

DIN EN 62769-4

ICS 35.240.50

**Feldgeräteintegration (FDI) –
Teil 4: FDI-Packages
(IEC 62769-4:2015);
Englische Fassung EN 62769-4:2015**

Field Device Integration (FDI) –
Part 4: FDI Packages
(IEC 62769-4:2015);
English version EN 62769-4:2015

Intégration des appareils de terrain (FDI) –
Partie 4: Paquetages FDI
(IEC 62769-4:2015);
Version anglaise EN 62769-4:2015

Gesamtumfang 87 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Anwendungsbeginn

Anwendungsbeginn für die von CENELEC am 2015-06-16 angenommene Europäische Norm als DIN-Norm ist 2016-03-01.

Nationales Vorwort

Vorausgegangener Norm-Entwurf: E DIN EN 62769-4:2013-01.

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

Die enthaltene IEC-Publikation wurde vom SC 65E „Devices and integration in enterprise systems“ erarbeitet.

Das IEC-Komitee hat entschieden, dass der Inhalt dieser Publikation bis zu dem Datum (stability date) unverändert bleiben soll, das auf der IEC-Website unter „<http://webstore.iec.ch>“ zu dieser Publikation angegeben ist. Zu diesem Zeitpunkt wird entsprechend der Entscheidung des Komitees die Publikation

- bestätigt,
- zurückgezogen,
- durch eine Folgeausgabe ersetzt oder
- geändert.

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

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

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 62769-4 veröffentlicht. Zu deren Abschnitt 1, der den Anwendungsbereich festlegt, und Abschnitt 3, der die Begriffe 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.

Nationaler Anhang NA (informativ)

1 Anwendungsbereich^{N1)}

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

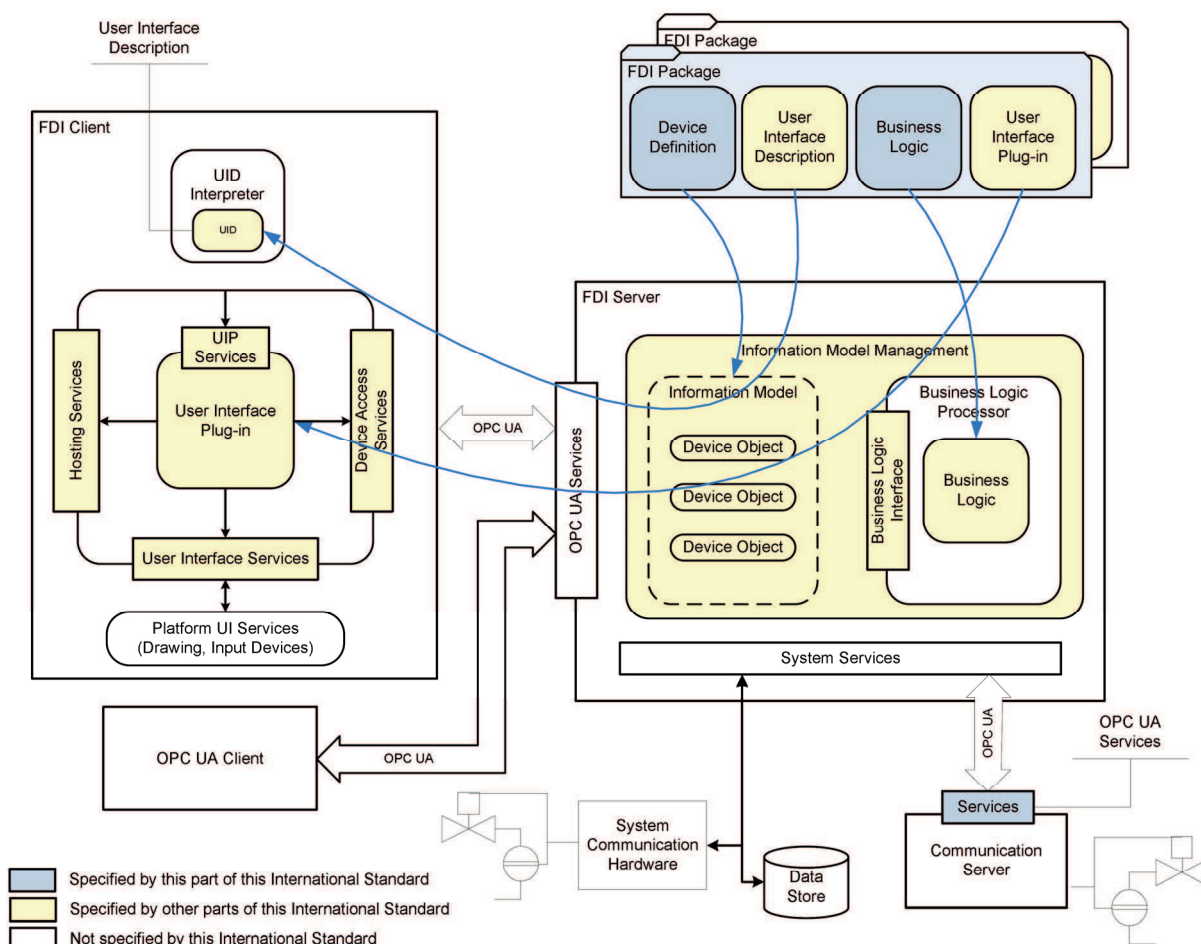


Bild 1 – FDI-Architektur

3 Begriffe, Abkürzungen und Konventionen^{N2)}

3.1 Begriffe

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

^{N1)} Nationale Fußnote: Die Nummerierung der IEC 62769-4:2015 wurde beibehalten.

