual user-defined value D	S-0-0016	S-0-0016
A-0-0528, Configuration of actual user-defined value E	S-0-0016	S-0-0016
A-0-0529, Container of actual user-defined value E	S-0-0016	S-0-0016
A-0-0530, Configuration of actual user-defined value F	S-0-0016	S-0-0016
A-0-0531, Container of actual user-defined value F	S-0-0016	S-0-0016
A-0-0540, Configuration of user-defined command value, bit A	S-0-0027	S-0-0027
A-0-0541, Configuration of user-defined command value, bit number A	S-0-0329	S-0-0329
A-0-0542, User-defined command value, bit number A	S-0-0145	S-0-0145
A-0-0543, Configuration of user-defined command value, bit B	S-0-0027	S-0-0027
A-0-0544, Configuration of user-defined command value, bit number B	S-0-0329	S-0-0329
A-0-0545, User-defined command value, bit number B	S-0-0145	S-0-0145
A-0-0546, Configuration of user-defined command value, bit C	S-0-0027	S-0-0027
A-0-0547, Configuration of user-defined command value, bit number C	S-0-0329	S-0-0329
A-0-0548, User-defined command value, bit number C	S-0-0145	S-0-0145
A-0-0549, Configuration of user-defined command value, bit D	S-0-0027	S-0-0027
A-0-0550, Configuration of user-defined command value, bit number D	S-0-0329	S-0-0329
A-0-0551, User-defined command value, bit number D	S-0-0145	S-0-0145
A-0-0560, Configuration of actual user-defined value, bit A	S-0-0026	S-0-0026
A-0-0561, Configuration of actual user-defined value, bit number A	S-0-0328	S-0-0328
A-0-0562, Actual user-defined value, bit number A	S-0-0144	S-0-0144
A-0-0563, Configuration of actual user-defined value, bit B	S-0-0026	S-0-0026
A-0-0564, Configuration of actial user-defined value, bit number B	S-0-0328	S-0-0328
A-0-0565, Actual user-defined value, bit number B	S-0-0144	S-0-0144
A-0-0566, Configuration of actual user-defined value, bit C	S-0-0026	S-0-0026
A-0-0567, Configuration of actual user-defined value, bit number C	S-0-0328	S-0-0328

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDC	Used_IDC
A-0-0568, Actual user-defined value, bit number C	S-0-0144	S-0-0144
A-0-0569, Configuration of actual user-defined value, bit D	S-0-0026	S-0-0026
A-0-0570, Configuration of actual user-defined value, bit number D	S-0-0328	S-0-0328
A-0-0571, Actual user-defined value, bit number D	S-0-0144	S-0-0144
A-0-0596, List of freely configurable parameters in the MDT	S-0-0188	S-0-0188
A-0-0597, List of freely configurable parameters in the AT	S-0-0187	S-0-0187
A-0-0598, List of configurable parameters in signal control word	S-0-0399	S-0-0399
A-0-0599, List of configurable parameters in signal status word	S-0-0398	S-0-0398
A-0-1030, Command: Clear all axis errors	-	S-0-0099
A-0-2206, Target force	S-0-0080	S-0-0080
A-0-2208, Cyclic command position	S-0-0047, after FB call	S-0-0047, after FB call

5.1.4 IndraDrive, Calculation in the Control, C-0-0000 - End

IDN, parameter name	Ident_IDC	Used_IDC
C-0-0400, Motion, cycle time, command value	-	S-0-0001
C-0-0479, Extended drive information	-	S-0-0030, S-0-1300.0.3,..., S-0-1302.0.1
C-0-0503, sercos master, cycle time	-	S-0-0002
C-0-0510, sercos master, address configuration	S-0-1040	S-0-1040
C-0-1030, Command: Clear all control errors	-	S-0-0099

5.2 IndraDrive: A/C ==> S-/P-Parameters (Calculation in the Drive)

5.2.1 General Information

☞ The information to be transferred from the A- and C-parameters differ for the drive types **IndraDrive**, **SercosDrive** and **HydraulicDrive** with regard to the location of the motion sequence calculation:

- IndraDrive, calculation in the drive, page 760,
- IndraDrive, calculation in the control, page 757,
- SercosDrive, calculation in the Control, page 766,
- HydraulicDrive, calculation in the drive, page 772,
- HydraulicDrive, calculation in the control, page 769,

- **Ident**_xyz means bit-identical copy of the source parameter on the target parameter,
- **Used**_xyz means that at least one bit of the target parameter is affected.

A-/C-parameters cover S-/P-parameters



For axes without position feedback (Open Loop), the data transfer is omitted for a part of the A-parameters to the S-/P-parameters, since these are not available.

The parameters are available in the image for the control interpolator and for import and export.

The parameters are highlighted in the following tables and explained in the key.

5.2.2 IndraDrive, Calculation in the Drive, A-0-0000 - A-0-0499

IDN, parameter name	Ident_IDD	Used_IDD
A-0-0002, Axis name	S-0-0142	S-0-0142
A-0-0007, Axis configuration	-	S-0-0032, S-0-0033, S-0-0034, S-0-0035, S-0-0284, S-0-0285, S-0-0286, S-0-0287
A-0-0021, Axis status	-	AT configuration
A-0-0022, Extended axis status	-	AT configuration
A-0-0023, Axis diagnostic number	-	S-0-0390
A-0-0024, Axis state	-	S-0-0139
A-0-0028, Travel range limit switch	P-0-0090	P-0-0090
A-0-0029, Position polarities	S-0-0055	S-0-0055
A-0-0030, Position limit value, positive	S-0-0049	S-0-0049
A-0-0031, Position limit value, negative	S-0-0050	S-0-0050
A-0-0032, Velocity limit value, positive	S-0-0038, S-0-0091	S-0-0038, S-0-0091
A-0-0033, Velocity limit value, negative	S-0-0039, S-0-0091	S-0-0039, S-0-0091
A-0-0034, Acceleration limit value, bipolar	S-0-0138	S-0-0138
A-0-0036, Jerk limit value, bipolar	S-0-0349	S-0-0349
A-0-0038, Torque/force limit value, bipolar	S-0-0092, S-0-0082, S-0-0083	S-0-0092, S-0-0082, S-0-0083
A-0-0045, Modulo value	S-0-0103	S-0-0103
A-0-0046, Feed distance of the slave drive	P-0-0159	P-0-0159
A-0-0048, Velocity polarities	S-0-0043	S-0-0043
A-0-0049, Torque-/force polarities	S-0-0085	S-0-0085
A-0-0050, Scaling type for torque/force data	S-0-0086	S-0-0086
A-0-0051, Scaling factor for torque/force data	S-0-0093	S-0-0093
A-0-0052, Scaling exponent for torque/force data	S-0-0094	S-0-0094
A-0-0053, Scaling type for acceleration data	S-0-0160	S-0-0160
A-0-0054, Scaling factor for acceleration data	S-0-0161	S-0-0161
A-0-0055, Scaling exponent for acceleration data	S-0-0162	S-0-0162
A-0-0056, Scaling type for velocity data	S-0-0044	S-0-0044

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDD	Used_IDD
A-0-0057, Scaling factor for velocity data	S-0-0045	S-0-0045
A-0-0058, Scaling exponent for velocity data	S-0-0046	S-0-0046
A-0-0059, Scaling type for position data [1)]	S-0-0076	S-0-0076
A-0-0060, Scaling factor for translatory position data	S-0-0077	S-0-0077
A-0-0061, Scaling exponent for translatory position data	S-0-0078	S-0-0078
A-0-0062, Position resolution, rotatory	S-0-0079	S-0-0079
A-0-0063, Scaling type for temperature data	S-0-0208	S-0-0208
A-0-0064, Torque/Force reference value	S-0-0111, P-0-0051	S-0-0111, P-0-0051
A-0-0100, Actual position value	S-0-0386	S-0-0386
A-0-0101, Actual position value, 8 bytes	S-0-0386	S-0-0386
A-0-0102, Actual velocity value	S-0-0040	S-0-0040
A-0-0103, Actual acceleration value	S-0-0164	S-0-0164
A-0-0110, Actual torque/force value	S-0-0084	S-0-0084
A-0-0150, Interpolated position	P-0-0434	P-0-0434
A-0-0151, Interpolated position of the control	P-0-0434	P-0-0434
A-0-0152, Interpolated velocity	P-0-0048	P-0-0048
A-0-0203, Direction of motion	-	S-0-0145, bit 4 + 5, after MC_MoveAbsolute
A-0-0204, Velocity threshold, positioning in modulo format	S-0-0417	S-0-0417
A-0-0216, Jerk [2)]	S-0-0193	S-0-0193
A-0-0219, Positioning window for shortest distance	S-0-0418	S-0-0418
A-0-0221, Torque/force window	S-0-0826	S-0-0826
A-0-0222, Standstill window	S-0-0124	S-0-0124
A-0-0223, Velocity window	S-0-0157	S-0-0157
A-0-0224, Rapid stop deceleration	S-0-0372 after emergency stop	S-0-0372 after emergency stop
A-0-0240, Feedrate override [2)]	S-0-0036, S-0-0108	S-0-0036, S-0-0108

[1)] In A-0-0059, no synchronization is performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

[2)] For an axis without position feedback (open loop), the drive parameter is not available for this axis parameter. Thus, no synchronization is performed.

5.2.3 IndraDrive, Calculation in the Drive, A-0-0500 - A-0-0999

IDN, parameter name	Ident_IDD	Used_IDD
A-0-0500, Configuration of user-defined command value A	S-0-0024	S-0-0024
A-0-0502, Configuration of user-defined command value B	S-0-0024	S-0-0024

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDD	Used_IDD
A-0-0504, Configuration of user-defined command value C	S-0-0024	S-0-0024
A-0-0506, Configuration of user-defined command value D	S-0-0024	S-0-0024
A-0-0508, Configuration of user-defined command value E	S-0-0024	S-0-0024
A-0-0510, Reserved	S-0-0024	S-0-0024
A-0-0520, Configuration of actual user-defined value A	S-0-0016	S-0-0016
A-0-0522, Configuration of actual user-defined value B	S-0-0016	S-0-0016
A-0-0524, Configuration of actual user-defined value C	S-0-0016	S-0-0016
A-0-0526, Configuration of actual user-defined value D	S-0-0016	S-0-0016
A-0-0527, Container of actual user-defined value D	S-0-0016	S-0-0016
A-0-0528, Configuration of actual user-defined value E	S-0-0016	S-0-0016
A-0-0529, Container of actual user-defined value E	S-0-0016	S-0-0016
A-0-0530, Configuration of actual user-defined value F	S-0-0016	S-0-0016
A-0-0531, Container of actual user-defined value F	S-0-0016	S-0-0016
A-0-0540, Configuration of user-defined command value, bit A	S-0-0027	S-0-0027
A-0-0541, Configuration of user-defined command value, bit number A	S-0-0329	S-0-0329
A-0-0542, User-defined command value, bit number A	S-0-0145	S-0-0145
A-0-0543, Configuration of user-defined command value, bit B	S-0-0027	S-0-0027
A-0-0544, Configuration of user-defined command value, bit number B	S-0-0329	S-0-0329
A-0-0545, User-defined command value, bit number B	S-0-0145	S-0-0145
A-0-0546, Configuration of user-defined command value, bit C	S-0-0027	S-0-0027
A-0-0547, Configuration of user-defined command value, bit number C	S-0-0329	S-0-0329
A-0-0548, User-defined command value, bit number C	S-0-0145	S-0-0145
A-0-0549, Configuration of user-defined command value, bit D	S-0-0027	S-0-0027
A-0-0550, Configuration of user-defined command value, bit number D	S-0-0329	S-0-0329
A-0-0551, User-defined command value, bit number D	S-0-0145	S-0-0145
A-0-0560, Configuration of actual user-defined value, bit A	S-0-0026	S-0-0026
A-0-0561, Configuration of actual user-defined value, bit number A	S-0-0328	S-0-0328
A-0-0562, Actual user-defined value, bit number A	S-0-0144	S-0-0144
A-0-0563, Configuration of actual user-defined value, bit B	S-0-0026	S-0-0026
A-0-0564, Configuration of actial user-defined value, bit number B	S-0-0328	S-0-0328
A-0-0565, Actual user-defined value, bit number B	S-0-0144	S-0-0144
A-0-0566, Configuration of actual user-defined value, bit C	S-0-0026	S-0-0026
A-0-0567, Configuration of actual user-defined value, bit number C	S-0-0328	S-0-0328
A-0-0568, Actual user-defined value, bit number C	S-0-0144	S-0-0144
A-0-0569, Configuration of actual user-defined value, bit D	S-0-0026	S-0-0026
A-0-0570, Configuration of actual user-defined value, bit number D	S-0-0328	S-0-0328

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDD	Used_IDD
A-0-0571, Actual user-defined value, bit number D	S-0-0144	S-0-0144
A-0-0596, List of freely configurable parameters in the MDT	S-0-0188	S-0-0188
A-0-0597, List of freely configurable parameters in the AT	S-0-0187	S-0-0187
A-0-0598, List of configurable parameters in signal control word	S-0-0399	S-0-0399
A-0-0599, List of configurable parameters in signal status word	S-0-0398	S-0-0398
A-0-0622, Synchronization run window, position [1)]	S-0-0228	S-0-0228
A-0-0623, Synchronization run window, velocity	S-0-0183	S-0-0183

[1)] For an axis without position feedback (open loop), the drive parameter is not available for this axis parameter. Thus, no synchronization is performed.

