

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Adjustable speed electrical power drive systems –  
Part 7-202: Generic interface and use of profiles for power drive systems –  
Profile type 2 specification**

**Entraînements électriques de puissance à vitesse variable –  
Partie 7-202: Interface générique et utilisation de profils pour les entraînements  
électriques de puissance – Spécification du profil de type 2**

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## CONTENTS

FOREWORD.....	9
INTRODUCTION.....	11
1 Scope.....	14
2 Normative references .....	14
3 Terms, definitions and abbreviated terms .....	15
3.1 Terms and definitions .....	15
3.2 Abbreviated terms .....	21
4 General .....	21
4.1 General .....	21
4.2 Control modes .....	22
4.2.1 General .....	22
4.2.2 Control methods .....	22
4.2.3 Control nomenclature .....	22
4.2.4 Position Control .....	23
4.2.5 Velocity Control .....	24
4.2.6 Acceleration Control .....	26
4.2.7 Torque Control .....	26
4.2.8 No Control .....	27
5 Data types .....	28
5.1 Data type overview .....	28
5.2 Conventions .....	29
6 CIP Drive Profile .....	29
6.1 Object model .....	29
6.1.1 Object overview .....	29
6.1.2 Object description .....	30
6.2 How objects affect behaviour .....	30
6.3 Defining object interfaces .....	30
6.4 I/O Connection messages .....	31
6.4.1 General .....	31
6.4.2 CIP Motion I/O connection .....	31
6.4.3 Controller-to-Device connection .....	34
6.4.4 Device-to-Controller connection .....	46
6.4.5 Fixed Device connection format .....	53
6.4.6 CIP Motion connection timing .....	54
6.5 Drive startup procedure .....	63
6.5.1 General .....	63
6.5.2 Motion I/O Connection creation .....	63
6.5.3 Motion Axis Object configuration .....	63
6.5.4 Time Synchronisation .....	64
6.6 Device visualisation.....	65
6.7 Ethernet Quality of Service (QoS).....	65
7 Motion Axis Object .....	66
7.1 General considerations.....	66
7.1.1 General .....	66
7.1.2 Object overview .....	66

7.1.3	Motion Axis Object abstraction .....	66
7.1.4	Motion Control Axis Object .....	67
7.1.5	Drive control classification .....	67
7.1.6	Required vs. Optional in implementation .....	68
7.2	Class attributes .....	75
7.2.1	General .....	75
7.2.2	Semantics .....	79
7.3	Instance attributes .....	82
7.3.1	General .....	82
7.3.2	Motion Control configuration attributes .....	83
7.3.3	Motor attributes .....	85
7.3.4	Feedback attributes .....	92
7.3.5	Event Capture attributes .....	98
7.3.6	Command reference generation attributes .....	102
7.3.7	Control mode attributes .....	106
7.3.8	Stopping & Braking attributes .....	116
7.3.9	DC Bus Control attributes .....	119
7.3.10	Power and thermal management attributes .....	120
7.3.11	Axis Status Attributes .....	122
7.3.12	Exception, fault, and alarm status attributes .....	126
7.3.13	Exception limit attributes .....	131
7.3.14	Exception action configuration attribute .....	132
7.3.15	Initialisation fault status attributes .....	134
7.3.16	Start inhibit status attributes .....	136
7.3.17	Axis statistical attributes .....	137
7.3.18	Axis info attributes .....	138
7.3.19	General purpose I/O attributes .....	138
7.3.20	Local Mode Attributes .....	139
7.4	Common services .....	139
7.4.1	Supported services .....	139
7.4.2	Service specific data .....	140
7.5	Object specific services .....	141
7.5.1	Supported services .....	141
7.5.2	Service specific data .....	142
7.6	Behaviour .....	151
7.6.1	State model .....	151
7.6.2	State behaviour .....	154
7.6.3	Fault and alarm behaviour .....	157
7.6.4	Start Inhibit behaviour .....	158
7.6.5	Visualization behaviour .....	158
7.6.6	Command generation behaviour .....	163
7.6.7	Feedback Interface Behavior .....	166
7.6.8	Event Capture Behavior .....	169
7.6.9	Control Mode Behaviour .....	170
	Bibliography .....	181

