

SLOVENSKI STANDARD SIST EN IEC 62453-309:2022

01-december-2022

Nadomešča:

SIST EN 62453-309:2018

Specifikacija vmesnika orodja procesne naprave - 309. del: Integracija komunikacijskih profilov - IEC 61784 CPF 9 (IEC 62453-309:2022)

Field device tool (FDT) interface specification - Part 309: Communication profile integration - IEC 61784 CPF 9 (IEC 62453-309:2022)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 309: Integration von Kommunikationsprofilen - Kommunikationsprofilfamilie (CPF) 9 nach IEC 61784 (IEC 62453-309:2022)

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 309: Intégration des profils de communication - CPF 9 de l'IEC 61784 (IEC 62453-309:2022)

Ta slovenski standard je istoveten z: EN IEC 62453-309:2022

ICS:

25.040.40 Merjenje in krmiljenje Industrial process

industrijskih postopkov measurement and control

35.240.50 Uporabniške rešitve IT v IT applications in industry

industriji

SIST EN IEC 62453-309:2022 en,fr,de

SIST EN IEC 62453-309:2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN IEC 62453-309:2022

https://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8ac3-b18fb3afce79/sist-en-iec-62453-309-2022

EUROPEAN STANDARD

EN IEC 62453-309

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2022

ICS 25.040.40; 35.100.05; 35.110

Supersedes EN 62453-309:2017

English Version

Field device tool (FDT) interface specification - Part 309: Communication profile integration - IEC 61784 CPF 9 (IEC 62453-309:2022)

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 309: Intégration des profils de communication - CPF 9 de l'IEC 61784 (IEC 62453-309:2022)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 309: Integration von Kommunikationsprofilen - Kommunikationsprofilfamilie (CPF) 9 nach IEC 61784 (IEC 62453-309:2022)

This European Standard was approved by CENELEC on 2022-10-07. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

EN IEC 62453-309:2022 (E)

European foreword

The text of document 65E/907/FDIS, future edition 3 of IEC 62453-309, 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 approved by CENELEC as EN IEC 62453-309:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2023-07-07 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-10-07

This document supersedes EN 62453-309:2017 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Teh STANDARD PREVIEW

Endorsement notice

The text of the International Standard IEC 62453-309:2022 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC/TR 62453-42 NOTE Harmonized as CLC/TR IEC 62453-42

EN IEC 62453-309:2022 (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 Where 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 61158-5-20	-	Industrial communication networks - Fieldbus specifications - Part 5-20: Application layer service definition - Type 20 elements	EN 61158-5-20	-
IEC 61158-6-20	Teh	Industrial communication networks - Fieldbus specifications - Part 6-20: Application layer protocol specification - Type 20 elements	EN 61158-6-20	-
IEC 61784-1	-	Industrial communication networks - Profiles Part 1: Fieldbus profiles	EN IEC 61784-1	-
IEC 62453-1 https:/	- //standa	Field device tool (FDT) interface specification - Part 1: Overview and guidance	EN 62453-1 678-44a7-8ac3-	-
IEC 62453-2	-	Field device tool (FDT) interface specification - Part 2: Concepts and detailed description	-	-

SIST EN IEC 62453-309:2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN IEC 62453-309:2022

https://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8ac3-b18fb3afce79/sist-en-iec-62453-309-2022



IEC 62453-309

Edition 3.0 2022-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Field device tool (FDT) interface specification – Part 309: Communication profile integration – IEC 61784 CPF 9

Spécification des interfaces des outils des dispositifs de terrain (FDT) – Partie 309: Intégration des profils de communication – CPF 9 de l'IEC 61784

https://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8ac3h18fb3afce79/sist-en-iec-62453-309-2022

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 25.040.40; 35.100.05; 35.110

ISBN 978-2-8322-5601-5

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

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

		RD	
IN		CTION	
1	Scop	e	8
2	Norm	native references	8
3	Term	s, definitions, symbols, abbreviated terms and conventions	9
	3.1	Terms and definitions	9
	3.2	Abbreviated terms	9
	3.3	Conventions	9
	3.3.1	31	
	3.3.2	, ,	
	3.3.3		
4		category	
5	Acce	ss to instance and device data	11
	5.1	General	11
	5.2	Process Channel objects provided by DTM	
	5.3	DTM services to access instance and device data	
6	Proto	ocol-specific behavior	
	6.1	Overview Standard PKEVIEW	
	6.2	Burst mode subscription	12
	6.3	Usage of device addressing information	
	6.4	Extended Command Numbers	
	6.5	Handling of communication failures and time-outs	
	6.6	Handling of delayed responses	
	6.7	Topologies with mixed HART protocols	
	6.7.1 6.7.2	General	
	6.7.2	11 3 _ ,	
	6.7.4		
	6.8	Nested communication with multiple gateways	
	6.9	Communication- and network structures in WirelessHART	
	6.9.1	General	
	6.9.2		
7	Proto	ocol-specific usage of general data types	
8	Proto	ocol-specific common data types	22
9		ork management data types	
	9.1	General	
	9.2	Addressing modes	
	9.3	Address information	
	9.4	Additional address information for 'Extended HART' protocols	
10		munication data types	
	10.1	General	
	10.2	Protocol-specific Addressing Information	
	10.3	Datatype definitions	
11		inel parameter data types	
12		ce identification	

