IEC/TR 62453-501

Edition 1.0 2009-08

TECHNICAL REPORT

colour inside

Field device tool (FDT) interface specification – Part 501: Communication implementation for common object model – IEC 61784 CPF 1

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE XC

ICS 25.040.40; 35.100.05; 35.110

ISBN 978-2-88910-726-1

® Registered trademark of the International Electrotechnical Commission

CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
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 6
3.3 Conventions 7
3.3.1 Data type names and references to data types 7
3.3.2 Vocabulary for requirements 7
3.3.3 Use of UML 7
4 Bus category 7
5 Access to instance and device data 7
6 Protocol specific usage of general data types 7
7 Protocol specific common data types - FdtFFDataTypesSchema 8
8 Network management data types 10
8.1 General 10
8.2 H1 Management – FdtFFH1ManagementSchema 10
8.3 HSE Management – FdtFFHseManagementSchema 31
8.4 Address management 50
8.5 FF specific Parameter Set 50
9 Communication data types 50
9.1 General 50
9.2 FMS communication – FdtFFFmsSchema 50
9.3 H1 communication – FdtFFH1CommunicationSchema 56
9.4 HSE communication – FdtFFHseCommunicationSchema 60
9.5 Standard block communication – BtmFFCommunicationSchema 65
10 Channel parameter data types – FdtFFChannelParameterSchema 66
11 Device identification 67
11.1 Device type identification data types – FDTFieldbusIdentSchema 67
11.2 Topology scan data types 69
11.2.1 General 69
11.2.2 Scan for devices – DtmFFSchema 69
11.2.3 Scan for blocks – FdtFFBlockSchema 70
11.3 Scan identification data types – FDTFieldbusScanIdentSchema 70
11.4 Device type identification data types – FDTFieldbusDeviceIdentSchema 72
11.5 XSLT Transformation 75
Bibliography 87

Figure 1 – Part 501 of the IEC 62453 series 5

Table 1 – Protocol specific usage of general data types 7

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 501: Communication implementation for common object model – IEC 61784 CPF 1

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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
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 62453-501, which is a technical report, has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation:

This part, in conjunction with the other parts of the first edition of the IEC 62453 series cancels and replaces IEC/PAS 62453-1, IEC/PAS 62453-2, IEC/PAS 62453-3, IEC/PAS 62453-4 and IEC/PAS 62453-5 published in 2006, and constitutes a technical revision.

Each part of the IEC/TR 62453-5xy series is intended to be read in conjunction with its corresponding part in the IEC 62453-3xy series.

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

Enquiry draft	Report on voting
65E/65/DTR	65E/114/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 publication 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 publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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

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 publication using a colour printer.

INTRODUCTION

This part of IEC 62453 is an interface specification for developers of FDT (Field Device Tool) 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 fieldbusses 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 DTM (Device Type Manager), 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 fieldbusses and thus meets the requirements for integrating different kinds of devices into heterogeneous control systems.

Figure 1 shows how IEC/TR 62453-501 is aligned in the structure of IEC 62453 series.

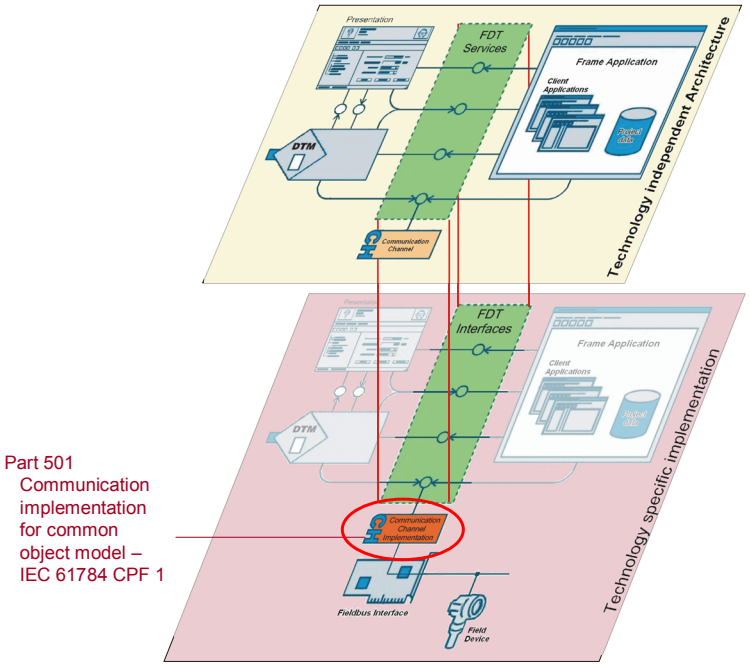


Figure 1 – Part 501 of the IEC 62453 series

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 501: Communication implementation for common object model – IEC 61784 CPF 1

1 Scope

IEC/TR 62453-501, which is a technical report, provides additional information for integrating the Foundation Fieldbus (FF) protocol into the COM implementation of the FDT Specification (IEC/TR 62453-41).

The document describes communication definitions, protocol specific extensions and the means for block (e.g. transducer, resource or function blocks) representation.

The new protocol specific definitions are based on FF-Specifications for H1 and HSE protocols. Furthermore, the definitions contain information that is needed by systems to configure FF Devices.

The scope is limited to Foundation Fieldbus device and system specific definitions.

This specification neither contains the FDT specification nor modifies it.

2 Normative references

The following referenced documents are indispensable for the application of this specification. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

IEC 62453-1:2009, *Field Device Tool (FDT) interface specification – Part 1: Overview and guidance*

IEC 62453-2:2009, *Field Device Tool (FDT) interface specification – Part 2: Concepts and detailed description*

IEC/TR 62453-41:2009, *Field Device Tool (FDT) interface specification – Part 41: Object model integration profile – Common object model*

IEC 62453-301:2009, *Field Device Tool (FDT) interface specification – Part 301: Communication profile integration – IEC 61784 CPF 1*