

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Adjustable speed electrical power drive systems –  
Part 7-1: Generic interface and use of profiles for power drive systems –  
Interface definition**

**Entraînements électriques de puissance à vitesse variable –  
Partie 7-1: Interface générique et utilisation de profils pour les entraînements  
électriques de puissance – Définition de l'interface**

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## CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	12
2 Normative references.....	12
3 Terms, definitions and abbreviated terms.....	13
3.1 Preamble.....	13
3.2 General definitions.....	13
3.3 Specific definitions.....	17
3.3.1 Common definitions.....	17
3.3.2 Definitions for Annex A.....	17
3.3.3 Definitions for Annex B.....	18
3.3.4 Definitions for Annex C.....	19
3.3.5 Definitions for Annex D.....	20
3.4 Abbreviated terms.....	22
3.4.1 Common abbreviations.....	22
3.4.2 Abbreviations for Annex A.....	22
3.4.3 Abbreviations for Annex B.....	22
3.4.4 Abbreviations for Annex C.....	22
3.4.5 Abbreviations for Annex D.....	22
3.5 Conventions.....	23
4 General architecture.....	23
4.1 Generic PDS interface.....	23
4.2 Typical structure of automation systems.....	27
4.3 Structure of the logical PDS.....	28
4.4 Use cases of the PDS.....	30
4.4.1 General.....	30
4.4.2 Use case engineering.....	31
4.4.3 Use case operation-control.....	31
5 Functional elements.....	32
5.1 Device identification FE.....	32
5.1.1 General.....	32
5.1.2 Parameters.....	32
5.2 Device Control FE.....	33
5.2.1 General.....	33
5.2.2 I/O data.....	33
5.2.3 States.....	34
5.2.4 Parameters.....	35
5.3 Communication FE.....	35
5.3.1 General.....	35
5.3.2 I/O data.....	36
5.3.3 States.....	36
5.3.4 Parameters.....	38
5.4 Basic drive FE.....	38
5.4.1 General.....	38
5.4.2 I/O data.....	39

5.4.3	States .....	40
5.4.4	Parameters .....	41
5.5	Optional application FE .....	42
6	Application modes .....	42
6.1	General .....	42
6.2	Torque control .....	43
6.3	Velocity control .....	44
6.4	Position control .....	45
7	Profile specific extensions .....	46
8	Structure for annexes .....	46
8.1	General .....	46
8.2	Structure of the annexes .....	47
Annex A (normative) Mapping to Profile CiA 402 drive and motion control .....		50
Annex B (normative) Mapping to profile CIP Motion™ .....		62
Annex C (normative) Mapping to profile PROFIdrive .....		74
Annex D (normative) Mapping to Profile SERCOS .....		87
Bibliography .....		100
Figure 1 – Structure of IEC 61800-7 .....		11
Figure 2 – Definition of power drive system .....		23
Figure 3 – Example of system structures for position-control applications .....		24
Figure 4 – Examples of system structures for velocity-control applications .....		25
Figure 5 – Examples of system structures for torque-control applications .....		26
Figure 6 – Typical structure of automation systems (adapted from IEC/TR 62390) .....		27
Figure 7 – Structure of the PDS with functional elements .....		29
Figure 8 – Functional Elements (FE) in the logical PDS .....		30
Figure 9 – Use case for the generic PDS interface .....		31
Figure 10 – The generic interface in the use case operation .....		32
Figure 11 – Device control FE state-chart diagram .....		34
Figure 12 – Device control FE state transition table .....		35
Figure 13 – Communication FE state-chart diagram .....		37
Figure 14 – Communication FE state transition table .....		37
Figure 15 – Optional communication FE state-chart diagram .....		38
Figure 16 – Optional communication FE state transition table .....		38
Figure 17 – Basic drive FE state-chart diagram .....		40
Figure 18 – Basic drive FE state transition table .....		40
Figure 19 – Optional basic drive FE state-chart diagram .....		41
Figure 20 – Optional basic drive FE state transition table .....		41
Figure 21 – Torque control application mode .....		43
Figure 22 – Torque control with velocity feedback application mode .....		43
Figure 23 – Velocity preset application mode .....		44
Figure 24 – Velocity control application mode .....		44

