

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



---

**Field device integration (FDI) –  
Part 103-4: Profiles – PROFINET**

**Intégration des appareils de terrain (FDI) –  
Partie 103-4: Profils – PROFINET**



**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](mailto:info@iec.ch)  
[www.iec.ch](http://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](http://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](http://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](http://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](http://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](http://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](http://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](mailto: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](http://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](http://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](http://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](http://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](http://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](http://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](mailto:csc@iec.ch).



IEC 62769-103-4

Edition 1.0 2015-05

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



---

**Field device integration (FDI) –  
Part 103-4: Profiles – PROFINET**

**Intégration des appareils de terrain (FDI) –  
Partie 103-4: Profils – PROFINET**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

---

ICS 25.040.40; 35.100

ISBN 978-2-8322-2624-7

**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.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms, definitions, abbreviated terms and acronyms .....	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms and acronyms .....	8
4 Conventions .....	8
4.1 EDDL syntax.....	8
4.2 XML syntax.....	8
4.3 Capitalizations .....	8
5 Profile for PROFINET .....	9
5.1 General.....	9
5.2 Catalog profile .....	9
5.2.1 Protocol support file.....	9
5.2.2 CommunicationProfile definition.....	10
5.2.3 Profile device.....	10
5.2.4 Protocol version information .....	10
5.3 Associating a Package with a device.....	11
5.3.1 Device type identification mapping.....	11
5.3.2 Device type revision mapping .....	12
5.4 Information Model mapping.....	13
5.4.1 ProtocolType definition .....	13
5.4.2 DeviceType mapping .....	14
5.4.3 FunctionalGroup identification definition .....	14
5.5 Topology elements.....	14
5.5.1 ConnectionPoint definition .....	14
5.5.2 Communication Device definition .....	16
5.5.3 Communication service provider definition .....	17
5.5.4 Network definition.....	17
5.6 Methods.....	18
5.6.1 Methods for FDI Communication Servers.....	18
5.6.2 Methods for Gateways .....	22
Annex A (normative) Topology scan schema.....	30
A.1 General.....	30
A.2 Network .....	30
A.3 ProfinetNetworkT .....	30
A.4 ProfinetConnectionPointT .....	30
A.5 ProfinetIdentificationT .....	31
A.6 MACT .....	32
A.7 IPv4T.....	32
A.8 IPv6T.....	32
A.9 DNSNameT.....	32
A.10 Hex4DigitT.....	32
Annex B (normative) Transfer service parameters.....	33

- B.1 General..... 33
- B.2 sendData ..... 33
- B.3 receiveData ..... 33
- B.4 TransferSendDataT..... 33
- B.5 TransferResultDataT..... 34
- B.6 OperationT..... 34
- Bibliography..... 35

- Figure 1 – Version mapping problem..... 12

- Table 1 – ProtocolSupportFile for FDI Device Packages ..... 9
- Table 2 – ProtocolSupportFile for FDI Communication Packages ..... 10
- Table 3 – Catalog values for profile devices..... 10
- Table 4 – Version mapping examples..... 11
- Table 5 – Device identification information mapping..... 12
- Table 6 – Protocol type Profinet\_IO ..... 13
- Table 7 – DeviceType Property mapping..... 14
- Table 8 – PROFINET identification type definition..... 14
- Table 9 – ConnectionPoint type for Profinet\_IO ..... 15
- Table 10 – Method Connect arguments ..... 19
- Table 11 – Method Disconnect arguments ..... 19
- Table 12 – Method Transfer arguments..... 20
- Table 13 – Method SetAddress arguments..... 21
- Table 14 – Method Connect arguments ..... 23
- Table 15 – Method Transfer arguments..... 25
- Table 16 – Method SetAddress arguments..... 27
- Table A.1 – Elements of ProfinetNetworkT..... 30
- Table A.2 – Attributes of ProfinetConnectionPointT..... 31
- Table A.3 – Elements of ProfinetConnectionPointT ..... 31
- Table A.4 – Attributes of ProfinetIdentificationT ..... 31
- Table B.1 – Attributes of TransferSendDataT..... 34
- Table B.2 – Attributes of TransferResultDataT ..... 34

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIELD DEVICE INTEGRATION (FDI) –****Part 103-4: Profiles – PROFINET**

## 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 62769-103-4 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/355/CDV	65E/418/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 website 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.**

## 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. 1<sup>st</sup> 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](http://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 103-4: Profiles – PROFINET

#### 1 Scope

This part of IEC 62769 specifies an FDI profile of IEC 62769 for IEC 61784-2\_CP 3/4, IEC 61784-2\_CP3/5 and IEC 61784-2\_CP3/6 (PROFINET<sup>1</sup>).

#### 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 61158-5-10, *Industrial communication networks – Fieldbus specifications – Part 5-10: Application layer service definition – Type 10 elements*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

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

IEC 62541-100:2015, *OPC Unified Architecture – Part 100: OPC UA for Devices*

IEC 62769-2, *Field Device Integration (FDI) – Part 2: FDI Client*

NOTE 1 IEC 62769-2 is technically identical to FDI-2022.

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

NOTE 2 IEC 62769-4 is technically identical to FDI-2024.

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

NOTE 3 IEC 62769-5 is technically identical to FDI-2025.

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

NOTE 4 IEC 62769-6 is technically identical to FDI-2026.

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

NOTE 5 IEC 62769-7 is technically identical to FDI-2027.

PI Order No.: 2.122:2008, *Specification for PROFIBUS – Device Description and Device Integration – Volume 1: GSD, V5.1, July 2008: GSD*; available at <[www.PROFIBUS.com](http://www.PROFIBUS.com)>

---

<sup>1</sup> PROFINET is the trade name of the non-profit consortium PROFIBUS & PROFINET International. This information is given for the convenience of users of this technical report and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance does not require use of the trade name. Use of the trade name requires permission of the trade name holder.