BS EN IEC 62769-103-4:2023

BSI Standards Publication

Field Device Integration (FDI)®

Part 103-4: PROFINET

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The UK participation in its preparation was entrusted to Technical Committee GEL/65/5, Devices and integration in enterprise systems.

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English Version

Field Device Integration (FDI)® - Part 103-4: PROFINET (IEC 62769-103-4:2023)

Intégration des appareils de terrain (FDI)® - Partie 103-4: PROFINET (IEC 62769-103-4:2023)

Feldgeräteintegration (FDI) - Teil 103-4: Profile - PROFINET (IEC 62769-103-4:2023)

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European foreword

The text of document 65E/863/CDV, future edition 3 of IEC 62769-103-4, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62769-103-4:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-02-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-05-23

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In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61804-3	NOTE Approved as EN IEC 61804-3
IEC 61804-4	NOTE Approved as EN IEC 61804-4
IEC 62769 (series)	NOTE Approved as EN IEC 62769 (series)

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61158-5-10	-	Industrial communication networks - Fieldbus specifications - Part 5-10: Application layer service definition - Type 10 elements	EN IEC 61158-5-10	-
IEC 61804	series	Devices and integration in enterprise systems - Function blocks (FB) for process control and electronic device description language (EDDL)	EN IEC 61804	series
IEC 61784-2	-	Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3	EN IEC 61784-2	-
IEC 62541-100	2015	OPC Unified Architecture - Part 100: Device Interface	EN 62541-100	2015
IEC 62769-2	-	Field Device Integration (FDI®) - Part 2: Client	EN IEC 62769-2	-
IEC 62769-4	-	Field Device Integration (FDI®) - Part 4: FDI Packages	EN IEC 62769-4	-
IEC 62769-5	-	Field Device Integration (FDI®) - Part 5: FDI Information Model	EN IEC 62769-5	-
IEC 62769-6	-	Field Device Integration (FDI®) - Part 6: FDI Technology Mappings	EN IEC 6269-6	-
IEC 62769-7	-	Field Device Integration (FDI®) - Part 7: Communication Devices	EN IEC 62769-7	-
PI Order No.: 2.122	2008	Specification for PROFIBUS - Device Description and Device Integration - Volume 1; GSD, V5.1, July 2008: GSD	-	-

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IEC 62769-103-4

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INTERNATIONAL STANDARD

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Field Device Integration (FDI)® – Part 103-4: PROFINET

Intégration des appareils de terrain (FDI)® – Partie 103-4: PROFINET

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIELD DEVICE INTEGRATION (FDI®) –

Part 103-4: PROFINET

FOREWORD

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IEC 62769-103-4 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) added DeviceType to ProfinetIdentificationT;
b) added namespace to Annex A and Annex B;
c) added mapping rule for Device type when running in profile mode;
d) replaced GSD file with GSDML file, detailing of device type mapping;
e) added mapping to PA DIM.

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The text of this International Standard is based on the following documents:

Draft	Report on voting
65E/863/CDV	65E/920/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62769 series, published under the general title *Field device integration (FDI®)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

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FIELD DEVICE INTEGRATION (FDI®) –

Part 103-4: PROFINET

1 Scope

This part of IEC 62769 specifies an FDI®[1] profile of IEC 62769 for IEC 61784-2_CP 3/4, IEC 61784-2_CP3/5 and IEC 61784-2_CP3/6 (PROFINET[2]).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61158-5-10, *Industrial communication networks – Fieldbus specifications – Part 5-10: Application layer service definition – Type 10 elements*

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

IEC 61804 (all parts), *Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL)*

IEC 62541-100:2015, *OPC unified architecture – Part 100: Device Interface*

IEC 62769-2, *Field device integration (FDI®) – Part 2: Client*

IEC 62769-4, *Field device integration (FDI®) – Part 4: FDI® Packages*

IEC 62769-5, *Field device integration (FDI®) – Part 5: Information Model*

IEC 62769-6, *Field device integration (FDI®) – Part 6: Technology Mapping*

IEC 62769-7, *Field device integration (FDI®) – Part 7: Communication devices*

PI Order No.: 2.122:2008, *Specification for PROFIBUS – Device Description and Device Integration – Volume 1: GSD, V5.1, July 2008: GSD;* available at <www.PROFIBUS.com>

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[1] FDI is a registered trademark of the non-profit organization Fieldbus Foundation, Inc. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance does not require use of the trade name. Use of the trade name requires permission of the trade name holder.