^{N2)} Nationale Fußnote: Die deutschen Übersetzungen haben Empfehlungscharakter und können nur die ungefähre Begrifflichkeit in Deutsch wiedergeben. Unter Experten wird empfohlen, ausschließlich die englischen Fachbegriffe zu verwenden, um die Gefahr von Missverständnissen zu reduzieren.

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

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

3.1.3

FDI-Gerätepaket

(en: FDI Device Package)

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

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

3.1.4

FDI-Paketmodell

(en: FDI Package Model)

Beschreibung der Struktur und Elemente eines FDI-Paketes

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

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

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Fassung.

3.1.6

FDI-Registrierungsinstanz

(en: FDI Registration Authority)

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

3.1.7

FDI-UIP-Paket

(en: FDI UIP Package)

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

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

Anmerkung 2 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

3.1.8

Paketkatalog

(en: Package Catalog)

Datei, die die Inhalte eines FDI-Paketes beschreibt

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

3.1.9

UIP-Katalog

(en: UIP Catalog)

Datei, die die Eigenschaften eines UIP beschreibt

Anmerkung 1 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

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.

Anmerkung 2 zum Begriff: Diese Anmerkung gilt nur für die französische Sprachfassung.

– Leerseite –

English Version

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

Intégration des appareils de terrain (FDI) - Partie 4:
Paquetages FDI
(IEC 62769-4:2015)

Feldgeräteintegration (FDI) - Teil 4: FDI-Packages
(IEC 62769-4:2015)

This European Standard was approved by CENELEC on 2015-06-16. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, 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: Avenue Marnix 17, B-1000 Brussels

European foreword

The text of document 65E/347/CDV, future edition 1 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 62769-4:2015.

The following dates are fixed:

- latest date by which the document has to be (dop) 2016-03-16
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-06-16
standards conflicting with the
document have to be withdrawn

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

Endorsement notice

The text of the International Standard IEC 62769-4:2015 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 61784-1.
IEC 61784-2	NOTE	Harmonized as EN 61784-2.
IEC 61804-5	NOTE	Harmonized as EN 61804-5.
IEC 62591	NOTE	Harmonized as EN 62591.

CONTENTS

CONTENTS	3
INTRODUCTION.....	9
1 Scope.....	10
2 Normative references	10
3 Terms, definitions, abbreviated terms and acronyms	11
3.1 Terms and definitions	11
3.2 Abbreviated terms and acronyms.....	13
4 FDI Package Model	13
4.1 Overview	13
4.2 FDI Package Elements	14
4.2.1 Package Catalog.....	14
4.2.2 Electronic Device Description	14
4.2.3 User Interface Plug-in	15
4.2.4 Attachment	16
4.3 FDI Package Types	16
4.3.1 FDI Device Package.....	16
4.3.2 FDI Communication Package	17
4.3.3 FDI UIP Package	18
4.3.4 FDI Profile Package	18
5 FDI Package implementation	20
5.1 Packaging technology	20
5.2 Use of Open Packaging Conventions.....	20
5.2.1 Unknown Parts.....	20
5.2.2 Invalid Parts.....	20
5.2.3 Unknown Relationships	20
5.2.4 Interleaving.....	20
5.2.5 Core Properties.....	20
5.2.6 Thumbnails	20
5.2.7 Digital signatures	20
5.3 FDI Package Parts	20
5.3.1 Package Catalog.....	20
5.3.2 Electronic Device Description	22
5.3.3 User Interface Plug-in	22
5.3.4 Attachments.....	25
6 FDI Package Versioning	27
6.1 Version Scheme.....	27
6.2 Versioned Elements	28
6.3 Version hierarchy	28
6.4 UIP compatibility	30
7 Digital Signatures and Registration Certificates	31
7.1 Signed Elements and Certification documents.....	31
7.2 Signing mechanism	32
7.3 FDI Package Originator, FDI Registration Authority.....	32
7.4 FDI Host behavior	32

Annex A (normative) File name conventions	34
A.1 Identification	34
A.2 FDI Package filename convention	34
Annex B (informative) FDI Package creation	35
B.1 General	35
B.2 Tools and components	35
B.2.1 Overview	35
B.2.2 FDI Reference Implementation/Common EDD Engine	35
B.2.3 FDI Package IDE	35
B.2.4 FDI Device Package Conformance Test Tool	35
B.3 Development.....	35
B.3.1 FDI Package core development.....	35
B.3.2 User Interface Plug-in development.....	36
B.3.3 FDI Package Attachment development	36
B.3.4 FDI Package binding and packaging.....	36
B.3.5 Conformance Test	37
Annex C (informative) FDI Package deployment	38
C.1 General	38
C.2 Scenarios	38
C.2.1 FDI Package deployment to PC based client/server systems.....	38
C.2.2 FDI Package deployment to an FDI standalone system	39
Annex D (informative) Example	41
D.1 General	41
D.2 Open Packaging Conventions.....	41
D.2.1 Overview	41
D.2.2 Parts	41
D.2.3 Relationships.....	42
D.2.4 OPC core features	42
D.2.5 OPC additional features	43
D.3 Creation and handling of FDI Packages	44
D.4 FDI Device Package example.....	44
D.4.1 Overview	44
D.4.2 User Interface Plug-in	48
D.4.3 EDD reference to UIP	50
D.4.4 FDI Registration Certificate	50
Annex E (normative) Schema.....	51
E.1 Target Namespace.....	51
E.2 Catalog.....	51
E.3 ClassificationIdT	51
E.4 CommunicationProfileT	51
E.5 CommunicationRoleT	52
E.6 CommunicationServerT	52
E.7 DeviceTypeT.....	52
E.8 FdiRegistrationCert	53
E.9 FdiRegistrationCertT	53
E.10 HexStringT	54
E.11 InterfaceT	54

