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Entwurf**Feldgeräteintegration (FDI) –
Teil 4: FDI-Packages
(IEC 65E/262/CD:2012), Text in Englisch**

Field Device Integration (FDI) –
Part 4: FDI Packages
(IEC 65E/262/CD:2012), Text in Englisch

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Dieser Norm-Entwurf mit Erscheinungsdatum 2012-12-17 wird der Öffentlichkeit zur Prüfung und Stellungnahme vorgelegt.

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Gesamtumfang 73 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE

Nationales Vorwort

Die englische Originalfassung des internationalen Dokuments IEC 65E/262/CD:2012 „Field Device Integration (FDI) – Part 4: FDI Packages“ (CD, en: Committee Draft) ist unverändert in diesen Norm-Entwurf übernommen worden.

Das internationale Dokument wurde vom SC 65E „Devices and integration in enterprise systems“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet und den nationalen Komitees zur Stellungnahme vorgelegt.

Die IEC und das Europäische Komitee für Elektrotechnische Normung (CENELEC) haben vereinbart, dass ein auf IEC-Ebene erarbeiteter Entwurf für eine Internationale Norm zeitgleich (parallel) bei IEC und CENELEC zur Umfrage (CDV-Stadium) und Abstimmung als FDIS (en: Final Draft International Standard) bzw. Schluss-Entwurf für eine Europäische Norm gestellt wird, um eine Beschleunigung und Straffung der Normungsarbeit zu erreichen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

Da der Abstimmungszeitraum für einen FDIS bzw. Schluss-Entwurf prEN nur 2 Monate beträgt, und dann keine sachlichen Stellungnahmen mehr abgegeben werden können, sondern nur noch eine „JA/NEIN“-Entscheidung möglich ist, wobei eine „NEIN“-Entscheidung fundiert begründet werden muss, wird bereits der CD als DIN-Norm-Entwurf veröffentlicht, um die Stellungnahmen aus der Öffentlichkeit frühzeitig berücksichtigen zu können.

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

Für den Fall einer undatierten Verweisung im normativen Text (Verweisung auf eine Norm ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils neueste gültige Ausgabe der in Bezug genommenen Norm.

Für den Fall einer datierten Verweisung im normativen Text bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe der Norm.

Der Zusammenhang der zitierten Normen mit den entsprechenden Deutschen Normen 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 den vorliegenden Normentwurf erfüllt.

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

Es ist vorgesehen, auch bei der entsprechenden zukünftigen Deutschen Norm auf die deutsche Sprachfassung zu verzichten und diese in der englischsprachigen Fassung zu veröffentlichen.

Nationaler Anhang NA (informativ)

3 Begriffe und Abkürzungen

3.1 Begriffe

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

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-Kommunikationspaket

(en: **FDI Communication Package**)

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

3.1.3

FDI-Gerätepaket

(en: **FDI Device Package**)

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

3.1.4

FDI-Paketmodell

(en: **FDI Package Model**)

Beschreibung der Struktur und Elemente eines FDI-Paketes

3.1.5

FDI-Profilpaket

(en: **FDI Profile Package**)

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

3.1.6

FDI-UIP-Paket

(en: **FDI UIP Package**)

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

3.1.7

Paketkatalog

(en: **Package Catalog**)

Datei, die den Inhalt eines FDI-Paketes beschreibt

3.1.8

UIP-Katalog

(en: **UIP Catalog**)

Datei, die die Eigenschaften eines UIP beschreibt

3.1.9

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.

