



INTERNATIONAL STANDARD

**Adjustable speed electrical power drive systems –
Part 7-303: Generic interface and use of profiles for power drive systems –
Mapping of profile type 3 to network technologies**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE **XD**

CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	12
2 Normative references	12
3 Terms, definitions and abbreviated terms	13
3.1 Terms and definitions	13
3.2 Abbreviated terms	16
4 Mapping to PROFIBUS DP.....	17
4.1 General.....	19
4.2 Mapping to PROFIBUS data types.....	19
4.3 Base Model at PROFIBUS DP	19
4.3.1 Communication Devices	19
4.3.2 Communication Relationship	20
4.3.3 Communication Network.....	21
4.3.4 Communication Services	22
4.3.5 P-Device Communication Model	24
4.3.6 Base Model State Machine	25
4.3.7 Definition of the CO	26
4.4 Drive Model at PROFIBUS DP.....	26
4.4.1 P-Device	26
4.4.2 Drive Unit	27
4.5 DO IO Data	27
4.5.1 COs for DO IO Data configuration	27
4.5.2 Standard telegram configuration.....	28
4.5.3 Cyclic Data exchange between DP-Slaves (DXB).....	30
4.6 Parameter Access	39
4.6.1 PAP for Parameter Access	39
4.6.2 Definition of the Base Mode Parameter Access mechanism.....	40
4.7 P-Device Configuration.....	46
4.7.1 P-Device Configuration on PROFIBUS DP.....	46
4.7.2 Drive Unit Configuration on PROFIBUS DP	47
4.7.3 Getting the Drive Object – ID (DO-ID).....	49
4.8 Alarm Mechanism.....	51
4.9 Clock Synchronous Operation	51
4.9.1 Sequence of an isochronous DP cycle.....	51
4.9.2 Time settings.....	52
4.9.3 Running-up, cyclic operation	57
4.9.4 Parameterisation, configuring (Set_Prm, GSD).....	68
4.9.5 Clock cycle generation (Global Control) and clock cycle save.....	69
4.9.6 Monitoring mechanisms.....	73
4.10 PROFIBUS DP specific Parameter	75
4.10.1 Overview of the communication interface related parameters	75
4.10.2 Definition of the specific parameters.....	75
4.11 Specified communication functions for the Application Classes	76
5 Mapping to PROFINET IO	77

5.1	General	77
5.2	Mapping to PROFINET IO data types	77
5.3	Base Model at PROFINET IO	77
5.3.1	Communication Devices	77
5.3.2	Communication Relationship	78
5.3.3	Communication Network	79
5.3.4	Communication Services	80
5.3.5	P-Device Communication Model	81
5.3.6	Base Model State Machine	83
5.3.7	Definition of the CO	84
5.4	Drive Model at PROFINET IO	84
5.4.1	P-Device	84
5.4.2	Drive Unit	85
5.4.3	DO Architecture	85
5.4.4	Definition of the Module Ident Number and API	87
5.4.5	Definition of the Submodule Ident Number	87
5.5	DO IO Data	88
5.5.1	COs for DO IO Data configuration	88
5.5.2	IO Data Producer and Consumer Status	89
5.6	Parameter Access	89
5.6.1	PAPs for Parameter Access	89
5.6.2	Base Mode Parameter Access	90
5.7	P-Device Configuration	92
5.7.1	P-Device Configuration on PROFINET IO	92
5.7.2	Drive Unit Configuration on PROFINET IO	93
5.7.3	Getting the Drive Object – D (DO-ID)	93
5.8	Alarm Mechanism	94
5.8.1	Use of the Diagnostic Objects	94
5.8.2	Use of the Alarm Mechanism	94
5.8.3	Use of the ChannelDiagnosisData Structure	95
5.8.4	Use of the ChannelErrorType	96
5.8.5	On demand access of Diagnosis Information	97
5.9	Clock Synchronous Operation	97
5.10	PROFINET IO specific Parameter	99
5.10.1	Overview about the communication interface related Parameters	99
5.10.2	Definition of the specific parameters	99
5.11	Specified communication functions for the Application Classes	100
	Bibliography	102
	Figure 1 – Structure of IEC 61800-7	11
	Figure 2 – PROFIBUS DP Devices in a PROFIdrive drive system	20
	Figure 3 – PROFIdrive Devices and their Relationship for PROFIBUS DP	21
	Figure 4 – General Communication Model for PROFIdrive at PROFIBUS DP	22
	Figure 5 – PROFIBUS DP DXB communication designations	23
	Figure 6 – Synchronous communication for PROFIdrive at PROFIBUS DP	24
	Figure 7 – Overview about the P-Device Communication Model on PROFIBUS	24
	Figure 8 – Mapping of the Base Model State Machine at PROFIBUS DP	26