E.12	ListOfCommunicationProfilesT	55
E.13	ListOfDeviceImagesT	55
E.14	ListOfDeviceTypesT	56
E.15	ListOfDocumentsT	56
E.16	ListOfInterfacesT	56
E.17	ListOfLocalizedStringsT	57
E.18	ListOfProtocolSupportFilesT	57
E.19	ListOfRegDeviceTypesT	58
E.20	ListOfRegistrationsT	58
E.21	ListOfSupportedDeviceRevisionsT	58
E.22	ListOfSupportedUipsT	59
E.23	ListOfUipVariantsT	59
E.24	LocalizedStringT	59
E.25	PackageT	60
E.26	PackageTypeT	61
E.27	PlatformT	61
E.28	RegDeviceTypeT	62
E.29	RegistrationT	62
E.30	RelationshipIdT	62
E.31	String256T	63
E.32	SupportedUipT	63
E.33	UipCatalog	63
E.34	UipStyleT	64
E.35	UipT	64
E.36	UipVariantT	65
E.37	UuidT	65
E.38	VersionSupportedT	66
E.39	VersionT	66
Annex F (normative) Communication protocol specific profiles		67
Annex G (informative) FDI Package life-cycle use cases		68
G.1	New Device Type	68
G.2	Replacement of Device	68
G.3	Firmware enhancements	68
G.4	FDI Package life-cycle polices	69
G.5	FDI Package update	69
G.6	FDI Package upgrade	69
G.7	FDI Package replacement/exchange	69
G.8	FDI Package uninstallation	69
Annex H (normative) Health Status Method		71
H.1	Background	71
H.2	Device Health Status Model	71
H.3	Standard EDD Method signature	71
H.4	Performance considerations	72
Annex I (normative) Modular devices		73
I.1	Concept	73
I.2	EDDL usage profile	73
I.3	Processing recommendations	74

I.3.1	Monolithic device with device variants	74
I.3.2	Remote IOs	74
I.3.3	How to identify the top level topology element	74
I.3.4	Packaging details example.....	74
Annex J (normative)	FDI Communication Packages for FDI Communication Server.....	76
J.1	General	76
J.2	Protocol Support File	76
J.3	CommunicationProfile definition	76
J.4	Profile Device	76
J.5	Protocol version information	76
J.6	Associating a Package with an FDI Communication Server	76
J.7	Handling of Catalog elements.....	76
J.8	Example	77
Annex K (normative)	FDI Profile for EDDs	78
K.1	Overview	78
K.2	Entry Point to Online handling	78
K.3	Entry Point to Offline handling	78
K.4	Upload and Download	78
K.5	Initial Data Set	78
K.6	Method GetHealthStatus	78
K.7	Actions	78
K.7.1	Pre- and Post-Read Actions	78
K.7.2	Pre- and Post-Write Actions	79
K.7.3	Refresh Actions on Variables	79
K.7.4	Actions on BIT_ENUMERATION.....	79
K.8	Shared files	79
Bibliography		80
Annex ZA (normative)	Normative references to international publications with their corresponding European publications.....	81
Figure 1 – FDI architecture diagram		10
Figure 2 – FDI Package Model.....		13
Figure 3 – Architectural mapping.....		14
Figure 4 – User Interface Plug-in Reference Model.....		15
Figure 5 – Multiple FDI Packages referencing a common UIP		16
Figure 6 – FDI Device Package.....		17
Figure 7 – FDI Communication Package.....		18
Figure 8 – FDI UIP Package		18
Figure 9 – FDI Profile Package		19
Figure 10 – Device Function and Parameter sets (type and profile specific)		19
Figure 11 – Catalog Element.....		21
Figure 12 – User Interface Plug-in.....		22
Figure 13 – UIP Catalog		24
Figure 14 – FDI Registration Certificate		27
Figure 15 – Version hierarchy		29