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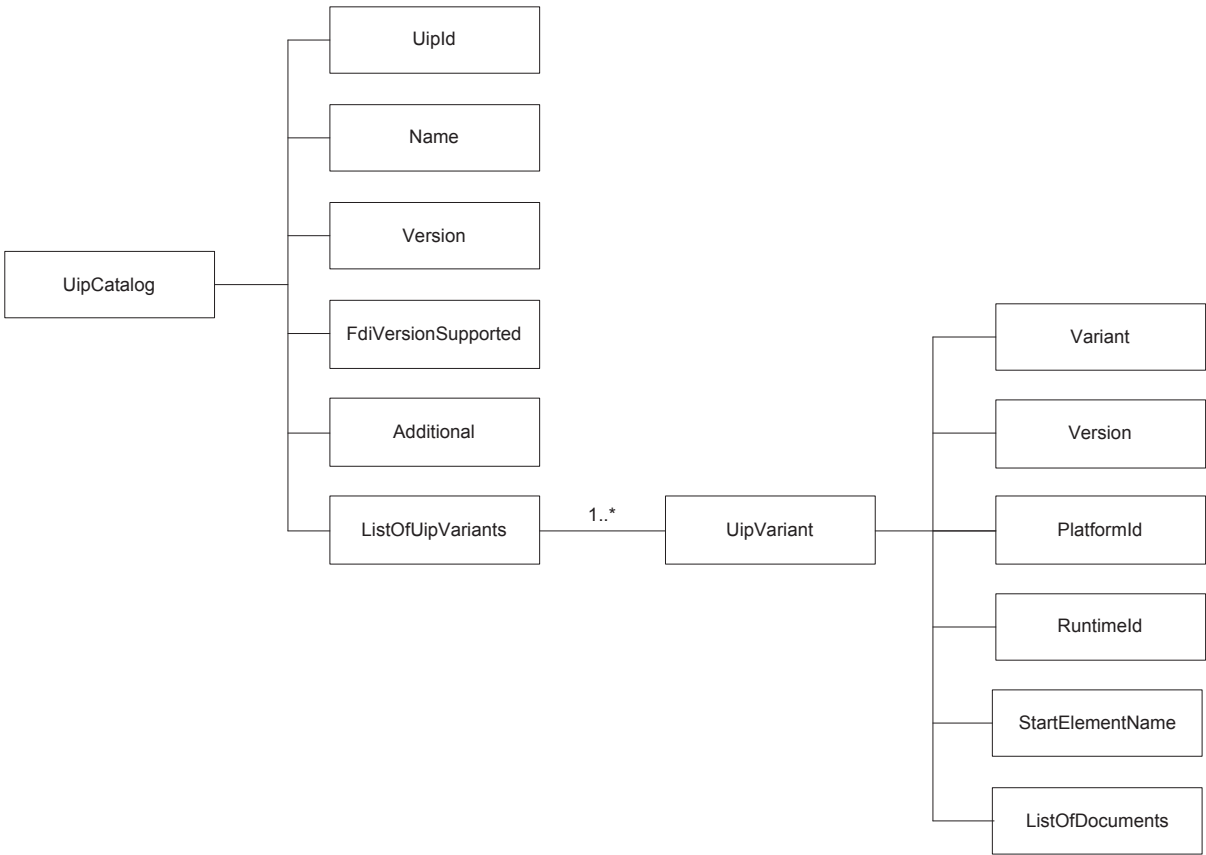


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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI) – Part 4: FDI Packages

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62769-4 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:

FDIS	Report on voting
65C/xxx/FDIS	65C/xxx/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 publication has been drafted in accordance with ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

The National Committees are requested to note that for this publication the stability date is 2017.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

IMPORTANT – The 'color inside' logo on the cover page of this publication indicates that it contains colors which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a color printer.

DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS; FIELD DEVICE INTEGRATION –

Part 4: FDI Packages

1 Scope

This International Standard specifies the FDI Packages. The overall FDI architecture is illustrated in Figure 1. The architectural components that are within the scope of this document have been highlighted in this illustration.

