

Špecifikácia rozhrania softvérových nástrojov na prácu s prevádzkovými prístrojmi (FDT) Časť 51-60: Implementácia komunikácie pre všeobecný objektový model - IEC 61784 CPF 6

TNI CLC/TR 62453-51-60

18 4012

Field device tool (FDT) interface specification - Part 51-60: Communication implementation for common object model - IEC 61784 CPF 6

Táto technická normalizačná informácia obsahuje anglickú verziu CLC/TR 62453-51-60:2019, IEC/TR 62453-51-60:2017.

This Technical standard information includes the English version of CLC/TR 62453-51-60:2019, IEC/TR 62453-51-60:2017.

Táto technická normalizačná informácia bola oznámená vo Vestníku ÚNMS SR č. 05/19

# TECHNICAL REPORT RAPPORT TECHNIQUE TECHNISCHER BERICHT

CLC/TR 62453-51-60

February 2019

ICS 25.040.40; 35.110

## **English Version**

Field device tool (FDT) interface specification - Part 51-60: Communication implementation for common object model - IEC 61784 CPF 6 (IEC/TR 62453-51-60:2017)

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 51-60: Mise en œuvre d'un profil de communication pour le modèle d'objet commun - CPF 6 de l'IEC 61784 (IEC/TR 62453-51-60:2017)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 51-60: Kommunikationsimplementierung mit dem allgemeinen Objektmodell (COM) - Kommunikationsprofilfamilie (CPF) 6 nach IEC 6178 (IEC/TR 62453-51-60:2017)

This Technical Report was approved by CENELEC on 2019-01-07.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

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

CLC/TR 62453-51-60:2019 (E)

## **European foreword**

This document (CLC/TR 62453-51-60:2019) consists of the text of the IEC/TR 62453-51-60:2017 prepared by IEC/TC 65 "Industrial-process measurement, control and automation".

## **Endorsement notice**

The text of the International Standard IEC TR 62453-51-60:2017 was approved by CENELEC as a European Standard without any modification.

CLC/TR 62453-51-60:2019 (E)

## Annex ZA

(normative)

# Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 61784-1	2014	Industrial communication networks - Profiles - Part 1: Fieldbus profiles	EN 61784-1	2014
IEC 62453-1	2016	Field device tool (FDT) interface specification - Part 1: Overview and guidance	EN 62453-1	2017
IEC TR 62453-41	2016	Field device tool (FDT) interface specification - Part 41: Object model integration profile - Common object mode	-	-
IEC 62453-2	2016	Field device tool (FDT) interface specification - Part 2: Concepts and detailed description	EN 62453-2	2017
IEC 62453-306	2009	Field device tool (FDT) interface specification - Part 306: Communication profile integration - IEC 61784 CPF 6	EN 62453-306	2009



## IEC TR 62453-51-60

Edition 1.0 2017-06

# TECHNICAL REPORT



Field device tool (FDT) interface specification –
Part 51-60: Communication implementation for common object model –
IEC 61784 CPF 6





## THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2017 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.

IEC Central Office Tel.: +41 22 919 02 11 3, rue de Varembé Fax: +41 22 919 03 00

CH-1211 Geneva 20 info@iec.ch Switzerland 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 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

### IEC Glossary - std.iec.ch/glossary

65 000 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.



## IEC TR 62453-51-60

Edition 1.0 2017-06

# TECHNICAL REPORT



Field device tool (FDT) interface specification – Part 51-60: Communication implementation for common object model – IEC 61784 CPF 6

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 25.040.40; 35.110.05; 35.110

ISBN 978-2-8322-4327-5

Warning! Make sure that you obtained this publication from an authorized distributor.