5.2.4 IndraDrive, Calculation in the Drive, A-0-1000 - A-0-2999

IDN, parameter name	Ident_IDD	Used_IDD
A-0-1030, Command: Clear all axis errors	S-0-0099	S-0-0099
A-0-2200, Command position	S-0-0282, after FB call	S-0-0282, after FB call
A-0-2201, Target position	S-0-0430, after FB call	S-0-0430, after FB call
A-0-2202, Command velocity	S-0-0259, after FB call	S-0-0259, after FB call
A-0-2203, Command acceleration	S-0-0260, after FB call	S-0-0260, after FB call
A-0-2204, Command deceleration	S-0-0359, after FB call	S-0-0359, after FB call
A-0-2205, Command jerk	S-0-0193, after FB call	S-0-0193, after FB call
A-0-2206, Target force	S-0-0080	S-0-0080
A-0-2207, Command direction of motion	S-0-0145, bit 4 + 5, after MC_MoveAbsolute	S-0-0145, bit 4 + 5, after MC_MoveAbsolute
A-0-2208, Cyclic command position	S-0-0047, after FB call	S-0-0047, after FB call
A-0-2220, Additive position value, process controller	P-0-0059	P-0-0059
A-0-2600, Additive master axis position, process controller	P-0-0692	P-0-0692
A-0-2601, ELS, filter constant, additive master axis position	P-0-0693	P-0-0693
A-0-2605, ELS, Gear ratio fine adjustment process controller	P-0-0694	P-0-0694
A-0-2610, ELS, additive position command value, process controller [1)]	P-0-0691	P-0-0691
A-0-2611, ELS, filter time constant, additive position command value [1)]	P-0-0060	P-0-0060
A-0-2615, ELS, additive velocity command value, process controller	P-0-0690	P-0-0690
A-0-2620, ELS, phase offset of table beginning, process controller[1)]	P-0-0695	P-0-0695

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_IDD	Used_IDD
A-0-2621, ELS, filter constant, phase offset of table [1)]	P-0-0696	P-0-0696
A-0-2650, ELS, resulting master axis position	P-0-0775	P-0-0775
A-0-2651, ELS, effective master axis position	P-0-0776	P-0-0776
A-0-2652, ELS, effective master axis velocity	P-0-0777	P-0-0777
A-0-2653, ELS, synchronous position command value	P-0-0778	P-0-0778
A-0-2654, ELS, synchronous velocity	P-0-0779	P-0-0779
A-0-2655, ELS, position command value	P-0-0434	P-0-0434
A-0-2656, ELS, cam, access phase	P-0-0227	P-0-0227
A-0-2657, ELS, effective velocity command value	P-0-0048	P-0-0048
A-0-2658, ELS, master axis, velocity	P-0-0764	P-0-0764
A-0-2710, ELS, phasing, additive position command value		P-0-0054
A-0-2711, ELS, phasing, additive position command value, velocity	P-0-0688	P-0-0688
A-0-2712, ELS, phasing, additive position command value, acceleration	P-0-0689	P-0-0689
A-0-2720, ELS, master axis gear, input revolutions	P-0-0156	P-0-0156
A-0-2721, ELS, master axis gear, output revolutions	P-0-0157	P-0-0157
A-0-2722, ELS, gear ratio fine adjust [1)]	P-0-0083	P-0-0083
A-0-2730, ELS, PhasingTableAngle, cam table beginning [1)]	P-0-0061	P-0-0061
A-0-2731, ELS, PhasingTableAngle, change velocity[1)]	P-0-0158	P-0-0158
A-0-2740, ELS, CamIn, cam table preselection	P-0-0088	P-0-0088
A-0-2741, ELS, CamIn, cam distance	P-0-0093	P-0-0093
A-0-2745, ELS, gear reduction[1)]	P-0-0755	P-0-0755
A-0-2750, ELS, PhasingSlave, additive position command value	S-0-0048	S-0-0048
A-0-2751, ELS, PhasingSlave, additive position command value, vel.	P-0-0686	P-0-0686
A-0-2752, ELS, PhasingSlave, additive position command value, acc.	P-0-0687	P-0-0687
A-0-2761, ELS, PhasingSlaveVel, additive command velocity	S-0-0037	S-0-0037
A-0-2765, Slave axis, master axis revolutions per master axis cycle	P-0-0750	P-0-0750
A-0-2790, ELS, synchronization velocity [1)]	P-0-0143	P-0-0143
A-0-2791, ELS, synchronization acceleration	P-0-0142	P-0-0142
A-0-2792, ELS, synchronization run window for modulo format [1)]	P-0-0151	P-0-0151
A-0-2793, ELS, synchronization direction	P-0-0154	P-0-0154
A-0-2794, ELS, synchronization mode	P-0-0155	P-0-0155
A-0-2795, Positioning window	S-0-0057	S-0-0057
A-0-2798, Polarity of master axis position	P-0-0108	P-0-0108

[1)] For an axis without position feedback (open loop), the drive parameter is not available for this axis parameter. Thus, no synchronization is performed.

A-/C-parameters cover S-/P-parameters

5.2.5 IndraDrive, Calculation in the Drive, C-0-0000 - End

IDN, parameter name	Ident_IDD	Used_IDD
C-0-0050, System time	-	P-0-0197, MPx04 ...
C-0-0400, Motion, cycle time, command value	-	S-0-0001
C-0-0479, Extended drive information	-	P-0-2004, S-0-0030, S-0-1300.0.3,..., S-0-1302.0.1
C-0-0503, sercos master, cycle time	-	S-0-0002
C-0-0510, sercos master, address configuration	S-0-1040	S-0-1040
C-0-1030, Command: Clear all control errors	-	S-0-0099

5.3 SercosDrive: A/C ==> S-/P-Parameters

5.3.1 General Information

The motion is always calculated at the SercosDrive on the control.

Command variables are transferred from the control to the drive and the control receives status variables from the drive.

An IndraDrive becomes a SercosDrive as it is the case with the drives of other manufacturers.



The information to be transferred from the A- and C-parameters differ for the drive types **IndraDrive**, **SercosDrive** and **HydraulicDrive** with regard to the location of the motion sequence calculation:

- IndraDrive, calculation in the drive, page 760,
- IndraDrive, calculation in the control, page 757,
- SercosDrive, calculation in the Control, page 766,
- HydraulicDrive, calculation in the drive, page 772,
- HydraulicDrive, calculation in the control, page 769,

- **Ident**_xyz means bit-identical copy of the source parameter on the target parameter,
- **Used**_xyz means that at least one bit of the target parameter is affected.

5.3.2 SercosDrive, A-0-0000 - A-0-2999

IDN, parameter name	Ident_SD	Used_SD
A-0-0002, Axis name	S-0-0142	S-0-0142
A-0-0007, Axis configuration	-	S-0-0032
A-0-0021, Axis status	-	AT configuration
A-0-0022, Extended axis status	-	AT configuration
A-0-0045, Modulo value	S-0-0103	S-0-0103
A-0-0050, Scaling type for torque/force data	S-0-0086	S-0-0086

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_SD	Used_SD
A-0-0053, Scaling type for acceleration data	S-0-0160	S-0-0160
A-0-0056, Scaling type for velocity data	S-0-0044	S-0-0044
A-0-0057, Scaling factor for velocity data	S-0-0045	S-0-0045
A-0-0058, Scaling exponent for velocity data	S-0-0046	S-0-0046
A-0-0059, Scaling type for position data [1)]	S-0-0076	S-0-0076
A-0-0060, Scaling factor for translatory position data	S-0-0077	S-0-0077
A-0-0061, Scaling exponent for translatory position data	S-0-0078	S-0-0078
A-0-0062, Position resolution, rotatory	S-0-0079	S-0-0079
A-0-0100, Actual position value	S-0-0051	S-0-0051
A-0-0101, Actual position value, 8 bytes	S-0-0051	S-0-0051
A-0-0102, Actual velocity value	S-0-0040	S-0-0040
A-0-0110, Actual torque/force value	S-0-0084	S-0-0084
A-0-0500, Configuration of user-defined command value A	S-0-0024	S-0-0024
A-0-0502, Configuration of user-defined command value B	S-0-0024	S-0-0024
A-0-0504, Configuration of user-defined command value C	S-0-0024	S-0-0024
A-0-0506, Configuration of user-defined command value D	S-0-0024	S-0-0024
A-0-0508, Configuration of user-defined command value E	S-0-0024	S-0-0024
A-0-0510, Reserved	S-0-0024	S-0-0024
A-0-0520, Configuration of actual user-defined value A	S-0-0016	S-0-0016
A-0-0522, Configuration of actual user-defined value B	S-0-0016	S-0-0016
A-0-0524, Configuration of actual user-defined value C	S-0-0016	S-0-0016
A-0-0526, Configuration of actual user-defined value D	S-0-0016	S-0-0016
A-0-0528, Configuration of actual user-defined value E	S-0-0016	S-0-0016
A-0-0530, Configuration of actual user-defined value F	S-0-0016	S-0-0016
A-0-0540, Configuration of user-defined command value, bit A	S-0-0027	S-0-0027
A-0-0541, Configuration of user-defined command value, bit number A	Not in PackProfile S-0-0329	Not in PackProfile S-0-0329
A-0-0542, User-defined command value, bit number A	Not in PackProfile S-0-0145	Not in PackProfile S-0-0145
A-0-0543, Configuration of user-defined command value, bit B	S-0-0027	S-0-0027
A-0-0544, Configuration of user-defined command value, bit number B	Not in PackProfile S-0-0329	Not in PackProfile S-0-0329
A-0-0545, User-defined command value, bit number B	Not in PackProfile S-0-0145	Not in PackProfile S-0-0145
A-0-0546, Configuration of user-defined command value, bit C	S-0-0027	S-0-0027
A-0-0547, Configuration of user-defined command value, bit number C	Not in PackProfile S-0-0329	Not in PackProfile S-0-0329

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_SD	Used_SD
A-0-0548, User-defined command value, bit number C	Not in PackProfile S-0-0145	Not in PackProfile S-0-0145
A-0-0549, Configuration of user-defined command value, bit D	S-0-0027	S-0-0027
A-0-0550, Configuration of user-defined command value, bit number D	Not in PackProfile S-0-0329	Not in PackProfile S-0-0329
A-0-0551, User-defined command value, bit number D	Not in PackProfile S-0-0145	Not in PackProfile S-0-0145
A-0-0560, Configuration of actual user-defined value, bit A	S-0-0026	S-0-0026
A-0-0561, Configuration of actual user-defined value, bit number A	Not in PackProfile S-0-0328	Not in PackProfile S-0-0328
A-0-0562, Actual user-defined value, bit number A	Not in PackProfile S-0-0144	Not in PackProfile S-0-0144
A-0-0563, Configuration of actual user-defined value, bit B	S-0-0026	S-0-0026
A-0-0564, Configuration of actial user-defined value, bit number B	Not in PackProfile S-0-0328	Not in PackProfile S-0-0328
A-0-0565, Actual user-defined value, bit number B	Not in PackProfile S-0-0144	Not in PackProfile S-0-0144
A-0-0566, Configuration of actual user-defined value, bit C	S-0-0026	S-0-0026
A-0-0567, Configuration of actual user-defined value, bit number C	Not in PackProfile S-0-0328	Not in PackProfile S-0-0328
A-0-0568, Actual user-defined value, bit number C	Not in PackProfile S-0-0144	Not in PackProfile S-0-0144
A-0-0569, Configuration of actual user-defined value, bit D	S-0-0026	S-0-0026
A-0-0570, Configuration of actual user-defined value, bit number D	Not in PackProfile S-0-0328	Not in PackProfile S-0-0328
A-0-0571, Actual user-defined value, bit number D	Not in PackProfile S-0-0144	Not in PackProfile S-0-0144
A-0-0596, List of freely configurable parameters in the MDT	S-0-0188	S-0-0188
A-0-0597, List of freely configurable parameters in the AT	S-0-0187	S-0-0187
A-0-0598, List of configurable parameters in signal control word	Not in PackProfile S-0-0399	Not in PackProfile S-0-0399
A-0-0599, List of configurable parameters in signal status word	Not in PackProfile S-0-0398	Not in PackProfile S-0-0398
A-0-1030, Command: Clear all axis errors	-	S-0-0099
A-0-2208, Cyclic command position	S-0-0047, after FB call	S-0-0047, after FB call

[1]) In A-0-0059, no synchronization is performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

Key:

- Not every PackProfile ... Parameter is not contained in each PackProfile, but it is still tried to trigger it.