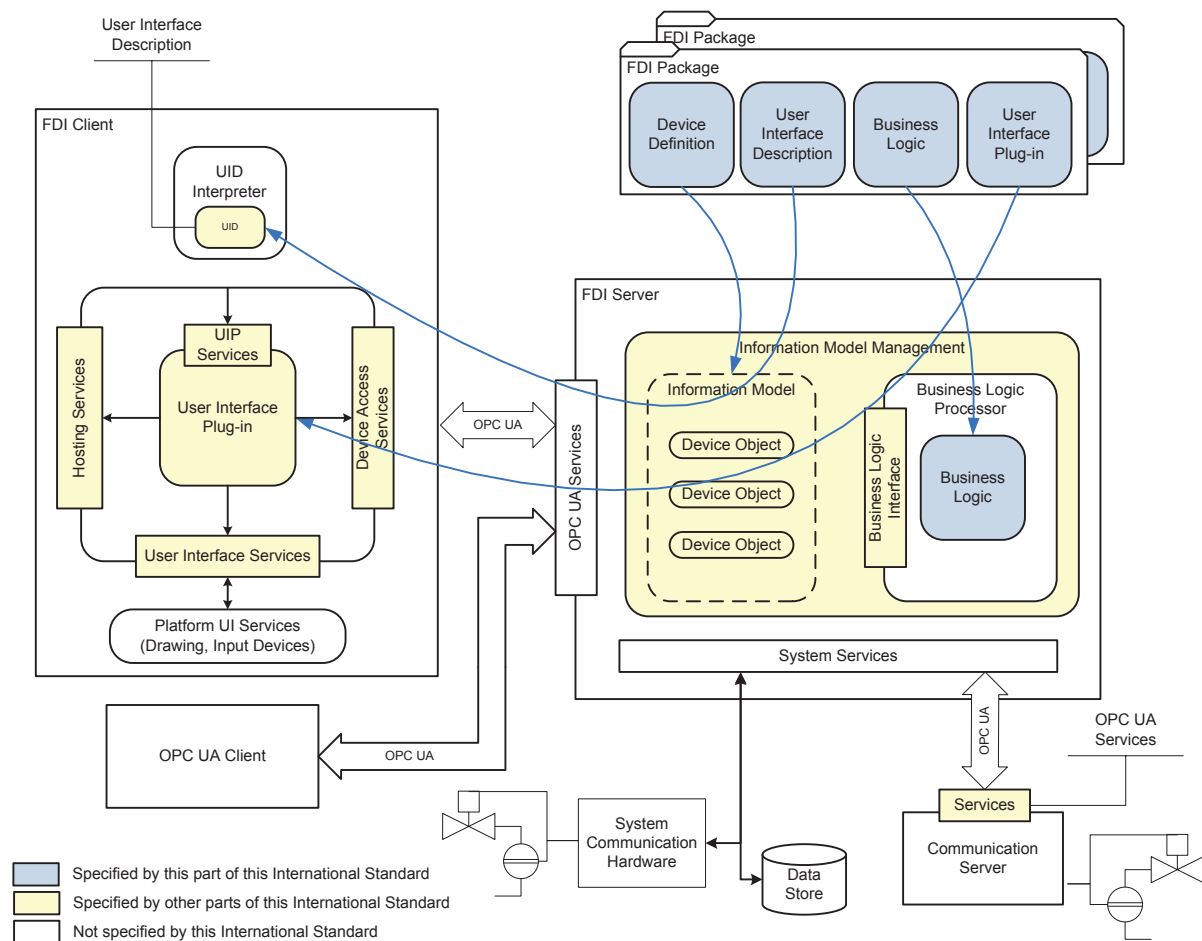


Figure 1 – FDI Architecture Diagram

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.

