
Specifikacija vmesnika orodja procesne naprave - 315. del: Integracija komunikacijskih profilov - IEC 61784 CPF 15 (IEC 62453-315:2009)

Field device tool interface specification -- Part 315: Communication profile integration - IEC 61784 CPF 15

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 315: Integration von Kommunikationsprofilen IEC 61784 Kommunikationsprofilfamilie (CPF) 15

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 315: Intégration des profils de communication - CEI 61784 CPF 15

<https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010>

Ta slovenski standard je istoveten z: EN 62453-315:2009

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry

SIST EN 62453-315:2010**en,fr**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62453-315:2010

<https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62453-315

October 2009

ICS 25.040.40; 35.100.05; 35.110

English version

**Field device tool (FDT) interface specification -
Part 315: Communication profile integration -
IEC 61784 CPF 15
(IEC 62453-315:2009)**

Spécification des interfaces des outils
des dispositifs de terrain (FDT) -
Partie 315: Intégration des profils
de communication -
CEI 61784 CPF 15
(CEI 62453-315:2009)

Field Device Tool (FDT)-
Schnittstellenspezifikation -
Teil 315: Integration
von Kommunikationsprofilen -
Kommunikationsprofilfamilie (CPF) 15
nach IEC 61784
(IEC 62453-315:2009)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This European Standard was approved by CENELEC on 2009-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 65E/131/FDIS, future edition 1 of IEC 62453-315, prepared by SC 65E, Devices and integration in enterprise systems, of IEC TC 65, Industrial-process measurement, control and automation, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62453-315 on 2009-08-01.

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

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2010-05-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2012-08-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62453-315:2009 was approved by CENELEC as a European Standard without any modification.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62453-315:2010
<https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61131-3	— ¹⁾	Programmable controllers - Part 3: Programming languages	EN 61131-3	2003 ²⁾
IEC 61158-5-15	— ¹⁾	Industrial communication networks - Fieldbus specifications - Part 5-15: Application layer service definition - Type 15 elements	EN 61158-5-15	2008 ²⁾
IEC 61158-6-15	— ¹⁾	Industrial communication networks - Fieldbus specifications - Part 6-15: Application layer protocol specification - Type 15 elements	EN 61158-6-15	2008 ²⁾
IEC 61784-1	— ¹⁾	Industrial communication networks - Profiles - Part 1: Fieldbus profiles	EN 61784-1	2008 ²⁾
IEC 61784-2	— ¹⁾	Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3	EN 61784-2	2008 ²⁾
IEC 62453-1	2009	Field device tool (FDT) interface specification - Part 1: Overview and guidance	EN 62453-1	2009
IEC 62453-2	2009	Field device tool (FDT) interface specification - Part 2: Concepts and detailed description	EN 62453-2	2009
IETF RFC 791	— ¹⁾	Internet Protocol - DARPA Internet Program Protocol Specification	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62453-315:2010

<https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010>



IEC 62453-315

Edition 1.0 2009-07

INTERNATIONAL STANDARD

**Field device tool (FDT) interface specification –
Part 315: Communication profile integration – IEC 61784 CPF 15**

[SIST EN 62453-315:2010
https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010](https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

XA

ICS 25.040.40; 35.100.05; 35.110

ISBN 2-8318-1049-6

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions, symbols, abbreviated terms and conventions	10
3.1 Terms and definitions	10
3.2 Abbreviated terms	10
3.3 Conventions	10
3.3.1 Data type names and references to data types	10
3.3.2 Vocabulary for requirements	10
4 Bus category	10
5 Access to instance and device data.....	11
5.1 Process Channel objects provided by DTM.....	11
5.2 DTM services to access instance and device data	11
6 Protocol specific behavior.....	11
6.1 General.....	11
6.2 Broadcasting	11
6.3 Unconfirmed private Modbus request	13
7 Protocol specific usage of general data types.....	15
8 Protocol specific common data types.....	15
8.1 General.....	15
8.2 Address information.....	16
9 Network management data types.....	16
10 Communication data types	17
10.1 General.....	17
10.2 Connection management data types.....	17
10.3 Transaction service specific data types	18
10.3.1 General	18
10.3.2 Data item addressing	18
10.3.3 Read coils transaction service	19
10.3.4 Read discrete inputs transaction service	20
10.3.5 Read holding registers transaction service	21
10.3.6 Read input registers transaction service	22
10.3.7 Write single coil transaction service	23
10.3.8 Write single register transaction service	24
10.3.9 Read exception status transaction service.....	25
10.3.10 Diagnostics transaction service	25
10.3.11 Get Comm event counter transaction service	26
10.3.12 Get Comm event log transaction service	27
10.3.13 Write multiple coils transaction service.....	29
10.3.14 Write multiple registers transaction service	29
10.3.15 Report slave ID transaction service	30
10.3.16 Read file record transaction service	31
10.3.17 Write file record transaction service	33
10.3.18 Mask write register transaction service.....	34