Figure 16 – UIP Version Support concept	31
Figure 17 – FDI Package signing.....	32
Figure B.1 – Tools used for FDI Package development	36
Figure D.1 – Parts and relationships in a package	41
Figure D.2 – Creating an FDI Package with the content files	44
Figure D.3 – FDI Device Package example.....	45
Figure D.4 – User Interface Plug-in example (fancytrend.uip).....	48
Figure I.1 – Modular device's package.....	73
Table 1 – UIP Platform.....	16
Table 2 – Package Catalog Part	21
Table 3 – EDD part	22
Table 4 – User Interface Plug-in part.....	23
Table 5 – UIP Catalog part.....	24
Table 6 – UIP Variant part.....	25
Table 7 – Image part.....	25
Table 8 – Documentation part	25
Table 9 – Protocol Support File Part.....	26
Table 10 – FDI Registration Certificate Part.....	26
Table 11 – Versioned Elements.....	28
Table 12 – Influence on FDI Package Version	29
Table A.1 – FDI Package naming convention.....	34
Table D.1 – Examples of standard MIME media types that can be used in FDI Packages	43
Table D.2 – Examples of FDI-custom MIME media types that can be used in FDI Packages	43
Table E.1 – Enumerations of CommunicationRoleT	52
Table E.2 – Elements of CommunicationServerT	52
Table E.3 – Elements of DeviceTypeT	53
Table E.4 – Elements of FdiRegistrationCertT	54
Table E.5 – Elements of InterfaceT	54
Table E.6 – Elements of ListOfCommunicationProfilesT	55
Table E.7 – Elements of ListOfDeviceImagesT	56
Table E.8 – Elements of ListOfDeviceTypesT	56
Table E.9 – Elements of ListOfDocumentsT	56
Table E.10 – Elements of ListOfInterfacesT	57
Table E.11 – Elements of ListOfLocalizedStringsT	57
Table E.12 – Elements of ListOfProtocolSupportFilesT	57
Table E.13 – Elements of ListOfRegDeviceTypesT	58
Table E.14 – Elements of ListOfRegistrationsT	58
Table E.15 – Elements of ListOfSupportedDeviceRevisionsT	59
Table E.16 – Elements of ListOfSupportedUipsT	59
Table E.17 – Elements of ListOfUipVariantsT	59
Table E.18 – Attributes of LocalizedStringT	60

Table E.19 – Elements of PackageT.....	60
Table E.20 – Enumerations of PackageTypeT	61
Table E.21 – Enumerations of PlatformT	61
Table E.22 – Elements of RegDeviceTypeT.....	62
Table E.23 – Elements of RegistrationT	62
Table E.24 – Elements of SupportedUipT	63
Table E.25 – Enumerations of UipStyleT	64
Table E.26 – Elements of UipT.....	64
Table E.27 – Elements of UipVariantT.....	65
Table F.1 – Communication protocol interest groups (alphabetical order).....	67
Table G.1– Device Replacement Guidelines.....	68
Table G.2 – Firmware enhancement guidelines	69
Table H.1 – Health Status State	71
Table J.1 – Catalog Mapping	76
Table J.2 – Handling of Catalog elements	76

INTRODUCTION

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.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holders of these patent rights have assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

- a) ABB Research Ltd
Claes Ryttoft
Affolterstrasse 4
Zurich, 8050
Switzerland
- b) Phoenix Contact GmbH & Co KG
Intellectual Property, Licenses & Standards
Flachsmarktstrasse 8, 32825 Blomberg
Germany
- c) Fisher Controls International LLC
John Dilger, Emerson Process Management LLLP
301 S. 1st Avenue, Marshalltown, Iowa 50158
USA
- d) Rockwell Automation Technologies, Inc.
1 Allen-Bradley Drive
Mayfield Heights, Ohio 44124
USA

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

ISO (www.iso.org/patents) and IEC (<http://patents.iec.ch>) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

FIELD DEVICE INTEGRATION (FDI) –

Part 4: FDI Packages

1 Scope

This part of IEC 62769 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 figure.

