



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 62769-103-4:2022**  
**01-maj-2022**

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**Integracija procesne naprave (FDI) - 103-4. del: Profili - PROFINET**

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

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Intégration des appareils de terrain (FDI) - Partie 103-4: Profils - PROFINET  
**PREVIEW**

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OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <b>Attention IEC-CENELEC parallel voting</b> The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.  The CENELEC members are invited to vote through the CENELEC online voting system.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

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

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## CONTENTS

1		
2		
3	FOREWORD .....	5
4	1 Scope .....	7
5	2 Normative references .....	7
6	3 Terms, definitions, abbreviated terms and acronyms .....	8
7	3.1 Terms and definitions .....	8
8	3.2 Abbreviated terms and acronyms .....	8
9	4 Conventions .....	8
10	4.1 EDDL syntax .....	8
11	4.2 XML syntax .....	8
12	4.3 Capitalizations .....	8
13	5 Profile for PROFINET .....	9
14	5.1 General .....	9
15	5.2 Catalog profile .....	9
16	5.2.1 Protocol support file .....	9
17	5.2.2 CommunicationProfile definition .....	10
18	5.2.3 Profile device .....	10
19	5.2.4 Protocol version information .....	10
20	5.3 Associating a Package with a device .....	11
21	5.3.1 Device type identification mapping .....	11
22	5.3.2 Device type revision mapping .....	12
23	5.4 Information Model mapping .....	13
24	5.4.1 ProtocolType definition .....	13
25	5.4.2 DeviceType mapping .....	13
26	5.4.3 FunctionalGroup identification definition .....	14
27	5.5 Topology elements .....	14
28	5.5.1 ConnectionPoint definition .....	14
29	5.5.2 Communication Device definition .....	16
30	5.5.3 Communication service provider definition .....	17
31	5.5.4 Network definition .....	18
32	5.6 Methods .....	19
33	5.6.1 Methods for FDI Communication Servers .....	19
34	5.6.2 Methods for Gateways .....	22
35	Annex A (normative) Topology scan schema .....	31
36	A.1 General .....	31
37	A.2 Target Namespace .....	31
38	A.3 Network .....	31
39	A.4 ProfinetNetworkT .....	31
40	A.5 ProfinetConnectionPointT .....	32
41	A.6 ProfinetIdentificationT .....	32
42	A.7 MACT .....	33

43	A.8	IPv4T .....	33
44	A.9	IPv6T .....	34
45	A.10	DNSNameT .....	34
46	A.11	Hex4DigitT .....	34
47	Annex B (normative)	Transfer service parameters .....	35
48	B.1	General .....	35
49	B.2	Target Namespace .....	35
50	B.3	sendData .....	35
51	B.4	receiveData .....	35
52	B.5	TransferSendDataT .....	35
53	B.6	TransferResultDataT .....	36
54	B.7	OperationT .....	36
55	Annex C (informativ)	Mapping to PA DIM .....	37
56	C.1	General .....	37
57	C.2	Mapping table .....	37
58	Bibliography .....		38
59			
60	Figure 1 – Version mapping problem .....		12
61			
62	Table 1 – ProtocolSupportFile for FDI Device Packages .....		9
63	Table 2 – ProtocolSupportFile for FDI Communication Packages .....		9
64	Table 3 – Catalog values for profile devices .....		10
65	Table 4 – Version mapping examples .....		10
66	Table 5 – Device identification information mapping .....		12
67	Table 6 – Protocol type Profinet_IO .....		13
68	Table 7 – DeviceType Property mapping .....		14
69	Table 8 – PROFINET identification type definition .....		14
70	Table 9 – ConnectionPoint type for Profinet_IO .....		15
71	Table 10 – Method Connect arguments .....		19
72	Table 11 – Method Disconnect arguments .....		20
73	Table 12 – Method Transfer arguments .....		21
74	Table 13 –Method SetAddress arguments .....		22
75	Table 14 – Method Connect arguments .....		24
76	Table 15 – Method Transfer arguments .....		26
77	Table 16 – Method SetAddress arguments .....		28
78	Table A.1 – Elements of ProfinetNetworkT .....		31
79	Table A.2 – Attributes of ProfinetConnectionPointT .....		32
80	Table A.3 – Elements of ProfinetConnectionPointT .....		32
81	Table A.4 – Attributes of ProfinetIdentificationT .....		33
82	Table B.1– Attributes of TransferSendDataT .....		36
83	Table B.2– Attributes of TransferResultDataT .....		36