- 17 IEC 61784-1 *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*
- 18 IEC 61784-2 *Industrial communication networks – Profiles – Part 2: Additional fieldbus*
19 *profiles for real-time networks based on ISO/IEC 8802-3*
- 20 IEC 61804-3:2014², *Function blocks (FB) for process control and Electronic device*
21 *description language (EDDL) – Part 3: EDDL syntax and semantics*
- 22 IEC 61804-5:2014³, *Function blocks (FB) for process control and Electronic device*
23 *description language (EDDL) – Part 5: EDDL Built-in library*
- 24 IEC 62591, *Industrial communication networks – Wireless communication network and*
25 *communication profiles – WirelessHART*
- 26 IEC 62769-1, *Field device integration (FDI) – Part 1: Overview*
- 27 NOTE IEC 62769-1 is technical identical to FDI-2021
- 28 IEC 62769-2, *Field device integration (FDI) – Part 2: FDI Client*
- 29 NOTE IEC 62769-2 is technical identical to FDI-2022
- 30 IEC 62769-3, *Field device integration (FDI) – Part 2: FDI Server*
- 31 NOTE IEC 62769-3 is technical identical to FDI-2023
- 32 IEC 62769-5, *Field device integration (FDI) – Part 5: FDI Information Model*
- 33 NOTE IEC 62769-5 is technical identical to FDI-2025
- 34 IEC 62769-6, *Field device integration (FDI) – Part 6: FDI Technology Mapping*
- 35 NOTE IEC 62769-6 is technical identical to FDI-2026
- 36 IEC 62769-7, *Field device integration (FDI) – Part 7: FDI Communication Devices*
- 37 NOTE IEC 62769-7 is technical identical to FDI-2027
- 38 ISO/IEC 15948 *Information technology -- Computer graphics and image processing --*
39 *Portable Network Graphics (PNG): Functional specification*
- 40 ISO/IEC 29500-2:2011 *Information Technology – Document Description and Processing*
41 *Languages – Office Open XML File Formats, Part 2 Open Packaging Conventions*
- 42 ISO/IEC 11578 *Information technology – Open Systems Interconnection – Remote Procedure*
43 *Call (RPC)*
- 44 **3 Terms, definitions, abbreviated terms and acronyms**
- 45 **3.1 Terms and definitions**
- 46 For the purposes of this document, the terms and definitions given in IEC 62769-1,
47 ISO/IEC 29500-2, and the following apply.

² To be published.

³ To be published.

48 **3.1.1**
49 **attachment**
50 device and protocol specific support files that are not directly used to integrate the Device into
51 the system

52 **3.1.2**
53 **FDI Communication Package**
54 FDI Package that provide information to integrate an FDI Communication Server to an FDI
55 Server

56 **3.1.3**
57 **FDI Device Package**
58 FDI Package that provides one or more device types to an FDI Server

59 **3.1.4**
60 **FDI Package Model**
61 description of the structure and elements of an FDI Package

62 **3.1.5**
63 **FDI Profile Package**
64 FDI Package that provides information for creating a device type node that can be associated
65 with a class of devices

66 **3.1.6**
67 **FDI UIP Package**
68 FDI Package that provides one or more UIPs to an FDI Server

69 **3.1.7**
70 **Package Catalog**
71 file that describes the contents of an FDI Package

72 **3.1.8**
73 **UIP Catalog**
74 file that describes the properties of a UIP

75 **3.1.9**
76 **UIP Variant**
77 platform specific element of a User Interface Plug-in

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

80 **3.2 Abbreviated terms and acronyms**

81 For the purposes of this document, the abbreviated terms and acronyms given in IEC 62769-1
82 and the following apply.

IDE Integrated Development Environment

83 **4 FDI Package Model**

84 **4.1 Overview**

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

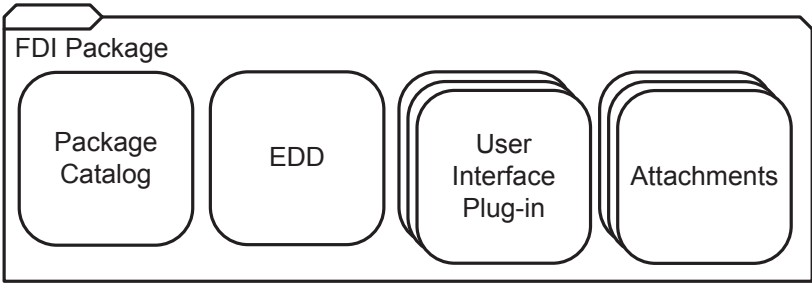


Figure 2 – FDI Package Model

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 specification.