A-/C-parameters cover S-/P-parameters

5.3.3 SercosDrive, C-0-0000 - End

IDN, parameter name	Ident_SD	Used_SD
C-0-0400, Motion, cycle time, command value	-	S-0-0001
C-0-0479, Extended drive information	-	S-0-0030
C-0-0503, sercos master, cycle time	-	S-0-0002
C-0-0510, sercos master, address configuration	S-0-1040	S-0-1040
C-0-1030, Command: Clear all control errors		S-0-0099

5.4 HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Control)

5.4.1 General Information

The information to be transferred from the A- and C-parameters differ for the drive types **IndraDrive**, **SercosDrive** and **HydraulicDrive** with regard to the location of the motion sequence calculation:

- IndraDrive, calculation in the drive, page 760,
- IndraDrive, calculation in the control, page 757,
- SercosDrive, calculation in the Control, page 766,
- HydraulicDrive, calculation in the drive, page 772,
- HydraulicDrive, calculation in the control, page 769,

- **Ident**_xyz means bit-identical copy of the source parameter on the target parameter,
- **Used**_xyz means that at least one bit of the target parameter is affected.

The following tables provides an overview for hydraulic drives (HydraulicDrive) on how the information of A- or C-parameters of the control are transferred to the S- or P-parameters of the hydraulic drives:

There are the following drive variants: HNC100-3x (HNC), IAC-R

5.4.2 HydraulicDrive, Calculation in the Control, A-0-0000 - A-0-0499

IDN, parameter name	Ident_HDC	Used_HDC
A-0-0002, Axis name	S-0-0142	S-0-0142
A-0-0007, Axis configuration	-	S-0-0032, S-0-0033, S-0-0034
A-0-0021, Axis status	-	AT configuration
A-0-0022, Extended axis status	-	AT configuration
A-0-0023, Axis diagnostic number	-	S-0-0390
A-0-0024, Axis state	-	S-0-0139
A-0-0028, Travel range limit switch	P-0-0090	P-0-0090

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_HDC	Used_HDC
A-0-0029, Position polarities	S-0-0055	S-0-0055
A-0-0030, Position limit value, positive	S-0-0049	S-0-0049
A-0-0031, Position limit value, negative	S-0-0050	S-0-0050
A-0-0032, Velocity limit value, positive	S-0-0038, S-0-0091	S-0-0038, S-0-0091
A-0-0033, Velocity limit value, negative	S-0-0039, S-0-0091	S-0-0039, S-0-0091
A-0-0034, Acceleration limit value, bipolar	S-0-0138	S-0-0138
A-0-0038, Torque/force limit value, bipolar	S-0-0092, S-0-0082, S-0-0083	S-0-0092, S-0-0082, S-0-0083
A-0-0045, Modulo value	S-0-0103	S-0-0103
A-0-0048, Velocity polarities	S-0-0043	S-0-0043
A-0-0049, Torque-/force polarities	S-0-0085	S-0-0085
A-0-0050, Scaling type for torque/force data	S-0-0086	S-0-0086
A-0-0051, Scaling factor for torque/force data	S-0-0093	S-0-0093
A-0-0052, Scaling exponent for torque/force data	S-0-0094	S-0-0094
A-0-0053, Scaling type for acceleration data	S-0-0160	S-0-0160
A-0-0054, Scaling factor for acceleration data	S-0-0161	S-0-0161
A-0-0055, Scaling exponent for acceleration data	S-0-0162	S-0-0162
A-0-0056, Scaling type for velocity data	S-0-0044	S-0-0044
A-0-0057, Scaling factor for velocity data	S-0-0045	S-0-0045
A-0-0058, Scaling exponent for velocity data	S-0-0046	S-0-0046
A-0-0059, Scaling type for position data [1)]	S-0-0076	S-0-0076
A-0-0060, Scaling factor for translatory position data	S-0-0077	S-0-0077
A-0-0061, Scaling exponent for translatory position data	S-0-0078	S-0-0078
A-0-0062, Position resolution, rotatory	S-0-0079	S-0-0079
A-0-0063, Scaling type for temperature data	S-0-0208	S-0-0208
A-0-0064, Torque/Force reference value	S-0-0825	S-0-0825
A-0-0066, Scaling type for valve control values	P-0-2882	P-0-2882
A-0-0100, Actual position value	S-0-0051	S-0-0051
A-0-0101, Actual position value, 8 bytes	S-0-0051	S-0-0051
A-0-0102, Actual velocity value	S-0-0040	S-0-0040
A-0-0103, Actual acceleration value	S-0-0164	S-0-0164
A-0-0110, Actual torque/force value	S-0-0084	S-0-0084
A-0-0221, Torque/force window	-	S-0-0826
A-0-0242, Position control, synchronization acceleration	P-0-0142	P-0-0142
A-0-0243, Position control, synchronization velocity	P-0-0143	P-0-0143

[1)] In A-0-0059, no synchronization is performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

A-/C-parameters cover S-/P-parameters

5.4.3 HydraulicDrive, Calculation in the Control, A-0-0500 - A-0-2999

IDN, parameter name	Ident_HDC	Used_HDC
A-0-0500, Configuration of user-defined command value A	S-0-0024	S-0-0024
A-0-0502, Configuration of user-defined command value B	S-0-0024	S-0-0024
A-0-0504, Configuration of user-defined command value C	S-0-0024	S-0-0024
A-0-0506, Configuration of user-defined command value D	S-0-0024	S-0-0024
A-0-0508, Configuration of user-defined command value E	S-0-0024	S-0-0024
A-0-0510, Reserved	S-0-0024	S-0-0024
A-0-0520, Configuration of actual user-defined value A	S-0-0016	S-0-0016
A-0-0522, Configuration of actual user-defined value B	S-0-0016	S-0-0016
A-0-0524, Configuration of actual user-defined value C	S-0-0016	S-0-0016
A-0-0526, Configuration of actual user-defined value D	S-0-0016	S-0-0016
A-0-0527, Container of actual user-defined value D	S-0-0016	S-0-0016
A-0-0528, Configuration of actual user-defined value E	S-0-0016	S-0-0016
A-0-0529, Container of actual user-defined value E	S-0-0016	S-0-0016
A-0-0530, Configuration of actual user-defined value F	S-0-0016	S-0-0016
A-0-0531, Container of actual user-defined value F	S-0-0016	S-0-0016
A-0-0540, Configuration of user-defined command value, bit A	S-0-0027	S-0-0027
A-0-0541, Configuration of user-defined command value, bit number A	S-0-0329	S-0-0329
A-0-0542, User-defined command value, bit number A	S-0-0145	S-0-0145
A-0-0543, Configuration of user-defined command value, bit B	S-0-0027	S-0-0027
A-0-0544, Configuration of user-defined command value, bit number B	S-0-0329	S-0-0329
A-0-0545, User-defined command value, bit number B	S-0-0145	S-0-0145
A-0-0546, Configuration of user-defined command value, bit C	S-0-0027	S-0-0027
A-0-0547, Configuration of user-defined command value, bit number C	S-0-0329	S-0-0329
A-0-0548, User-defined command value, bit number C	S-0-0145	S-0-0145
A-0-0549, Configuration of user-defined command value, bit D	S-0-0027	S-0-0027
A-0-0550, Configuration of user-defined command value, bit number D	S-0-0329	S-0-0329
A-0-0551, User-defined command value, bit number D	S-0-0145	S-0-0145
A-0-0560, Configuration of actual user-defined value, bit A	S-0-0026	S-0-0026
A-0-0561, Configuration of actual user-defined value, bit number A	S-0-0328	S-0-0328
A-0-0562, Actual user-defined value, bit number A	S-0-0144	S-0-0144
A-0-0563, Configuration of actual user-defined value, bit B	S-0-0026	S-0-0026
A-0-0564, Configuration of actial user-defined value, bit number B	S-0-0328	S-0-0328
A-0-0565, Actual user-defined value, bit number B	S-0-0144	S-0-0144
A-0-0566, Configuration of actual user-defined value, bit C	S-0-0026	S-0-0026
A-0-0567, Configuration of actual user-defined value, bit number C	S-0-0328	S-0-0328

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_HDC	Used_HDC
A-0-0568, Actual user-defined value, bit number C	S-0-0144	S-0-0144
A-0-0569, Configuration of actual user-defined value, bit D	S-0-0026	S-0-0026
A-0-0570, Configuration of actual user-defined value, bit number D	S-0-0328	S-0-0328
A-0-0571, Actual user-defined value, bit number D	S-0-0144	S-0-0144
A-0-0596, List of freely configurable parameters in the MDT	S-0-0188	S-0-0188
A-0-0597, List of freely configurable parameters in the AT	S-0-0187	S-0-0187
A-0-0598, List of configurable parameters in signal control word	S-0-0399	S-0-0399
A-0-0599, List of configurable parameters in signal status word	S-0-0398	S-0-0398
A-0-1030, Command: Clear all axis errors	-	S-0-0099
A-0-2206, Target force	S-0-0080	S-0-0080
A-0-2208, Cyclic command position	S-0-0047, after FB call	S-0-0047, after FB call

5.4.4 HydraulicDrive, Calculation in the Control, C-0-0000 - End

IDN, parameter name	Ident_HDC	Used_HDC
C-0-0400, Motion, cycle time, command value	-	S-0-0001
C-0-0479, Extended drive information	-	S-0-0030, S-0-1300.0.3,..., S-0-1302.0.1
C-0-0503, sercos master, cycle time	-	S-0-0002
C-0-0510, sercos master, address configuration	S-0-1040	S-0-1040
C-0-1030, Command: Clear all control errors	-	S-0-0099

5.5 HydraulicDrive: A/C ==> S-/P-Parameters (Calculation in the Drive)

5.5.1 General Information

☞ The information to be transferred from the A- and C-parameters differ for the drive types **IndraDrive**, **SercosDrive** and **HydraulicDrive** with regard to the location of the motion sequence calculation:

- IndraDrive, calculation in the drive, page 760,
- IndraDrive, calculation in the control, page 757,
- SercosDrive, calculation in the Control, page 766,
- HydraulicDrive, calculation in the drive, page 772,
- HydraulicDrive, calculation in the control, page 769,

- **Ident**_xyz means bit-identical copy of the source parameter on the target parameter,
- **Used**_xyz means that at least one bit of the target parameter is affected.

A-/C-parameters cover S-/P-parameters

The following tables provides an overview for hydraulic drives (HydraulicDrive) on how the information of A- or C-parameters of the control are transferred to the S- or P-parameters of the hydraulic drives:

There are the following drive variants: HNC100-3x (HNC), IAC-R

5.5.2 HydraulicDrive, Calculation in the Drive, A-0-0000 - A-0-0499

IDN, parameter name	Ident_HDD	Used_HDD
A-0-0002, Axis name	S-0-0142	S-0-0142
A-0-0007, Axis configuration	-	S-0-0032, S-0-0033, S-0-0034, S-0-0035, S-0-0284, S-0-0285, S-0-0286, S-0-0287
A-0-0021, Axis status	-	AT configuration
A-0-0022, Extended axis status	-	AT configuration
A-0-0023, Axis diagnostic number	-	S-0-0390
A-0-0024, Axis state	-	S-0-0139
A-0-0028, Travel range limit switch	P-0-0090	P-0-0090
A-0-0029, Position polarities	S-0-0055	S-0-0055
A-0-0030, Position limit value, positive	S-0-0049	S-0-0049
A-0-0031, Position limit value, negative	S-0-0050	S-0-0050
A-0-0032, Velocity limit value, positive	S-0-0038, S-0-0091	S-0-0038, S-0-0091
A-0-0033, Velocity limit value, negative	S-0-0039, S-0-0091	S-0-0039, S-0-0091
A-0-0034, Acceleration limit value, bipolar	S-0-0138	S-0-0138
A-0-0036, Jerk limit value, bipolar	S-0-0349	S-0-0349
A-0-0038, Torque/force limit value, bipolar	S-0-0092, S-0-0082, S-0-0083	S-0-0092, S-0-0082, S-0-0083
A-0-0046, Feed distance of the slave drive	P-0-0159	P-0-0159
A-0-0048, Velocity polarities	S-0-0043	S-0-0043
A-0-0049, Torque-/force polarities	S-0-0085	S-0-0085
A-0-0050, Scaling type for torque/force data	S-0-0086	S-0-0086
A-0-0051, Scaling factor for torque/force data	S-0-0093	S-0-0093
A-0-0052, Scaling exponent for torque/force data	S-0-0094	S-0-0094
A-0-0053, Scaling type for acceleration data	S-0-0160	S-0-0160
A-0-0054, Scaling factor for acceleration data	S-0-0161	S-0-0161
A-0-0055, Scaling exponent for acceleration data	S-0-0162	S-0-0162
A-0-0056, Scaling type for velocity data	S-0-0044	S-0-0044
A-0-0057, Scaling factor for velocity data	S-0-0045	S-0-0045
A-0-0058, Scaling exponent for velocity data	S-0-0046	S-0-0046
A-0-0059, Scaling type for position data [1)]	S-0-0076	S-0-0076
A-0-0060, Scaling factor for translatory position data	S-0-0077	S-0-0077

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_HDD	Used_HDD
A-0-0061, Scaling exponent for translatory position data	S-0-0078	S-0-0078
A-0-0062, Position resolution, rotatory	S-0-0079	S-0-0079
A-0-0063, Scaling type for temperature data	S-0-0208	S-0-0208
A-0-0064, Torque/Force reference value	S-0-0825	S-0-0825
A-0-0066, Scaling type for valve control values	P-0-2882	P-0-2882
A-0-0100, Actual position value	S-0-0386	S-0-0386
A-0-0101, Actual position value, 8 bytes	S-0-0386	S-0-0386
A-0-0102, Actual velocity value	S-0-0040	S-0-0040
A-0-0103, Actual acceleration value	S-0-0164	S-0-0164
A-0-0110, Actual torque/force value	S-0-0084	S-0-0084
A-0-0150, Interpolated position	P-0-0434	P-0-0434
A-0-0151, Interpolated position of the control	P-0-0434	P-0-0434
A-0-0152, Interpolated velocity	P-0-0048	P-0-0048
A-0-0216, Jerk	S-0-0193	S-0-0193
A-0-0221, Torque/force window	S-0-0826	S-0-0826
A-0-0222, Standstill window	S-0-0124	S-0-0124
A-0-0223, Velocity window	S-0-0157	S-0-0157
A-0-0224, Rapid stop deceleration	S-0-0372 after emergency stop	S-0-0372 after emergency stop
A-0-0240, Feedrate override	S-0-0036, S-0-0108	S-0-0036, S-0-0108

[1]) In A-0-0059, no synchronization is performed for an encoder axis to parameter S-0-0076 of the drive on which the measurement encoder of the encoder axis is configured.