10.3.19	Read/write holding registers transaction service	35
10.3.20	Read FIFO queue transaction service	37
10.3.21	Encapsulated interface transport transaction service	37
10.3.22	Read device identification transaction service	38
10.3.23	Private Modbus transaction service	41
10.3.24	Unconfirmed private Modbus transaction service	42
10.3.25	Modbus exception response	43
11	Channel parameter data types	44
12	Device Identification	46
12.1	Common device type identification data types	46
12.2	Topology scan data types	47
12.3	Scan identification data types	48
12.4	Device type identification data types – provided by DTM	50
12.5	Mapping of protocol specific device identification objects to FDT data types	51
	Bibliography	53
	Figure 1 – Part 315 of the IEC 62453 series	8
	Figure 2 – Broadcast sequence with Modbus Serial Line Communication DTM	12
	Figure 3 – Broadcast sequence with Modbus TCP Communication DTM	13
	Figure 4 – Broadcast sequence without Modbus Communication DTM	13
	Figure 5 – Unconfirmed request with Modbus Serial Line Communication DTM	14
	Figure 6 – Unconfirmed request with Modbus TCP Communication DTM	14
	Figure 7 – Unconfirmed request without Modbus Communication DTM	15
	Figure 8 – Data item addressing	19
	Table 1 – Protocol identifiers	10
	Table 2 – Address information for broadcast mode	11
	Table 3 – Broadcast transaction requests	12
	Table 4 – Protocol specific usage of general FDT data types	15
	Table 5 – Simple address information data types	16
	Table 6 – Structured address information data types	16
	Table 7 – Structured network management data types	17
	Table 8 – Simple common communication data types	17
	Table 9 – Structured connection management service data types	18
	Table 10 – Simple ReadCoilsReq data types	19
	Table 11 – Structured ReadCoilsReq data types	19
	Table 12 – Simple ReadCoilsRsp data types	20
	Table 13 – Structured ReadCoilsRsp data types	20
	Table 14 – Simple ReadDiscreteInputsReq data types	20
	Table 15 – Structured ReadDiscreteInputsReq data types	20
	Table 16 – Simple ReadDiscreteInputsRsp data types	21
	Table 17 – Structured ReadDiscreteInputsRsp data types	21
	Table 18 – Simple ReadHoldingRegistersReq data types	21
	Table 19 – Structured ReadHoldingRegistersReq data types	21
	Table 20 – Simple ReadHoldingRegistersRsp data types	22

Table 21 – Structured ReadHoldingRegistersRsp data types	22
Table 22 – Simple ReadInputRegistersReq data types	22
Table 23 – Structured ReadInputRegistersReq data types	22
Table 24 – Simple ReadInputRegistersRsp data types	23
Table 25 – Structured ReadInputRegistersRsp data types	23
Table 26 – Simple WriteSingleCoilReq data types	23
Table 27 – Structured WriteSingleCoilReq data types	23
Table 28 – Structured WriteSingleCoilRsp data types	24
Table 29 – Simple WriteSingleRegisterReq data types	24
Table 30 – Structured WriteSingleRegisterReq data types	24
Table 31 – Structured WriteSingleRegisterRsp data types	24
Table 32 – Structured ReadExceptionStatusReq data types	25
Table 33 – Simple ReadExceptionStatusRsp data types	25
Table 34 – Structured ReadExceptionStatusRsp data types	25
Table 35 – Simple diagnostics data types	26
Table 36 – Structured DiagnosticsReq data types	26
Table 37 – Structured DiagnosticsRsp data types	26
Table 38 – Structured GetCommEventCounterReq data types	27
Table 39 – Simple GetCommEventCounterRsp data types	27
Table 40 – Structured GetCommEventCounterRsp data types	27
Table 41 – Structured GetCommEventLogReq data types	28
Table 42 – Simple GetCommEventLogRsp data types	28
Table 43 – Structured GetCommEventLogRsp data types	28
Table 44 – Simple WriteMultipleCoilsReq data types	29
Table 45 – Structured WriteMultipleCoilsReq data types	29
Table 46 – Structured WriteMultipleCoilsRsp data types	29
Table 47 – Simple WriteMultipleRegistersReq data types	30
Table 48 – Structured WriteMultipleRegistersReq data types	30
Table 49 – Structured WriteMultipleRegistersRsp data types	30
Table 50 – Structured ReportSlaveIDReq data types	31
Table 51 – Simple ReportSlaveIDRsp data types	31
Table 52 – Structured ReportSlaveIDRsp data types	31
Table 53 – Simple ReadFileSubRequest data types	32
Table 54 – Structured ReadFileSubRequest data types	32
Table 55 – Structured ReadFileRecordReq data types	32
Table 56 – Simple ReadFileSubResponse data types	32
Table 57 – Structured ReadFileSubResponse data types	33
Table 58 – Structured ReadFileRecordRsp data types	33
Table 59 – Simple WriteFileSubRequest data types	33
Table 60 – Structured WriteFileSubRequest data types	34
Table 61 – Structured WriteFileRecordReq data types	34
Table 62 – Structured WriteFileRecordRsp data types	34
Table 63 – Simple MaskWriteRegisterReq data types	35