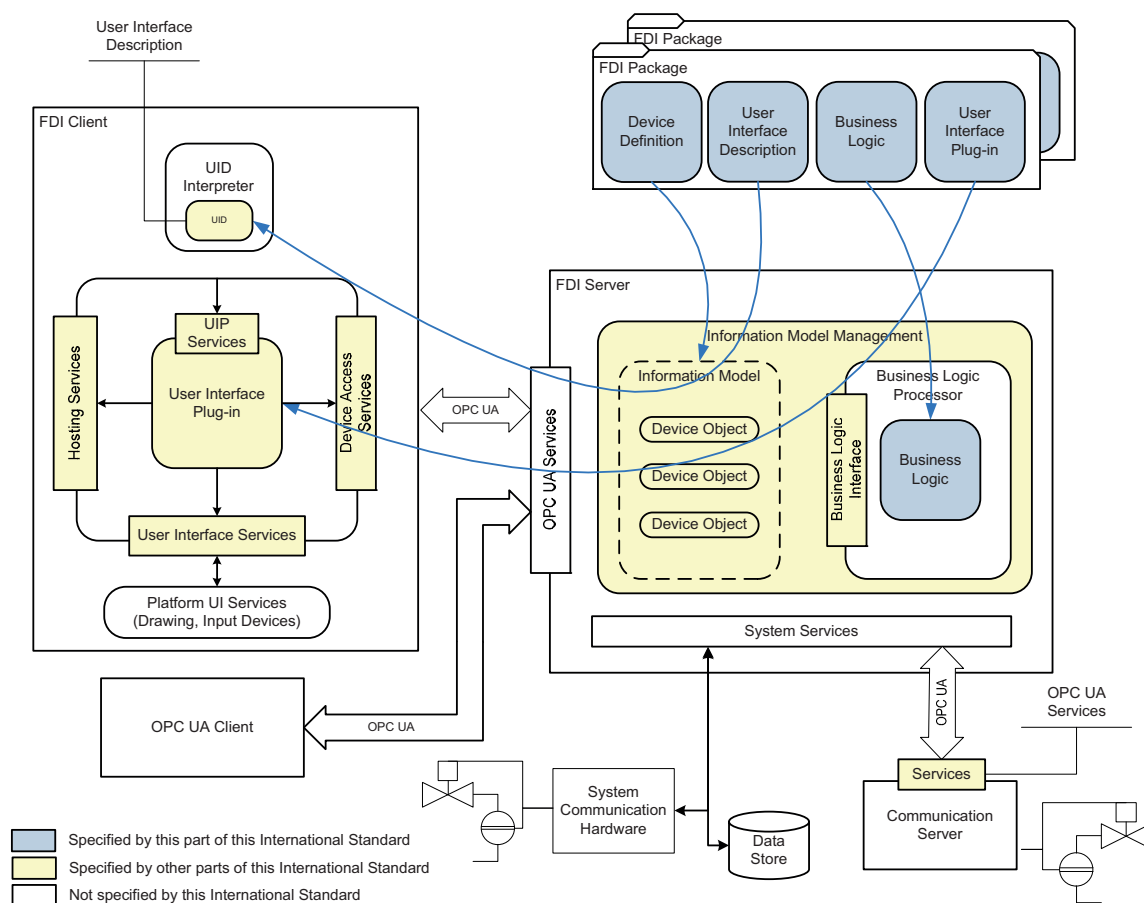


Figure 1 – FDI architecture diagram

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.

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

IEC 61804-3¹, *Function blocks (FB) for process control and Electronic Device Description Language (EDDL) – Part 3: EDDL syntax and semantics*

IEC 61804-4:–2, *Function blocks (FB) for process control and Electronic device description language (EDDL) – Part 4: EDD interpretation*

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

NOTE IEC 62769-1 is technically identical to FDI-2021.

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

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

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

NOTE IEC 62769-6 is technically identical to FDI-2026.

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

NOTE IEC 62769-7 is technically identical to FDI-2027.

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

ISO/IEC 29500-2:2011, *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/>

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 62769-1, ISO/IEC 29500-2, and the following apply.

3.1.1

attachment

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

¹ To be published.

² To be published.

3.1.2

FDI Communication Package

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

Note 1 to entry: This note applies to the French language only.

3.1.3

FDI Device Package

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

Note 1 to entry: This note applies to the French language only.

3.1.4

FDI Package Model

description of the structure and elements of an FDI Package

Note 1 to entry: This note applies to the French language only.

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

Note 1 to entry: This note applies to the French language only.

3.1.6

FDI Registration Authority

entity, which 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

Note 1 to entry: This note applies to the French language only.

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

3.1.8

Package Catalog

file that describes the contents of an FDI Package

Note 1 to entry: This note applies to the French language only.

3.1.9

UIP Catalog

file that describes the properties of a UIP

Note 1 to entry: This note applies to the French language only.

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.

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

3.2 Abbreviated terms and acronyms

For the purposes of this document, the abbreviated terms and acronyms 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)

4 FDI Package Model

4.1 Overview

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

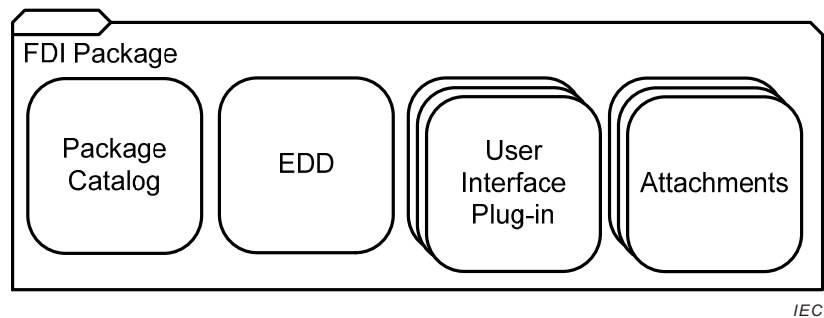


Figure 2 – FDI Package Model

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 standard.