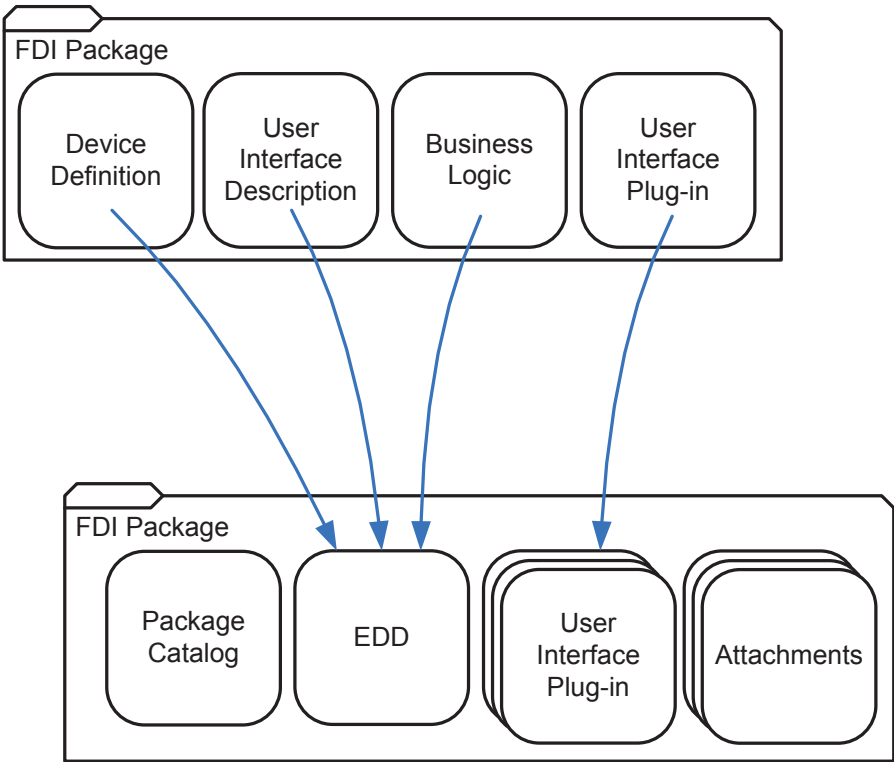


Figure 3 – Architectural Mapping

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

104 type information, hardware and input / output device requirements, FDI Technology Version,
105 and protocol specific characteristics.