Figure 25 – Velocity control with position feedback application mode.....	45
Figure 26 – Position preset application mode.....	45
Figure 27 – Position control application mode.....	46
Figure A.1 – CiA 402 logical power drive system model.....	51
Figure B.1 – Object structure of the logical PDS.....	63
Figure B.2 – Object structure of the logical PDS.....	63
Figure B.3 – Motion Axis Object state machine.....	66
Figure C.1 – Overview of communication devices and services in PROFIdrive.....	75
Figure C.2 – Structure of the PROFIdrive device.....	76
Figure C.3 – PROFIdrive Axis type Drive Object.....	77
Figure C.4 – Functional block diagram of the PROFIdrive Axis type DO.....	78
Figure C.5 – Mapping of communication FE states.....	81
Figure D.1 – Topology example.....	88
Figure D.2 – State machine of Basic Drive FE.....	93
Table 1 – Structures within the scope of this part of IEC 61800-7.....	27
Table 2 – Parameters in the device identification FE.....	33
Table 3 – Status values for the device control FE.....	34
Table 4 – Command values for the device control FE.....	34
Table 5 – Parameters in the device control FE.....	35
Table 6 – Status values for the communication FE (see Figure 13).....	36
Table 7 – Command values for the communication FE (see Figure 13).....	36
Table 8 – Status values for the optional communication FE (see Figure 15).....	36
Table 9 – Command values for the optional communication FE (see Figure 15).....	36
Table 10 – Status values of the basic drive FE.....	39
Table 11 – Optional status values for the basic drive FE.....	39
Table 12 – Command values for basic drive FE.....	39
Table 13 – Optional command values for the basic drive FE.....	40
Table 14 – Possible generic application modes.....	42
Table 15 – Set-point values for generic application modes.....	42
Table 16 – Mapping of names to profiles.....	46
Table 17 – Structure of annexes.....	47
Table 18 – Profile specific terms.....	48
Table 19 – Supported application modes.....	48
Table 20 – I/O data for profile torque mode.....	48
Table 21 – I/O data for profile velocity mode.....	49
Table 22 – I/O data for profile position mode.....	49
Table A.1 – Profile specific terms.....	50
Table A.2 – Drive device identification parameters.....	52
Table A.3 – Status values for the device control FE.....	52
Table A.4 – Command values for the device control FE.....	52
Table A.5 – Parameters in the device control FE.....	53
Table A.6 – Status values for the communication FE.....	53

Table A.7 – Command values for the communication FE.....	53
Table A.8 – Status values for the basic drive FE.....	54
Table A.9 – Command values for the basic drive FE.....	54
Table A.10 – Basic drive FE parameters.....	55
Table A.11 – Optional application functions FE parameters.....	55
Table A.12 – Supported application modes.....	56
Table A.13 – I/O data for profile torque mode.....	56
Table A.14 – Parameter for profile torque mode.....	56
Table A.15 – I/O data for cyclic sync torque mode.....	57
Table A.16 – Parameter for cyclic sync torque mode.....	57
Table A.17 – I/O data for velocity mode.....	57
Table A.18 – Parameter for velocity mode.....	57
Table A.19 – I/O data for profile velocity mode.....	58
Table A.20 – Parameter for profile velocity mode.....	58
Table A.21 – I/O data for cyclic sync velocity mode.....	58
Table A.22 – Parameter for cyclic sync velocity mode.....	58
Table A.23 – I/O data for profile position mode.....	59
Table A.24 – Parameter for profile position mode.....	59
Table A.25 – I/O data for interpolated position mode.....	60
Table A.26 – Parameter for interpolated position mode.....	60
Table A.27 – I/O data for cyclic sync position mode.....	60
Table A.28 – Parameter for cyclic sync position mode.....	61
Table B.1 – Profile specific terms.....	62
Table B.2 – Mapping of parameters for the device identification FE.....	65
Table B.3 – Mapping of status values for the device control FE.....	65
Table B.4 – Mapping of command values for the device control FE.....	65
Table B.5 – Mapping of parameters for the device control FE.....	67
Table B.6 – Mapping of status values for the communication FE.....	67
Table B.7 – Mapping of command values for the communication FE.....	68
Table B.8 – Mapping of status values for the optional communication FE.....	68
Table B.9 – Mapping of command values for the optional communication FE.....	68
Table B.10 – Status values for the basic drive FE.....	69
Table B.11 – Command values for the basic drive FE.....	69
Table B.12 – Drive Control Mode values for the basic drive FE.....	69
Table B.13 – Command Data Set values for the basic drive FE.....	70
Table B.14 – Actual Data Set values for the basic drive FE.....	70
Table B.15 – Status Data Set values for the basic drive FE.....	71
Table B.16 – Supported application modes.....	72
Table B.17 – Set-point values for the generic application modes.....	72
Table B.18 – I/O data for profile torque mode.....	72
Table B.19 – I/O data for profile velocity mode.....	73
Table B.20 – I/O data for profile position mode.....	73
Table C.1 – Profile specific terms.....	74