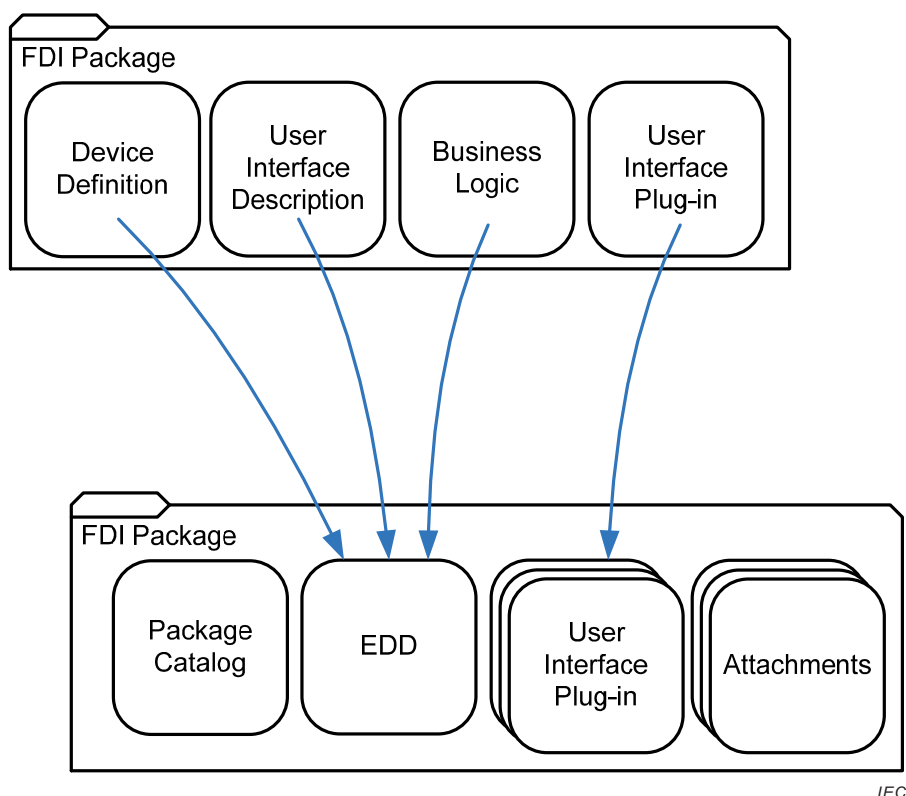


Figure 3 – Architectural mapping

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.

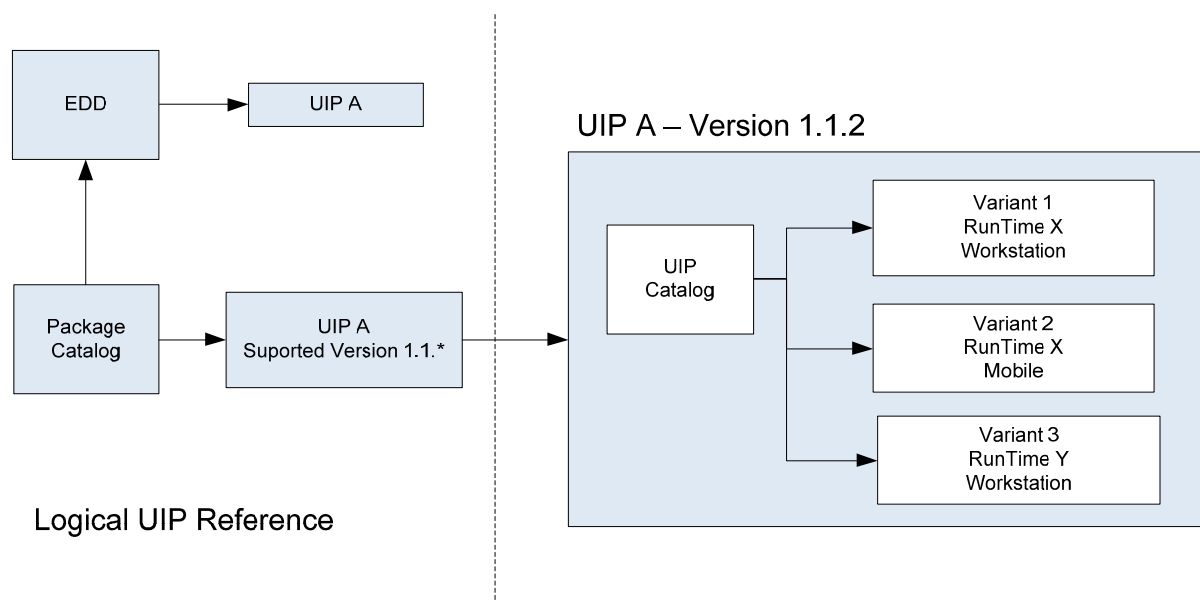
To maximize interoperability, the initial setup of a device shall be achievable solely with the User Interface Descriptions, Device Definition and Business Logic that are part of the EDD in the FDI Device Package. The use of User Interface Plug-ins is optional and targeted in particular for the complete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



IEC

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.

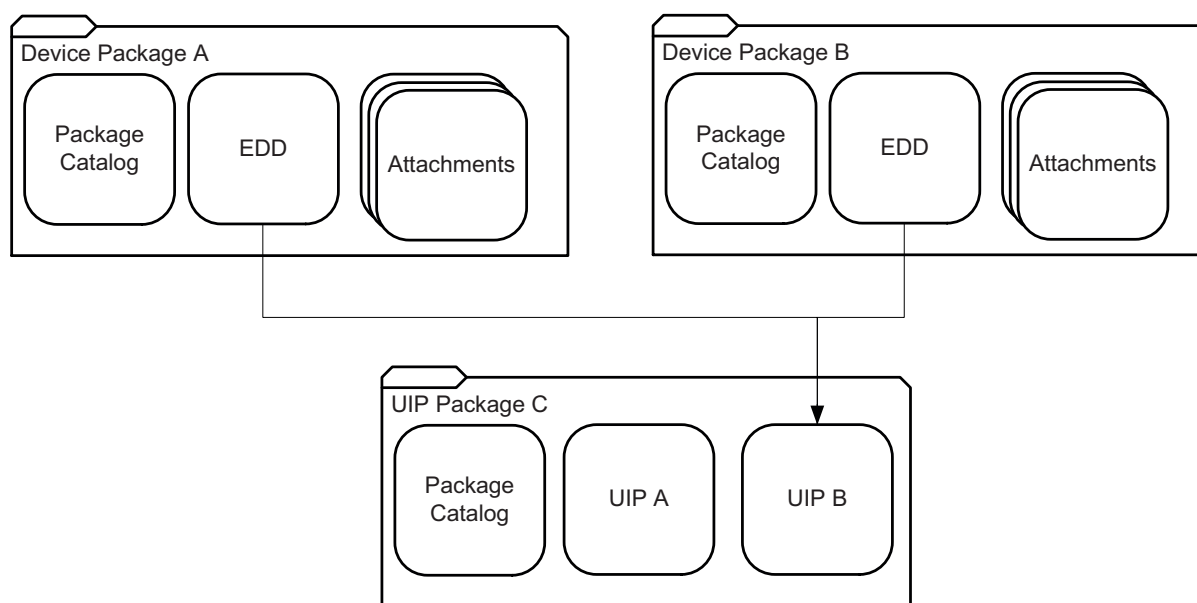
The target platform defines specific screen resolutions and input devices that shall be supported by the UIP Variant. Available target platforms are described in Table 1.

