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Ersatz für
DIN EN 62769-4:2016-03
Siehe Anwendungsbeginn

**Feldgeräteintegration (FDI) –
Teil 4: FDI-Packages
(IEC 62769-4:2021);
Englische Fassung EN IEC 62769-4:2021**

Field Device Integration (FDI) –
Part 4: FDI Packages
(IEC 62769-4:2021);
English version EN IEC 62769-4:2021

Intégration des appareils de terrain (FDI) –
Partie 4: Paquetages FDI
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Anwendungsbeginn

Anwendungsbeginn für die von CENELEC am 2021-03-12 angenommene Europäische Norm als DIN-Norm ist 2022-09-01.

Für DIN EN 62769-4:2016-03 besteht eine Übergangsfrist bis 2024-03-12.

Nationales Vorwort

Vorausgegangener Norm-Entwurf: E DIN EN 62769-4:2019-05.

Für dieses Dokument ist das nationale Arbeitsgremium DKE/K 956 „Industrielle Kommunikation“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE (www.dke.de) zuständig.

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Der Zusammenhang der zitierten Dokumente mit den entsprechenden deutschen Dokumenten ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründet, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Diese Bedingungen sind für die vorliegende Norm erfüllt.

Da sich die Benutzer der vorliegenden Norm der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN IEC 62769-4 veröffentlicht. Zu deren Abschnitt 1, der den Anwendungsbereich festlegt und Abschnitt 3, der die Begriffe, Abkürzungen und Konventionen festlegt, wurde eine Übersetzung angefertigt und als informativer Nationaler Anhang NA der vorliegenden Norm hinzugefügt. Für die meisten der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Diese Norm steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Das Original-Dokument enthält Bilder in Farbe, die in der Papierversion in einer Graustufen-Darstellung wiedergegeben werden. Elektronische Versionen dieses Dokuments enthalten die Bilder in der originalen Farbdarstellung.

Änderungen

Gegenüber DIN EN 62769-4:2016-03 wurden folgende Änderungen vorgenommen:

- a) Unterstützung von Package-Entwicklern bei der Erstellung von EDDs für das heutige EDD-Basissystem mit einem einzigen Entwicklungswerkzeug;
- b) die Digitale Signatur beinhaltet jetzt einen zuverlässigen Zeitstempel für die langfristige Validierung des FDI-Package;
- c) Zeitstempel für die Signatur des Gerätepackage.

Frühere Ausgaben

DIN EN 62769-4: 2016-03

Nationaler Anhang NA (informativ)

Auszugsweise Übersetzung

Reihenfolge und Inhalt der folgenden Abschnitte sind identisch mit denen in den jeweiligen Abschnitten der Englischen Fassung.

1 Anwendungsbereich

Dieser Teil von IEC 62769 legt den FDI-Package fest. Die gesamtheitliche FDI-Architektur ist in Bild 1 dargestellt. Die im Anwendungsbereich dieses Dokuments liegenden Architekturkomponenten sind in diesem Bild hervorgehoben.

