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Entwurf

**Feldgeräteintegration (FDI) –
Profile –
Teil 103-4: PROFINET
(IEC 65E/355/CDV:2013);
Englische Fassung FprEN 62769-103-4:2013**

Field Device Integration (FDI) –
Profiles –
Part 103-4: PROFINET
(IEC 65E/355/CDV:2013);
English version FprEN 62769-103-4:2013

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Gesamtumfang 32 Seiten

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Nationales Vorwort

Die Englische Fassung des europäischen Dokuments FprEN 62769-103-4:2013 „Feldgeräteintegration (FDI) – Profile – Teil 103-4: PROFINET“ (Entwurf in der Umfrage) ist unverändert in diesen Norm-Entwurf übernommen worden.

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Das internationale Dokument wurde vom SC 65E „Devices and integration in enterprise systems“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet.

Bei der Abstimmung zu dem Europäischen Schluss-Entwurf bei CENELEC und dem Internationalen Schluss-Entwurf bei IEC [Final Draft International Standard (FDIS)] sind jeweils nur „JA/NEIN“-Entscheidungen möglich, wobei „NEIN“-Entscheidungen fundiert begründet werden müssen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI) – PROFILES –

Part 103-4: PROFINET

FOREWORD

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- International Standard 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.

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

FDIS	Report on voting
65E/XX/FDIS	65E/XX/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.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

- 54 • reconfirmed,
55 • withdrawn,
56 • replaced by a revised edition, or
57 • amended.

58

59 The National Committees are requested to note that for this publication the stability date
60 is 2017.

61 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE
62 DELETED AT THE PUBLICATION STAGE.

63

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65 **contains colors which are considered to be useful for the correct understanding of its**
66 **contents. Users should therefore print this document using a color printer.**

FIELD DEVICE INTEGRATION (FDI) – PROFILES –

Part 103-4: PROFINET

1 Scope

This International Standard specifies a FDI profile of IEC 62769 for IEC 61784-2_CP 3/4 IEC 61784-2_CP3/5 and IEC 61784-2_CP3/6 (PROFINET)¹.

2 Normative references

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

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

IEC 61804-3², *Function blocks (FB) for process control and EDDL – Part 3: Electronic Device Description Language (EDDL)*

IEC 61804-4², *Function blocks (FB) for process control and EDDL – Part 4: EDDL interoperability*

IEC 62541-100³, *OPC UA Specification – Part 100: OPC UA for Devices*

IEC 62769-1, *Field device integration (FDI) – Part 1: Overview*

NOTE 1 IEC 62769-1 is technical identical to FDI-2021

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

NOTE 2 IEC 62769-2 is technical identical to FDI-2022

IEC 62769-3, *Field device integration (FDI) – Part 3: FDI Server*

NOTE 3 IEC 62769-3 is technical identical to FDI-2023

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

NOTE 4 IEC 62769-4 is technical identical to FDI-2024

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

NOTE 5 IEC 62769-5 is technical identical to FDI-2025

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

NOTE 6 IEC 62769-6 is technical identical to FDI-2026

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

NOTE 7 IEC 62769-7 is technical identical to FDI-2027

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

¹ PROFINET is the trade name of the non-profit consortium PROFIBUS & PROFINET International. This information is given for the convenience of users of this technical report 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.

² Release date is to be defined. Publication considering communication device specific EDDL extensions is pending.

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

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

106 ISO 15745-3:2003, *Industrial automation systems and integration – Open systems application*
 107 *integration framework – Part 3: Reference description for IEC 61158-based control systems*

108 NOTE 8 PI specification with the Order No.: 2.122 "GSD Specification V5.1" is an updated edition of the GSD
 109 specification in ISO 15745-3:2003, 6.2.

110 ISO 15745-4:2003, *Industrial automation systems and integration – Open systems application*
 111 *integration framework – Part 4: Reference description for Ethernet-based control systems,*
 112 *Amendment 1 (2006): PROFINET profiles*

113 NOTE 9 PI specification with the Order No.: 2.352 "GSDML Specification for PROFINET IO" is an updated edition
 114 of the PROFINET profile in ISO 15745-4:2003, Amd1.

