PD CLC/TR 62453-51-90:2019

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# Field device tool (FDT) interface specification

Part 51-90: Communication implementation for common object model – IEC 61784 CPF 9 (IEC/TR 62453-51-90:2017)

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# National foreword

This Published Document is the UK implementation of CLC/TR 62453-51-90:2019. It is identical to IEC TR 62453-51-90:2017. It supersedes PD IEC TR 62453-51-90:2017, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/65/3, Industrial communications: process measurement and control, including fieldbus.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Published by BSI Standards Limited 2019

ISBN 978 0 539 01946 9

ICS 25.040.40; 35.100.05; 35.110

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 March 2018.

**Amendments/corrigenda issued since publication**

| Date | Text affected |
|---|---|
| 28 February 2019 | This corrigendum renumbers PD IEC TR 62453-51-90:2017 as PD CLC/TR 62453-51-90:2019 |

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

# CLC/TR 62453-51-90

February 2019

ICS 25.040.40; 35.110

English Version

# Field device tool (FDT) interface specification - Part 51-90: Communication implementation for common object model - IEC 61784 CPF 9 (IEC/TR 62453-51-90:2017)

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 51-90: Mise en œuvre d'un profil de communication pour le modèle d'objet commun - CPF 9 de l'IEC 61784 (IEC/TR 62453-51-90:2017)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 51-90: Kommunikationsimplementierung mit dem allgemeinen Objektmodell (COM) - Kommunikationsprofilfamilie (CPF) 9 nach IEC 61784 (IEC/TR 62453-51-90:2017)

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

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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# European foreword

This document (CLC/TR 62453-51-90:2019) consists of the text of the IEC/TR 62453-51-90:2017 prepared by IEC/TC 65 "Industrial-process measurement, control and automation".

## Endorsement notice

The text of the International Standard IEC TR 62453-51-90:2017 was approved by CENELEC as a European Standard without any modification.



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# 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.

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| 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 62453-2 | 2016 | Field device tool (FDT) interface specification - Part 2: Concepts and detailed description | EN 62453-2 | 2017 |
| IEC TR 62453-41 | 2016 | Field device tool (FDT) interface specification - Part 41: Object model integration profile - Common object model | - | - |
| IEC 62453-309 | 2016 | Field device tool (FDT) interface specification - Part 309: Communication profile integration - IEC 61784 CPF 9 | EN 62453-309 | 2017 |



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

# FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

## Part 51-90: Communication implementation for common object model – IEC 61784 CPF 9

## FOREWORD

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IEC TR 62453-51-90, 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 62453-509 published in 2009. This edition constitutes a technical revision. The main changes provide support for the updated HART protocol.

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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 63453-309.

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.

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# 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 IEC 62453-51-xy series is aligned in the structure of the IEC 62453 series.

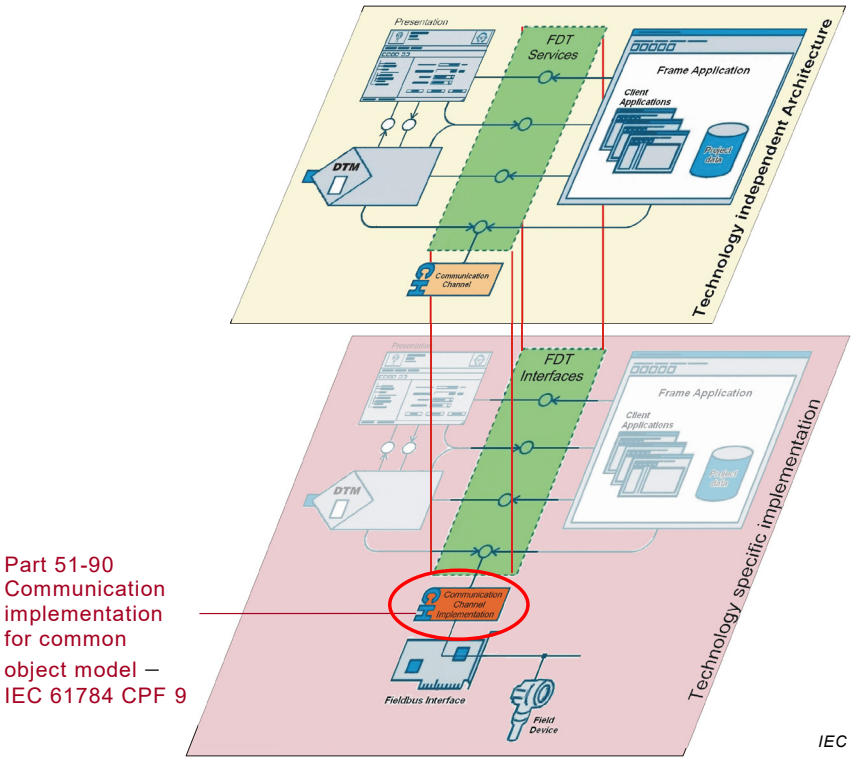


**Figure 1 – Part 51-90 of the IEC 62453 series**

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# FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