Table C.2 – Parameters for device identification .....	79
Table C.3 – Status values for the device control FE .....	80
Table C.4 – Command values for the device control FE .....	80
Table C.5 – Device control parameters .....	80
Table C.6 – Status values of the basic drive FE .....	82
Table C.7 – Command values of the basic drive FE .....	82
Table C.8 – Status values for the optional basic drive FE .....	83
Table C.9 – Command values for the optional basic drive FE .....	83
Table C.10 – Device control parameters .....	83
Table C.11 – Supported application modes .....	84
Table C.12 – I/O data for profile velocity mode .....	85
Table C.13 – I/O data for profile velocity control mode with position feedback .....	85
Table C.14 – I/O data for profile velocity control mode (process technology) .....	86
Table C.15 – I/O data for profile position preset .....	86
Table C.16 – I/O data for profile position mode .....	86
Table D.1 – Profile specific terms .....	87
Table D.2 – Device identification parameters .....	90
Table D.3 – Status values for the device control FE .....	90
Table D.4 – Command values for the device control FE .....	91
Table D.5 – Parameters for the device control FE .....	91
Table D.6 – Status values for the basic drive and communication FE .....	93
Table D.7 – Command values for the basic drive and communication FE .....	94
Table D.8 – IDN for operation modes .....	94
Table D.9 – Supported application modes .....	95
Table D.10 – Additional application modes .....	96
Table D.11 – I/O data for profile torque mode .....	96
Table D.12 – Configuration data for torque control .....	96
Table D.13 – I/O data for profile velocity mode .....	97
Table D.14 – Configuration data for velocity control .....	97
Table D.15 – I/O data for profile position mode .....	98
Table D.16 – Configuration data for position control .....	98



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**ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –****Part 7-1: Generic interface and use of profiles  
for power drive systems –  
Interface definition**

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Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61800 series, under the general title *Adjustable speed electrical power drive systems*, can be found on the IEC website.

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WITHDRAWN

## 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 drive 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**

- 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 often specified with incompatibilities. This requires the system integrator to write special interfaces for the application software and this 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.

This part of IEC 61800-7 is divided into a generic part and several annexes as shown in Figure 1. The drive profiles 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.

