

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



Field device integration (FDI) –  
Part 1: Overview

STANDARD PREVIEW  
(standards.iteh.ai)

Intégration des appareils de terrain (FDI) –  
Partie 1: Vue d'ensemble

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IEC 62769-1:2015





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ELECTROTECHNIQUE  
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ICS 25.040.40; 35.100

ISBN 978-2-8322-2622-3

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**FIELD DEVICE INTEGRATION (FDI) –**

**Part 1: Overview**

**FOREWORD**

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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.

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

CDV	Report on voting
65E/337/CDV	65E/421/RVC

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.

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 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

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## INTRODUCTION

The IEC 62657 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 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

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 EP2182418;
- 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, 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 62453 (all parts), *Field device tool (FDT<sup>®</sup>) interface specification*

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

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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] <sup>1</sup>

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*

<sup>1</sup> Numbers in square brackets refer to the Bibliography.

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

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

#### 3.1 Terms and definitions

For the purposes of this document, the 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.

##### 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<sup>®</sup>) 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.  
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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

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**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 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 terms and definitions given in IEC 62541-3 (OPC UA) and the following apply.

Aggregates **iTeh STANDARD PREVIEW**  
ArrayDimensions **(standards.iteh.ai)**  
AuditEvent  
AuditUpdateMethodEvent [IEC 62769-1:2015](#)  
BrowseName <https://standards.iteh.ai/catalog/standards/sist/38c502a1-030d-4aaa-89df-8b0abb3e54f1/iec-62769-1-2015>  
ByteString  
DataType  
DataVariable  
Folder  
HasComponent  
HasProperty  
HasSubType  
HasTypeDefinition  
ModellingRule  
NodeId  
Property  
UserAccessLevel  
UserExecutable  
Value  
ValueRank

### 3.4 IEC 62541-4 (OPC UA) terms

For the purposes of this document, the terms and definitions given in IEC 62541-4 (OPC UA) apply.

AddReferences  
Browse  
BrowseNext  
Call  
CreateSession  
NodeManagement  
Read  
Request Header  
Response Header  
StatusCode  
TranslateBrowsePathsToNodeIds  
UserIdentityToken  
Write

### 3.5 IEC 62541-5 (OPC UA) terms

For the purposes of this document, the terms and definitions given in IEC 62541-5 apply.

BaseObjectType  
PropertyType

### 3.6 IEC 62541-100 (OPC UA for Devices) terms

For the purposes of this document, the terms and definitions given in IEC 62541-100 apply.

Block  
Device  
DeviceType  
Parameter

### 3.7 Abbreviated terms and acronyms

DTM	Device Type Manager
EDD	Electronic Device Description
EDDL	Electronic Device Description Language
FB	Function blocks
FDI	Field Device Integration
FDT <sup>®2</sup>	Field Device Tool (see IEC 62453)
GUI	Graphical User Interface
n/a	Not applicable
OPC	Open packaging conventions
OPC UA	OPC Unified Architecture (see IEC 62541)

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