Figure 9 – PROFIBUS DP specific Logical P-Device model (multi axis drive)	26
Figure 10 – Mapping of PROFIBUS Slot to the PROFIdrive DO	27
Figure 11 – Application example of DXB communication	32
Figure 12 – Dataflow inside a Homogeneous P-Device with DXB relations	35
Figure 13 – Structure of a DXB Subscriber table (inside a Prm-Block)	36
Figure 14 – Timing diagram of PROFIBUS with slave-to-slave communication	37
Figure 15 – PAP and Parameter Access mechanism for a PROFIBUS homogeneous P-Device	39
Figure 16 – PAP and Parameter Access mechanism for a PROFIBUS heterogeneous P-Device	40
Figure 17 – Telegram sequence via MS1 AR or MS2 AR	41
Figure 18 – Drive Unit Structure	48
Figure 19 – Configuration and communication channels for the Modular Drive Unit type at PROFIBUS DP	49
Figure 20 – Meaning of parameter P978 (list of all DO-Ids) for the DU at PROFIBUS DP 50	
Figure 21 – Example of P978 for a complex Modular Drive Unit at PROFIBUS DP	51
Figure 22 – Sequence of an isochronous DP cycle	52
Figure 23 – Time settings	53
Figure 24 – Example: Simplest DP cycle	55
Figure 25 – Example: Optimised DP cycle	56
Figure 26 – Example: Optimised DP cycle ($T_{MAPC} = 2 \cdot T_{DP}$)	57
Figure 27 – Running-up (sequence with respect to time)	58
Figure 28 – Phase 1: Slave parameterisation configuration	59
Figure 29 – Phase 2: Synchronization of the PLL to the Clock Global Control	60
Figure 30 – Phase 3: Synchronization of the slave application with the master's Sign-Of-Life	62
Figure 31 – State diagram of phases 2 and 3 of the run-up	63
Figure 32 – Phase 4: Synchronization of the master application to the slave's Sign-Of-Life 64	
Figure 33 – Example: Running-up to cyclic operation (Phase 1) ($T_{MAPC}/T_{DP} = 2/1$)	65
Figure 34 – Example: Running-up to cyclic operation (Phase 2) ($T_{MAPC}/T_{DP} = 2/1$)	65
Figure 35 – Example: Running-up to cyclic operation (Phase 3) ($T_{MAPC}/T_{DP} = 2/1$)	66
Figure 36 – Example: Running-up to cyclic operation (Phase 4) ($T_{MAPC}/T_{DP} = 2/1$)	67
Figure 37 – Example: Running-up to cyclic operation (Phase 5) ($T_{MAPC}/T_{DP} = 2/1$)	67
Figure 38 – PLL for clock save in the slave	71
Figure 39 – Run time compensation	73
Figure 40 – DP cycle violation	74
Figure 41 – Example: Clock failure (fault after 4 DP cycles)	74
Figure 42 – PROFINET IO Devices in a PROFIdrive drive system	78
Figure 43 – PROFIdrive Devices and their Relationship for PROFINET IO	79
Figure 44 – General Communication Model for PROFIdrive at PROFINET IO	80
Figure 45 – Synchronous communication for PROFIdrive at PROFINET IO	81
Figure 46 – Overview about the P-Device Communication Model on PROFINET IO	81
Figure 47 – Contents of IO AR and Supervisor AR	82