Figure 1 – Structure of IEC 61800-7..... 13

Figure 2 – Open loop position control .....	23
Figure 3 – Closed loop position control .....	24
Figure 4 – Open loop velocity control .....	25
Figure 5 – Closed loop velocity control .....	25
Figure 6 – Acceleration control .....	26
Figure 7 – Torque control.....	27
Figure 8 – No control .....	28
Figure 9 – Object Model for a CIP Motion drive.....	29
Figure 10 – CIP Motion I/O connection model .....	31
Figure 11 – Controller-to-Device Connection Format.....	32
Figure 12 – Device-to-Controller Connection Format.....	33
Figure 13 – CIP Motion I/O Connection Channels .....	34
Figure 14 – CIP Motion Controller-to-Device Connection Format .....	34
Figure 15 – Connection Header .....	35
Figure 16 – Connection Format.....	35
Figure 17 – Connection Header .....	36
Figure 18 – Instance Data Block.....	37
Figure 19 – Instance Data Header .....	38
Figure 20 – Cyclic Data Header .....	38
Figure 21 – Cyclic Write Data Block.....	43
Figure 22 – Event Data Block .....	43
Figure 23 – Service Data Block.....	45
Figure 24 – CIP Motion Controller-to-Device Connection Format .....	46
Figure 25 – Connection Header .....	46
Figure 26 – Connection Header .....	47
Figure 27 – Adjustment of actual position data based on device time stamp .....	48
Figure 28 – Instance Data Block.....	48
Figure 29 – Instance Data Header .....	49
Figure 30 – Cyclic Data Block.....	49
Figure 31 – Cyclic Read Data Block.....	50
Figure 32 – Event Data Block .....	51
Figure 33 – Service Data Block.....	52
Figure 34 – Fixed Controller to Device Connection Format (fixed size = 16 bytes) .....	53
Figure 35 – Fixed Device to Controller Connection Format (fixed size = 16 bytes) .....	53
Figure 36 – CIP Motion I/O Connection timing model .....	54
Figure 37 – Controller-to-Drive Connection timing with fine interpolation.....	55
Figure 38 – Controller-to-Drive Connection timing with unequal update periods .....	57
Figure 39 – Use of Time Stamp to adjust actual position to the controller’s timebase .....	58
Figure 40 – Coordination of two drives with different Update Periods. ....	59
Figure 41 – Coordination of multiple drive axes in case of delayed Controller-to-Device Connection packets.....	60
Figure 42 – Propagation of a step change in time .....	61
Figure 43 – Group Sync of CIP Motion drives .....	64

Figure 44 – Object components for CIP motion architecture.....	66
Figure 45 – Controller Consumed Connection Data Format.....	79
Figure 46 – Controller Produced Connection Data Format .....	80
Figure 47 – Control Mode bit field .....	84
Figure 48 – IEEE per phase motor model.....	85
Figure 49 – Feedback Configuration bit field .....	97
Figure 50 – Event Checking Control word field.....	100
Figure 51 – Event Checking Status word field .....	101
Figure 52 – Interpolation Control word field.....	105
Figure 53 – Get Axis Attribute List Request Format.....	142
Figure 54 – Get Axis Attribute List Response Format.....	143
Figure 55 – Get Axis Attribute List Response – Example 1.....	144
Figure 56 – Get Axis Attribute List Response – Example 2.....	144
Figure 57 – Get Axis Attribute List Response – Example 3.....	144
Figure 58 – Get Axis Attribute List Response – Example 4.....	144
Figure 59 – Set Axis Attribute List Request Format.....	145
Figure 60 – Set Axis Attribute List Request – Example 1.....	146
Figure 61 – Set Axis Attribute List Request – Example 2.....	146
Figure 62 – Set Axis Attribute List Request – Example 3.....	146
Figure 63 – Set Axis Attribute List Response Format.....	146
Figure 64 – Set Cyclic Write List Request Format.....	147
Figure 65 – Set Cyclic Write List Response Format.....	147
Figure 66 – Set Cyclic Read List Request Format.....	148
Figure 67 – Set Cyclic Read List Response Format.....	148
Figure 68 – Motion Axis Object State Model.....	152
Figure 69 – Command Generator.....	163
Figure 70 – Feedback Channels 1 and 2.....	167
Figure 71 – Feedback Channels 3 and 4.....	168
Figure 72 – Event Capture Functionality .....	169
Figure 73 – No Control (Feedback Only).....	171
Figure 74 – Closed Loop Position Control.....	172
Figure 75 – Closed Loop Velocity Control .....	174
Figure 76 – Open Loop Frequency Control.....	176
Figure 77 – Acceleration Control.....	177
Figure 78 – Torque Control.....	178
Figure 79 – Closed Loop Current Vector Control.....	179
Table 1 – Data types.....	28
Table 2 – Objects present in a CIP Motion drive device .....	30
Table 3 – Object effect on behavior .....	30
Table 4 – Object interfaces .....	30
Table 5 – Time Data Set.....	36
Table 6 – Axis Control .....	39

