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**Field device integration (FDI) –
Part 1: Overview**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI) –

Part 1: Overview

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62769-1:2015. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 62769-1 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

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

- a) support for generic protocol extension for faster adoption of other technologies;
- b) digital signature now include trusted timestamping for long term validation of FDI Package;
- c) support of new protocols.

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

FDIS	Report on voting
65E/758/FDIS	65E/768/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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- withdrawn,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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INTRODUCTION

The IEC ~~62657~~ 62769 series has the general title *Field Device Integration (FDI)* and the following parts:

- Part 1: Overview
- Part 2: FDI Client
- Part 3: FDI Server
- Part 4: FDI Packages
- Part 5: FDI Information Model
- Part 6: FDI Technology Mapping
- Part 7: FDI Communication Devices
- Part 100: Profiles – Generic Protocol Extensions
- Part 101-1: Profiles – Foundation Fieldbus H1
- Part 101-2: Profiles – Foundation Fieldbus HSE
- Part 103-1: Profiles – PROFIBUS
- Part 103-4: Profiles – PROFINET
- Part 109-1: Profiles – HART and WirelessHART
- Part 115-2: Profiles – Protocol-specific Definitions for Modbus RTU
- Part 150-1: Profiles – ISA 100.11a

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

- ~~a) method for the supplying and installation of device specific functionalities, see Patent Family DE10357276;~~
- ~~b) method and device for accessing a functional module of automation system, see Patent Family EP2162418;~~
- ~~c) methods and apparatus to reduce memory requirements for process control system software applications, see Patent Family US2013232186;~~
- ~~d) extensible device object model, see Patent Family US12/893,680.~~

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FIELD DEVICE INTEGRATION (FDI) –

Part 1: Overview

1 Scope

This part of IEC 62769 describes the concepts and overview of the Field Device Integration (FDI) specifications. The detailed motivation for the creation of this technology is also described (see 4.1). Reading this document is helpful to understand the other parts of this multi-part standard.

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

~~IEC 62453 (all parts), Field device tool (FDT[®]) interface specification~~

~~IEC 62541 (all parts), OPC Unified Architecture~~

IEC TR 62541-1, OPC Unified Architecture – Part 1: Overview and concepts

IEC 62541-3, OPC Unified Architecture – Part 3: Address Space Model

IEC 62541-4, OPC Unified Architecture – Part 4: Services

IEC 62541-5, OPC Unified Architecture – Part 5: Information Model

IEC 62541-100, OPC Unified Architecture – Part 100: Device Interface

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

~~NOTE IEC 62769-2 is technically identical to FDI-2022[4]¹~~

~~IEC 62769-3, Field Device Integration (FDI) – Part 3: FDI Server~~

~~NOTE IEC 62769-3 is technically identical to FDI-2023.[5]~~

~~IEC 62769-4:2015, Field Device Integration (FDI) – Part 4: FDI Packages~~

~~NOTE IEC 62769-4 is technically identical to FDI-2024.[6]~~

~~IEC 62769-5:2015, Field Device Integration (FDI) – Part 5: FDI Information Model~~

~~NOTE IEC 62769-5 is technically identical to FDI-2025.[7]~~

¹ Numbers in square brackets refer to the Bibliography.

~~IEC 62769-6:2015, Field Device Integration (FDI) – Part 6: FDI Technology Mapping~~

~~NOTE – IEC 62769-6 is technically identical to FDI-2026. [8]~~

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

~~NOTE – IEC 62769-7 is technically identical to FDI-2027. [9]~~

~~ISO/IEC 11578, Information technology – Open Systems Interconnection – Remote Procedure Call (RPC)~~

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

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions given in IEC TR 62541-1, IEC 62541-3, IEC 62541-4, IEC 62541-5, IEC 62541-100, as well as the following apply.

ISO and IEC maintain terminological 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>

3.1.1

Field Device Integration

FDI

device integration and device management technology, combining base concepts and technology aspects of the Electronic Device Description Language (EDDL) according to IEC 61804 and Field Device Tool (FDT[®]) according to IEC 62453, as well as in IEC 62541-1 (OPC UA)

Note 1 to entry: The combination of those different proven technologies ensures a secure life cycle and the ability to address all challenges of Device Integration and Device Management in a scalable manner.