Figure 48 – M CR used for Cyclic Data Exchange between P-Devices	83
Figure 49 – Mapping of the Base Model State Machine at PROFINET IO	84
Figure 50 – PROFINET IO specific Logical P-Device model (multi axis drive)	85
Figure 51 – Representation of the PROFIdrive DO by PROFINET IO Submodules (CO).....	86
Figure 52 – Hierarchical model of the P-Device on PROFINET IO.....	87
Figure 53 – Modularity of the DO IO Data block (example).....	89
Figure 54 – Data flow for request and response for the Base Mode Parameter Access	92
Figure 55 – Configuration and communication channels for the Modular Drive Unit type at PROFINET IO	93
Figure 56 – Meaning of parameter P978 "list of all DO-IDs" for the DU at PROFINET IO	94
Figure 57— Generation of Diagnosis Data according to the fault classes mechanism	96
Figure 58 – Sequence of an isochronous Data Cycle	98
Table 1 – Mapping of data types	19
Table 2 – DP IDs and PROFIdrive IDs of the standard telegrams	28
Table 3 – 1 Drive Axis, standard telegram 3.....	29
Table 4 – 2 Drive Axes, standard telegram 3.....	30
Table 5 – 2 Drive Axes, standard telegram 3, per axis one D, B link each with 2 words	30
Table 6 – 1 Drive Axis, standard telegram 20.....	30
Table 7 – Slave No.11 (Publisher)	33
Table 8 – Slave No.12 (Publisher and Subscriber)	33
Table 9 – Configuration of the DXB communication link of the coating drive	34
Table 10 – Slave No.10 (Subscriber)	34
Table 11 – Configuration of the DXB communication links of the unwinder.....	34
Table 12 – Parameters (Set_Prm, GSD) for slave-to-slave communication (Data- eXchange Broadcast).....	38
Table 13 – Services used for Parameter Access on PROFIBUS DP	41
Table 14 – Defined PAPs for Parameter Access	41
Table 15 – State machine for DP-slave processing	42
Table 16 – MS1/MS2 AR telegram frame, Write request.....	42
Table 17 – MS1/MS2 AF telegram frame, Write response	43
Table 18 – MS1/MS2 AR telegram frame, Read request	43
Table 19 – MS1/MS2 AR telegram frame, Read response.....	43
Table 20 – Process data ASE telegram frame, Error response	44
Table 21 – Allocation of Error class and code for PROFIdrive	44
Table 22 – Data block lengths.....	45
Table 23 – Limits due to the Process data ASE data block length	46
Table 24 – GSD parameters for the MS1/MS2 AR services	46
Table 25 – DP Services for Running-up, cyclic operation	57
Table 26 – Parameters (Set_Prm, GSD) for "Clock Cycle Synchronous Drive Interface"	68
Table 27 – Possible synchronization type combinations	69
Table 28 – Conditions for Isochronous Mode	70
Table 29 – Input signals of the PLL.....	71
Table 30 – Output signals of the PLL	72

Table 31 – Overview of the specific PROFIBUS DP parameters for “Communication system interfaces”	75
Table 32 – PROFIdrive Specific Parameter listed by number	75
Table 33 – Coding of the baud rate in Parameter 963	76
Table 34 – Specified communication functions for the Application Classes	76
Table 35 – Mapping of data types	77
Table 36 – Structure of the Submodule-ID	88
Table 37 – Definition of Submodule-Type Classes	88
Table 38 – Definition of Parameter Access Modes (PAP)	90
Table 39 – Use of the AlarmNotification-PDU	95
Table 40 – Use of ChannelDiagnosisData	95
Table 41 – Use of ChannelErrorType	96
Table 42 – Use of the DiagnosisData	97
Table 43 – Overview of the specific PROFINET IO parameters for “Communication system interfaces”	99
Table 44 – PROFIdrive Specific Parameter listed by number	99
Table 45 – Specified communication functions for the Application Classes	101

Currently in preview, click buy full version.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –**Part 7-303: Generic interface and use
of profiles for power drive systems –
Mapping of profile type 3 to network technologies**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the following:

Publication / Application serial number	Holder	Title	Derwent accession Number	Derwent publication
EP844542	[SI]	Numerical control method and control structure for controlling of movement of objects whereby speed control is effected at a higher rate than position control	1998-274369	EP844542-A1 27.05.1998; DE59603496-G 02.12.1999; EP844542-B1 27.10.1999

The IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from

[SI]	Siemens AG Corporate Intellectual Property Licensing & Transactions Otto-Hahn-Ring 6 81730 Munich Germany
------	--

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC shall not be held responsible for identifying any or all such patent rights.