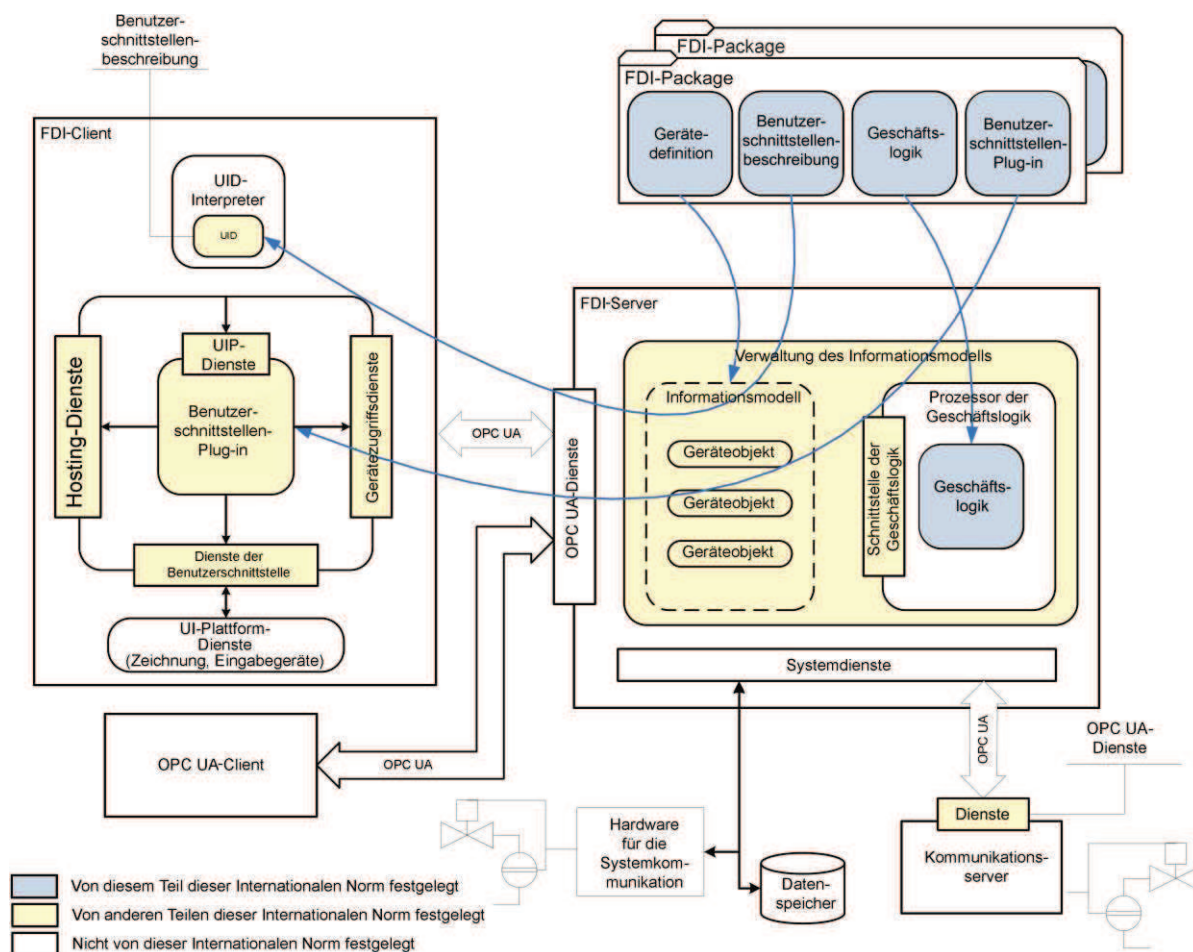


Bild 1 – FDI-Architektur

3 Begriffe, Abkürzungen und Konventionen

3.1 Begriffe

Für die Anwendung dieses Dokuments gelten die Begriffe nach IEC 62769-1, ISO/IEC 29500-2 und die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Anwendung in der Normung unter den folgenden Adressen bereit:

- IEC Electropedia: verfügbar unter <http://www.electropedia.org/>
- ISO Online Browsing Platform: verfügbar unter <http://www.iso.org/obp>

3.1.1

Anlage

en **Attachment**

geräte- und protokollspezifische Unterstützungsdateien, die nicht direkt zur Integration des Gerätes in das System verwendet werden

3.1.2

FDI-Kommunikationspackage

en **FDI Communication Package**

FDI-Package, das Informationen zur Integration eines FDI-Kommunikationsservers in einen FDI-Server bereitstellt

3.1.3

FDI-Gerätepackage

en **FDI Device Package**

FDI-Package, das einem FDI-Server einen oder mehrere Gerätetypen bereitstellt

3.1.4

FDI-Packagemodell

en **FDI Package Model**

Beschreibung der Struktur und Elemente eines FDI-Packages

3.1.5

FDI-Profilpackage

en **FDI Profile Package**

FDI-Package, das Informationen für die Erstellung eines Gerätetypknotens bereitstellt, der einer Klasse von Geräten zugeordnet werden kann

3.1.6

FDI-Registrierungsinstanz

en **FDI Registration Authority**

Einheit, die das Recht und die Möglichkeit hat, Konformitätsprüfungen an FDI-Packages durchzuführen und Registrierungszertifikate auszugeben

3.1.7

FDI-UIP-Package

en **FDI UIP Package**

FDI-Package, das einem FDI-Server ein oder mehrere UIPs bereitstellt

3.1.8

Packagekatalog

en **Package Catalog**

Datei, die die Inhalte eines FDI-Packages beschreibt

3.1.9

UIP-Katalog

en **UIP Catalog**

Datei, die die Eigenschaften eines UIP beschreibt

3.1.10

UIP-Variante

en **UIP Variant**

plattformspezifisches Element eines Benutzerschnittstellen-Plug-ins

Anmerkung 1 zum Begriff: Ein UIP besteht aus einer oder mehreren Varianten. Es kann z. B. eine Variante für tragbare Geräte optimiert sein, eine andere Variante ist möglicherweise für Geräte mit Großbildschirm optimiert.