# Part 51-90: Communication implementation for common object model – IEC 61784 CPF 9

## 1 Scope

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

This part of IEC 62453 specifies the implementation of communication and other services based on IEC 62453-309.

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 62453-309:2016, *Field device tool (FDT) interface specification – Part 309: Communication profile integration – IEC 61784 CPF 9*

## 3 Terms, definitions, symbols, abbreviated terms and conventions

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62453-1, IEC 62453-2, IEC TR 62453-41 and IEC 62453-309 apply.

[1] HART ® is the trade name of a product supplied by HART Communication Foundation. This information is given for convenience of users of this document and does not constitute an endorsement by IEC of the product named. Equivalent products may be used if they can be shown to lead to the same results.

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

### 3.2 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviations given in IEC 62453-1, IEC 62453-2, IEC 62453-309, and IEC TR 62453-41 apply.

### 3.3 Conventions

#### 3.3.1 Data type names and references to data types

The conventions for naming and referencing of data types are explained in IEC 62453-2:2016, Clause A.1.

#### 3.3.2 Vocabulary for requirements

The following expressions are used when specifying requirements.

| | |
|---|---|
| Usage of “shall” or “mandatory” | No exceptions allowed. |
| Usage of “should” or “recommended” | Strong recommendation. It may make sense in special exceptional cases to differ from the described behaviour. |
| Usage of “can” or “optional” | Function or behaviour may be provided, depending on defined conditions. |

## 4 Bus category

IEC 61784 CPF 9 protocol is identified in the attribute busCategory of the BusCategory element by the identifiers, as specified in IEC 62453-309.

## 5 Access to instance and device data

Used at methods:

- IDtmParameter methods
- IDtmSingleDeviceDataAccess methods
- IDtmSingleInstanceDataAccess methods

These methods (if supported according IEC TR 62453-41) shall provide access to at least all parameters defined in IEC 62453-309.

## 6 Protocol specific usage of general data types

Table 1 shows how general data types are used with IEC 61784 CPF 9 devices.

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**Table 1 – Protocol specific usage of general data types**

| Attribute | Description for use |
|---|---|
| fdt:address | All these attributes of the FDTDatatype schema are used as defined in IEC 62453-309. |
| fdt:protocolId | |
| fdt:deviceTypeId | |
| fdt:deviceTypeInformation | |
| fdt:deviceTypeInformationPath | |
| fdt:manufacturerId | |
| fdt:semanticId<br>fdt:applicationDomain | |
| fdt:tag | |

# 7 Protocol specific common data types

This clause specifies the protocol specific common data types, which are used in the definition of other data types.

The data types described in this clause are defined for the following namespace:
Namespace: <namespace identifier>

# 8 Network management data types

## 8.1 General

The data types specified in this clause are used at following methods:

- IDtmParameter:GetParameters
- IDtmParameter:SetParameters

## 8.2 HART device address

The element <BusInformation/@slaveAddress> (defined in IEC TR 62453-41) is used for defining the network address of a device.

# 9 Communication data types

## 9.1 General

The data types specified in this clause are used with the methods of IFdtCommunication.

The definition of the attribute follows the data type definition as defined in IEC 62453-309.

## 9.2 General communication – FDTHARTCommunicationSchema

This schema is used for communication of all protocols.

```
<Schema name="FDTHARTCommunicationSchema" xmlns="urn:schemas-microsoft-com:xml-data" xmlns:dt="urn:schemas-microsoft-com:datatypes" xmlns:fdt="x-schema:FDTDataTypesSchema.xml">
    <!--Definition of Attributes-->
    <AttributeType name="schemaVersion" dt:type="number" default="1.21"/>
    <AttributeType name="address1" dt:type="ui1"/>
    <AttributeType name="address2" dt:type="ui1"/>
    <AttributeType name="address3" dt:type="ui1"/>
```

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