The International Standard IEC 61800-7-303 has been prepared by subcommittee SC 22G: Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC technical committee TC 22: Power electronic systems and equipment.

The text of this standard is based on the following documents:

FDIS	Report on voting
22G/185/FDIS	22G/193/RVD

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

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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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.

IEC 61800-7-1 is divided into a generic part and several annexes as shown in Figure 1. The drive profile types for CiA 402¹, CIP Motion^{TM2}, PROFIdrive³ and SERCOS interface^{TM4} 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.

This part of IEC 61800-7 specifies how the profile type 3 (PROFIdrive) is mapped to the network technologies PROFIBUS⁵ and PROFINET⁶.

IEC 61800-7-301, IEC 61800-7-302 and IEC 61800-7-304 specify how the profile types 1, 2 and 4 are mapped to different network technologies (such as CANopen⁷, EtherCAT^{TM8}, Ethernet Powerlink^{TM9}, DeviceNet^{TM10}, ControlNet^{TM11}, EtherNet/IP^{TM12}, and SERCOS interface).

-
- 1 CiA 402 is a trade name of CAN in Automation, e.V. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this profile does not require use of the trade name CiA 402.
 - 2 CIP MotionTM is a trade name of Open DeviceNet Vendor Association, Inc. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name CIP MotionTM. Use of the trade name CIP MotionTM requires permission of Open DeviceNet Vendor Association, Inc.
 - 3 PROFIdrive is a trade name of PROFIBUS International. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this profile does not require use of the trade name PROFIdrive. Use of the trade name PROFIdrive requires permission of PROFIBUS International.
 - 4 SERCOSTM and SERCOS interfaceTM are trade names of SECCO International e.V. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this profile does not require use of the trade name SERCOS and SERCOS interface. Use of the trade name SERCOS and SERCOS interface requires permission of the trade name holder.
 - 5 PROFIBUS is a trade name of PROFIBUS International. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this profile does not require use of the trade name PROFIBUS. Use of the trade name PROFIBUS requires permission of PROFIBUS International.
 - 6 PROFINET is a trade name of PROFIBUS International. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this profile does not require use of the trade name PROFINET. Use of the trade name PROFINET requires permission of PROFIBUS International.
 - 7 CANopen is an acronym for Controller Area Network *open* and is used to refer to EN 50325-4.
 - 8 EtherCATTM is a trade name of Beckhoff, Verl. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name EtherCATTM. Use of the trade name EtherCATTM requires permission of the trade name holder.
 - 9 Ethernet PowerlinkTM is a trade name of B&R, control of trade name use is given to the non profit organization EPSG. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name Ethernet PowerlinkTM. Use of the trade name Ethernet PowerlinkTM requires permission of the trade name holder.
 - 10 DeviceNetTM is a trade name of Open DeviceNet Vendor Association, Inc. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name DeviceNetTM. Use of the trade name DeviceNetTM requires permission of Open DeviceNet Vendor Association, Inc.
 - 11 ControlNetTM is a trade name of ControlNet International, Ltd. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name ControlNetTM. Use of the trade name ControlNetTM requires permission of ControlNet International, Ltd.
 - 12 EtherNet/IPTM is a trade name of ControlNet International, Ltd. and Open DeviceNet Vendor Association, Inc. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name EtherNet/IPTM. Use of the trade name EtherNet/IPTM requires permission of either ControlNet International, Ltd. or Open DeviceNet Vendor Association, Inc.