The different profile types 1, 2, 3 and 4 are specified in IEC 61800-7-201, IEC 61800-7-202, 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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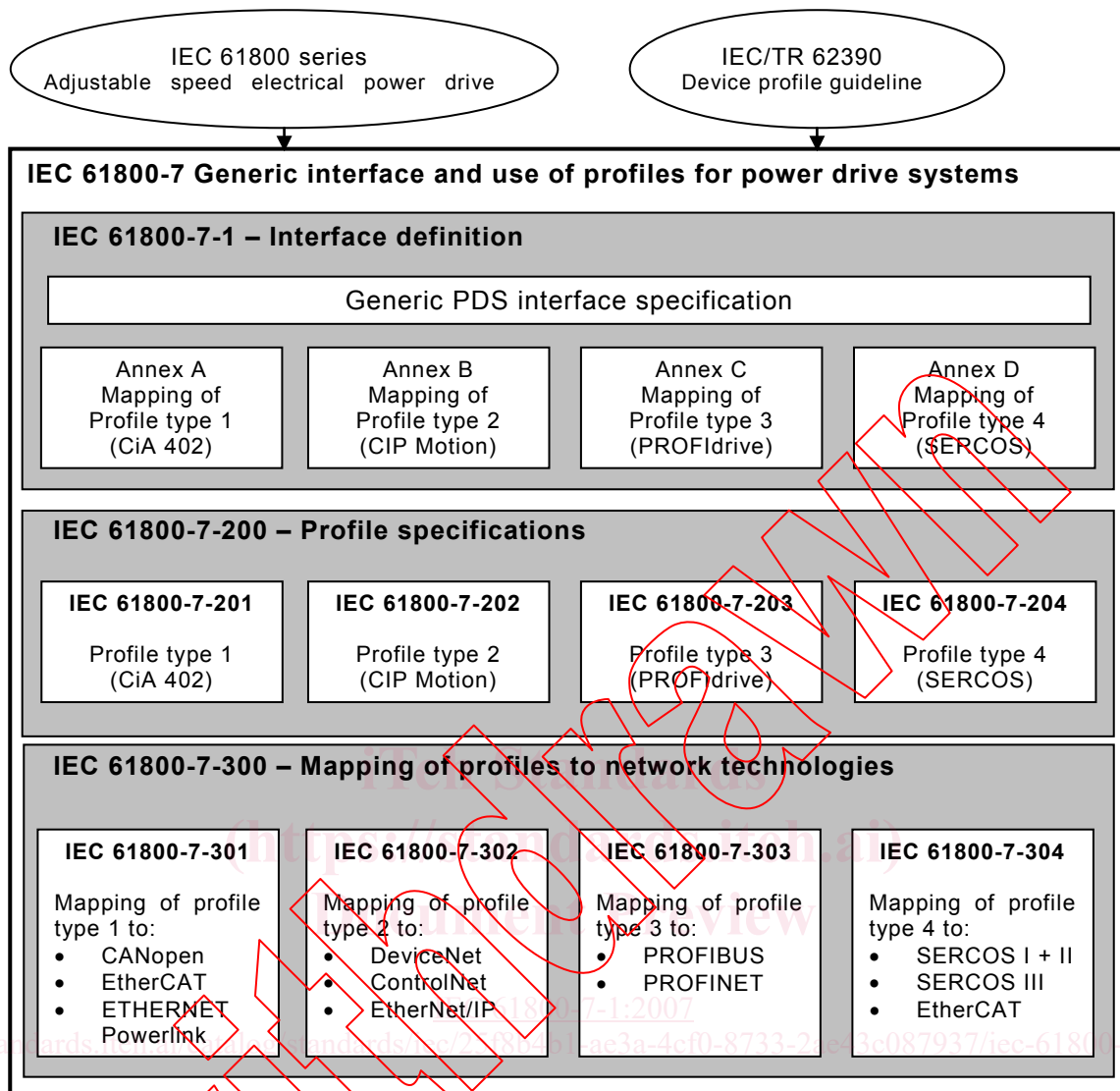


Figure 1 – Structure of IEC 61800-7

## ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

### Part 7-1: Generic interface and use of profiles for power drive systems – Interface definition

#### 1 Scope

IEC 61800-7 specifies profiles for power drive systems (PDS) and their mapping to existing communication systems by use of a generic interface model.

The functions specified in this part of IEC 61800-7 are not intended to ensure functional safety. This requires additional measures according to the relevant standards, agreements and laws.

This part of IEC 61800-7 specifies a generic interface between power drive system(s) (PDS) and the application control program in a controller. The generic PDS interface is not specific to any particular communication network technology. Annexes of this part of IEC 61800-7 specify the mapping of the different drive profiles types onto the generic PDS interface.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61158-5-2, *Industrial communication networks – Fieldbus specifications – Part 5-2: Application layer service definition – Type 2 elements*

IEC 61158-5-3, *Industrial communication networks – Fieldbus specifications – Part 5-3: Application layer service definition – Type 3 elements*

IEC 61158-5-10, *Industrial communication networks – Fieldbus specifications – Part 5-10: Application layer service definition – Type 10 elements*

IEC 61158-6-2, *Industrial communication networks – Fieldbus specifications – Part 6-2: Application layer protocol specification – Type 2 elements*

IEC 61158-6-3, *Industrial communication networks – Fieldbus specifications – Part 6-3: Application layer protocol specification – Type 3 elements*

IEC 61158-6-10, *Industrial communication networks – Fieldbus specifications – Part 6-10: Application layer protocol specification – Type 10 elements*

IEC 61800-7 (all parts), *Adjustable speed electrical power drive systems – Generic interface and use of profiles for power drive systems*

IEC 61800-7-1, *Adjustable speed electrical power drive systems – Part 7-1: Generic interface and use of profiles for power drive systems – Interface definition*

IEC 61800-7-201, *Adjustable speed electrical power drive systems – Part 7-201: Generic interface and use of profiles for power drive systems – Profile type 1 specification*