5.5.3 HydraulicDrive, Calculation in the Drive, A-0-0500 - A-0-0999

IDN, parameter name	Ident_HDD	Used_HDD
A-0-0500, Configuration of user-defined command value A	S-0-0024	S-0-0024
A-0-0502, Configuration of user-defined command value B	S-0-0024	S-0-0024
A-0-0504, Configuration of user-defined command value C	S-0-0024	S-0-0024
A-0-0506, Configuration of user-defined command value D	S-0-0024	S-0-0024
A-0-0508, Configuration of user-defined command value E	S-0-0024	S-0-0024
A-0-0510, Reserved	S-0-0024	S-0-0024
A-0-0520, Configuration of actual user-defined value A	S-0-0016	S-0-0016
A-0-0522, Configuration of actual user-defined value B	S-0-0016	S-0-0016
A-0-0524, Configuration of actual user-defined value C	S-0-0016	S-0-0016
A-0-0526, Configuration of actual user-defined value D	S-0-0016	S-0-0016
A-0-0527, Container of actual user-defined value D	S-0-0016	S-0-0016
A-0-0528, Configuration of actual user-defined value E	S-0-0016	S-0-0016

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_HDD	Used_HDD
A-0-0529, Container of actual user-defined value E	S-0-0016	S-0-0016
A-0-0530, Configuration of actual user-defined value F	S-0-0016	S-0-0016
A-0-0531, Container of actual user-defined value F	S-0-0016	S-0-0016
A-0-0540, Configuration of user-defined command value, bit A	S-0-0027	S-0-0027
A-0-0541, Configuration of user-defined command value, bit number A	S-0-0329	S-0-0329
A-0-0542, User-defined command value, bit number A	S-0-0145	S-0-0145
A-0-0543, Configuration of user-defined command value, bit B	S-0-0027	S-0-0027
A-0-0544, Configuration of user-defined command value, bit number B	S-0-0329	S-0-0329
A-0-0545, User-defined command value, bit number B	S-0-0145	S-0-0145
A-0-0546, Configuration of user-defined command value, bit C	S-0-0027	S-0-0027
A-0-0547, Configuration of user-defined command value, bit number C	S-0-0329	S-0-0329
A-0-0548, User-defined command value, bit number C	S-0-0145	S-0-0145
A-0-0549, Configuration of user-defined command value, bit D	S-0-0027	S-0-0027
A-0-0550, Configuration of user-defined command value, bit number D	S-0-0329	S-0-0329
A-0-0551, User-defined command value, bit number D	S-0-0145	S-0-0145
A-0-0560, Configuration of actual user-defined value, bit A	S-0-0026	S-0-0026
A-0-0561, Configuration of actual user-defined value, bit number A	S-0-0328	S-0-0328
A-0-0562, Actual user-defined value, bit number A	S-0-0144	S-0-0144
A-0-0563, Configuration of actual user-defined value, bit B	S-0-0026	S-0-0026
A-0-0564, Configuration of actial user-defined value, bit number B	S-0-0328	S-0-0328
A-0-0565, Actual user-defined value, bit number B	S-0-0144	S-0-0144
A-0-0566, Configuration of actual user-defined value, bit C	S-0-0026	S-0-0026
A-0-0567, Configuration of actual user-defined value, bit number C	S-0-0328	S-0-0328
A-0-0568, Actual user-defined value, bit number C	S-0-0144	S-0-0144
A-0-0569, Configuration of actual user-defined value, bit D	S-0-0026	S-0-0026
A-0-0570, Configuration of actual user-defined value, bit number D	S-0-0328	S-0-0328
A-0-0571, Actual user-defined value, bit number D	S-0-0144	S-0-0144
A-0-0596, List of freely configurable parameters in the MDT	S-0-0188	S-0-0188
A-0-0597, List of freely configurable parameters in the AT	S-0-0187	S-0-0187
A-0-0598, List of configurable parameters in signal control word	S-0-0399	S-0-0399
A-0-0599, List of configurable parameters in signal status word	S-0-0398	S-0-0398

5.5.4 HydraulicDrive, Calculation in the Drive, A-0-1000 - A-0-2999

IDN, parameter name	Ident_HDD	Used_HDD
A-0-1030, Command: Clear all axis errors	S-0-0099	S-0-0099
A-0-2200, Command position	S-0-0282, after FB call	S-0-0282, after FB call

A-/C-parameters cover S-/P-parameters

IDN, parameter name	Ident_HDD	Used_HDD
A-0-2201, Target position	S-0-0430, after FB call	S-0-0430, after FB call
A-0-2202, Command velocity	S-0-0259, after FB call	S-0-0259, after FB call
A-0-2203, Command acceleration	S-0-0260, after FB call	S-0-0260, after FB call
A-0-2204, Command deceleration	S-0-0359, after FB call	S-0-0359, after FB call
A-0-2205, Command jerk	S-0-0193, after FB call	S-0-0193, after FB call
A-0-2206, Target force	S-0-0080	S-0-0080
A-0-2208, Cyclic command position	S-0-0047, after FB call	S-0-0047, after FB call
A-0-2211, Cyclic analog value	P-0-2891, after FB call	P-0-2891, after FB call
A-0-2220, Additive position value, process controller	P-0-0059	P-0-0059
A-0-2795, Positioning window	S-0-0057	S-0-0057

5.5.5 HydraulicDrive, Calculation in the Drive, C-0-0000 - End

IDN, parameter name	Ident_HDD	Used_HDD
C-0-0050, System time	-	P-0-0197, HNC analog MPx04
C-0-0400, Motion, cycle time, command value	-	S-0-0001
C-0-0479, Extended drive information	-	P-0-2004, S-0-0030, S-0-1300.0.3,…, S-0-1302.0.1
C-0-0503, sercos master, cycle time	-	S-0-0002
C-0-0510, sercos master, address configuration	S-0-1040	S-0-1040
C-0-1030, Command: Clear all control errors	-	S-0-0099

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Our technology-oriented Competence Center in Lohr, Germany, is responsible for all your service-related queries for electric drive and controls.

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To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

Index

A

A-0-0000, Dummy, A-parameter..... 77
A-0-0001, Logic axis number..... 78
A-0-0002, Axis name..... 78
A-0-0004, Axis type..... 79
A-0-0005, Drive address..... 81
A-0-0006, Drive type..... 82
A-0-0007, Axis configuration..... 83
A-0-0008, Link axis, master axis selection..... 85
A-0-0009, Osci: list of all A-parameters that can be oscilloscoped..... 86
A-0-0010, List of all A-parameters..... 86
A-0-0011, List of all invalid A-parameters..... 87
A-0-0012, Checksum of all A-parameters..... 88
A-0-0013, IDN list of checksum A-parameters.... 89
A-0-0014, List of incorrect synchronized A-parameters..... 90
A-0-0016, Project identification number..... 91
A-0-0018, Control word of controller..... 91
A-0-0019, Status word of controller..... 93
A-0-0020, Axis diagnostic message..... 94
A-0-0021, Axis status..... 95
A-0-0022, Extended axis status..... 99
A-0-0023, Axis diagnostic number..... 100
A-0-0024, Axis state..... 101
A-0-0026, Telegram error counter of the drive.. 104
A-0-0027, Error counter of data loss..... 105
A-0-0028, Travel range limit switch..... 105
A-0-0029, Position polarities..... 106
A-0-0030, Position limit value, positive..... 108
A-0-0031, Position limit value, negative..... 109
A-0-0032, Velocity limit value, positive..... 110
A-0-0033, Velocity limit value, negative..... 111
A-0-0034, Acceleration limit value, bipolar..... 112
A-0-0036, Jerk limit value, bipolar..... 112
A-0-0038, Torque/force limit value, bipolar..... 113
A-0-0045, Modulo value..... 115
A-0-0046, Feed distance of the slave drive..... 115
A-0-0048, Velocity polarities..... 117
A-0-0049, Torque-/force polarities..... 118
A-0-0050, Scaling type for torque/force data.... 119
A-0-0051, Scaling factor for torque/force data.. 120
A-0-0052, Scaling exponent for torque/force data..... 121
A-0-0053, Scaling type for acceleration data.... 125
A-0-0054, Scaling factor for acceleration data.. 126
A-0-0055, Scaling exponent for acceleration data..... 127
A-0-0056, Scaling type for velocity data..... 128
A-0-0057, Scaling factor for velocity data..... 129
A-0-0058, Scaling exponent for velocity data... 130
A-0-0059, Scaling type for position data..... 131
A-0-0060, Scaling factor for translatory position data..... 133
A-0-0061, Scaling exponent for translatory position data..... 134
A-0-0062, Position resolution, rotatory..... 135
A-0-0063, Scaling type for temperature data.... 136
A-0-0064, Torque/Force reference value..... 136
A-0-0066, Scaling type for valve control values 138
A-0-0080, Jogging, short distance..... 139
A-0-0081, Jogging, long distance..... 140
A-0-0082, Jogging, low velocity..... 141
A-0-0083, Jogging, high velocity..... 143
A-0-0084, Jogging, acceleration..... 144
A-0-0085, Jogging, deceleration..... 145
A-0-0086, Jogging, acceleration jerk..... 146
A-0-0087, Jogging, deceleration jerk..... 147
A-0-0100, Actual position value..... 148
A-0-0101, Actual position value, 8 bytes..... 149
A-0-0102, Actual velocity value..... 150
A-0-0103, Actual acceleration value..... 151
A-0-0108, Actual position value, incremental.... 152
A-0-0110, Actual torque/force value..... 153
A-0-0150, Interpolated position..... 153
A-0-0151, Interpolated position of the control... 154
A-0-0152, Interpolated velocity..... 155
A-0-0153, Interpolated acceleration..... 155
A-0-0156, Interpolated force..... 156
A-0-0158, Interpolated analog control value..... 157
A-0-0170, Reaction to force limitation..... 157
A-0-0171, Position for interpolation effect..... 159
A-0-0172, Velocity for interpolation effect..... 160
A-0-0173, Acceleration for interpolation effect.. 161
A-0-0200, Default master axis..... 161
A-0-0201, Interpolator configuration..... 162
A-0-0203, Direction of motion..... 166
A-0-0204, Velocity threshold, positioning in modulo format..... 167
A-0-0216, Jerk..... 168
A-0-0219, Positioning window for shortest distance..... 169
A-0-0221, Torque/force window..... 170
A-0-0222, Standstill window..... 171
A-0-0223, Velocity window..... 171
A-0-0224, Rapid stop deceleration..... 172
A-0-0225, Rapid stop jerk..... 173
A-0-0230, Blending distance PTP..... 174
A-0-0240, Feedrate override..... 174
A-0-0241, Feedrate override control word..... 175
A-0-0242, Position control, synchronization acceleration..... 176
A-0-0243, Position control, synchronization velocity..... 178
A-0-0300, Master axis, actual position value.... 180
A-0-0302, Master axis, actual velocity value..... 180
A-0-0500, Configuration of user-defined command value A..... 181

