
Integracija procesne naprave (FDI) - 100. del: Profili - Splošni protokoli

Field device integration (FDI) - Part 100: Profiles - Generic protocols

Feldgeräteintegration (FDI) - Teil 100: Profile - Allgemeine Protokolle

Intégration des appareils de terrain (FDI) - Partie 100: Profils - Protocoles génériques

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Field device integration (FDI) - Part 100: Profiles - Generic protocols

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FIELD DEVICE INTEGRATION (FDI) –

Part 100: Profiles – Generic Protocols

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IEC 62769-100 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 second edition cancels and replaces the first 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 ExtendedDeviceRevision implementing the FDI Version scheme and the method ScanExtended.

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

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

146
147 Full information on the voting for its approval can be found in the report on voting indicated in the above
148 table.

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

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

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

- 157 • reconfirmed,
 - 158 • withdrawn,
 - 159 • replaced by a revised edition, or
 - 160 • amended.
- 161

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FIELD DEVICE INTEGRATION (FDI) –

Part 100: Profiles – Generic Protocols

1 Scope

This part of IEC 62769 specifies an FDI profile of IEC 62769 for Generic Protocols. That means that all interfaces are defined and a host can add support for more protocols without changing its implementation. Nevertheless, there are some protocol-specific definitions (PSD) that need to be specified per protocol using this profile. Annex C specifies what PSD need to be defined per protocol so that FDI Device Packages, FDI Communication Packages for Gateways and FDI Communication Servers, FDI Communication Server, Gateways and Devices supporting such a protocol can work together in a host not aware about this specific protocol.

NOTE: A host not using FDI communication server but a proprietary mechanism for communication needs to define its own means to deal with this profile to support several protocols without changing its implementation. This is specific to the proprietary way how the communication driver is bound to the host.

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

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

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

IEC 62769-1, *Field Device Integration (FDI) – Part 1: Overview*

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

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

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

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

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 61804 series, IEC 62541-100, IEC 62769-2, IEC 62769-4, IEC 62769-5, and IEC 62769-7 apply.

3.2 Abbreviations

For the purposes of this specification, the following abbreviations apply.

200	EDD	Electronic Device Description
201	EDDL	Electronic Device Description Language (see IEC 61804)
202	FDI	Field Device Integration
203	FCG	FieldComm Group
204	XML	Extensible markup language (see REC-xml-20081126)

205 4 Conventions

206 4.1 EDDL syntax

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

210 4.2 XML syntax

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

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

214 4.3 Capitalizations

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

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

- 217 • FDI Client, or
- 218 • FDI Server.

219 Some of these terms are compound terms such as:

- 220 • Communication Servers, or
- 221 • Profile Package.

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

- 224 • ProtocolSupportFile or
- 225 • ProtocolType.

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

- 228 • DEVICE_REV or
- 229 • DEVICE_MODEL

230 5 Profile for Generic Protocols

231 5.1 General

232 This profile document to the FDI specification in IEC 62769 specifies the protocol specifics needed for FDI
 233 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.

5.2 Catalog profile

5.2.1 Protocol support file

5.2.1.1 FDI Device Package

Protocol specific attachments are mentioned in the Package Catalog as defined in IEC 62769-5. As this annex defines a profile generically suitable for many protocols it does not define requirements for any protocol specific attachments. However, it does also not prevent the usage of protocol specific attachments. The PSD define the requirements on the need of ProtocolSupportFiles for a specific protocol. However, the configuration of a device using an FDI Device Package shall not require the usage of a protocol specific attachment. Table 1 specifies the parameters of the ProtocolSupportFile in the FDI Device Package in case one or many are provided.

Table 1 – ProtocolSupportFile for FDI Device Packages

Parameter	Description
Content Type	text/plain
Root Namespace	empty
Source Relationship	http://fdi-cooperation.com/2010/relationship/attachment-protocol
Filename	Not defined

5.2.1.2 FDI Communication Packages

The same rules as for FDI Device Packages applies.

5.2.2 CommunicationProfile definition

IEC 62769-4 defines a CommunicationProfileT string for the Catalog XML schema. The string is protocol specific and defined as ProfileIdentifier in the PSD (see Annex C).

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 2 focus on catalog content that is vendor independent.

Table 2 – Catalog values for profile devices

Element	Attribute	Content
PackageType	—	Profile
Manufacturer	—	Empty
DeviceModel	—	The format of the DeviceModel is protocol specific and details on the format are defined in the PSD (see Annex C). In order to assign a scan result with a profile package the ProfileId of the scan result shall be mapped to the DeviceModel of the profile package.

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 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. The PSD (see Annex C) define the mapping of versions of a specific protocol to this field.

5.3 Associating a Package with a device

1.1.1 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 the scan result through an XML document (the schema is defined in Clause A.5).

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

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

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

- a) The physical Device instance identified at a specific device address is not logically present in the Information Model (as Instance): Enable the FDI Host system to find the appropriate FDI Device Package according to the device catalog information.
- b) The physical Device instance identified by the device address is logically present in the Information Model (as Instance): Enable the FDI Host system to compare device type information presented in scan result (see the identification in Clause A.5) and the device type specific information of the Instance present in the Information Model.

The FDI Device Package contains device type identification information that can be compared to scan result based on the Catalog Schema in IEC 62769-4 defining the XML (simple) element types “DeviceModel” and “Manufacturer”. Both types are used in the (complex) element types “Protocol” and “RegDeviceType”.

As a result of the FDI Package deployment the FDI Package information is then present in the Information Model as the specified FunctionalGroup Identification containing SerialNumber and Tag (see 5.4.2).

The mapping between different device identification data sources is described in Table 3. Since scan results provided by the Communication Server or Gateway can convey data that is produced by the device (firmware) the device type identification mapping shall be supported by providing corresponding data in the FDI Device Package contained Catalog and Information Model.