84 Table C.1: Mapping from PN standard parametrs to PA DIM ..... 37  
85  
86

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## FIELD DEVICE INTEGRATION (FDI) –

## Part 103-4: PROFINET

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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 2021. 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) 1798added 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;

135 e) added mapping to PA DIM.

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

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

137

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

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

141 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance  
142 with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at  
143 [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in  
144 greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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

- 148 • reconfirmed,
- 149 • withdrawn,
- 150 • replaced by a revised edition, or
- 151 • amended.

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# FIELD DEVICE INTEGRATION (FDI) – PROFILES –

## Part 103-4: PROFINET

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### 1 Scope

161 This part of IEC 62769 specifies an FDI profile of IEC 62769 for IEC 61784-2\_CP 3/4, IEC 61784-2\_CP3/5  
162 and IEC 61784-2\_CP3/6 (PROFINET<sup>1</sup>).

### 2 Normative references

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

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

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

171 *IEC 61804 (all parts), Function blocks (FB) for process control and Electronic Device Description*  
172 *Language (EDDL)*

173 *IEC 62541-100:2015, OPC Unified Architecture – Part 100: OPC UA for Devices*

174 *IEC 62769-2, Field Device Integration (FDI) – Part 2: FDI Client*

175 *IEC 62769-4, Field Device Integration (FDI) – Part 4: FDI Packages*

176 *IEC 62769-5, Field Device Integration (FDI) – Part 5: FDI Information Model*

177 *IEC 62769-6, Field Device Integration (FDI) – Part 6: FDI Technology Mapping*

178 *IEC 62769-7, Field Device Integration (FDI) – Part 7: FDI Communication Devices*

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

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

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<sup>1</sup> 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.

## 182 3 Terms, definitions, abbreviated terms and acronyms

### 183 3.1 Terms and definitions

184 For the purposes of this document, the terms and definitions given in IEC 61158-5-10, *IEC 61784-2*,  
185 IEC 61804 (all parts), IEC 62541-100, IEC 62769-2, IEC 62769-4, IEC 62769-5, IEC 62769-6, IEC 62769-  
186 7 and PI Order No.: 2.352:2014 apply.

### 187 3.2 Abbreviated terms and acronyms

188 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 (RFC 791)
UIP	User Interface plug-in
UUID	Universal unique identifier (see ISO/IEC 11578)
XML	Extensible markup language (see REC-xml-20081126)

## 189 4 Conventions

### 190 4.1 EDDL syntax

191 This part of IEC 62769 specifies content for the EDD component that is part of FDI Communication  
192 Packages. The specification content using EDDL syntax uses the font `Courier New`. The EDDL syntax  
193 is used for method signature, variable, data structure and component declarations.

### 194 4.2 XML syntax

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

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

### 198 4.3 Capitalizations

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

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

- 201 • FDI Client, or
- 202 • FDI Server.

203 Some of these terms are compound terms such as:

- 204 • Communication Servers, or
- 205 • Profile for Package.

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

- 208 • ProtocolSupportFile, or
- 209 • ProtocolType.