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.



IEC

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.

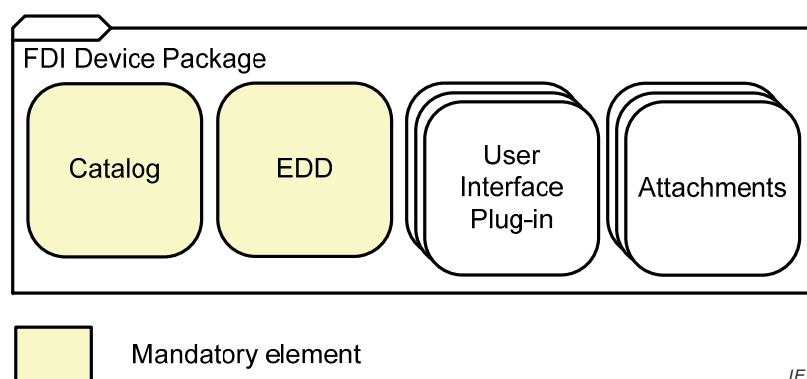


Figure 6 – FDI Device Package

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.

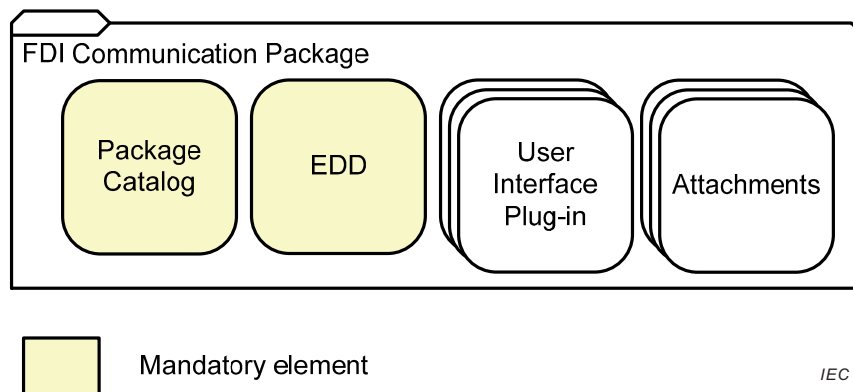


Figure 7 – FDI Communication Package

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.

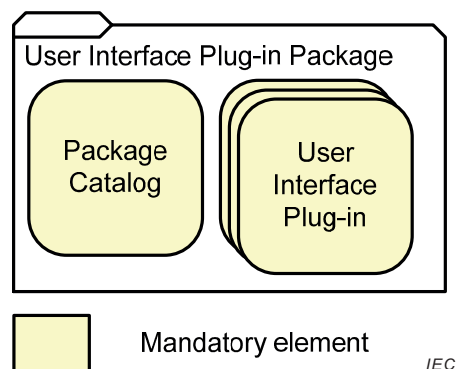


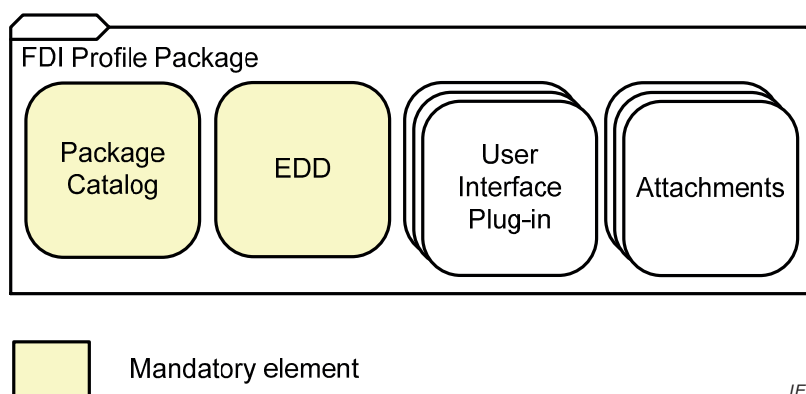
Figure 8 – FDI UIP Package

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.

