

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Field Device Integration (FDI) –
Part 4: FDI Packages**

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

Withdrawing



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2015 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 60 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Field Device Integration (FDI) –
Part 4: FDI Packages**

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040.40; 35.100

ISBN 978-2-8322-2640-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	11
2 Normative references	11
3 Terms, definitions, abbreviated terms and acronyms	12
3.1 Terms and definitions.....	12
3.2 Abbreviated terms and acronyms	14
4 FDI Package Model	14
4.1 Overview.....	14
4.2 FDI Package Elements.....	15
4.2.1 Package Catalog	15
4.2.2 Electronic Device Description	15
4.2.3 User Interface Plug-in.....	16
4.2.4 Attachment	17
4.3 FDI Package Types.....	17
4.3.1 FDI Device Package	17
4.3.2 FDI Communication Package.....	18
4.3.3 FDI UIP Package	19
4.3.4 FDI Profile Package.....	19
5 FDI Package implementation	21
5.1 Packaging technology	21
5.2 Use of Open Packaging Conventions	21
5.2.1 Unknown Parts	21
5.2.2 Invalid Parts	21
5.2.3 Unknown Relationships	21
5.2.4 Interleaving.....	21
5.2.5 Core Properties	21
5.2.6 Thumbnails	21
5.2.7 Digital signatures.....	21
5.3 FDI Package Parts.....	21
5.3.1 Package Catalog	21
5.3.2 Electronic Device Description	23
5.3.3 User Interface Plug-in.....	23
5.3.4 Attachments	26
6 FDI Package Versioning	28
6.1 Version Scheme.....	28
6.2 Versioned Elements.....	29
6.3 Version hierarchy.....	29
6.4 UIP compatibility.....	31
7 Digital Signatures and Registration Certificates	32
7.1 Signed Elements and Certification documents.....	32
7.2 Signing mechanism.....	33
7.3 FDI Package Originator, FDI Registration Authority.....	33
7.4 FDI Host behavior.....	33
Annex A (normative) File name conventions	35

A.1	Identification	35
A.2	FDI Package filename convention	35
Annex B (informative)	FDI Package creation	36
B.1	General.....	36
B.2	Tools and components	36
B.2.1	Overview	36
B.2.2	FDI Reference Implementation/Common EDD Engine.....	36
B.2.3	FDI Package IDE.....	36
B.2.4	FDI Device Package Conformance Test Tool.....	36
B.3	Development.....	36
B.3.1	FDI Package core development	36
B.3.2	User Interface Plug-in development	37
B.3.3	FDI Package Attachment development	37
B.3.4	FDI Package binding and packaging	38
B.3.5	Conformance Test	38
Annex C (informative)	FDI Package deployment	39
C.1	General.....	39
C.2	Scenarios	39
C.2.1	FDI Package deployment to PC based client/server systems	39
C.2.2	FDI Package deployment to an FDI standalone system.....	40
Annex D (informative)	Example.....	42
D.1	General.....	42
D.2	Open Packaging Conventions	42
D.2.1	Overview	42
D.2.2	Parts.....	42
D.2.3	Relationships	43
D.2.4	OPC core features.....	43
D.2.5	OPC additional features.....	44
D.3	Creation and handling of FDI Packages	45
D.4	FDI Device Package example	45
D.4.1	Overview	45
D.4.2	User Interface Plug-in	49
D.4.3	EDD reference to UIP	51
D.4.4	FDI Registration Certificate.....	51
Annex E (normative)	Schema.....	52
E.1	Target Namespace.....	52
E.2	Catalog	52
E.3	ClassificationIdT	52
E.4	CommunicationProfileT	52
E.5	CommunicationRoleT.....	53
E.6	CommunicationServerT.....	53
E.7	DeviceTypeT.....	53
E.8	FdiRegistrationCert.....	54
E.9	FdiRegistrationCertT.....	54
E.10	HexStringT.....	55
E.11	InterfaceT	55
E.12	ListOfCommunicationProfilesT	56
E.13	ListOfDeviceImagesT	56

E.14	ListOfDeviceTypesT	57
E.15	ListOfDocumentsT	57
E.16	ListOfInterfacesT	57
E.17	ListOfLocalizedStringsT	58
E.18	ListOfProtocolSupportFilesT	58
E.19	ListOfRegDeviceTypesT	59
E.20	ListOfRegistrationsT	59
E.21	ListOfSupportedDeviceRevisionsT	59
E.22	ListOfSupportedUipsT	60
E.23	ListOfUipVariantsT	60
E.24	LocalizedStringT	60
E.25	PackageT	61
E.26	PackageTypeT	62
E.27	PlatformT	62
E.28	RegDeviceTypeT	63
E.29	RegistrationT	63
E.30	RelationshipIdT	63
E.31	String256T	64
E.32	SupportedUipT	64
E.33	UipCatalog	64
E.34	UipStyleT	65
E.35	UipT	65
E.36	UipVariantT	66
E.37	UuidT	66
E.38	VersionSupportedT	67
E.39	VersionT	67
Annex F (normative) Communication protocol specific profiles		68
Annex G (informative) FDI Package life-cycle use cases		69
G.1	New Device Type	69
G.2	Replacement of Device	69
G.3	Firmware enhancements	69
G.4	FDI Package life-cycle polices	70
G.5	FDI Package update	70
G.6	FDI Package upgrade	70
G.7	FDI Package replacement/exchange	70
G.8	FDI Package uninstallation	70
Annex H (normative) Health Status Method		72
H.1	Background	72
H.2	Device Health Status Model	72
H.3	Standard EDD Method signature	72
H.4	Performance considerations	73
Annex I (normative) Modular devices		74
I.1	Concept	74
I.2	EDDL usage profile	74
I.3	Processing recommendations	75
I.3.1	Monolithic device with device variants	75
I.3.2	Remote IOs	75
I.3.3	How to identify the top level topology element	75