Index

A-0-0501, Container of user-defined command value A..... 182
A-0-0502, Configuration of user-defined command value B..... 183
A-0-0503, Container of user-defined command value B..... 183
A-0-0504, Configuration of user-defined command value C..... 184
A-0-0505, Container of user-defined command value C..... 185
A-0-0506, Configuration of user-defined command value D..... 186
A-0-0507, Container of user-defined command value D..... 186
A-0-0508, Configuration of user-defined command value E..... 187
A-0-0509, Container of user-defined command value E..... 188
A-0-0510, Reserved..... 189
A-0-0511, Reserved..... 189
A-0-0520, Configuration of actual user-defined value A..... 190
A-0-0521, Container of actual user-defined value A..... 191
A-0-0522, Configuration of actual user-defined value B..... 191
A-0-0523, Container of actual user-defined value B..... 192
A-0-0524, Configuration of actual user-defined value C..... 193
A-0-0525, Container of actual user-defined value C..... 194
A-0-0526, Configuration of actual user-defined value D..... 194
A-0-0527, Container of actual user-defined value D..... 195
A-0-0528, Configuration of actual user-defined value E..... 196
A-0-0529, Container of actual user-defined value E..... 197
A-0-0530, Configuration of actual user-defined value F..... 197
A-0-0531, Container of actual user-defined value F..... 198
A-0-0540, Configuration of user-defined command value, bit A..... 199
A-0-0541, Configuration of user-defined command value, bit number A..... 200
A-0-0542, User-defined command value, bit number A..... 200
A-0-0543, Configuration of user-defined command value, bit B..... 201
A-0-0544, Configuration of user-defined command value, bit number B..... 202
A-0-0545, User-defined command value, bit number B..... 203
A-0-0546, Configuration of user-defined command value, bit C..... 204
A-0-0547, Configuration of user-defined command value, bit number C..... 205
A-0-0548, User-defined command value, bit number C..... 206
A-0-0549, Configuration of user-defined command value, bit D..... 207
A-0-0550, Configuration of user-defined command value, bit number D..... 207
A-0-0551, User-defined command value, bit number D..... 208
A-0-0560, Configuration of actual user-defined value, bit A..... 209
A-0-0561, Configuration of actual user-defined value, bit number A..... 210
A-0-0562, Actual user-defined value, bit number A..... 211
A-0-0563, Configuration of actual user-defined value, bit B..... 212
A-0-0564, Configuration of actial user-defined value, bit number B..... 212
A-0-0565, Actual user-defined value, bit number B..... 213
A-0-0566, Configuration of actual user-defined value, bit C..... 214
A-0-0567, Configuration of actual user-defined value, bit number C..... 215
A-0-0568, Actual user-defined value, bit number C..... 216
A-0-0569, Configuration of actual user-defined value, bit D..... 217
A-0-0570, Configuration of actual user-defined value, bit number D..... 217
A-0-0571, Actual user-defined value, bit number D..... 218
A-0-0596, List of freely configurable parameters in the MDT..... 219
A-0-0597, List of freely configurable parameters in the AT..... 220
A-0-0598, List of configurable parameters in signal control word..... 221
A-0-0599, List of configurable parameters in signal status word..... 221
A-0-0606, Drive, Software revision..... 222
A-0-0622, Synchronization run window, position..... 223
A-0-0623, Synchronization run window, velocity..... 224
A-0-0627, Controller axis, diagnostic number... 225
A-0-0630, Controller axis, controller name..... 225
A-0-0651, Diagnostics, control word..... 226
A-0-1000, Command: Load basic axis parameters..... 227
A-0-1030, Command: Clear all axis errors..... 228
A-0-2100, List of all backup operation A-parameters..... 229
A-0-2121, Axis status..... 230
A-0-2200, Command position..... 231
A-0-2201, Target position..... 233

Index

A-0-2202, Command velocity..... 234
A-0-2203, Command acceleration..... 236
A-0-2204, Command deceleration..... 238
A-0-2205, Command jerk..... 239
A-0-2206, Target force..... 240
A-0-2207, Command direction of motion..... 241
A-0-2208, Cyclic command position..... 242
A-0-2209, Cyclic command torque..... 243
A-0-2210, Cyclic command velocity..... 243
A-0-2211, Cyclic analog value..... 244
A-0-2220, Additive position value, process controller..... 245
A-0-2600, Additive master axis position, process controller..... 246
A-0-2601, ELS, filter constant, additive master axis position..... 247
A-0-2605, ELS, Gear ratio fine adjustment process controller..... 248
A-0-2610, ELS, additive position command value, process controller..... 248
A-0-2611, ELS, filter time constant, additive position command value..... 249
A-0-2615, ELS, additive velocity command value, process controller..... 250
A-0-2620, ELS, phase offset of table beginning, process controller..... 250
A-0-2621, ELS, filter constant, phase offset of table..... 251
A-0-2650, ELS, resulting master axis position.. 252
A-0-2651, ELS, effective master axis position.. 253
A-0-2652, ELS, effective master axis velocity... 253
A-0-2653, ELS, synchronous position command value..... 254
A-0-2654, ELS, synchronous velocity..... 255
A-0-2655, ELS, position command value..... 255
A-0-2656, ELS, cam, access phase..... 256
A-0-2657, ELS, effective velocity command value..... 257
A-0-2658, ELS, master axis, velocity..... 257
A-0-2700, ELS, master axis, control number.... 258
A-0-2701, ELS, master axis, axis number..... 259
A-0-2710, ELS, phasing, additive position command value..... 260
A-0-2711, ELS, phasing, additive position command value, velocity..... 260
A-0-2712, ELS, phasing, additive position command value, acceleration..... 261
A-0-2720, ELS, master axis gear, input revolutions..... 262
A-0-2721, ELS, master axis gear, output revolutions..... 263
A-0-2722, ELS, gear ratio fine adjust..... 264
A-0-2730, ELS, PhasingTableAngle, cam table beginning..... 265
A-0-2731, ELS, PhasingTableAngle, change velocity..... 265
A-0-2740, ELS, CamIn, cam table preselection 266
A-0-2741, ELS, CamIn, cam distance..... 267
A-0-2745, ELS, gear reduction..... 268
A-0-2750, ELS, PhasingSlave, additive position command value..... 269
A-0-2751, ELS, PhasingSlave, additive position command value, vel..... 270
A-0-2752, ELS, PhasingSlave, additive position command value, acc..... 270
A-0-2761, ELS, PhasingSlaveVel, additive command velocity..... 271
A-0-2762, Slave axis, additive command velocity, acceleration..... 272
A-0-2765, Slave axis, master axis revolutions per master axis cycle..... 272
A-0-2790, ELS, synchronization velocity..... 274
A-0-2791, ELS, synchronization acceleration... 275
A-0-2792, ELS, synchronization run window for modulo format..... 276
A-0-2793, ELS, synchronization direction..... 277
A-0-2794, ELS, synchronization mode..... 278
A-0-2795, Positioning window..... 280
A-0-2796, MotionProfile selection..... 281
A-0-2797, Relative positioning of MotionProfile 282
A-0-2798, Polarity of master axis position..... 283
A-0-2800, Master axis encoder, configuration.. 284
A-0-2801, Master axis encoder, status..... 285
A-0-2802, Master axis encoder, input revolutions..... 286
A-0-2803, Master axis encoder, output revolutions..... 287
A-0-2804, Master axis encoder, filter type..... 287
A-0-2805, Master axis encoder, filter cutoff frequency..... 288
A-0-2806, Master axis encoder, reference position..... 289
A-0-2807, Command: Set absolute position..... 290
A-0-2808, Master axis encoder, additive position command value..... 291
A-0-2900, MotionProfile, master axis switching position..... 291
A-0-2901, MotionProfile, motion step 1, initial slave axis position..... 292
A-0-2902, MotionProfile 0, diagnostics..... 293
A-0-2903, MotionProfile 1, diagnostics..... 294
A-0-2904, MotionProfile, basic configuration.... 295
A-0-2910, MotionProfile 0, number of motion steps..... 296
A-0-2911, MotionProfile 0, master axis velocity 296
A-0-2912, MotionProfile 0, list of initial master axis positions..... 297
A-0-2913, MotionProfile 0, list of motion laws... 298
A-0-2914, MotionProfile 0, list of distances..... 300
A-0-2915, MotionProfile 0, list of slave axis velocities..... 301
A-0-2920, MotionProfile 1, number of motion steps..... 302
A-0-2921, MotionProfile 1, master axis velocity 302
A-0-2922, MotionProfile 1, list of initial master axis positions..... 303

Index

A-0-2923, MotionProfile 1, list of motion laws... 304
A-0-2924, MotionProfile 1, list of distances..... 306
A-0-2925, MotionProfile 1, list of slave axis velocities..... 307
A-0-2930, MotionProfile, control word..... 308
A-0-2931, MotionProfile, status word..... 309
A-0-3009, FlexProfile, control word..... 314
A-0-3000, FlexProfile, current set..... 311
A-0-3001, FlexProfile, current step..... 312
A-0-3002, FlexProfile, master axis switching position..... 312
A-0-3004, FlexProfile, master axis, additive command position value..... 314
A-0-3003, FlexProfile, slave axis, additive command position value..... 313
A-0-3010, FlexProfile, status word..... 316
A-0-3011, FlexProfile, conditions: control variables..... 318
A-0-3012, FlexProfile, conditions: status variables..... 319
A-0-3013, FlexProfile, value, current time-master..... 321
A-0-3020, FlexProfile 0, master axis velocity.... 321
A-0-3021, FlexProfile 0, list of master axis sources..... 322
A-0-3022, FlexProfile 0, list of slave axis distances..... 323
A-0-3023, FlexProfile 0, list of master axis ranges..... 324
A-0-3024, FlexProfile 0, list of master axis ranges, units..... 324
A-0-3025, FlexProfile 0, list of motion laws..... 325
A-0-3026, FlexProfile 0, list of motion step types..... 327
A-0-3027, FlexProfile 0, list of slave axis starting velocities..... 328
A-0-3028, FlexProfile 0, list of slave axis starting accelerations..... 330
A-0-3029, FlexProfile 0, list of slave axis starting jerks..... 331
A-0-3030, FlexProfile 0, list of slave axis end velocities..... 333
A-0-3031, FlexProfile 0, list of slave axis end accelerations..... 335
A-0-3032, FlexProfile 0, list of slave axis end jerks..... 336
A-0-3033, FlexProfile 0, list of slave axis travel velocities..... 338
A-0-3034, FlexProfile 0, list of slave axis travel accelerations..... 339
A-0-3035, FlexProfile 0, list of slave axis travel jerks..... 341
A-0-3036, FlexProfile 0, list of turning point displacements..... 343
A-0-3040, FlexProfile 0, events, list of motion step assignments..... 344
A-0-3041, FlexProfile 0, events, list of trigger modes..... 344
A-0-3042, FlexProfile 0, events, list of action modes..... 345
A-0-3043, FlexProfile 0, events, list of trigger values..... 347
A-0-3044, FlexProfile 0, events, list of trigger values, units..... 347
A-0-3046, FlexProfile 0, command: Check and apply event..... 348
A-0-3047, FlexProfile 0, diagnostics..... 349
A-0-3048, FlexProfile 0, command: Check and apply profile..... 350
A-0-3049, FlexProfile 0, checksum..... 351
A-0-3050, FlexProfile 1, master axis velocity.... 352
A-0-3051, FlexProfile 1, list of master axis sources..... 353
A-0-3052, FlexProfile 1, list of slave axis distances..... 354
A-0-3053, FlexProfile 1, list of master axis ranges..... 354
A-0-3054, FlexProfile 1, list of master axis ranges, units..... 355
A-0-3055, FlexProfile 1, list of motion laws..... 356
A-0-3056, FlexProfile 1, list of motion step types..... 358
A-0-3057, FlexProfile 1, list of slave axis starting velocities..... 359
A-0-3058, FlexProfile 1, list of slave axis starting accelerations..... 361
A-0-3059, FlexProfile 1, list of slave axis starting jerks..... 362
A-0-3060, FlexProfile 1, list of slave axis end velocities..... 364
A-0-3061, FlexProfile 1, list of slave axis end accelerations..... 366
A-0-3062, FlexProfile 1, list of slave axis end jerks..... 367
A-0-3063, FlexProfile 1, list of slave axis travel velocities..... 369
A-0-3064, FlexProfile 1, list of slave axis travel accelerations..... 370
A-0-3065, FlexProfile 1, list of slave axis travel jerks..... 372
A-0-3066, FlexProfile 1, list of turning point displacements..... 374
A-0-3070, FlexProfile 1, events, list of motion step assignments..... 375
A-0-3071, FlexProfile 1, events, list of trigger modes..... 375
A-0-3072, FlexProfile 1, events, list of action modes..... 376
A-0-3073, FlexProfile 1, events, list of trigger values..... 378
A-0-3074, FlexProfile 1, events, list of trigger values, units..... 378
A-0-3076, FlexProfile 1, command: Check and apply event..... 379
A-0-3077, FlexProfile 1, diagnostics..... 380