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

108 4.2.2 Electronic Device Description

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

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

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

116 4.2.3 User Interface Plug-in

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

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

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

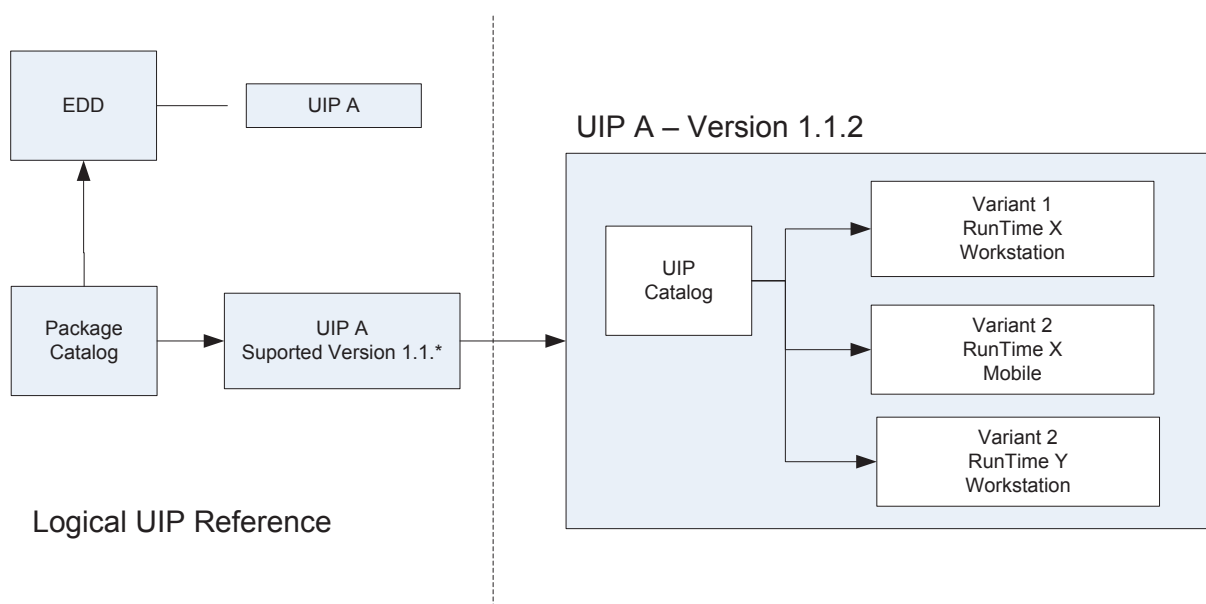


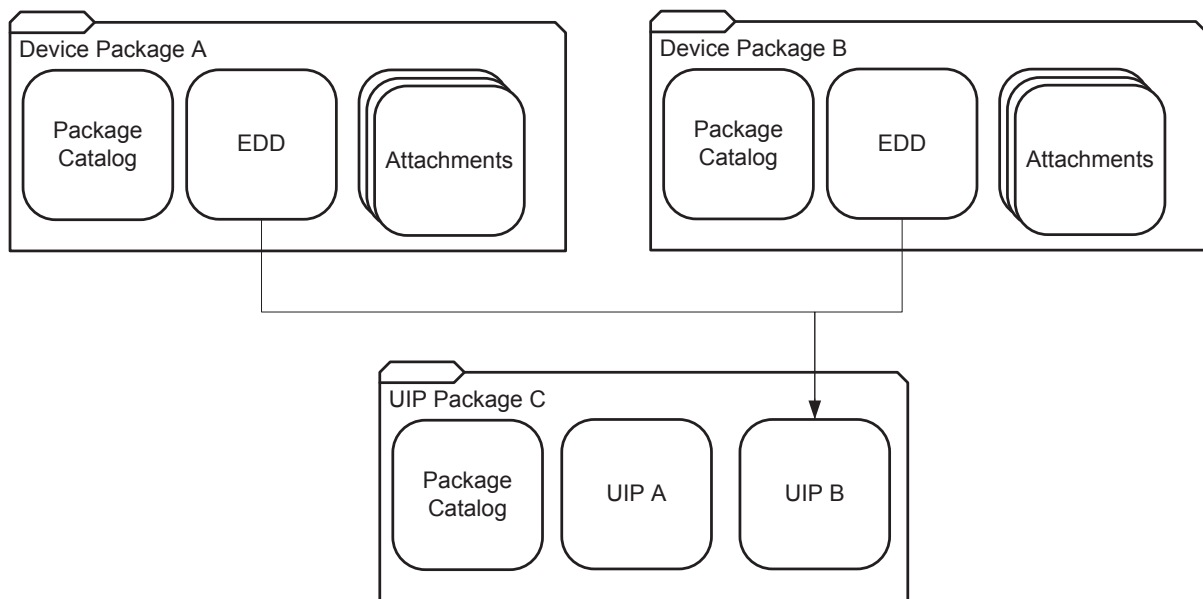
Figure 4 – User Interface Plug-in Reference Model

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

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

136 The target platform defines specific screen resolutions and/or input devices (for example,
 137 mouse and keyboard support) that have to be supported by the UIP Variant. The following
 138 target platforms are defined:

- 139 • “Full Client” (FULL) – with specified minimum screen resolution capabilities, memory
 140 capabilities, input devices available (like mouse and keyboard)
- 141 • “Portable Client” (MOBILE) – defined maximum screen resolution, memory available and
 142 limited input devices possible (mouse only...)



143

144

Figure 5 – Multiple FDI Packages referencing a common UIP

145 A UIP can be delivered internally (self contained) or the UIP can be delivered through an FDI
 146 UIP Package. An EDD of one package shall not reference any UIP delivered self contained
 147 with another package. Figure 5 illustrates two FDI Device Packages referencing UIPs from an
 148 FDI UIP Package.

149 4.2.4 Attachment

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

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

- 153 • Protocol specific files (see 5.3.4.3)
- 154 • Documentation (see 5.3.4.2)
- 155 • Device pictures (see 5.3.4.1)

156 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 one or more device type(s) to a system. Figure 6 shows the physical structure of an FDI Device Package containing a single device type.