3.2 Abkürzungen

Für die Anwendung dieses Dokuments gelten die Abkürzungen nach IEC 62769-1 und die folgenden Abkürzungen.

CFF	Eigenschaftendatei für FOUNDATION Fieldbus (en: Capabilities File for FOUNDATION Fieldbus)
ID	Bezeichner (en: Identifier)
IDE	Integrierte Entwicklungsumgebung (en: Integrated Development Environment)
IM	Informationsmodell (en: Information Model)
PNG	Portable Netzwerkgrafik (en: Portable network graphics)
ZIP	Zipper (Format für die Archivdatei) (en: Zipper)

3.3 Konventionen

Für die Anwendung dieses Dokuments gelten die Konventionen nach IEC 62769-1.

EUROPEAN STANDARD

EN IEC 62769-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2021

ICS 25.040.40; 35.100.05

Supersedes EN 62769-4:2015 and all of its amendments and corrigenda (if any)

English version

**Field Device Integration (FDI) – Part 4: FDI Packages
(IEC 62769-4:2021)**

Intégration des appareils de
terrain (FDI) – Partie 4: Paquetages FDI
(IEC 62769-4:2021)

Feldgeräteintegration (FDI) – Teil 4: FDI-Packages
(IEC 62769-4:2021)

This European Standard was approved by CENELEC on 2021-03-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brüssel

European foreword

The text of document 65E/761/FDIS, future edition 2 of IEC 62769-4, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62769-4:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop): 2021-12-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow): 2024-03-12

This document supersedes EN 62769-4:2015 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62769-4:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61784-1	NOTE	Harmonized as EN IEC 61784-1.
IEC 61784-2	NOTE	Harmonized as EN IEC 61784-2.
IEC 62591	NOTE	Harmonized as EN 62591.
IEC 62769-2	NOTE	Harmonized as EN 62769-2.
IEC 62769-3	NOTE	Harmonized as EN 62769-3.
IEC 62769-5	NOTE	Harmonized as EN 62769-5.
IEC 62769-7	NOTE	Harmonized as EN 62769-7.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61804	series	Function blocks (FB) for process control and electronic device description language (EDDL)	EN IEC 61804	series
IEC 61804-5	2015	Function blocks (FB) for process control and electronic device description language (EDDL) - Part 5: EDDL Built-in library	EN 61804-5	2015
IEC 62769-1	-	Field Device Integration (FDI) - Part 1: Overview	EN 62769-1	-
IEC 62769-6	-	Field Device Integration (FDI) - Part 6: Technology Mapping	EN 62769-6	-
ISO/IEC 29500-2	2016	Information technology - Document description and processing languages - Office Open XML File Formats - Part 2: Open Packaging Conventions	-	-
ISO 639-1	-	Codes for the representation of names of languages - Part 1: Alpha-2 code	-	-
ISO 32000-1	-	Document management - Portable document format - Part 1: PDF 1.7	-	-
Extensible Markup Language (XML) 1.0	-	W3C Recommendation, available at http://www.w3.org/TR/REC-xml/	-	-
XML Schema Definition Language (XSD) 1.1	-	W3C Recommendation, available at http://www.w3.org/TR/xmlschema11-1/	-	-
ETSI EN 319 132-1	-	Electronic Signatures and Infrastructures (ESI); XAdES digital signatures; Part 1: Building blocks and XAdES baseline signatures	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ETSI TS 101 733	-	Electronic Signatures and Infrastructures (ESI); CMS Advanced Electronic Signatures (CAAdES)	-	-
FIPS 140-2	-	Security Requirements for Cryptographic Modules	-	-

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INTRODUCTION

The IEC 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

ISO/IEC 29500-2:2016, *Information technology – Document description and processing languages – Office Open XML File Formats – Part 2: Open Packaging Conventions*

ISO 639-1, *Codes for the representation of names of languages – Part 1: Alpha-2 code*

ISO 32000-1, *Document management – Portable document format – Part 1: PDF 1.7*

Extensible Markup Language (XML) 1.0, W3C Recommendation, available at <<http://www.w3.org/TR/REC-xml/>>

XML Schema Definition Language (XSD) 1.1, W3C Recommendation, available at <<http://www.w3.org/TR/xmlschema11-1/>>

ETSI EN 319 132-1, *Electronic Signatures and Infrastructures (ESI); XAdES digital signatures; Part 1: Building blocks and XAdES baseline signatures*

ETSI TS 101 733, *Electronic Signatures and Infrastructures (ESI); CMS Advanced Electronic Signatures (CAES)*