I.3.4	Packaging details example	75
Annex J (normative)	FDI Communication Packages for FDI Communication Server	77
J.1	General.....	77
J.2	Protocol Support File	77
J.3	CommunicationProfile definition.....	77
J.4	Profile Device	77
J.5	Protocol version information.....	77
J.6	Associating a Package with an FDI Communication Server	77
J.7	Handling of Catalog elements	77
J.8	Example.....	78
Annex K (normative)	FDI Profile for EDDs.....	79
K.1	Overview.....	79
K.2	Entry Point to Online handling.....	79
K.3	Entry Point to Offline handling.....	79
K.4	Upload and Download	79
K.5	Initial Data Set	79
K.6	Method GetHealthStatus	79
K.7	Actions	79
K.7.1	Pre- and Post-Read Actions.....	79
K.7.2	Pre- and Post-Write Actions.....	80
K.7.3	Refresh Actions on Variables.....	80
K.7.4	Actions on BIT_ENUMERATION.....	80
K.8	Shared files	80
Bibliography.....		81
Figure 1 – FDI architecture diagram.....		11
Figure 2 – FDI Package Model.....		14
Figure 3 – Architectural mapping		15
Figure 4 – User Interface Plug-in Reference Model		16
Figure 5 – Multiple FDI Packages referencing a common UIP		17
Figure 6 – FDI Device Package.....		18
Figure 7 – FDI Communication Package		19
Figure 8 – FDI UIP Package		19
Figure 9 – FDI Profile Package		20
Figure 10 – Device Function and Parameter sets (type and profile specific).....		20
Figure 11 – Catalog Element.....		22
Figure 12 – User Interface Plug-in		23
Figure 13 – UIP Catalog		25
Figure 14 – FDI Registration Certificate		28
Figure 15 – Version hierarchy		30
Figure 16 – UIP Version Support concept		32
Figure 17 – FDI Package signing		33
Figure B.1 – Tools used for FDI Package development.....		37
Figure D.1 – Parts and relationships in a package		42
Figure D.2 – Creating an FDI Package with the content files.....		45
Figure D.3 – FDI Device Package example		46

Figure D.4 – User Interface Plug-in example (fancytrend.uip)	49
Figure I.1 – Modular device's package	74
Table 1 – UIP Platform.....	17
Table 2 – Package Catalog Part.....	22
Table 3 – EDD part	23
Table 4 – User Interface Plug-in part	24
Table 5 – UIP Catalog part.....	25
Table 6 – UIP Variant part	26
Table 7 – Image part.....	26
Table 8 – Documentation part	26
Table 9 – Protocol Support File Part	27
Table 10 – FDI Registration Certificate Part.....	27
Table 11 – Versioned Elements	29
Table 12 – Influence on FDI Package Version.....	30
Table A.1 – FDI Package naming convention	35
Table D.1 – Examples of standard MIME media types that can be used in FDI Packages.....	44
Table D.2 – Examples of FDI-custom MIME media types that can be used in FDI Packages.....	44
Table E.1 – Enumerations of CommunicationRoleT.....	53
Table E.2 – Elements of CommunicationServerT	53
Table E.3 – Elements of DeviceTypeT	54
Table E.4 – Elements of FdiRegistrationCertT.....	55
Table E.5 – Elements of InterfaceT.....	55
Table E.6 – Elements of ListOfCommunicationProfilesT	56
Table E.7 – Elements of ListOfDeviceImagesT.....	57
Table E.8 – Elements of ListOfDeviceTypesT	57
Table E.9 – Elements of ListOfDocumentsT	57
Table E.10 – Elements of ListOfInterfacesT	58
Table E.11 – Elements of ListOfLocalizedStringsT	58
Table E.12 – Elements of ListOfProtocolSupportFilesT	58
Table E.13 – Elements of ListOfRegDeviceTypesT	59
Table E.14 – Elements of ListOfRegistrationsT	59
Table E.15 – Elements of ListOfSupportedDeviceRevisionsT	60
Table E.16 – Elements of ListOfSupportedUipsT.....	60
Table E.17 – Elements of ListOfUipVariantsT.....	60
Table E.18 – Attributes of LocalizedStringT	61
Table E.19 – Elements of PackageT	61
Table E.20 – Enumerations of PackageTypeT.....	62
Table E.21 – Enumerations of PlatformT.....	62
Table E.22 – Elements of RegDeviceTypeT	63
Table E.23 – Elements of RegistrationT	63
Table E.24 – Elements of SupportedUipT.....	64

Table E.25 – Enumerations of UipStyleT 65

Table E.26 – Elements of UipT 65

Table E.27 – Elements of UipVariantT 66

Table F.1 – Communication protocol interest groups (alphabetical order) 68

Table G.1– Device Replacement Guidelines 69

Table G.2 – Firmware enhancement guidelines 70

Table H.1 – Health Status State 72

Table J.1 – Catalog Mapping 77

Table J.2 – Handling of Catalog elements 77

Withdrawn

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

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:

CDV	Report on voting
65E/347/CDV	65E/424/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

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

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

Withdrawn

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.