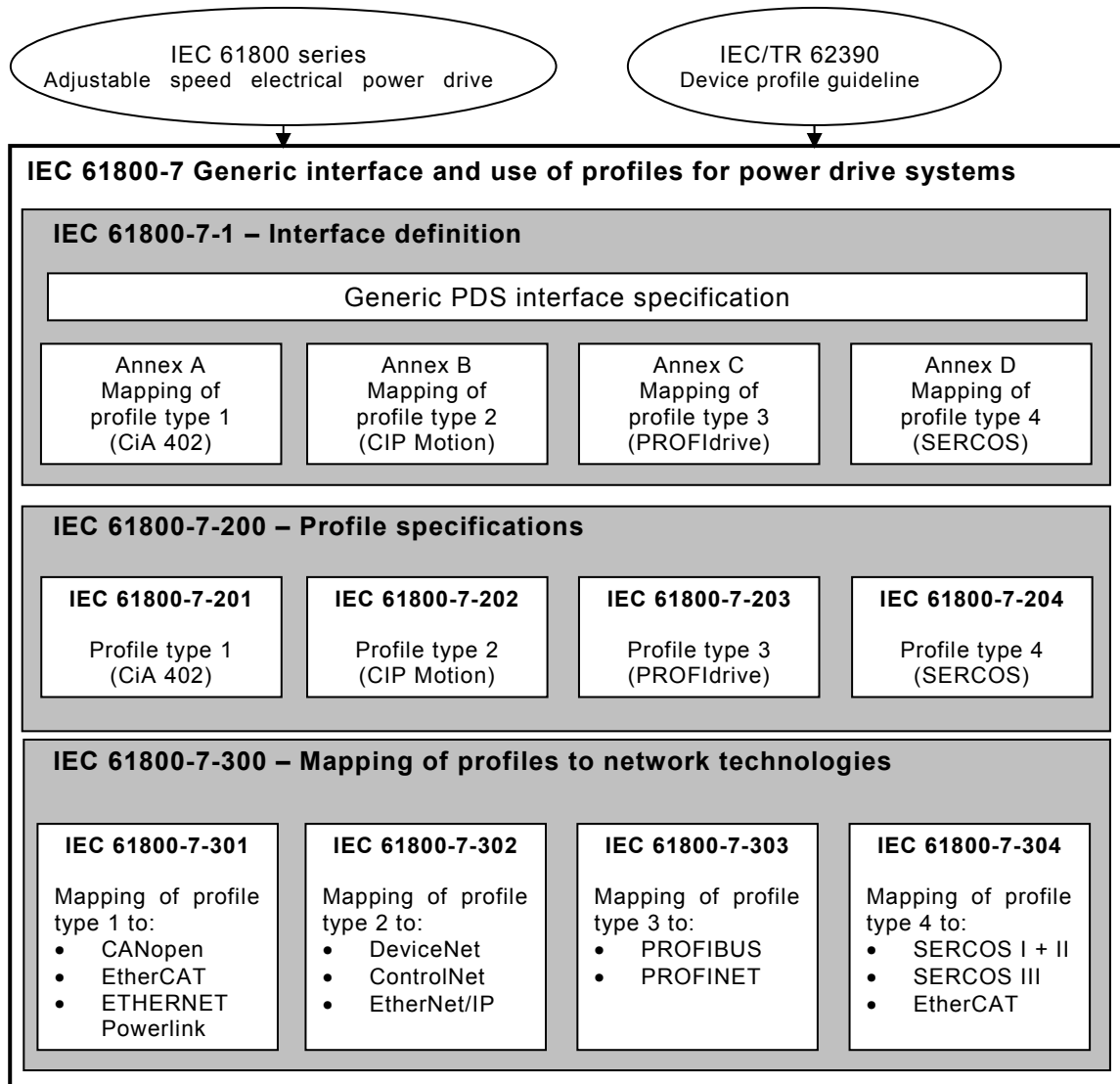


Figure 1 – Structure of IEC 61800-7

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 7-303: Generic interface and use of profiles for power drive systems – Mapping of profile type 3 to network technologies

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 how the profile type 3 (PROFIdrive) specified in IEC 61800-7-203 onto different network technologies.

- PROFIBUS DP, see Clause 4,
- PROFINET IO, see Clause 5.

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 (all parts), *Industrial communication networks – Fieldbus specifications*

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 61158-6-3, *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 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

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

IEC 61800-7-203, *Adjustable speed electrical power drive systems – Part 7-203: Generic interface and use of profiles for power drive systems – Profile type 3 specification*