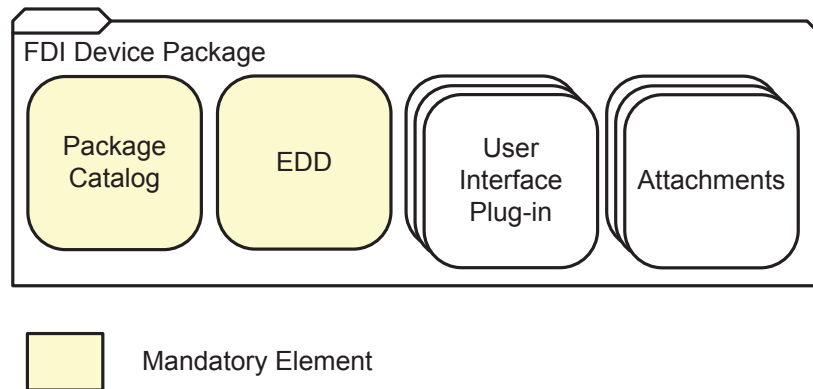


Figure 6 – FDI Device Package

The FDI Device Package shall have a Package Catalog and EDD.

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

The FDI Device Package may also include Attachments.

4.3.2 FDI Communication Package

The FDI Communication Package is intended to provide information about communication device that will be exposed through the FDI Server. Its 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.

Specific implementation requirements of the shown FDI Communication Package elements are described in IEC 62769-7.

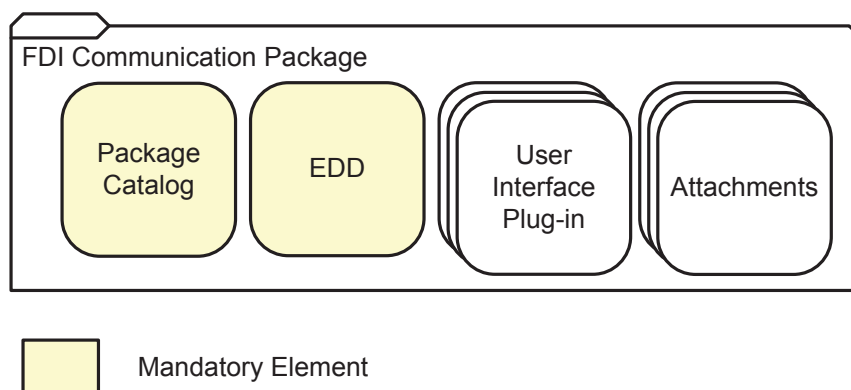


Figure 7 – FDI Communication Package

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

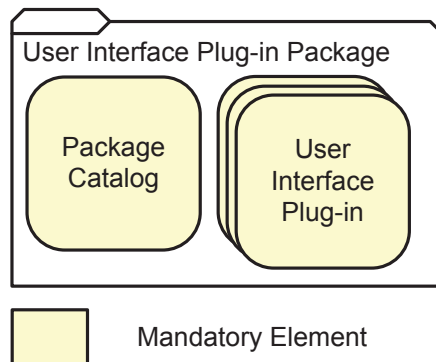


Figure 8 – FDI UIP Package

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.

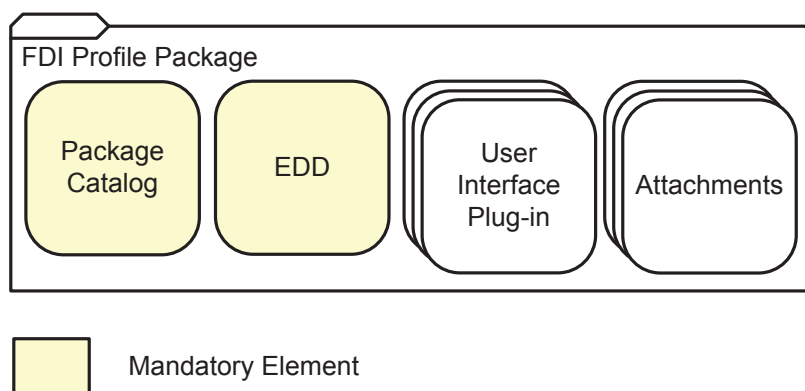


Figure 9 – FDI Profile Package

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.