Index

A-0-3078, FlexProfile 1, command: Check and apply profile..... 381
A-0-3079, FlexProfile 1, checksum..... 382
A-0-3080, FlexProfile 2, master axis velocity.... 383
A-0-3081, FlexProfile 2, list of master axis sources..... 384
A-0-3082, FlexProfile 2, list of slave axis distances..... 385
A-0-3083, FlexProfile 2, list of master axis ranges..... 385
A-0-3084, FlexProfile 2, list of master axis ranges, units..... 386
A-0-3085, FlexProfile 2, list of motion laws..... 387
A-0-3086, FlexProfile 2, list of motion step types..... 389
A-0-3087, FlexProfile 2, list of slave axis starting velocities..... 390
A-0-3088, FlexProfile 2, list of slave axis starting accelerations..... 392
A-0-3089, FlexProfile 2, list of slave axis starting jerks..... 393
A-0-3090, FlexProfile 2, list of slave axis end velocities..... 395
A-0-3091, FlexProfile 2, list of slave axis end accelerations..... 397
A-0-3092, FlexProfile 2, list of slave axis end jerks..... 398
A-0-3093, FlexProfile 2, list of slave axis travel velocities..... 400
A-0-3094, FlexProfile 2, list of slave axis travel accelerations..... 401
A-0-3095, FlexProfile 2, list of slave axis travel jerks..... 403
A-0-3096, FlexProfile 2, list of turning point displacements..... 405
A-0-3100, FlexProfile 2, events, list of motion step assignments..... 406
A-0-3101, FlexProfile 2, events, list of trigger modes..... 406
A-0-3102, FlexProfile 2, events, list of action modes..... 407
A-0-3103, FlexProfile 2, events, list of trigger values..... 409
A-0-3104, FlexProfile 2, events, list of trigger values, units..... 409
A-0-3106, FlexProfile 2, command: Check and apply event..... 410
A-0-3107, FlexProfile 2, diagnostics..... 411
A-0-3108, FlexProfile 2, command: Check and apply profile..... 412
A-0-3109, FlexProfile 2, checksum..... 413
A-0-3110, FlexProfile 3, master axis velocity.... 414
A-0-3111, FlexProfile 3, list of master axis sources..... 415
A-0-3112, FlexProfile 3, list of distances..... 416
A-0-3113, FlexProfile 3, list of master axis ranges..... 416
A-0-3114, FlexProfile 3, list of master axis ranges, units..... 417
A-0-3115, FlexProfile 3, list of motion laws..... 418
A-0-3116, FlexProfile 3, list of motion step types..... 420
A-0-3117, FlexProfile 3, list of slave axis starting velocities..... 421
A-0-3118, FlexProfile 3, list of slave axis starting accelerations..... 423
A-0-3119, FlexProfile 3, list of slave axis starting jerks..... 424
A-0-3120, FlexProfile 3, list of slave axis end velocities..... 426
A-0-3121, FlexProfile 3, list of slave axis end accelerations..... 428
A-0-3122, FlexProfile 3, list of slave axis end jerks..... 429
A-0-3123, FlexProfile 3, list of slave axis travel velocities..... 431
A-0-3124, FlexProfile 3, list of slave axis travel accelerations..... 432
A-0-3125, FlexProfile 3, list of slave axis travel jerks..... 434
A-0-3126, FlexProfile 3, list of turning point displacements..... 436
A-0-3130, FlexProfile 3, events, list of motion step assignments..... 437
A-0-3131, FlexProfile 3, events, list of trigger modes..... 437
A-0-3132, FlexProfile 3, events, list of action modes..... 438
A-0-3133, FlexProfile 3, events, list of trigger values..... 440
A-0-3134, FlexProfile 3, events, list of trigger values, units..... 440
A-0-3136, FlexProfile 3, command: Check and apply event..... 441
A-0-3137, FlexProfile 3, diagnostics..... 442
A-0-3138, FlexProfile 3, command: Check and apply profile..... 443
A-0-3139, FlexProfile 3, checksum..... 444
A-parameters..... 75
About this documentation..... 23
Validity of the documentation..... 23
ANSI Z535.6-2006..... 24
Application phases..... 23

C

C-0-0000, Dummy, C-parameter..... 445
C-0-0001, Language selection..... 446
C-0-0002, Name of parameter file..... 446
C-0-0003, Name of diagnostic file..... 446
C-0-0004, Name of menu file..... 447
C-0-0009, Osci: list of all C-parameters that can be oscilloscoped..... 447
C-0-0010, Version number, hardware..... 447
C-0-0011, Version number, PLC firmware..... 447

Index

C-0-0012, Version number, firmware..... 448
C-0-0013, Version number, BSP..... 448
C-0-0014, Version number, MLPI Server Core. 448
C-0-0017, Reserved for internal use..... 449
C-0-0020, Hardware, configuration..... 449
C-0-0021, Hardware, details..... 449
C-0-0022, Local bus, configuration..... 450
C-0-0023, System status..... 450
C-0-0024, Internal system status..... 452
C-0-0025, Function module bus, configuration. 453
C-0-0026, Hardware details of function module no. 1..... 454
C-0-0027, Hardware details of function module no. 2..... 454
C-0-0028, Hardware details of function module no. 3..... 455
C-0-0029, Hardware details of function module no. 4..... 455
C-0-0030, Control name..... 455
C-0-0031, Control address..... 456
C-0-0032, Serial number of control..... 457
C-0-0033, Project identification number..... 457
C-0-0034, Client, access locking number..... 457
C-0-0035, C2C, identification number..... 458
C-0-0036, Control configuration..... 458
C-0-0039, sercos local and function module bus, actual configuration..... 459
C-0-0040, sercos local and function module bus, command configuration..... 461
C-0-0041, Local and function module bus, actual configuration..... 463
C-0-0050, System time..... 465
C-0-0051, Operating hour counter..... 466
C-0-0052, Operating hour counter, fan..... 466
C-0-0060, Switch-on delay time..... 466
C-0-0063, Scaling type for temperature data of the control..... 466
C-0-0070, Control temperature..... 467
C-0-0071, Maximum control temperature..... 467
C-0-0080, User-defined decimal number..... 467
C-0-0081, User-defined text..... 468
C-0-0110, List of all C-parameters..... 468
C-0-0111, List of all invalid C-parameters..... 468
C-0-0112, Checksum of all C-parameters..... 469
C-0-0113, IDN list of checksum C-parameters. 469
C-0-0114, IDN list of import errors..... 470
C-0-0120, Maximum number of controls..... 470
C-0-0121, Maximum number of axes..... 470
C-0-0122, Maximum number of axes of a producer..... 470
C-0-0123, Maximum number of kinematics..... 471
C-0-0124, Maximum number of touch probes.. 471
C-0-0125, Maximum number of programmable limit switches..... 471
C-0-0126, Maximum number of oscilloscope channels..... 471
C-0-0140, Minimum logic axis number..... 472
C-0-0141, Maximum logic axis number..... 472
C-0-0200, Engineering, IP address..... 472
C-0-0201, Engineering, subnet mask..... 472
C-0-0202, Engineering, standard gateway..... 473
C-0-0203, Engineering, user name..... 473
C-0-0205, Engineering, MAC address..... 473
C-0-0206, TCP, time to live..... 474
C-0-0207, UDP, ports..... 474
C-0-0208, TCP, port for acyclic channels..... 474
C-0-0209, Sender timeout..... 474
C-0-0210, TCP, max. number of connection.... 475
C-0-0211, Reserved..... 475
C-0-0212, Drive server, configuration..... 475
C-0-0216, Engineering, IP address, actual configuration..... 476
C-0-0217, Engineering, subnet mask, actual configuration..... 476
C-0-0218, List of existing network interfaces.... 476
C-0-0219, Status of network configuration..... 477
C-0-0220, sercos master, IP address, command configuration..... 477
C-0-0221, sercos master, subnet mask, command configuration..... 478
C-0-0222, sercos master, IP address, actual configuration..... 478
C-0-0223, sercos master, subnet mask, actual configuration..... 478
C-0-0224, sercos master, MAC address..... 478
C-0-0225, C2C, IP address, command configuration..... 479
C-0-0226, C2C, subnet mask, command configuration..... 479
C-0-0227, C2C, IP address, actual configuration..... 479
C-0-0228, C2C, subnet mask, actual configuration..... 480
C-0-0229, C2C, MAC address..... 480
C-0-0230, Bridge, IP address, command configuration..... 480
C-0-0231, Bridge, subnet mask, command configuration..... 481
C-0-0232, Bridge, command configuration of assigned interfaces..... 481
C-0-0233, Bridge, actual configuration of assigned interfaces..... 481
C-0-0234, Automatic IP address generation, actual configuration..... 482
C-0-0235, Automatic IP address generation, command configuration..... 483
C-0-0236, Bridge, IP address, actual configuration..... 483
C-0-0237, Bridge, subnet mask, actual configuration..... 484
C-0-0238, Bridge, MAC address..... 484
C-0-0242, Onboard RT Ethernet, IP address, actual configuration..... 484
C-0-0243, Onboard RT Ethernet, subnet mask, actual configuration..... 485

Index

C-0-0244, Onboard RT Ethernet, MAC address, actual configuration..... 485
C-0-0250, Engineering, DHCP configuration.... 485
C-0-0251, Engineering, DNS server IP..... 485
C-0-0252, Engineering, DHCP initial address... 486
C-0-0253, Engineering, DHCP end address..... 486
C-0-0254, Engineering, DHCP lease time..... 486
C-0-0260, sercos master, DHCP configuration. 486
C-0-0261, sercos master, DNS server IP..... 487
C-0-0262, sercos master, DHCP initial address..... 487
C-0-0263, sercos master, DHCP end address. 487
C-0-0264, sercos master, DHCP lease time..... 487
C-0-0270, Bridge, DHCP configuration..... 487
C-0-0271, Bridge, DNS server IP..... 488
C-0-0272, Bridge, DHCP initial address..... 488
C-0-0273, Bridge, DHCP end address..... 488
C-0-0274, Bridge, DHCP lease time..... 488
C-0-0280, Onboard RT Ethernet, DHCP configuration..... 489
C-0-0281, Onboard RT Ethernet, DNS server IP..... 489
C-0-0282, Onboard RT Ethernet, DHCP initial address..... 489
C-0-0283, Onboard RT Ethernet, DHCP end address..... 489
C-0-0284, Onboard RT Ethernet, DHCP lease time..... 489
C-0-0290, C2C, DHCP configuration..... 490
C-0-0291, C2C, DNS server IP..... 490
C-0-0292, C2C, DHCP initial address..... 490
C-0-0293, C2C, DHCP end address..... 490
C-0-0294, C2C, DHCP lease time..... 491
C-0-0300, PLS No.1, control word..... 491
C-0-0301, PLS No.1, status word..... 492
C-0-0302, PLS No.1, signal selection..... 492
C-0-0303, PLS No.1, control signal..... 493
C-0-0304, PLS No.1, outputs..... 494
C-0-0305, PLS No.1, internal registers..... 494
C-0-0307, PLS No.1, reference axis configuration..... 495
C-0-0308, PLS No.1, reference axis position, additive..... 497
C-0-0309, PLS No.1, reference axis definition.. 499
C-0-0310, PLS No.1, hysteresis..... 500
C-0-0311, PLS No.1, lead time when switching on..... 501
C-0-0312, PLS No.1, lead time when switching off..... 502
C-0-0313, PLS No.1, switch track number..... 503
C-0-0314, PLS No.1, switch-on position of switch track..... 504
C-0-0315, PLS No.1, switch-off position of switch track..... 505
C-0-0316, PLS No.1, command: Initialize switch track..... 506
C-0-0317, PLS No.1, command: Activate switch track..... 507
C-0-0318, PLS No.1, output mode..... 507
C-0-0319, PLS No.1, switch-on duration..... 508
C-0-0325, PLS No.2, control word..... 509
C-0-0326, PLS No.2, status word..... 510
C-0-0327, PLS No.2, signal selection..... 511
C-0-0328, PLS No.2, control signal..... 512
C-0-0329, PLS No.2, outputs..... 512
C-0-0330, PLS No.2, internal registers..... 513
C-0-0332, PLS No.2, reference axis configuration..... 514
C-0-0333, PLS No.2, reference axis position, additive..... 515
C-0-0334, PLS No.2, reference axis definition.. 517
C-0-0335, PLS No.2, hysteresis..... 518
C-0-0336, PLS No.2, lead time when switching on..... 519
C-0-0337, PLS No.2, lead time when switching off..... 520
C-0-0338, PLS No.2, switch track number..... 521
C-0-0339, PLS No.2, switch-on position of switch track..... 522
C-0-0340, PLS No.2, switch-off position of switch track..... 523
C-0-0341, PLS No.2, command: Initialize switch track..... 524
C-0-0342, PLS No.2, command: Activate switch track..... 525
C-0-0343, PLS No.2, output mode..... 525
C-0-0344, PLS No.2, switch-on duration..... 526
C-0-0350, PLS No.3, control word..... 527
C-0-0351, PLS No.3, status word..... 528
C-0-0352, PLS No.3, signal selection..... 529
C-0-0353, PLS No.3, control signal..... 530
C-0-0354, PLS No.3, outputs..... 530
C-0-0355, PLS No.3, internal registers..... 531
C-0-0357, PLS No.3, reference axis configuration..... 532
C-0-0358, PLS No.3, reference axis position, additive..... 533
C-0-0359, PLS No.3, reference axis definition.. 535
C-0-0360, PLS No.3, hysteresis..... 536
C-0-0361, PLS No.3, lead time when switching on..... 537
C-0-0362, PLS No.3, lead time when switching off..... 538
C-0-0363, PLS No.3, switch track number..... 539
C-0-0364, PLS No.3, switch-on position of switch track..... 540
C-0-0365, PLS No.3, switch-off position of switch track..... 541
C-0-0366, PLS No.3, command: Initialize switch track..... 542
C-0-0367, PLS No.3, command: Activate switch track..... 543
C-0-0368, PLS No.3, output mode..... 543
C-0-0369, PLS No.3, switch-on duration..... 544
C-0-0375, PLS No.4, control word..... 545
C-0-0376, PLS No.4, status word..... 546