FIPS 140-2, *Security Requirements for Cryptographic Modules*

3 Terms, definitions, abbreviated terms and conventions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62769-1, ISO/IEC 29500-2, and 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

Attachment

device and protocol-specific support files that are not directly used to integrate the Device into the system

3.1.2

FDI Communication Package

FDI Package that provides information to integrate an FDI Communication Server to an FDI Server

3.1.3

FDI Device Package

FDI Package that provides one or more device types to an FDI Server

3.1.4

FDI Package Model

description of the structure and elements of an FDI Package

3.1.5

FDI Profile Package

FDI Package that provides information for creating a device type node that can be associated with a class of devices

3.1.6

FDI Registration Authority

entity that has the right and the ability to perform FDI conformance tests on FDI Packages and to issue registration certificate documents

3.1.7

FDI UIP Package

FDI Package that provides one or more UIPs to an FDI Server

3.1.8

Package Catalog

file that describes the contents of an FDI Package

3.1.9

UIP Catalog

file that describes the properties of a UIP

3.1.10

UIP Variant

platform-specific element of a User Interface Plug-in

Note 1 to entry: A UIP is composed of one or more variants. For example, one variant may be optimized for portable devices while another variant is optimized for large-screen devices.

3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in IEC 62769-1 as well as the following apply.

CFF	Capabilities File for FOUNDATION Fieldbus
ID	Identifier
IDE	Integrated Development Environment
IM	Information Model
PNG	Portable network graphics
ZIP	Zipper (archive file format)

3.3 Conventions

For the purposes of this document, the conventions given in IEC 62769-1 apply.

4 FDI Package Model

4.1 Overview

The FDI Package Model (see Figure 2) provides all the elements necessary to integrate devices, network components and FDI Communication Servers into a system.

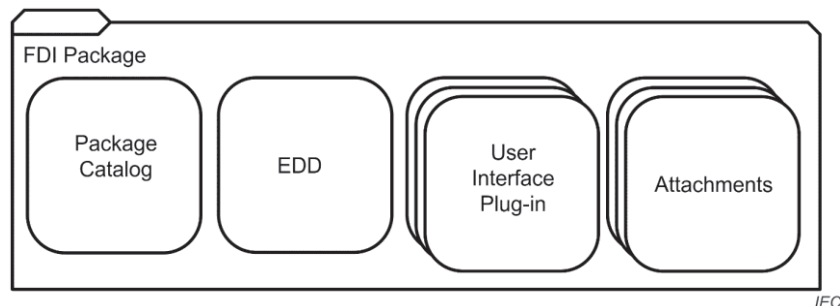


Figure 2 – FDI Package Model

Figure 3 shows the mapping of the FDI Package functional elements, as specified in IEC 62769-1, to the physical elements in an actual FDI Package, as specified in this document.