Table 64 – Structured MaskWriteRegisterReq data types.....	35
Table 65 – Structured MaskWriteRegisterRsp data types.....	35
Table 66 – Simple ReadWriteRegistersReq data types	36
Table 67 – Structured ReadWriteRegistersReq data types.....	36
Table 68 – Simple ReadWriteRegistersRsp data types.....	36
Table 69 – Structured ReadWriteRegistersRsp data types	36
Table 70 – Simple ReadFifoQueueReq data types	37
Table 71 – Structured ReadFifoQueueReq data types.....	37
Table 72 – Simple ReadFifoQueueRsp data types	37
Table 73 – Structured ReadFifoQueueRsp data types.....	37
Table 74 – Simple EncapsulatedInterfaceTransportReq data types	38
Table 75 – Structured EncapsulatedInterfaceTransportReq data types	38
Table 76 – Simple EncapsulatedInterfaceTransportRsp data types	38
Table 77 – Structured EncapsulatedInterfaceTransportRsp data types.....	38
Table 78 – Simple ReadDeviceIdentificationReq data types.....	39
Table 79 – Structured ReadDeviceIdentificationReq data types	39
Table 80 – Simple IdentificationObject data types.....	39
Table 81 – Structured IdentificationObject data types	39
Table 82 – Simple ReadDeviceIdentificationRsp data types.....	40
Table 83 – Structured ReadDeviceIdentificationRsp data types.....	41
Table 84 – Simple PrivateModbusReq data types	41
Table 85 – Structured PrivateModbusReq data types.....	41
Table 86 – Simple PrivateModbusRsp data types.....	41
Table 87 – Structured PrivateModbusRsp data types	42
Table 88 – Simple UnconfirmedPrivateModbusReq data types.....	42
Table 89 – Structured UnconfirmedPrivateModbusReq data types	42
Table 90 – Structured UnconfirmedPrivateModbusRsp data types	42
Table 91 – Simple ModbusExceptionRsp data types	43
Table 92 – Structured ModbusExceptionRsp data types.....	43
Table 93 – Simple channel parameter data types.....	44
Table 94 – Structured channel parameter data types	45
Table 95 – Simple common identification data types	46
Table 96 – Simple device information data types	47
Table 97 – Structured device information data types.....	48
Table 98 – Simple scan identification data types.....	49
Table 99 – Structured scan identification data types	49
Table 100 – Structured device type identification data types	50
Table 101 – Mapping of protocol specific identification objects in FDT	52
Table 102 – Additional information for optional identification objects.....	52

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 315: Communication profile integration –
IEC 61784 CPF 15

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.

International Standard IEC 62453-315 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 62453-3xy series is intended to be read in conjunction with IEC 62453-2.

The text of this standard is based on the following documents:

FDIS	Report on voting
65E/131/FDIS	65E/144/RVD

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 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.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62453-315:2010

<https://standards.iteh.ai/catalog/standards/sist/f7608bd2-4090-46e8-9011-78ce4f64501d/sist-en-62453-315-2010>

Figure 1 – Part 315 of the IEC 62453 series

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 315: Communication profile integration – IEC 61784 CPF 15

1 Scope

Communication Profile Family 15 (commonly known as Modbus¹⁾) defines communication profiles based on IEC 61158-5-15 and IEC 61158-6-15. The basic profile CP 15/1 (Modbus TCP) is defined in IEC 61784-1. An additional communication profile (Modbus Serial Line) is defined in [2].

This part of the IEC 62453 provides information for integrating Modbus TCP® and Modbus Serial Line® protocol support into FDT based systems.

NOTE This part of IEC 62453 only specifies the mapping of Modbus parameters to FDT data types. For restrictions of protocol specific parameters concerning allowed values and concerning limitations of arrays used in the definition of FDT data types, refer to IEC 61158-5-15 and the MODBUS Application Protocol Specification.

2 Normative references

The following referenced documents are indispensable for the application 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.

- iTech STANDARD PREVIEW
(standards.iteh.ai)
- SIST EN 62453-315:2010
78ce4f64501d/sist-en-62453-315-2010
- IEC 61131-3, *Programmable controllers – Part 3: Programming languages –*
- IEC 61158-5-15, *Industrial communication networks – Fieldbus specifications – Part 5-15: Application layer service definition – Type 15 elements*
- IEC 61158-6-15, *Industrial communication networks – Fieldbus specifications – Part 6-20: Application layer protocol specification – Type 15 elements*
- IEC 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*
- 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*
- RFC 791, *Internet Protocol* (available at <<http://www.ietf.org/rfc/rfc0791.txt>>)

1) Modbus is the trademark of Schneider Automation Inc. It is registered in the United States of America. 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 trademark Modbus. Use of the trademark Modbus requires permission from Schneider Automation Inc.