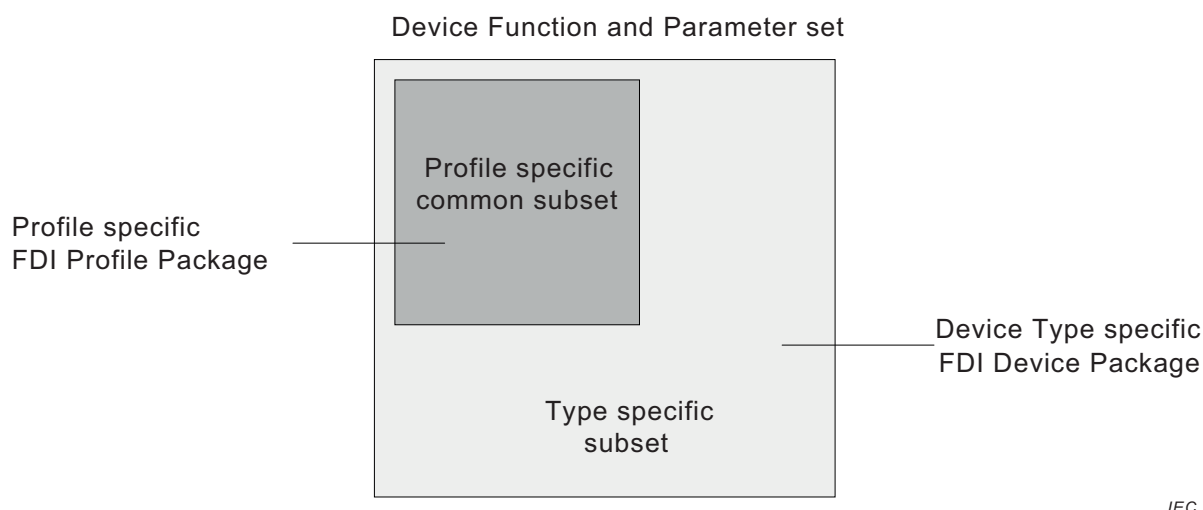


IEC

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.



IEC

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 standard.

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 to enable forward compatibility.

5.2.2 Invalid Parts

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

5.2.3 Unknown Relationships

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

5.2.4 Interleaving

All parts of the FDI Package shall be laid out using simple ordering. The package producer shall not interleave parts.

5.2.5 Core Properties

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

5.2.6 Thumbnails

The thumbnail is an optional part of an FDI Package.

5.2.7 Digital signatures

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

5.3 FDI Package Parts

5.3.1 Package Catalog

5.3.1.1 Format

The Package Catalog part is an XML file whose schema is defined in Annex E. An FDI Package shall have only one Package Catalog. The Package Catalog shall be identified by a single package

relationship. The root element of the file is Catalog. The structure of a Catalog element is illustrated in Figure 11.

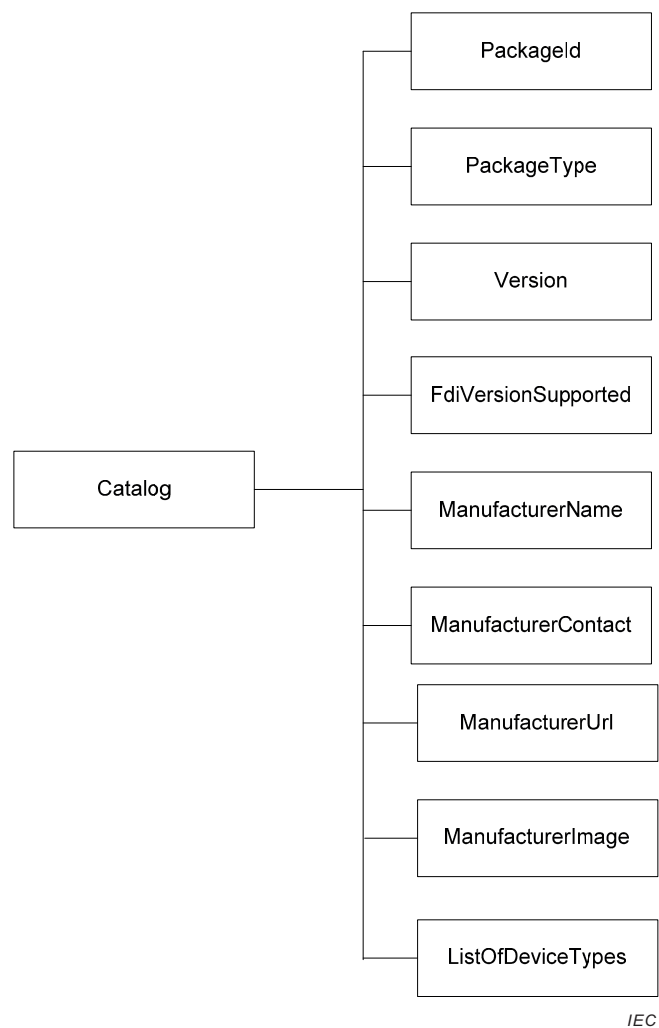


Figure 11 – Catalog Element

The Package Catalog part is described in Table 2.

Table 2 – Package Catalog Part

Part	Content
Content Type	application/vnd.fdi.package.catalog+xml
Root Namespace	http://fdi-cooperation.com/2010/package-catalog
Source Relationship	http://fdi-cooperation.com/2010/relationships/package-catalog
Filename	catalog.xml

5.3.1.2 Content

The schema for the Package Catalog is described in Annex E.