IEC 62453-303-2

Edition 1.1   2016-06
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

**FIeld device tool (FDT) interface specification –
Part 303-2: Communication profile integration – IEC 61784 CP 3/4, CP 3/5
and CP 3/6**

**Spécification des interfaces des outils des dispositifs de terrain (FDT) –
Partie 303-2: Intégration des profils de communication – CP 3/4, CP 3/5 et
CP 3/6 de l'IEC 61784**

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FOREWORD

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IEC 62453-303-2 edition 1.1 contains the first edition (2009-06) [documents 65E/128/FDIS and 65E/141/RVD] and its amendment 1 (2016-06) [documents 65E/336/CDV and 65E/395A/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62453-303-2 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

Each part of the IEC 62453-3xy series is intended to be read in conjunction with IEC 62453-2.

The French version of this standard has not been voted upon.

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

A 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 the base publication and its amendment 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

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Document Preview

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 kinds of fieldbusses and thus meets the requirements for integrating different kinds of devices into heterogeneous control systems.

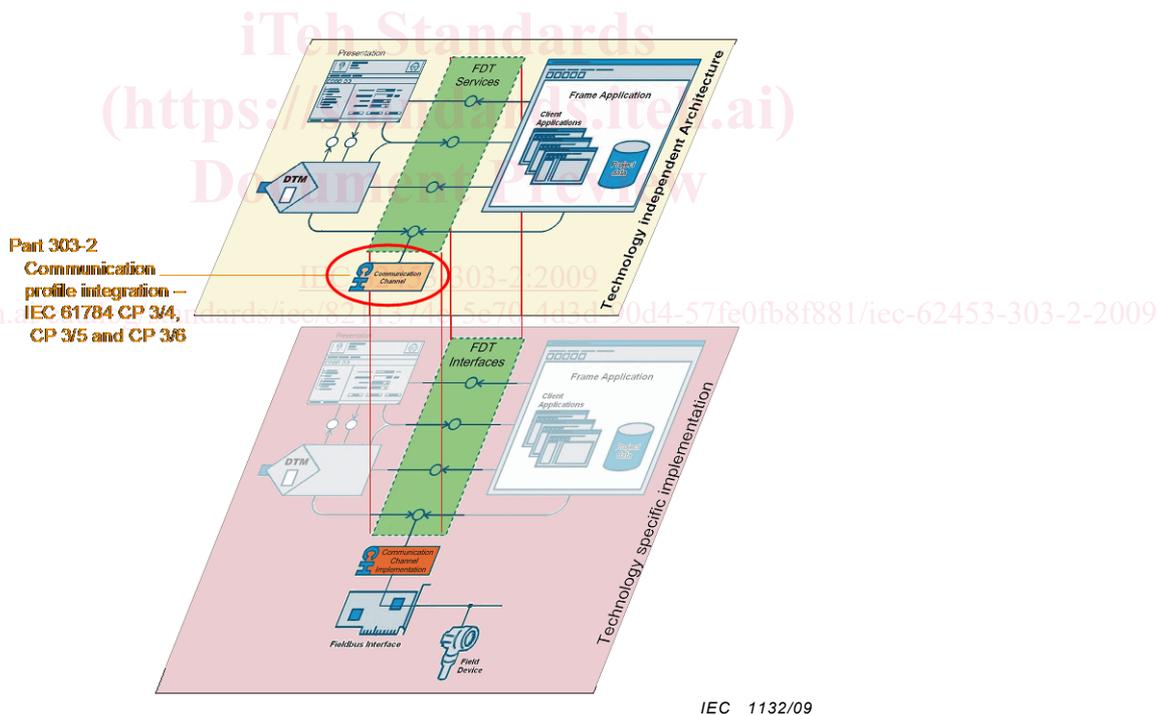Figure 1 shows how IEC 62453-303-2 is aligned in the structure of the IEC 62453 series.

Figure 1 – Part 303-2 of the IEC 62453 series

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 303-2: Communication profile integration – IEC 61784 CP 3/4, CP 3/5 and CP 3/6

1   Scope

Communication Profile 3/4, Communication Profile 3/5 and Communication Profile 3/6 (commonly known as PROFINET®[1] IO) define communication profiles based on IEC 61158-5-10 and IEC 61158-6-10. The basic profiles CP 3/4, CP 3/5, and CP 3/6 are defined in IEC 61784-2.

This part of IEC 62453 provides information for integrating the PROFINET® technology into the FDT interface (IEC 62453-2).

This part of the IEC 62453 specifies communication and other services.

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

IEC 61158-6-10, *Industrial communication networks – Fieldbus specifications – Part 6-10: Application layer protocol specification – 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 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*

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, ~~and~~ IEC 62453-2 as well as the following apply.