115 **3 Terms, definitions, abbreviated terms and acronyms**

116 **3.1 Terms and definitions**

117 For the purposes of this document, the terms and definitions given in the normative
 118 references apply.

119 **3.2 Abbreviated terms and acronyms**

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

DCP	Discovery and basic configuration protocol (according to IEC 61158-5-10)
DNS	Domain name system
EDD	Electronic device description
EDDL	Electronic device description language (see IEC 61804)
GSD	General station description (see ISO 15745-3)
GSDML	GSD markup language (see ISO 15745-4, Amd1)
IP	Internet protocol (RFC 791)
UIP	User Interface plug-in
UUID	Universal unique identifier (see ISO/IEC 11578:1996)
XML	Extensible markup language (see REC-xml-20081126)

121

122 **4 Conventions**

123 **4.1 EDDL Syntax**

124 This part of IEC 62769 specifies content for the EDD component that is part of a FDI
 125 Communication Packages. The specification content using EDDL syntax uses font `Courier`
 126 `New`. The EDDL Syntax is used for method signature-, variable-, data structure- and
 127 component declarations.

128 **4.2 XML syntax**

129 XML syntax examples use font `Courier New`. The XML syntax is used to describe XML
 130 document schema.

131 Example: `<xsd:simpleType name="ExampleType">`

4.3 Capitalizations

The IEC 62769 series use capitalized terms to emphasize that these terms have a FDI specific meaning.

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

- FDI Client or
- FDI Server.

Some of these terms are compound terms like:

- 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 like:

- ProtocolSupportFile or
- ProtocolType.

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

- PROFILE_ID or
- Profinet_PA_Network

5 Profile for PROFINET

5.1 General

This profile annex 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 consideration in the Communication Servers hosted information model.

5.2 Catalog profile

5.2.1 Protocol support file

5.2.1.1 FDI Device Package

A GSD 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 ISO 15745-4, Amd1 is a mandatory attachment for FDI Device Packages representing PROFINET devices. Table 1 specifies the parameters of ProtocolSupportFile in the FDI Device Package.

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 ISO 15745-4:2003, Amd1.

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 ISO 15745-4:2003, Amd1

5.2.2 Protocol Version Information

IEC 62769-4 defines an element type named InterfaceT for the Catalog XML schema. Element type InterfaceT contains an element named Version which is supposed to provide version information about the applied communication protocol profile. The value has to follow the IEC 62769-4 defined version information schema defined in element type VersionT. This section describes how to apply the currently known protocol versions defined by the non-profit consortium PROFIBUS & PROFINET International. The general rule is to apply the value "0" for parts of the IEC 62769-4 defined version information that is not used by currently known protocol versions.

Table 3 – Version mapping examples

Protocol / Version	InterfaceT Version value
PROFINET Version 2.3	2.3.0

NOTE 1 The currently known PROFINET IO protocol revision information is considered to provide major and minor version information. Leading zeros are not considered in version value evaluation since only the actual decimal values are relevant.

NOTE 2 The given table can be considered to be an example only since this document cannot foresee how future protocol versions are defined.

5.2.3 CommunicationProfile definition

IEC 62769-4 defines a CommunicationProfileT enumeration type for the Catalog XML schema. The PROFINET specific value defined inside this enumeration is "profinet_io".

5.3 Associating a package with a device

5.3.1 Device type identification mapping

The purpose of device type identification mapping is to enable FDI host systems to compare the scan result against the topology representation in the Information Model. FDI host systems shall also be enabled to determine the FDI Device Package that fits for a device entry contained in the scan result. This will enable the user of an FDI host system to synchronize the Information Model with the actual installation.

The communication server implemented scan service (defined in 5.6.1.7) provides scan result through an XML document (schema defined in Annex A).

The Gateway implemented scan service (defined in 5.6.2.7) provides scan result by means of the Information Model that contains data structures created from EDD content as specified in 5.6.2.7.