Index

C-0-0377, PLS No.4, signal selection..... 547
C-0-0378, PLS No.4, control signal..... 548
C-0-0379, PLS No.4, outputs..... 548
C-0-0380, PLS No.4, internal registers..... 549
C-0-0382, PLS No.4, reference axis configuration..... 550
C-0-0383, PLS No.4, reference axis position, additive..... 551
C-0-0384, PLS No.4, reference axis definition.. 553
C-0-0385, PLS No.4, hysteresis..... 554
C-0-0386, PLS No.4, lead time when switching on..... 555
C-0-0387, PLS No.4, lead time when switching off..... 556
C-0-0388, PLS No.4, switch track number..... 557
C-0-0389, PLS No.4, switch-on position of switch track..... 558
C-0-0390, PLS No.4, switch-off position of switch track..... 559
C-0-0391, PLS No.4, command: Initialize switch track..... 560
C-0-0392, PLS No.4, command: Activate switch track..... 561
C-0-0393, PLS No.4, output mode..... 561
C-0-0394, PLS No.4, switch-on duration..... 562
C-0-0400, Motion, cycle time, command value. 563
C-0-0401, Time period of the integrated PLC of the MC cycle time..... 564
C-0-0402, Motion, startup of cycle time..... 564
C-0-0403, Motion, priority calculation..... 564
C-0-0404, Time slot control..... 565
C-0-0405, PLC, configuration..... 565
C-0-0406, Preset of operating state of all PLC applications..... 566
C-0-0407, Watchdog, communication..... 566
C-0-0408, Timeslot, communication..... 566
C-0-0410, Motion, cycle time (Tcyc), actual value..... 567
C-0-0412, List of current time slot measurements..... 567
C-0-0413, List of maximum time slot measurements..... 568
C-0-0414, List of minimum time slot measurements..... 569
C-0-0415, CPU load, current..... 569
C-0-0416, CPU load, maximum..... 570
C-0-0417, CPU load, minimum..... 570
C-0-0418, CPU load, threshold value for warning..... 570
C-0-0420, Motion, watchdog sensitivity..... 571
C-0-0421, Motion, absolute error counter..... 571
C-0-0422, Motion, number of successive errors..... 571
C-0-0423, Motion, cycle counter..... 572
C-0-0425, TaskViewer, buffer size..... 572
C-0-0440, Configuration PM/OM switching..... 572
C-0-0450, Motion, startup target mode..... 573
C-0-0451, Motion, target mode..... 574
C-0-0452, Motion, current mode..... 574
C-0-0476, Configured user tasks..... 575
C-0-0477, Command-actual comparison of the sercos devices..... 576
C-0-0478, sercos device configuration..... 578
C-0-0479, Extended sercos device information 580
C-0-0480, Configured axis number..... 581
C-0-0481, List of detected sercos devices..... 582
C-0-0482, List of non-linked sercos devices..... 582
C-0-0483, List of configured axes..... 582
C-0-0484, Axis configuration list..... 583
C-0-0500, sercos master, configuration..... 585
C-0-0501, sercos master, baud rate..... 585
C-0-0502, sercos master, OWG length..... 586
C-0-0503, sercos master, cycle time..... 586
C-0-0504, sercos master, SVC busy timeout.... 586
C-0-0505, sercos master, consumer timeout.... 587
C-0-0506, sercos Master, sercos III, configuration of function modes..... 587
C-0-0507, sercos master, allowed telegram losses..... 588
C-0-0510, sercos master, address configuration..... 588
C-0-0511, sercos master, binary inputs, command values..... 589
C-0-0514, sercos master, status..... 589
C-0-0515, sercos master, sercos III, FPGA, image..... 590
C-0-0516, sercos master, slave identification... 591
C-0-0517, sercos master, addresses ring break..... 591
C-0-0518, sercos master, position ring break... 592
C-0-0519, sercos master, sercos III, internal connection configuration..... 592
C-0-0520, sercos master, sercos III, external connection configuration..... 592
C-0-0521, sercos master, sercos III, connection configuration active..... 593
C-0-0535, sercos master, error counter for Port1 and Port2..... 593
C-0-0620, Diagnostic memory index..... 593
C-0-0621, Diagnostics, indexed message..... 594
C-0-0622, Diagnostics, number of messages in the memory..... 594
C-0-0623, Diagnostics, last reset message..... 594
C-0-0624, Diagnostics, absolute indices..... 595
C-0-0625, Diagnostics, display message..... 595
C-0-0626, Diagnostics..... 595
C-0-0627, Diagnostic number..... 596
C-0-0650, Diagnostics, status word..... 596
C-0-0660, Dispay, display period of messages 597
C-0-0670, List of active trace modules..... 597
C-0-0671, Trace, storage settings..... 597
C-0-0672, Save trace after this DSH message. 598
C-0-0673, Save trace in DSH message mask.. 598
C-0-0674, Save trace after specified time..... 598
C-0-0675, Save trace under this file name..... 599

Index

C-0-0676, Percentage of trace data saved after trigger signal..... 599
C-0-0700, C2C, cycle time (Tcyc), command value..... 599
C-0-0701, C2C, configuration of function modes..... 600
C-0-0702, C2C, OWG length..... 601
C-0-0703, C2C, configuration of master axes... 601
C-0-0704, C2C, binary inputs, command values..... 603
C-0-0705, C2C, calibration of dead time compensation..... 604
C-0-0710, C2C, cycle time (Tcyc), actual value 606
C-0-0711, C2C, error counter MDT..... 606
C-0-0712, C2C, link data, status..... 607
C-0-0713, C2C, binary inputs, status..... 608
C-0-0714, C2C, function module, status..... 608
C-0-0715, FM, sercos III, FPGA, image..... 610
C-0-0716, C2C, sercos III, error counter for data loss..... 610
C-0-0717, C2C, addresses ring break..... 611
C-0-0735, C2C, error counter for Port1/Port2... 611
C-0-0750, C2C, startup target mode..... 612
C-0-0751, C2C, target mode..... 613
C-0-0752, C2C, current mode..... 614
C-0-0778, C2C, command configuration..... 615
C-0-0779, C2C, device information..... 617
C-0-0800, Oscilloscope, status word..... 618
C-0-0801, Oscilloscope, time resolution..... 619
C-0-0802, Oscilloscope, memory depth..... 620
C-0-0803, Oscilloscope, signal selection list..... 620
C-0-0804, Oscilloscope, number of valid values..... 621
C-0-0805, Oscilloscope, control word..... 621
C-0-0806, Oscilloscope, number of channels... 621
C-0-0807, Oscilloscope, sample time stamp.... 622
C-0-0820, Oscilloscope, sample task selection 622
C-0-0821, Oscilloscope, sample task interval... 622
C-0-0822, Oscilloscope, sample task task ID... 623
C-0-0825, Oscilloscope, sample task status..... 623
C-0-0830, Oscilloscope, IEC sample task 00... 623
C-0-0831, Oscilloscope, IEC sample task 01... 623
C-0-0832, Oscilloscope, IEC sample task 02... 624
C-0-0833, Oscilloscope, IEC sample task 03... 624
C-0-0834, Oscilloscope, IEC sample task 04... 624
C-0-0840, Oscilloscope, system sample task 00..... 624
C-0-0841, Oscilloscope, system sample task 01..... 624
C-0-0850, Oscilloscope, trigger mask..... 625
C-0-0851, Oscilloscope, trigger signal..... 625
C-0-0852, Oscilloscope, trigger threshold..... 625
C-0-0853, Oscilloscope, trigger edge..... 626
C-0-0854, Oscilloscope, number of measured values after trigger event..... 626
C-0-0855, Oscilloscope, trigger time stamp..... 627
C-0-0856, Oscilloscope, external trigger signal 627
C-0-0857, Oscilloscope, internal trigger signal. 628
C-0-0858, Oscilloscope, AUX trigger path..... 628
C-0-0859, Oscilloscope, AUX trigger..... 628
C-0-0860, Oscilloscope, default trigger..... 628
C-0-0900, Device operating state..... 629
C-0-0915, Number of PLC applications..... 629
C-0-0916, PLC router address..... 629
C-0-0920, Operating states of PLC applications..... 630
C-0-1006, Command: Delete files on OEM partition..... 634
C-0-1005, Command: Delete files on SYSTEM partition..... 633
C-0-1007, Command: Delete files on USER partition..... 634
C-0-1009, Command: Get extended sercos device information..... 635
C-0-1008, Command: Get function modul bus information..... 635
C-0-1000, Command: Load basic parameters.. 630
C-0-1001, Command: Restore MC- and PLC-Retain-Data..... 631
C-0-1003, Command: Restore PLC-Retain-Data..... 632
C-0-1002, Command: Save MC- and PLC-Retain-Data..... 631
C-0-1004, Command: Save PLC-Retain-Data.. 632
C-0-1010, Command: Export parameter..... 636
C-0-1011, Command: Import parameter..... 636
C-0-1019, Command: Restart and reset to default..... 637
C-0-1020, Command: Restart after firmware update..... 638
C-0-1021, Command: Restart..... 638
C-0-1022, Command: Activate firmware update..... 639
C-0-1023, Command: Apply IP configuration... 639
C-0-1024, Command: Load basic parameter of IP configuration..... 640
C-0-1030, Command: Clear all control errors... 641
C-0-1041, Command: Start task record..... 641
C-0-1042, Command: Stop task record..... 642
C-0-1050, Command: Reset parameter C-0-0413 and C-0-0414..... 643
C-0-1051, Command: Reset parameter C-0-0416 and C-0-0417..... 643
C-0-1052, Command: Reset parameter C-0-0421 and C-0-0422..... 644
C-0-1060, Command: Save all trace recordings..... 644
C-0-1061, Command: Unlock all trace buffers.. 644
C-0-1070, Command: Switch PM/OM..... 645
C-0-2002..... 646
C-0-2009..... 646
C-0-2007..... 646
C-0-2008..... 646
C-0-2005..... 646
C-0-2006..... 646
C-0-2003..... 646

Index

C-0-2004..... 646
C-0-2001 to C-0-2099, point tables on the control..... 646
C-0-2001, ELS, point table1..... 646
C-0-2010..... 646
C-0-2011..... 646
C-0-2012..... 646
C-0-2013..... 646
C-0-2014..... 646
C-0-2015..... 646
C-0-2016..... 646
C-0-2017..... 646
C-0-2018..... 646
C-0-2019..... 646
C-0-2020..... 646
C-0-2021..... 646
C-0-2022..... 646
C-0-2023..... 646
C-0-2024..... 646
C-0-2025..... 646
C-0-2026..... 646
C-0-2027..... 646
C-0-2028..... 646
C-0-2029..... 646
C-0-2030..... 646
C-0-2031..... 646
C-0-2032..... 646
C-0-2033..... 646
C-0-2034..... 646
C-0-2035..... 646
C-0-2036..... 646
C-0-2037..... 646
C-0-2038..... 646
C-0-2039..... 646
C-0-2040..... 646
C-0-2041..... 646
C-0-2042..... 646
C-0-2043..... 646
C-0-2044..... 646
C-0-2045..... 646
C-0-2046..... 646
C-0-2047..... 646
C-0-2048..... 646
C-0-2049..... 646
C-0-2050..... 646
C-0-2051..... 646
C-0-2052..... 646
C-0-2053..... 646
C-0-2054..... 646
C-0-2055..... 646
C-0-2056..... 646
C-0-2057..... 646
C-0-2058..... 646
C-0-2059..... 646
C-0-2060..... 646
C-0-2061..... 646
C-0-2062..... 646
C-0-2063..... 646
C-0-2064..... 646
C-0-2065..... 646
C-0-2066..... 646
C-0-2067..... 646
C-0-2068..... 646
C-0-2069..... 646
C-0-2070..... 646
C-0-2071..... 646
C-0-2072..... 646
C-0-2073..... 646
C-0-2074..... 646
C-0-2075..... 646
C-0-2076..... 646
C-0-2077..... 646
C-0-2078..... 646
C-0-2079..... 646
C-0-2080..... 646
C-0-2081..... 646
C-0-2082..... 646
C-0-2083..... 646
C-0-2084..... 646
C-0-2085..... 646
C-0-2086..... 646
C-0-2087..... 646
C-0-2088..... 646
C-0-2089..... 646
C-0-2090..... 646
C-0-2091..... 646
C-0-2092..... 646
C-0-2093..... 646
C-0-2094..... 646
C-0-2095..... 646
C-0-2096..... 646
C-0-2097..... 646
C-0-2098..... 646
C-0-2099..... 646
C-0-2100, List of all backup operation C-parameters..... 646
C-0-2480, Configured kinematic number..... 647
C-0-2482, List of non-linked axes..... 647
C-0-2483, List of configured kinematics..... 648
C-0-2484, Kinematic configuration list..... 648
C-0-2499, Touch probe, IDN list signal selection..... 649
C-parameters..... 445
C2C access..... 42, 76

D
Direct access:..... 42, 76
Documentation structure..... 23

E
Editable?..... 41

F
FLOAT(REAL) precision..... 35

Index

H

Hazard warnings... 24
Helpdesk... 777
Hotline... 777
HydraulicDrive... 46
HydraulicDrive: A/C ==> S-/P-Parameters
Calculation in the control... 769
Calculation in the drive... 772