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

- 212 • PROFILE\_ID, or
- 213 • Profinet\_PA\_Network

## 214 5 Profile for PROFINET

### 215 5.1 General

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

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

### 220 5.2 Catalog profile

#### 221 5.2.1 Protocol support file

##### 222 5.2.1.1 FDI Device Package

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

224 Protocol specific attachments are mentioned in the Package Catalog as defined in  
225 IEC 62769-5. A communication feature list mark-up language (GSDML) file according to PI Order No.:  
226 2.352:2014 is a mandatory attachment for FDI Device Packages representing PROFINET devices. Table 1  
227 specifies the parameters of ProtocolSupportFile in the FDI Device Package

228 **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.

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##### 230 5.2.1.2 FDI Communication Package

231 A GSDML file as specified in ISO 15745 4:2003, Amd1, is an optional attachment for FDI Communication  
232 Packages representing PROFINET IO devices. Table 2 specifies the parameters of ProtocolSupportFile  
233 for FDI Communication Packages.

234 **Table 2 – ProtocolSupportFile for FDI Communication Packages**

Parameter	Description
Content Type	text/xml
Root Namespace	Empty

Parameter	Description
Source Relationship	http://fdi-cooperation.com/2010/relationship/attachment-protocol
Filename	According to PI Order No.: 2.352:2014

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236

### 5.2.2 CommunicationProfile definition

237

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

238

239

### 5.2.3 Profile device

240

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.

241

242

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**Table 3 – Catalog values for profile devices**

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

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### 5.2.4 Protocol version information

103-4-2022

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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 version information about the applied communication protocol profile. The value has to follow the IEC 62769-4 defined version information schema defined in the element type VersionT. Table 4 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 version information according to IEC 62769-4 that are not used in currently known protocol versions.

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**Table 4 – Version mapping examples**

Protocol / Version	InterfaceT Version value
PROFINET Version 2.3	2.3.0
<p>NOTE 1 This Table is just an example since this document cannot foresee how future protocol versions will be defined.</p> <p>NOTE 2 The currently known PROFINET protocol revision information provides major and minor version information. Leading zeros are not considered in version value evaluation since only the actual decimal values are relevant.</p>	

254

255 **5.3 Associating a Package with a device**

256 **5.3.1 Device type identification mapping**

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

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

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

265 Common for both ways of presenting the scan result is that scan results contain device type identification  
266 and device instance identification.

267 FDI host systems comparing the actual network topology configuration against the topology representation  
268 in the Information Model shall be enabled to handle the following situations:

269 a) The physical Device instance identified at a specific device address is not logically present in the  
270 Information model (as Instance): Enable the FDI Host system to find the appropriate FDI Device  
271 package according to the device catalogue information.

272 b) The physical Device instance identified by the device address is logically present in the Information  
273 Model (as Instance): Enable the FDI Host system to compare the device type information presented in  
274 the scan result (see the identification in Clause A.6 and 5.6.2.7) and the device type specific  
275 information of the Instance present in the Information Model.

276 The FDI Device package contains device type identification information that can be compared to the scan  
277 result based on the Catalog Schema in IEC 62769-4 which defines the XML element (simple) type  
278 "DeviceModel" and "Manufacturer". Both types are used in (complex) element types "Protocol" and  
279 "RegDeviceType".  
<https://standards.iteh.ai/catalog/standards/sist/20c13802-3d80-4170-84d8-0fa8fc117269/osist-pren-iec-62769-103-4-702>

280 As a result of the FDI Package deployment the FDI Package information is then present in the Information  
281 Model as specified FunctionalGroup Identification containing VendorID and DeviceID (see 5.4.3).

282 If a device is used as a profile device, the DeviceID returned in the scan result does not fit to the DeviceID  
283 within the GSDML. In this case, DeviceType can be used to identify the FDI Package based on the name  
284 of the device in the FDI Package Catalog.

285 The mapping between different device identification data sources is described in Table 5. Since scan  
286 results provided by the Communication Server or Gateway can convey data that is produced by the device  
287 (firmware) the device type identification mapping shall be supported by providing corresponding data in  
288 the FDI Device Package contained Catalog and Information Model.