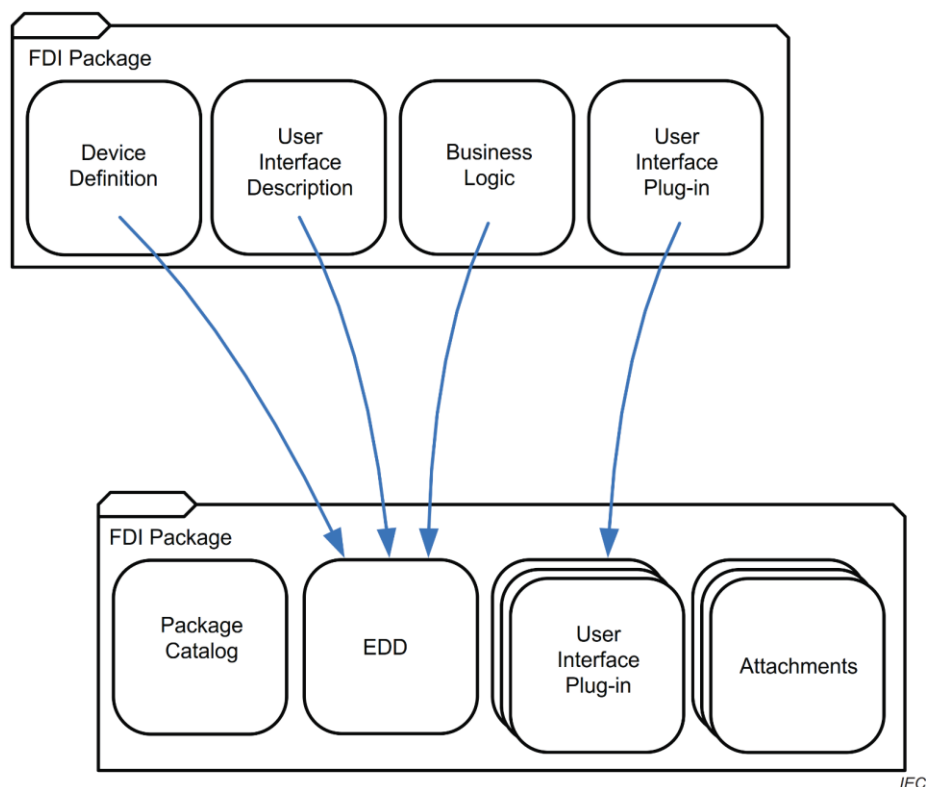


Figure 3 – Architectural mapping

The Electronic Device Description (EDD) corresponds to the Device Definition, the User Interface Description, and the Business Logic functional elements. A set of physical User Interface Plug-ins corresponds to the User Interface Plug-in functional element.

The other physical elements in the FDI Package, the Package Catalog and Attachments, provide support for basic mechanisms such as identification, versioning and deployment, and distribution of manufacturer and/or protocol-specific information about the device and/or the User Interface Plug-ins.

4.2 FDI Package Elements

4.2.1 Package Catalog

The Package Catalog is a required element that provides information about the contents of the FDI Package including, but not limited to, identification and version information, device type information, hardware and input/output device requirements, FDI Technology Version, and protocol-specific characteristics.

The Package Catalog is used by an FDI Server to create a catalog of device types and to create DeviceType Nodes in the Information Model.

4.2.2 Electronic Device Description

The EDD is an element that provides Device Definition, User Interface Descriptions, and Business Logic to an FDI Server.

Subclause 4.3 specifies for which FDI Package types an EDD is required.

To maximize interoperability, the initial setup of a device shall be achievable solely with the User Interface Descriptions, Device Definition and Business Logic that are part of the EDD in the FDI Device Package. The use of User Interface Plug-ins is optional and targeted in particular for the complete setup of complex devices.

4.2.3 User Interface Plug-in

A User Interface Plug-in (UIP) is an element that enables an FDI Client to present a programmed user interface. The FDI Server only stores the UIP from a consumed package; it does not execute or interpret the UIP.

A UIP is referenced from a User Interface Description. Those references are reflected in the Information Model through functional groups (see IEC 62769-5). References to UIPs in the Information Model are logical through a unique reference. The physical structure of the UIP is not at the Information Model level. Physically, a single UIP may consist of one or more UIP Variants, each targeted at a specific platform and run-time environment.

Figure 4 illustrates the logical reference to a UIP in the EDD and the physical structure of that UIP. The EDD of the FDI Package references a globally unique identifier of the UIP. In addition, the Package Catalog also lists the UIPs required by the device type along with the versions of the UIP supported by the package.