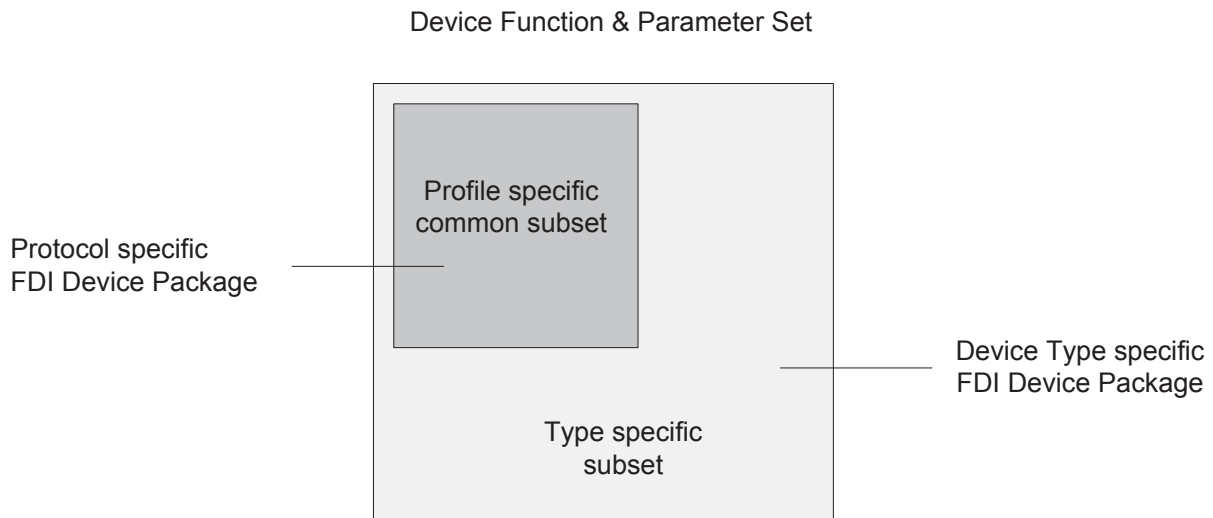


Figure 10 – Device Function & Parameter sets (type and profile specific)

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.

Detailed description of the communication protocol specific requirements is not part of this specification.

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.

5 FDI Package Implementation

5.1 Packaging Technology

The FDI Package's format complies with the Open Packaging Convention as specified by ISO/IEC 29500-2. The Open Packaging Convention specification is designed to represent a broad range of applications. The technology was designed to provide a mechanism for delivering, deploying, and utilizing a set of logically and physically related components in a flexible, extensible, efficient, and open manner.

Subclause 5.2 clarifies the use of specific elements of the Open Packaging Conventions specification.

5.2 Use of Open Packaging Conventions

5.2.1 Unknown Parts

Unknown parts are all parts not defined in this document or ISO/IEC 29500-2. Unknown parts may exist as the FDI specification is updated and legacy FDI Server may not have knowledge of these additional parts. Unknown parts shall be ignored by the FDI Server if unknown to enable forward compatibility.

226 5.2.2 Invalid Parts

227 Invalid parts are those parts that do not conform to the naming guidelines or that do not
228 associate with content types specified in this document or ISO/IEC 29500-2. Invalid parts
229 shall not be used in an FDI Package.

230 5.2.3 Unknown Relationships

231 Unknown relationships are those relationships that are not defined in this document or
232 ISO/IEC 29500-2. Unknown relationships shall be ignored by an FDI Package consumer.

233 5.2.4 Interleaving

234 The package producer shall not interleave parts.

235 5.2.5 Core Properties

236 The core properties are not used in the FDI Package Model and shall be ignored by all FDI
237 Package consumers.

238 5.2.6 Thumbnails

239 The thumbnail is an optional part of an FDI Package.

240 5.2.7 Digital Signatures

241 The use of digital signatures as specified in ISO/IEC 29500-2 is a mandatory part of an FDI
242 Package. For more details see Clause 7.

243 5.3 FDI Package Parts**244 5.3.1 Package Catalog****245 5.3.1.1 Format**

246 The Package Catalog part is an XML file whose schema is defined in Annex E. An FDI
247 Package shall have only one Package Catalog. The Package Catalog shall be identified by a
248 single package relationship. The root element of the file is Catalog. The structure of a
249 Catalog element is illustrated in Figure 11.