## - 2 - IEC TR 62453-51-60:2017 © IEC 2017

## **CONTENTS**

INTRODUCTION	FOREWORD	3
2       Normative references       6         3       Terms, definitions, symbols, abbreviated terms and conventions       6         3.1       Terms and definitions       6         3.2       Symbols and abbreviated terms       7         3.3       Conventions       7         3.3.1       Data type names and references to data types       7         3.3.2       Vocabulary for requirements       7         4       Bus category       7         5       Access to instance and device data       7         6       Protocol specific behavior       6         7       Protocol specific usage of general data types       8         8       Network management data types       8         8.1       General       8         8.2       Interbus Device Address       8         9       Communication data types – FDTInterbusPCPCommunicationSchema       9         10       Channel parameter data types – FDTInterbusChannelParameterSchema       11         11       Device identification       12         11.1       Device type identification data types – FDTInterbusDeviceSchema       12         11.2       Topology scan data types – FDTInterbusDeviceSchema       13         11.3       Scan i	INTRODUCTION	5
2       Normative references       6         3       Terms, definitions, symbols, abbreviated terms and conventions       6         3.1       Terms and definitions       6         3.2       Symbols and abbreviated terms       7         3.3       Conventions       7         3.3.1       Data type names and references to data types       7         3.3.2       Vocabulary for requirements       7         4       Bus category       7         5       Access to instance and device data       7         6       Protocol specific behavior       6         7       Protocol specific usage of general data types       8         8       Network management data types       8         8.1       General       8         8.2       Interbus Device Address       8         9       Communication data types – FDTInterbusPCPCommunicationSchema       9         10       Channel parameter data types – FDTInterbusChannelParameterSchema       11         11       Device identification       12         11.1       Device type identification data types – FDTInterbusDeviceSchema       12         11.2       Topology scan data types – FDTInterbusDeviceSchema       13         11.3       Scan i	1 Scope	6
3.1       Terms and definitions       6         3.2       Symbols and abbreviated terms       7         3.3       Conventions       7         3.3.1       Data type names and references to data types       7         3.3.2       Vocabulary for requirements       7         4       Bus category       7         5       Access to instance and device data       7         6       Protocol specific behavior       8         7       Protocol specific usage of general data types       8         8       Network management data types       8         8.1       General       8         8.2       Interbus Device Address       8         9       Communication data types – FDTInterbusPCPCommunicationSchema       9         10       Channel parameter data types – FDTInterbusChannelParameterSchema       11         11       Device identification       12         11.1       Device type identification data types – FDTInterbusChannelParameterSchema       12         11.2       Topology scan data types – DTMInterbusDeviceSchema       13         11.3       Scan identification data types – FDTInterbusDeviceIdentSchema       14         11.4       Device type identification data types – FDTInterbusDeviceIdentSchema <t< td=""><td>·</td><td></td></t<>	·	
3.1       Terms and definitions       6         3.2       Symbols and abbreviated terms       7         3.3       Conventions       7         3.3.1       Data type names and references to data types       7         3.3.2       Vocabulary for requirements       7         4       Bus category       7         5       Access to instance and device data       7         6       Protocol specific behavior       8         7       Protocol specific usage of general data types       8         8       Network management data types       8         8.1       General       8         8.2       Interbus Device Address       8         9       Communication data types – FDTInterbusPCPCommunicationSchema       9         10       Channel parameter data types – FDTInterbusChannelParameterSchema       11         11       Device identification       12         11.1       Device type identification data types – FDTInterbusChannelParameterSchema       12         11.2       Topology scan data types – DTMInterbusDeviceSchema       13         11.3       Scan identification data types – FDTInterbusDeviceIdentSchema       14         11.4       Device type identification data types – FDTInterbusDeviceIdentSchema <t< td=""><td>3 Terms, definitions, symbols, abbreviated terms and conventions</td><td>6</td></t<>	3 Terms, definitions, symbols, abbreviated terms and conventions	6
3.2 Symbols and abbreviated terms 7 3.3 Conventions 7 3.3.1 Data type names and references to data types 7 3.3.2 Vocabulary for requirements 7 4 Bus category 7 5 Access to instance and device data 7 6 Protocol specific behavior 8 7 Protocol specific usage of general data types 8 8 Network management data types 8 8 Network management data types 8 8.1 General 8 8.2 Interbus Device Address 8 9 Communication data types - FDTInterbusPCPCommunicationSchema 8 10 Channel parameter data types - FDTInterbusChannelParameterSchema 11 11 Device identification 12 11.1 Device type identification data types - FDTInterbusIdentSchema 12 11.2 Topology scan data types - DTMInterbusDeviceSchema 13 11.3 Scan identification data types - FDTInterbusScanIdentSchema 14 11.4 Device type identification data types - FDTInterbusDeviceIdentSchema 14 11.5 XSLT Transformation 17 Bibliography 26 Figure 1 - Part 51-60 of the IEC 62453 series 5	· · · · · · · · · · · · · · · · · · ·	
3.3 Conventions		
3.3.2 Vocabulary for requirements 74 Bus category 75 Access to instance and device data 76 Protocol specific behavior 87 Protocol specific usage of general data types 88 Network management data types 88.1 General 88.2 Interbus Device Address 89 Communication data types 9 FDTInterbusPCPCommunicationSchema 9 Communication data types 9 FDTInterbusPCPCommunicationSchema 110 Device identification 111 Device identification 112 11.1 Device type identification data types 9 FDTInterbusDeviceSchema 113 11.2 Topology scan data types 9 DTMInterbusDeviceSchema 114 11.3 Scan identification data types 9 FDTInterbusScanIdentSchema 115 11.4 Device type identification data types 9 FDTInterbusDeviceIdentSchema 116 11.5 XSLT Transformation 117 Bibliography 26 Figure 1 9 Part 51-60 of the IEC 62453 series 5	·	
4 Bus category	3.3.1 Data type names and references to data types	7
5 Access to instance and device data	3.3.2 Vocabulary for requirements	7
6 Protocol specific behavior	4 Bus category	7
Protocol specific usage of general data types	5 Access to instance and device data	7
8 Network management data types	6 Protocol specific behavior	8
8.1 General	7 Protocol specific usage of general data types	8
8.2 Interbus Device Address	8 Network management data types	8
8.2 Interbus Device Address	8.1 General	8
10 Channel parameter data types – FDTInterbusChannelParameterSchema		
11 Device identification	9 Communication data types – FDTInterbusPCPCommunicationSchema	9
11.1 Device type identification data types – FDTInterbusIdentSchema	10 Channel parameter data types – FDTInterbusChannelParameterSchema	11
11.2 Topology scan data types – DTMInterbusDeviceSchema	11 Device identification	12
11.2 Topology scan data types – DTMInterbusDeviceSchema	11.1 Device type identification data types – FDTInterbusIdentSchema	12
11.4 Device type identification data types – FDTInterbusDeviceIdentSchema	••	
11.5 XSLT Transformation	11.3 Scan identification data types – FDTInterbusScanIdentSchema	14
Bibliography	11.4 Device type identification data types – FDTInterbusDeviceIdentSchema	16
Figure 1 – Part 51-60 of the IEC 62453 series5	11.5 XSLT Transformation	17
	Bibliography	26
Table 1 Protocol aposific usage of general data types	Figure 1 – Part 51-60 of the IEC 62453 series	5
	Table 1 – Protocol specific usage of general data types	8