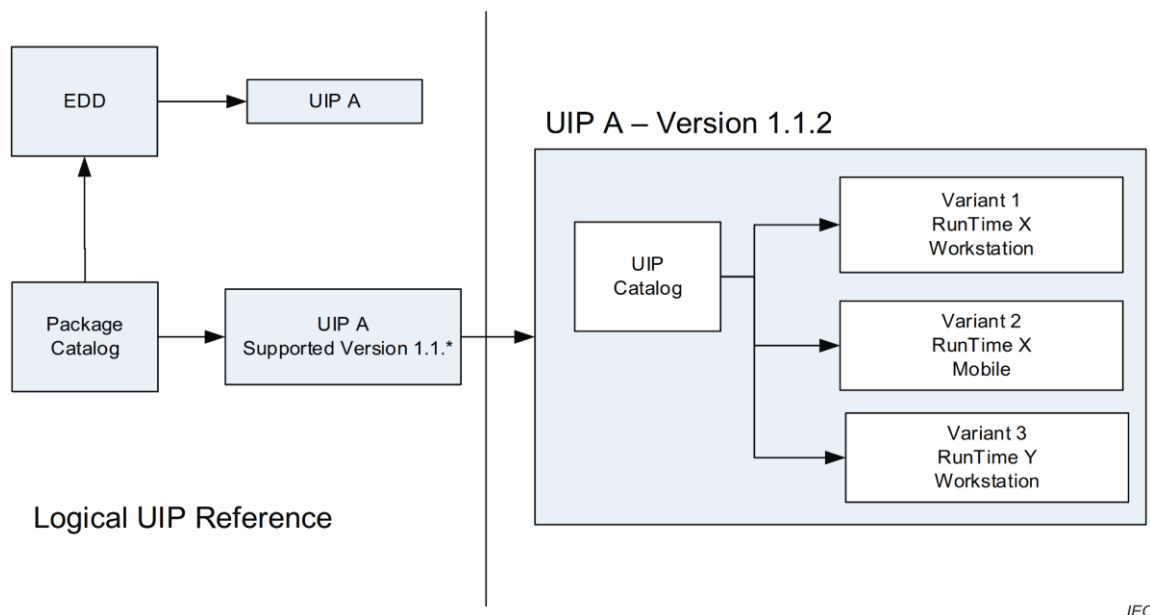


Figure 4 – User Interface Plug-in Reference Model

A UIP can be designed to meet different platform requirements since not all platforms support the same screen sizes and input devices.

When an FDI Client requests a UIP specifying the platform type, the deployment mechanism in the FDI Server looks for a UIP Variant that meets the platform type specified and returns it to the FDI Client.

The target platform defines specific screen resolutions and input devices that shall be supported by the UIP Variant. Available target platforms are described in Table 1.

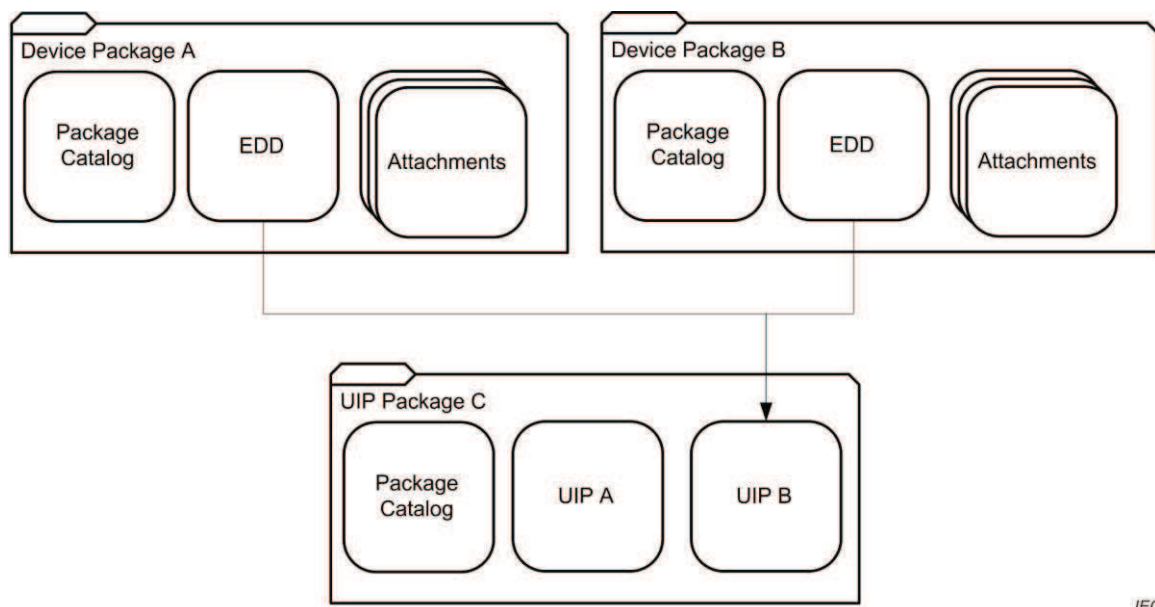
Table 1 – UIP Platform

Platform	Characteristics
Workstation	A full client typically with a larger display, full keyboard and mouse input.
Mobile	A limited client typically with a smaller display and limited input capabilities.

Detailed platform requirements are technology dependent and specified in IEC 62769-6.

A UIP can be delivered internally (self-contained) or the UIP can be delivered through an FDI UIP Package. An EDD of one package shall not reference any UIP delivered self-contained with another package.

Figure 5 illustrates two FDI Device Packages referencing UIPs from an FDI UIP Package. In this example, the EDD from Device Package A and Device Package B references UIP B delivered by UIP Package C.



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Figure 5 – Multiple FDI Packages referencing a common UIP

4.2.4 Attachment

Attachments provide device and protocol-specific support files, along with other files that are not directly used to integrate the device into the system, for example, product manuals.