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[1] PROFINET ® is the trademark of PROFIBUS Nutzerorganisation e.V. (PNO). PNO is a non-profit trade organization to support the fieldbus PROFIBUS. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the registered trademark. Use of the trademark PROFIBUS and PROFINET requires permission of the trade name holder.

3.1.1
IO Controller
controlling device that acts as client for several IO devices (field devices)

3.1.2
IO Device
field device that acts as server for IO operation

3.1.3
IO Supervisor
engineering device that manages commissioning and diagnosis of an IO system

3.2   Abbreviated terms

For the purposes of this document, the abbreviations given in IEC 62453-1 and IEC 62453-2 and the following apply.

AR	Application Relation
DCP	Discovery and basic Configuration Protocol
GSDML	Generic Station Description Markup Language
IOCS	IO Consumer Status
IOPS	IO Provider Status
UML	Unified Modeling Language

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, 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.

3.3.3   Use of UML

Figures in this document are using UML notation as defined in Annex A of IEC 62453-1.

4   Bus category

IEC 61784 CP 3/4, CP 3/5 and CP 3/6 protocols are identified in the protocolId element of the structured data type 'fdt:BusCategory' by the following unique identifier as defined in Table 1:

Table 1 – Protocol identifier

Identifier value	ProtocolId name	Description
DFC98364-DAB8-493B-BB92-23B3F92FEBCD	'Profinet IO'	Support of IEC 61784 CP 3/4, CP 3/5 and CP 3/6 protocols

IEC 61784 CP 3/4, CP 3/5 and CP 3/6 use the following unique identifier for its physical layers.

Table 2 – Physical layer identifier

PhysicalLayer element	Description
99C36176-E59A-11DA-9023-0002B3ECDCBE	10BASET
99C36177-E59A-11DA-9023-0002B3ECDCBE	10BASETXHD
99C36178-E59A-11DA-9023-0002B3ECDCBE	10BASETXFD
99C36179-E59A-11DA-9023-0002B3ECDCBE	100BASETXHD
99C3617A-E59A-11DA-9023-0002B3ECDCBE	100BASETXFD
99C3617B-E59A-11DA-9023-0002B3ECDCBE	10BASEFXHD
99C3617C-E59A-11DA-9023-0002B3ECDCBE	10BASEFXFD
99C3617D-E59A-11DA-9023-0002B3ECDCBE	1000BASEXHD
99C3617E-E59A-11DA-9023-0002B3ECDCBE	1000BASEXFD
99C3617F-E59A-11DA-9023-0002B3ECDCBE	1000BASELXHD
99C36180-E59A-11DA-9023-0002B3ECDCBE	1000BASELXFD
99C36181-E59A-11DA-9023-0002B3ECDCBE	1000BASESXHD
99C36182-E59A-11DA-9023-0002B3ECDCBE	1000BASESXFD
99C36183-E59A-11DA-9023-0002B3ECDCBE	1000BASETHD
99C36184-E59A-11DA-9023-0002B3ECDCBE	1000BASETFD
99C36185-E59A-11DA-9023-0002B3ECDCBE	10GigBASEFX

Identifier value	Description
307DD808-C010-11DB-90E7-0002B3ECDCBE	10BASET (Depreciated)
307DD809-C010-11DB-90E7-0002B3ECDCBE	10BASETXHD (Depreciated)
307DD80A-C010-11DB-90E7-0002B3ECDCBE	10BASETXFD (Depreciated)
307DD80B-C010-11DB-90E7-0002B3ECDCBE	10BASEFLHD (Depreciated)
307DD80C-C010-11DB-90E7-0002B3ECDCBE	10BASEFLFD (Depreciated)
307DD80D-C010-11DB-90E7-0002B3ECDCBE	10BASEFXHD (Depreciated)
307DD80E-C010-11DB-90E7-0002B3ECDCBE	10BASEFXFD (Depreciated)
307DD80F-C010-11DB-90E7-0002B3ECDCBE	100BASETXHD (Depreciated)
307DD810-C010-11DB-90E7-0002B3ECDCBE	100BaseTXFD (Default for Media Type Copper)
307DD811-C010-11DB-90E7-0002B3ECDCBE	100BASEFXHD (Depreciated)
307DD812-C010-11DB-90E7-0002B3ECDCBE	100BaseFXFD (Default for Media Type Fiber Optic)
307DD813-C010-11DB-90E7-0002B3ECDCBE	100BaseLX10
307DD814-C010-11DB-90E7-0002B3ECDCBE	100BASEPX10 (Depreciated)
307DD815-C010-11DB-90E7-0002B3ECDCBE	1000BASEXHD (Depreciated)
307DD816-C010-11DB-90E7-0002B3ECDCBE	1000BaseXFD
307DD817-C010-11DB-90E7-0002B3ECDCBE	1000BASELXHD (Depreciated)
307DD818-C010-11DB-90E7-0002B3ECDCBE	1000BaseLXFD
307DD819-C010-11DB-90E7-0002B3ECDCBE	1000BASESXHD (Depreciated)
307DD81A-C010-11DB-90E7-0002B3ECDCBE	1000BaseSXFD
307DD81B-C010-11DB-90E7-0002B3ECDCBE	1000BASETHD (Depreciated)
307DD81C-C010-11DB-90E7-0002B3ECDCBE	1000BaseTFD
307DD81D-C010-11DB-90E7-0002B3ECDCBE	10GbaseFX