IEC TR 62453-51-60:2017 © IEC 2017

– 3 –

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

\_\_\_\_\_

## FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION -

## Part 51-60: Communication implementation for common object model – IEC 61784 CPF 6

## **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.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 62453-51-60, which is a technical report, has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process management, control and automation.

This document cancels and replaces IEC TR 62453-506 published in 2009. This edition constitutes a technical revision. The main changes consist in updates of the schemas.

Each part of the IEC 62453-51-xy series is intended to be read in conjunction with its corresponding part in the IEC 62453-3xy series. This document corresponds to IEC 62453-306.

### - 4 - IEC TR 62453-51-60:2017 © IEC 2017

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
65E/440/DTR	65E/514/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The list of all parts of the IEC 62453 series, under the general title *Field device tool (FDT) interface specification*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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

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

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.

IEC TR 62453-51-60:2017 © IEC 2017 - 5 -

## INTRODUCTION

This part of IEC 62453 is an interface specification for developers of Field Device Tool (FDT) components for function control and data access within a client/server architecture. The specification is a result of an analysis and design process to develop standard interfaces to facilitate the development of servers and clients by multiple vendors that need to interoperate seamlessly.

With the integration of fieldbuses into control systems, there are a few other tasks which need to be performed. In addition to fieldbus- and device-specific tools, there is a need to integrate these tools into higher-level system-wide planning or engineering tools. In particular, for use in extensive and heterogeneous control systems, typically in the area of the process industry, the unambiguous definition of engineering interfaces that are easy to use for all those involved is of great importance.

A device-specific software component, called Device Type Manager (DTM), is supplied by the field device manufacturer with its device. The DTM is integrated into engineering tools via the FDT interfaces defined in this specification. The approach to integration is in general open for all kind of fieldbuses and thus meets the requirements for integrating different kinds of devices into heterogeneous control systems.

Figure 1 shows how this part of the IEC 62453-51-xy series is aligned in the structure of IEC 62453 series.

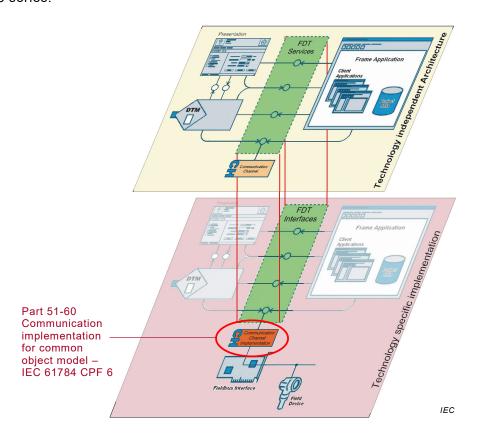


Figure 1 - Part 51-60 of the IEC 62453 series

- 6 - IEC TR 62453-51-60:2017 © IEC 2017

## FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION -

## Part 51-60: Communication implementation for common object model – IEC 61784 CPF 6

## 1 Scope

This part of the IEC 62453-51-xy series, which is a Technical Report, provides information for integrating the INTERBUS®¹ technology into the COM-based implementation of FDT interface specification (IEC TR 62453-41).

This part of IEC 62453 specifies implementation of communication and other services based on IEC 62453-306.

This document neither contains the FDT specification nor modifies it.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61784-1:2014, Industrial communication networks - Profiles - Part 1: Fieldbus profiles

IEC 62453-1:2016, Field device tool (FDT) interface specification – Part 1: Overview and guidance

IEC 62453-2:2016, Field device tool (FDT) interface specification – Part 2: Concepts and detailed description

IEC TR 62453-41:2016, Field device tool (FDT) interface specification – Part 41: Object model integration profile – Common object model

IEC 62453-306:2009, Field device tool (FDT) interface specification – Part 306: Communication profile integration – IEC 61784 CPF 6

## koniec náhľadu – text ďalej pokračuje v platenej verzii STN

<sup>1</sup> INTERBUS ® is the trade name of Phoenix Contact GmbH & Co. KG., control of trade name use is given to the non profit organisation INTERBUS Club. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of ist products. Compliance to this profile does not require use of the trade name INTERBUS. Use of the trade name INTERBUS requires permission of the INTERBUS Club.