The following types of Attachments are defined and reflected in the Package Catalog:

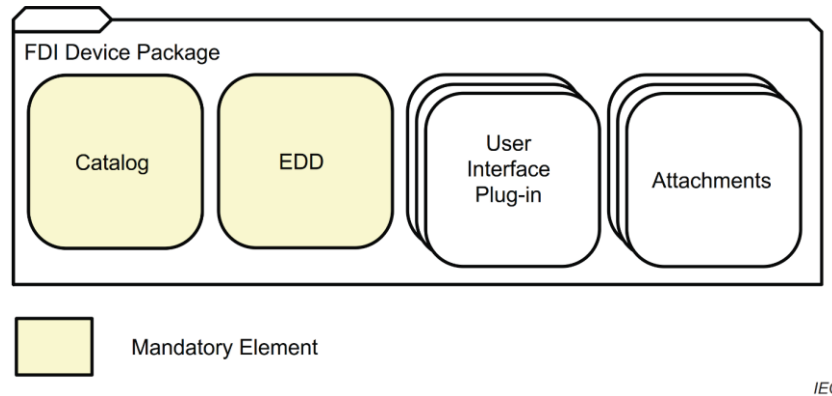
- Protocol-specific files (see 5.3.4.3);
- Documentation (see 5.3.4.2);
- Device pictures (see 5.3.4.1).

Some protocol-specific files are mandatory (see Annex F).

4.3 FDI Package Types

4.3.1 FDI Device Package

The FDI Device Package is intended to provide information about a device to a system. An FDI Device Package describes a single device type. Figure 6 shows the physical structure of an FDI Device Package describing a single device type. Details about how to create a package for a modular device is described in Annex I.



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Figure 6 – FDI Device Package

The FDI Device Package shall have a single Package Catalog.

An FDI Package for simple Devices contains one EDD. For modular Devices, multiple EDDs may exist (see Annex I).

The FDI Device Package may include one or more User Interface Plug-ins.

The FDI Device Package may include Attachments.

4.3.2 FDI Communication Package

The FDI Communication Package is intended to provide information about a single FDI Communication Device. The group of FDI Communication Devices splits into two sub-groups.

- FDI Communication Packages for Gateways – Contain everything required to describe all device functions and logic required to bridge between different communication protocol networks, including the bridging algorithms (details are described in IEC 62769-7).
- FDI Communication Packages for FDI Communication Servers – Contain basic information to describe the communication device and to integrate it into the FDI Host but also to create a valid reference to the external FDI Communication Server application. This application shall not be delivered as part of the FDI Communication Package. The FDI Communication Server provides access to single field devices or field device networks (details are described in IEC 62769-7).

Requirements to the FDI Communication Package content that are specific for FDI Communication Servers are defined in Annex J.

However, representatives of both groups are integrated into FDI Hosts by using FDI Communication Packages. Their physical structure is shown in Figure 7. Binary components necessary to communicate to the communication hardware shall be provided outside the scope of this FDI Communication Package.

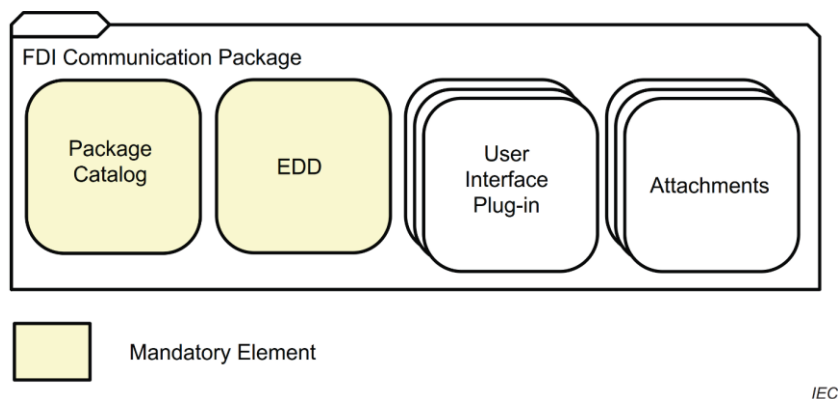


Figure 7 – FDI Communication Package

4.3.3 FDI UIP Package

The FDI UIP Package delivers User Interface Plug-ins to an FDI Server. It is used to distribute one or more UIPs that are intended to be shared by several device types. Its physical structure is illustrated in Figure 8.

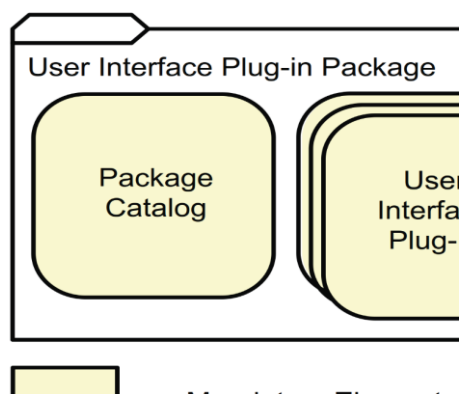


Figure 8 – FDI UIP Package

The FDI UIP Package shall have a Package Catalog and one or more User Interface Plug-ins.