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PI Order No.: 2.352:2014, *GSDML Specification for PROFINET IO;* available at <www.PROFIBUS.com>

3 Terms, definitions, abbreviated terms and acronyms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61158-5-10, IEC 61784-2, IEC 61804 (all parts), IEC 62541-100, IEC 62769-2, IEC 62769-4, IEC 62769-5, IEC 62769-6, IEC 62769-7 and PI Order No.: 2.352:2014 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http:www.iso.org/obp

3.2 Abbreviated terms and acronyms

For the purposes of this document, the following abbreviated terms and acronyms apply:

DCP	Discovery and basic configuration protocol (see IEC 61158-5-10)
DNS	Domain name system
EDD	Electronic Device Description
EDDL	Electronic Device Description Language (see IEC 61804 (all parts))
GSD	General station description (see PI Order No.: 2.122:2008)
GSDML	GSD markup language (see PI Order No.: 2.352:2014)
IP	Internet protocol (IETF RFC 791)
UIP	User Interface plug-in
UUID	Universal unique identifier (see ISO/IEC 11578)
XML	Extensible markup language (see REC-xml-20081126)

4 Conventions

4.1 EDDL syntax

This document specifies content for the EDD component that is part of FDI® Communication Packages. The specification content using EDDL syntax uses the font Courier New. The EDDL syntax is used for method signature, variable, data structure and component declarations.

4.2 XML syntax

XML syntax examples use the font Courier New. The XML syntax is used to describe XML document schema.

Example: `<xs:simpleType name="ExampleType">`

4.3 Capitalizations

The IEC 62769 series uses capitalized terms to emphasize that these terms have an FDI® specific meaning.

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Some of these terms using an acronym as a prefix for example

- FDI® Client, or
- FDI® Server.

Some of these terms are compound terms such as:

- Communication Servers, or
- Profile for Package.

Parameter names or attributes are concatenated to a single term, where the original terms starting in this term with a capital letter such as:

- ProtocolSupportFile, or
- ProtocolType.

Parameter names or attributes can also be constructed by using an underscore character to concatenate two or more terms such as:

- PROFILE_ID, or
- Profinet_PA_Network

5 Profile for PROFINET

5.1 General

This profile document to the FDI® specification in IEC 62769 specifies the protocol specifics needed for FDI® Packages describing Communication Servers, Gateways and Devices.

For Communication Servers this document defines also protocol specifics as these need to be considered in the Communication Servers hosted Information Model.

Annex B defines the XML schema for Direct Access Services. Annex C provides an overview of mapping PROFIBUS standard parameters to PA DIM.

5.2 Catalog profile

5.2.1 Protocol support file

5.2.1.1 FDI® Device Package

A GSDML file is a mandatory Attachment for FDI® Device Packages representing PROFINET IO devices.

Protocol specific attachments are mentioned in the Package Catalog as defined in IEC 62769-5. A communication feature list mark-up language (GSDML) file according to PI Order No.: 2.352:2014 is a mandatory attachment for FDI® Device Packages representing PROFINET devices. Table 1 specifies the parameters of ProtocolSupportFile in the FDI® Device Package.

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Table 1 – ProtocolSupportFile for FDI® Device Packages

Parameter	Description
Content Type	text/xml
Root Namespace	Empty
Source Relationship	http://fdi-cooperation.com/2010/relationship/attachment-protocol
Filename	According to PI Order No.: 2.352:2014.

5.2.1.2 FDI® Communication Package

A GSDML file as specified in ISO 15745-4:2003,/AMD1, is an optional attachment for FDI® Communication Packages representing PROFINET IO devices. Table 2 specifies the parameters of ProtocolSupportFile for FDI® Communication Packages.

Table 2 – ProtocolSupportFile for FDI® Communication Packages

Parameter	Description
Content Type	text/xml
Root Namespace	Empty
Source Relationship	http://fdi-cooperation.com/2010/relationship/attachment-protocol
Filename	According to PI Order No.: 2.352:2014

5.2.2 CommunicationProfile definition

IEC 62769-4 defines a CommunicationProfileT string for the Catalog XML schema. The PROFINET specific value shall be "profinet_io".

5.2.3 Profile device

A Profile Package shall provide the catalog values for profile devices, enabling the FDI® Server to leverage a generic device description, if a specific one is not available. The definitions in Table 3 focus on catalog content that is vendor independent.

Table 3 – Catalog values for profile devices

Element	Attribute	Content
PackageType	—	Profile
Manufacturer	—	Empty
DeviceModel	—	Allowed profile identifier values (PROFILE_ID) are provided by PROFIBUS & PROFINET International (PI). PI provides and maintains a XML file (Profile_ID_Table) containing the assignment of PROFILE_ID to profiles. It is available at <http://www.profibus.com/IM/Profile_ID_Table.xml> The file can be downloaded by any engineering or service tool whenever it's connected to the Internet. NOTE More information is provided in PI Order No.: 3.502 (I&M Profile) and related profile definitions referred therein. The string format shall be hexadecimal starting with 0x, e.g. '0x3D00'.

5.2.4 Protocol version information

IEC 62769-4 defines an element type named InterfaceT for the Catalog XML schema. The element type InterfaceT contains an element named Version which is supposed to provide

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