Table 7 – Command Data Set .....	39
Table 8 – Command Data Element to Motion Axis Object Attribute mapping .....	40
Table 9 – Actual Data Set .....	40
Table 10 – Actual Data Element to Motion Axis Object Attribute Mapping .....	41
Table 11 – Status Data Set configuration .....	41
Table 12 – Interpolation Control .....	42
Table 13 – Axis Response .....	50
Table 14 – Event Type .....	52
Table 15 – Propagation of a step change in time (example 1) .....	61
Table 16 – Propagation of a step change in time (example 2) .....	63
Table 17 – CIP Motion visualisation components .....	65
Table 18 – Instance attribute implementation vs. Device Control Code .....	68
Table 19 – Class attributes for the Motion Axis Object .....	77
Table 20 – Node Control bit definitions .....	80
Table 21 – Node Status bit definitions .....	81
Table 22 – Node Faults code definitions .....	81
Table 23 – Node Alarms code definitions .....	82
Table 24 – Dynamic Unit vs. Feedback Configuration .....	83
Table 25 – Motion Control configuration attributes .....	83
Table 26 – Motor Control field enumeration definitions .....	84
Table 27 – Control Method field enumeration definitions .....	84
Table 28 – General Motor Info Attributes .....	86
Table 29 – General Motor Configuration Attributes .....	86
Table 30 – General PM Motor Configuration Attributes .....	89
Table 31 – General Rotary Motor Configuration Attributes .....	89
Table 32 – General Linear Motor Configuration Attributes .....	90
Table 33 – Rotary PM Motor Configuration Attributes .....	90
Table 34 – Linear PM Motor Configuration Attributes .....	91
Table 35 – Induction Motor Configuration Attributes .....	91
Table 36 – General Feedback Info Attributes .....	92
Table 37 – Feedback Configuration Attributes .....	93
Table 38 – Feedback Selection field enumeration definitions .....	98
Table 39 – Event Attributes .....	99
Table 40 – Event Checking Control bit definitions .....	100
Table 41 – Event Checking Status bit definitions .....	101
Table 42 – Command Generator Signal Attributes .....	102
Table 43 – Command Generator Configuration Attributes .....	103
Table 44 – Command Target Update enumeration definition .....	105
Table 45 – Position Loop Signal Attributes .....	106
Table 46 – Position Loop Configuration Attributes .....	107
Table 47 – Velocity Loop Signal Attributes .....	108
Table 48 – Velocity Loop Configuration Attributes .....	108
Table 49 – Acceleration Signal Attributes .....	110



Table 50 – Torque/Force Reference Signal Attributes .....	110
Table 51 – Torque/Force Reference Configuration Attributes .....	111
Table 52 – Current Loop Signal Attributes.....	112
Table 53 – Current Loop Configuration Attributes .....	114
Table 54 – Frequency Control Signal Attributes .....	114
Table 55 – Frequency Control Configuration Attributes .....	115
Table 56 – Drive Output Attributes .....	115
Table 57 – Stopping/Braking Attributes .....	116
Table 58 – Stopping Mode enumeration definitions .....	117
Table 59 – DC Bus Control Attributes .....	119
Table 60 – Power and Thermal Management Status Attributes .....	121
Table 61 – Power and Thermal Management Configuration Attributes.....	122
Table 62 – Axis Status Attributes .....	123
Table 63 – Axis Status bit definitions .....	124
Table 64 – Axis I/O Status bit definitions.....	124
Table 65 –Status Data Set bit definitions .....	125
Table 66 – Exception, Fault and Alarm Status Attributes.....	126
Table 67 – Standard Exception Table .....	129
Table 68 – Exception Factory Limit Info Attributes .....	131
Table 69 – Exception User Limit Configuration Attributes .....	132
Table 70 – Exception Action Configuration Attribute.....	133
Table 71 – Exception Action Bit Definitions.....	133
Table 72 – Initialisation Fault Status Attributes .....	134
Table 73 – Standard Initialisation Fault Table .....	136
Table 74 – Start Inhibit Status Attributes.....	136
Table 75 – Standard Start Inhibit Table.....	137
Table 76 –Statistical Attributes .....	137
Table 77 – Axis Info Attributes .....	138
Table 78 – General Purpose I/O Attributes.....	138
Table 79 – Local Mode Configuration Attributes .....	139
Table 80 – Motion Axis Object – Common Services .....	139
Table 81 – Group_Sync Request Data Structure .....	140
Table 82 – Group_Sync Response Data Structure .....	140
Table 83 – Motion Axis Object – Object Specific Services.....	141
Table 84 – Run Motor Test Request Data Structure .....	149
Table 85 – Get Motor Test Response Data Structure .....	149
Table 86 – Run Inertia Test Request Data Structure .....	150
Table 87 – Get Inertia Test Response Data Structure .....	150
Table 88 – Run Hookup Test Request Data Structure .....	151
Table 89 – Get Hookup Test Response Data Structure .....	151
Table 90 – Axis Control Request Code .....	152
Table 91 – Axis Response Acknowledge Codes .....	153
Table 92 – Completion Criteria for Requested Operation .....	153