4.3.4 FDI Profile Package

An FDI Profile Package provides information for creating a device type node that can be associated with a class of devices implementing a common set of parameters and functions (described in profiles or profile like definitions created by, for example, communication foundations or similar interest groups).

Conceptually, an FDI Profile Package provides information that is a super class of an FDI Device Package. The FDI Profile Package is represented in Figure 9.

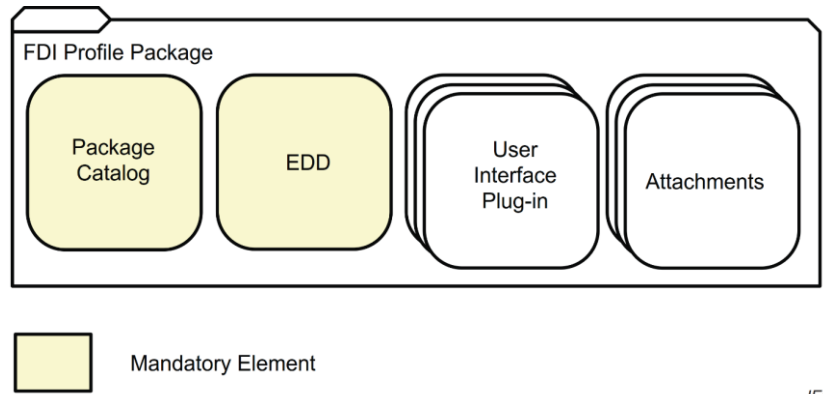


Figure 9 – FDI Profile Package

These packages enable integration of devices without having a specific FDI Device Package. FDI Profile Packages only support standard functionalities as defined by the corresponding communication protocol and application profiles (Annex F).

An FDI Profile Package shall be self-contained. For example, if a Profile B extends the definition of a Profile A, then the FDI Profile Package for the Profile B shall include a complete definition of Profile B, including the elements from Profile A.

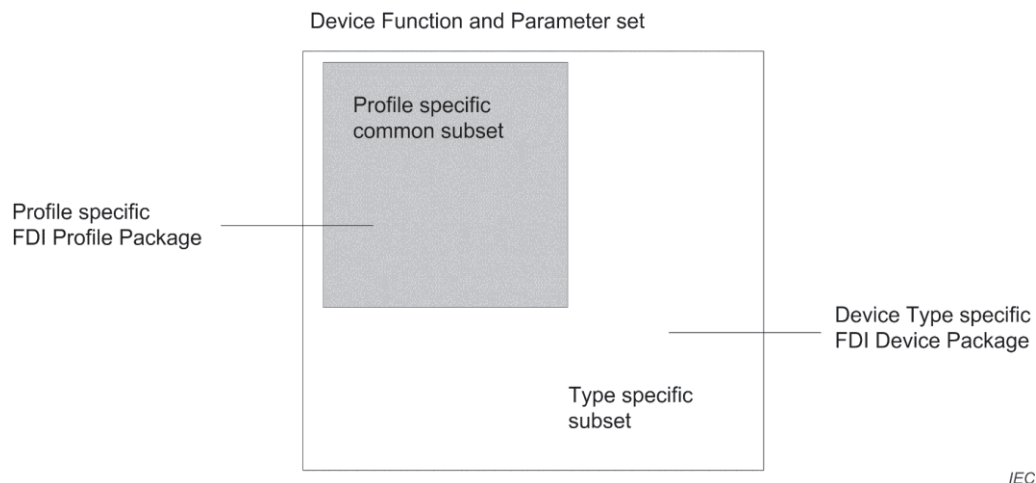


Figure 10 – Device Function and Parameter sets (type- and profile-specific)

Figure 10 represents the entire functionality of a device. Some of the functionality conforms to a specific communication profile, which may be accessed by using an FDI Profile Package. If there is a need to access Device Type specific functionality, in addition to the common functionality, then an FDI Device Package is required.

The detailed description of the communication protocol-specific requirements is not part of this document.

An automatic FDI Package selection implementation (launching FDI Packages matching a connected physical device) typically would search first for available Device Type specific FDI Device Packages. If the specific package is not available, the profile specific FDI Profile Package is loaded (if available). This behavior, however, is system-specific.