Identifier value	Description
307DD81E-C010-11DB-90E7-0002B3ECDCBE	10GbaseLX4
307DD81F-C010-11DB-90E7-0002B3ECDCBE	10GBaseR
307DD820-C010-11DB-90E7-0002B3ECDCBE	10GbaseER
307DD821-C010-11DB-90E7-0002B3ECDCBE	10GbaseLR
307DD822-C010-11DB-90E7-0002B3ECDCBE	10GbaseSR
307DD823-C010-11DB-90E7-0002B3ECDCBE	10GbaseW
307DD824-C010-11DB-90E7-0002B3ECDCBE	10GbaseEW
307DD824-C010-11DB-90E7-0002B3ECDCBE	10GbaseLW
307DD825-C010-11DB-90E7-0002B3ECDCBE	10GbaseSW
307DD826-C010-11DB-90E7-0002B3ECDCBE	10GbaseCX4
307DD827-C010-11DB-90E7-0002B3ECDCBE	2BaseTL
307DD828-C010-11DB-90E7-0002B3ECDCBE	10PassTS
307DD829-C010-11DB-90E7-0002B3ECDCBE	100BaseBX10D
307DD82A-C010-11DB-90E7-0002B3ECDCBE	100BaseBX10U
307DD82B-C010-11DB-90E7-0002B3ECDCBE	100BaseLX10
307DD82C-C010-11DB-90E7-0002B3ECDCBE	1000BaseBX10D
307DD82D-C010-11DB-90E7-0002B3ECDCBE	1000BaseBX10U
307DD82F-C010-11DB-90E7-0002B3ECDCBE	1000BaseLX10
307DD830-C010-11DB-90E7-0002B3ECDCBE	1000BasePX10D
307DD831-C010-11DB-90E7-0002B3ECDCBE	1000BasePX10U
307DD832-C010-11DB-90E7-0002B3ECDCBE	1000BasePX20D
307DD833-C010-11DB-90E7-0002B3ECDCBE	1000BasePX20U
307DD834-C010-11DB-90E7-0002B3ECDCBE	10GBaseT or 100BasePXFD
307DD835-C010-11DB-90E7-0002B3ECDCBE	10GBaseLRM
307DD836-C010-11DB-90E7-0002B3ECDCBE	1000BaseKX
307DD837-C010-11DB-90E7-0002B3ECDCBE	1000BaseKX4
307DD838-C010-11DB-90E7-0002B3ECDCBE	1000BaseKR
307DD839-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePRXD1
307DD83A-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePXRD2
307DD83B-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePXRD3
307DD83C-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePRXU1
307DD83D-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePXRU2
307DD83E-C010-11DB-90E7-0002B3ECDCBE	10G1GBasePXRU3
307DD83F-C010-11DB-90E7-0002B3ECDCBE	10GBasePRD1
307DD840-C010-11DB-90E7-0002B3ECDCBE	10GBasePRD2
307DD841-C010-11DB-90E7-0002B3ECDCBE	10GBasePRD3
307DD842-C010-11DB-90E7-0002B3ECDCBE	10GBasePRU1
307DD843-C010-11DB-90E7-0002B3ECDCBE	10GBasePRU3
307DD844-C010-11DB-90E7-0002B3ECDCBE	40GbaseKR4
307DD845-C010-11DB-90E7-0002B3ECDCBE	40GbaseCR4
307DD845-C010-11DB-90E7-0002B3ECDCBE	40GbaseSR4
307DD846-C010-11DB-90E7-0002B3ECDCBE	40GbaseFR
307DD847-C010-11DB-90E7-0002B3ECDCBE	40GbaseLR4
307DD848-C010-11DB-90E7-0002B3ECDCBE	100GbaseCR10