I

IndraDrive... 46
IndraDrive: A/C ==> S-/P-Parameters
Calculation in the control... 757
Calculation in the drive... 760
Initial value... 42
Initial value HydraulicDrive... 43
IntelliSense of a function variable synchronously in the C2C link... 39
Interaction between parameters and function blocks... 35

K

K-0-0000, Dummy, K-parameter... 650
K-0-0001, Logic kinematic number... 650
K-0-0002, Kinematic name... 650
K-0-0003, Maximum path velocity... 651
K-0-0004, Reserved... 651
K-0-0005, Software limit switch, positive, MCS 652
K-0-0006, Software limit switch, negative, MCS... 652
K-0-0007, Axis number of kinematics... 653
K-0-0008, Axis configuration list... 653
K-0-0009, Osci: list of all K-parameters that can be oscilloscoped... 655
K-0-0010, List of all K-parameters... 656
K-0-0011, List of all invalid K-parameters... 656
K-0-0012, Checksum of all K-parameters... 657
K-0-0013, IDN list of checksum K-parameters.. 657
K-0-0014, Path acceleration, change time... 657
K-0-0015, Path deceleration, change time... 660
K-0-0016, Project identification number... 662
K-0-0019, Kinematic type... 663
K-0-0020, Kinematic diagnostic message... 663
K-0-0021, Kinematic status... 664
K-0-0022, Extended kinematic status... 667
K-0-0023, Kinematic diagnostic number... 670
K-0-0031, Transformation scheme... 671
K-0-0032, Referencing of axes, command configuration... 672
K-0-0033, IPOS, update at coordinate change. 673
K-0-0034, Maximum path acceleration (bipolar)... 673
K-0-0035, Maximum path jerk (bipolar)... 673
K-0-0036, MCS axis monitoring... 674
K-0-0040, Transformation, lengths of the mechanics... 674
K-0-0041, Transformation, factors... 675
K-0-0042, Offset of BCS system... 676
K-0-0043, Assignment list of workpiece coordinates... 676
K-0-0045, Tool selection... 678
K-0-0050, Distance units MCS... 678
K-0-0051, Velocity units MCS... 679
K-0-0052, Acceleration units MCS... 680
K-0-0053, Jerk units MCS... 681
K-0-0054, Measuring unit for kinematic data.... 681
K-0-0070, Belt number of kinematics... 682
K-0-0071, Coupling factors, belt 1... 682
K-0-0072, Coupling factors, belt 2... 684
K-0-0073, Coupling factors, belt 3... 684
K-0-0074, Coupling factors, belt 4... 684
K-0-0080, Jogging, distance short in MCS... 685
K-0-0081, Jogging, distance long in MCS... 686
K-0-0082, Jogging, velocity low in MCS... 687
K-0-0083, Jogging, velocity high in MCS... 688
K-0-0084, Jogging, acceleration in MCS... 689
K-0-0085, Jogging, deceleration in MCS... 690
K-0-0086, Jogging, acceleration jerk in MCS.... 691
K-0-0087, Jogging, deceleration jerk in MCS... 691
K-0-0096, Peak value of command buffer size. 692
K-0-0097, Maximum command buffer size... 693
K-0-0098, Current command buffer size... 693
K-0-0099, Kinematic configuration... 693
K-0-0100, Current position, Cartesian Machine Coordinate System... 694
K-0-0102, Current path velocity... 695
K-0-0103, Current path acceleration... 695
K-0-0104, Current path jerk... 695
K-0-0105, Actual position, Cartesian Workpiece Coordinates... 696
K-0-0106, Coordinate values of tool... 696
K-0-0107, Coordinate values of workpiece... 696
K-0-0121 to K-0-0136, coordinate names... 696
K-0-0121, Coordinate name C1... 697
K-0-0122... 696
K-0-0123... 696
K-0-0124... 696
K-0-0125... 696
K-0-0126... 696
K-0-0127... 696
K-0-0128... 696
K-0-0129... 696
K-0-0130... 696
K-0-0131... 696
K-0-0132... 696
K-0-0133... 696
K-0-0134... 696
K-0-0135... 696
K-0-0136... 696
K-0-0140, Tool name... 697
K-0-0141, Workpiece name... 697
K-0-0150, Interpolated command position... 698
K-0-0152, Interpolated path velocity... 698
K-0-0153, Interpolated path acceleration... 698
K-0-0154, Interpolated path jerk... 699

Index

K-0-0155, Safe zones on/off..... 699
K-0-0156, Safe zone 1 min. point..... 699
K-0-0156/K-0-0157 Zone of protection1 min./max. point up to K-0-0218/K-0-0219 Zone of protection32 min./max. point..... 700
K-0-0157, Safe zone 1 max. point..... 700
K-0-0158..... 700
K-0-0159..... 700
K-0-0160..... 700
K-0-0161..... 700
K-0-0162..... 700
K-0-0163..... 700
K-0-0164..... 700
K-0-0165..... 700
K-0-0166..... 700
K-0-0167..... 700
K-0-0168..... 700
K-0-0169..... 700
K-0-0170..... 700
K-0-0171..... 700
K-0-0172..... 700
K-0-0173..... 700
K-0-0174..... 700
K-0-0175..... 700
K-0-0176..... 700
K-0-0177..... 700
K-0-0178..... 700
K-0-0179..... 700
K-0-0180..... 700
K-0-0181..... 700
K-0-0182..... 700
K-0-0183..... 700
K-0-0184..... 700
K-0-0185..... 700
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K-0-0188..... 700
K-0-0189..... 700
K-0-0190..... 700
K-0-0191..... 700
K-0-0192..... 700
K-0-0193..... 700
K-0-0194..... 700
K-0-0195..... 700
K-0-0196..... 700
K-0-0197..... 700
K-0-0198..... 700
K-0-0199..... 700
K-0-0200..... 700
K-0-0201..... 700
K-0-0202..... 700
K-0-0203..... 700
K-0-0204..... 700
K-0-0205..... 700
K-0-0206..... 700
K-0-0207..... 700
K-0-0208..... 700
K-0-0209..... 700
K-0-0210..... 700
K-0-0211..... 700
K-0-0212..... 700
K-0-0213..... 700
K-0-0214..... 700
K-0-0215..... 700
K-0-0216..... 700
K-0-0217..... 700
K-0-0218..... 700
K-0-0219..... 700
K-0-0220, File transfer name..... 702
K-0-0221, File name to be compiled..... 703
K-0-0223, Selection of error reaction..... 703
K-0-0224, Emergency halt deceleration..... 704
K-0-0225, Emergency halt jerk..... 704
K-0-0240, Feedrate override..... 705
K-0-0241, Feedrate override control word..... 705
K-0-0242, Acceleration override..... 706
K-0-0243, Deceleration override..... 706
K-0-0250, Continuous slope lead time..... 707
K-0-1000, Command: Load basic kinematic parameters..... 708
K-0-1060, Command: Load file from CF..... 708
K-0-1061, Command: Save file to CF..... 709
K-0-1062, Command: Compile file to MLC..... 709
K-0-2100, List of all backup operation K-parameters..... 709
K-0-2200, Programmed position 1 (active)..... 710
K-0-2201, Programmed position 2 (active)..... 710
K-0-2202, Type of actively programmed position..... 711
K-0-2203, Interpolation type..... 711
K-0-2204, Currently active QLL file name..... 711
K-0-2205, Currently active line number..... 711
K-0-2300, PLC bit input (RCL)..... 712
K-0-2301, PLC integer input (RCL)..... 712
K-0-2302, PLC floating point input (RCL)..... 712
K-parameters..... 650

L

Lists of parameters that can be oscilloscoped.... 74
Load basic parameters..... 59

M

M-0-0000, Dummy, M-parameter..... 713
M-0-0001, Logic touch probe number..... 713
M-0-0002, Touch probe name..... 713
M-0-0005, Input selection..... 713
M-0-0006, Signal selection..... 714
M-0-0007, Control word..... 715
M-0-0009, Osci: list of all M-parameters that can be oscilloscoped..... 717
M-0-0010, List of all M-parameters..... 717
M-0-0016, Project identification number..... 717
M-0-0021, Status word..... 718
M-0-0024, Command: Activation..... 719
M-0-0130, Measured value, positive edge..... 719

Index

M-0-0131, Measured value, negative edge..... 720
M-0-0132, Difference value..... 720
M-0-0133, Time difference..... 721
M-0-0140, Time stamp, positive edge..... 721
M-0-0141, Time stamp, negative edge..... 722
M-0-0200, Dead-time compensation, positive edge..... 722
M-0-0201, Dead-time compensation, negative edge..... 723
M-0-0202, Starting position of the expectation window, positive edge..... 723
M-0-0203, End position of the expectation window, positive edge..... 723
M-0-0204, Starting position of the expectation window, negative edge..... 724
M-0-0205, End position of the expectation window, negative edge..... 724
M-0-0206, Maximum number of marker failures..... 725
M-0-0224, Number of marker failures, positive edge..... 725
M-0-0225, Number of marker failures, negative edge..... 726
M-0-0401, Input status..... 726
M-0-0405, Enabling..... 727
M-0-0409, Counter of measured values, positive edge..... 727
M-0-0410, Counter of measured values, negative edge..... 728
M-0-0411, Counter of difference values..... 728
M-0-1000, Command: Load basic touch probe parameters..... 729
M-0-2100, List of all backup operation M-parameters..... 729
M-parameters..... 712
MinMax editable..... 42
MinMax test..... 42
MLC programmable limit switches, N-parameters..... 71, 730
MLC programmable limit switches, previous C-parameters..... 71, 730
MLC_IDN..... 41
MLC-AT configuration
IndraDrive/HydraulicDrive..... 53
IndraDrive/HydraulicDrive with interpolation in the control..... 55
SercosDrive..... 55
MLC-MDT configuration
Interpolation in the IndraDrive/HydraulicDrive..... 47
SercosDrive..... 51
MLC-MDT Configuration
Interpolation in the control..... 51
Motion/PLC data formats..... 35

N

N-0-0000, Dummy, N-parameter..... 731
N-0-0001, Logical switch track number..... 731
N-0-0002, Switch track name..... 731
N-0-0009, Osci: list of all N-parameters that can be oscilloscoped..... 731
N-0-0010, List of all N-parameters..... 732
N-0-0016, Project identification number..... 732
N-0-0300, Control word..... 732
N-0-0302, Signal selection..... 733
N-0-0303, Control signals..... 734
N-0-0304, Outputs..... 735
N-0-0305, Internal registers..... 735
N-0-0307, Reference axis configuration..... 736
N-0-0308, Reference axis position, additive..... 737
N-0-0309, Reference axis definition..... 739
N-0-0310, Hysteresis..... 739
N-0-0311, Lead time when switching on..... 741
N-0-0312, Lead time when switching off..... 742
N-0-0313, Switch track number..... 743
N-0-0314, Switch-on position of switch track..... 744
N-0-0315, Switch-off position of switch track..... 745
N-0-0316, Command: Initialize switch track..... 746
N-0-0317, Command: Activate switch track..... 747
N-0-0318, Output mode..... 747
N-0-0319, Switch-on duration..... 748
N-0-1000, Command: Load basic PLS parameters..... 749
N-0-2100, List of all backup operation N-parameters..... 750
N-parameters..... 730
Names and abbreviations..... 32

O

O-0-0000, Dummy, O-parameter..... 750
O-0-0001, Logical channel number..... 751
O-0-0002, Channel name..... 751
O-0-0003, Signal selection..... 751
O-0-0004, Measured value list..... 752
O-0-0005, AUX signal path..... 752
O-0-0006, AUX signal..... 752
O-0-0007, List index..... 753
O-0-0009, Osci: list of all O-parameters that can be oscilloscoped..... 753
O-0-0010, List of all O-parameters..... 753
O-0-0016, Project identification number..... 754
O-0-0021, Channel status..... 754
O-0-1000, Command: Load basic oscilloscope parameters..... 754
O-0-2100, List of all backup operation O-parameters..... 755
O-parameters..... 750
Oscilloscope..... 42, 76
Oscilloscope, O-parameters..... 72

P

PLC access to parameter values
via Shared Memory..... 37
With function block..... 37

Index

With function variable access..... 38
PLC access to the parameter values
With function variable access synchronously in the C2C link..... 39
PLCopen, general goal..... 35
Point tables on the control..... 646
Programming - PLCopen..... 35

R
REAL(FLOAT) precision..... 35
REFERENCE_TO to a function variable synchronously in the C2C link..... 39

S
Safety alert symbol..... 24
Safety instructions..... 24
SercosDrive..... 46
SercosDrive: A/C ==> S-/P-parameters..... 766
Service hotline..... 777
Signal words..... 24
Support..... 777
Symbols..... 26

T
Target group..... 23
Touch probe..... 42, 76
Touch Probe, M-parameters..... 70
Trace parameters..... 70
Type editable..... 42

U
Using parameters by means of PLC functions blocks..... 36

W
Warnings..... 24
Where is it saved?..... 41

X
XLC/MLC command parameters..... 59
XLC/MLC communication parameters..... 61
XLC/MLC data container, A-parameters..... 45
XLC/MLC diagnostic parameters..... 57
XLC/MLC FlexProfile, A-parameters..... 64
XLC/MLC MotionProfile, A-parameters..... 64

Notes

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