Table 93 – Successful Axis Control Request Cycle ..... 154  
Table 94 – Unsuccessful Axis Control Request Cycle ..... 154  
Table 95 – Axis State Mapping to Identity Object with LED Behavior ..... 159  
Table 96 – CIP Motion Device Seven-Segment Display Behavior ..... 160  
Table 97 – CIP Motion Multi-Character Alphanumeric Display Behavior ..... 161  
Table 98 – Multi-Axis Multi-Character Alphanumeric Display Behavior ..... 162

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**ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –****Part 7-202: Generic interface and use  
of profiles for power drive systems –  
Profile type 2 specification**

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## INTRODUCTION

The IEC 61800 series is intended to provide a common set of specifications for adjustable speed electrical power drive systems.

IEC 61800-7 describes a generic interface between control systems and power drive systems. This interface can be embedded in the control system. The control system itself can also be located in the drive (sometimes known as "smart drive" or "intelligent drive").

A variety of physical interfaces is available (analogue and digital inputs and outputs, serial and parallel interfaces, fieldbuses and networks). Profiles based on specific physical interfaces are already defined for some application areas (e.g. motion control) and some device classes (e.g. standard drives, positioner). The implementations of the associated drivers and application programmers interfaces are proprietary and vary widely.

IEC 61800-7 defines a set of common drive control functions, parameters, and state machines or description of sequences of operation to be mapped to the profiles.

IEC 61800-7 provides a way to access functions and data of a drive that is independent of the used drive profile and communication interface. The objective is a common drive model with generic functions and objects suitable to be mapped on different communication interfaces. This makes it possible to provide common implementations of motion control (or velocity control or drive control applications) in controllers without any specific knowledge of the drive implementation.

There are several reasons to define a generic interface.

### **For a drive device manufacturer**

- Less effort to support system integrators
- Less effort to describe drive functions because of common terminology
- The selection of drives does not depend on availability of specific support

### **For a control device manufacturer**

- No influence of bus technology
- Easy device integration
- Independent of a drive supplier

### **For a system integrator (builds modules, machines, plants etc.)**

- Less integration effort for devices
- Only one understandable way of modeling
- Independent of bus technology

Much effort is needed to design a motion control application with several different drives and a specific control system. The tasks to implement the system software and to understand the functional description of the individual components may exhaust the project resources. In some cases, the drives do not share the same physical interface. Some control devices just support a single interface which will not be supported by a specific drive. On the other hand, the functions and data structures are specified with incompatibilities. It is up to the systems integrator to write interfaces to the application software to handle that which should not be his responsibility.

Some applications need device exchangeability or integration of new devices in an existing configuration. They are faced with different incompatible solutions. The efforts to adopt a solution to a drive profile and to manufacturer specific extensions may be unacceptable. This will reduce the degree of freedom to select a device best suited for this application to the selection of the unit which will be available for a specific physical interface and supported by the controller.

IEC 61800-7-1 is divided into a generic part and several annexes as shown in Figure 1. The drive profile types for CiA 402<sup>1</sup>, CIP Motion<sup>TM2</sup>, PROFIdrive<sup>3</sup> and SERCOS Interface<sup>TM4</sup> are mapped to the generic interface in the corresponding annex. The annexes have been submitted by open international network or fieldbus organizations which are responsible for the content of the related annex and use of the related trademarks.

This part of IEC 61800-7 specifies the profile type 2 (CIP Motion<sup>TM</sup>).

The profile types 1, 3 and 4 are specified in IEC 61800-7-201, IEC 61800-7-203 and IEC 61800-7-204.

IEC 61800-7-301, IEC 61800-7-302, IEC 61800-7-303 and IEC 61800-7-304 specify how the profile types 1, 2, 3 and 4 are mapped to different network technologies (such as CANopen<sup>5</sup>, EtherCAT<sup>TM6</sup>, Ethernet Powerlink<sup>TM7</sup>, DeviceNet<sup>TM8</sup>, ControlNet<sup>TM9</sup>, EtherNet/IP<sup>TM10</sup>, PROFIBUS<sup>11</sup>, PROFINET<sup>12</sup> and SERCOS Interface).

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<sup>5</sup> CANopen is an acronym for Controller Area Network open and is used to refer to EN 50325-4.

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