~~Note 2 to entry: This note applies to the French language only.~~

~~Note 3 to entry: This note applies to the French language only.~~

~~Note 4 to entry: This note applies to the French language only.~~

3.1.2

Action

procedure that requires collaboration between an FDI Client and an FDI Server

3.1.3

Business Logic

descriptive element of an FDI Package that specifies the device-specific behavior and/or mapping logic for a Nested Communication

3.1.4

Business Logic Interface

interface through which Business Logic is integrated with the Information Model

3.1.5

Communication Device

physical device that provides access to networks and devices

Note 1 to entry: Gateways and routers are examples of communication devices.

3.1.6**Connection Point**

logical representation of a connection of a communication end point to a communication network

3.1.7**Device Access Services**

set of services through which a User Interface Plug-in accesses the Information Model of an FDI Server

3.1.8**Device Definition**

required element of an FDI Package that provides the core definition of a device

3.1.9**Device Instance**

representation of a specific device in the Information Model of an FDI Server

3.1.10**Device Tool**

standalone application that contains both an FDI Client and an FDI Server

3.1.11**Device Topology**

arrangement of communication networks and devices that forms a network

3.1.12**Device Type**

representation of a type of device in the Information Model of an FDI Server

3.1.13**FDI Client**

software component that uses the Information Model, interprets user interface descriptions, and hosts user interface plug-ins

3.1.14**FDI Communication Server**

OPC UA server that is used by an FDI Server to access non-native networks

3.1.15**FDI Package**

collection of components that provide all the information necessary to integrate a type of device into a system

3.1.16**FDI Server**

software component that implements the Information Model, executes Business Logic, and communicates with device via Native Communication and/or Nested Communication

3.1.17**FDI Technology Version**

version number that identifies to a specific revision of the overall FDI technology

3.1.18**Hosting Services**

set of services through which a User Interface Plug-in interacts with an FDI Client

3.1.19**Information Model**

set of objects, variables, and methods exposed by an FDI Server

3.1.20**Modular Device**

device that is composed of one or more subdevices

3.1.21**Native Communication**

communication with devices that are an integral part of the system

3.1.22**Nested Communication**

communication with devices through a series of communication devices

3.1.23**Offline Data**

device information maintained by an FDI Server that is stored in an FDI Server-specific database

3.1.24**Online Data**

device information maintained by an FDI Server that is retrieved from a physical device

3.1.25**User Interface Services****UI Services**

set of services through which a User Interface Plug-in accesses the operating system

3.1.26**Platform User Interface Services****platform UI services**

user interface services provided natively by the operating system

3.1.27**User Interface Description****UID**

descriptive element of an FDI package that is used by an FDI Client to render user interface

3.1.28**User Interface Description Interpreter****UID interpreter**

software component in an FDI Client that renders user interface descriptions and invokes actions

3.1.29**User Interface Plug-In****UIP**

executable element of an FDI package that is executed by an FDI Client

3.1.30**User Interface Plug-In UIP Services****UIP services**

set of services through which an FDI Client interacts with a user interface plug-in

3.2 IEC TR 62541-1 terms (OPC UA)

For the purposes of this document, the following terms and definitions given in IEC TR 62541-1 apply.

AddressSpace
Attribute
Client
Method
Node
NodeClass
Notification
Object
ObjectType
Reference
ReferenceType
Server
Service Set
Session
Subscription
Variable

3.3 IEC 62541-3 (OPC UA) terms

For the purposes of this document, the following terms and definitions given in IEC 62541-3 ~~(OPC UA) and the following~~ apply.

Aggregates
ArrayDimensions
AuditEvent
AuditUpdateMethodEvent
BrowseName
ByteString
DataType
DataVariable
Folder
HasComponent
HasProperty
HasSubType
HasTypeDefinition
ModellingRule
NodeId
Property
UserAccessLevel
UserExecutable
Value
ValueRank