• • • • • • • • • • • • • • • • • • • •	33
12.2 Address Range for Scan	33
12.3 Support for Extended Manufacturer and Device Type Code	34
12.4 Device type identification data types for protocol 'HART_Basic'	34
12.5 Common device type identification data types for 'Extended_HART'	0.7
protocols	
12.6 Topology scan data types	
12.8 Scan identification data types for 'Extended_HART' protocols	
12.9 Device type identification data types – provided by DTM	
Bibliography	
Figure 1 – Part 309 of the IEC 62453 series	7
Figure 2 – Burst mode subscription	13
Figure 3 – Handling of delayed responses (scenario 1)	15
Figure 4 – Handling of delayed responses (scenario 2)	16
Figure 5 – Behavior of DTMs supporting 'Extended_HART' and 'HART_Basic'	
Figure 6 – Behavior of DTMs requires 'Extended_HART' or 'HART_Basic'	
Figure 7 – Host connected to a WirelessHART gateway device	
Figure 8 – FDT Topology of a WirelessHART network	
Figure 9 – Host connected to HART FSK	
Figure 10 – FDT Topology when directly connected to a WirelessHART adapter	
rigure to TET repolegy when alleedly confidence to a wholeserman adapter	40010021
Table 1 – Protocol identifiers SIST EN IEC 62453-309:2022 Table 2 – Protocol identifiers Market Bloom Alexander State Bloom Alexander Bloom A	10
https://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8a	103-
Table 2 – Definition of PhysicalLayer	
Table 4 – Relation of Protocolld and supported features	
Table 5 – Simple address information data types	
Table 6 – Structured address information data types	
Table 7 – Simple communication data types	
Table 8 – Structured communication data types	
Table 9 – Simple channel parameter data types	
Table 10 – Structured channel parameter data types	
Table 11 – Address range for device identification	34
Table 12 – Identification data types with protocol-specific mapping for protocol 'HART_Basic'	35
=	
Table 13 – Identification data types with semantics for protocol 'HART Basic'	
Table 13 – Identification data types with semantics for protocol 'HART_Basic' Table 14 – Simple identification data types for protocol 'HART Basic' with protocol	
Table 13 – Identification data types with semantics for protocol 'HART_Basic' Table 14 – Simple identification data types for protocol 'HART_Basic' with protocol independent semantics	col
Table 14 – Simple identification data types for protocol 'HART_Basic' with protocol independent semantics	col 37 otocol
Table 14 – Simple identification data types for protocol 'HART_Basic' with protocol independent semantics	col 37 otocol 37
Table 14 – Simple identification data types for protocol 'HART_Basic' with protocol independent semantics	col 37 otocol 37
Table 14 – Simple identification data types for protocol 'HART_Basic' with protocol independent semantics	col 37 otocol 37 -

- 4 - IEC 62453-309:2022 © IEC 2022

Table 18 – Simple identification data types for 'Extended_HART' protocols with protocol independent semantics	41
Table 19 – Structured identification data types for 'Extended_HART' protocols with protocol independent semantics	41
Table 20 – Structured device type identification data types	42
Table 21 – Simple scan identification data types for protocol 'HART_Basic'	42
Table 22 – Structured scan identification data types for protocol 'HART_Basic'	43
Table 23 – Simple scan identification data types for 'Extended_HART' protocols	44
Table 24 – Structured scan identification data types for 'Extended_HART' protocols	45
Table 25 – Structured device type identification data types	47

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN IEC 62453-309:2022 https://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8ac3-b18fb3afce79/sist-en-iec-62453-309-2022

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION -

Part 309: Communication profile integration – IEC 61784 CPF 9

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.

IEC 62453-309 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- corrections in regard to accessing information in the respective device and
- corrections in regard to describing support for different protocol versions.

IEC 62453-309:2022 © IEC 2022

The text of this International Standard is based on the following documents:

Draft	Report on voting	
65E/907/FDIS	65E/936/RVD	

- 6 -

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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

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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

reconfirmed,

(standards.iteh.ai)

- withdrawn,
- replaced by a revised edition, or EN IEC 62453-309:2022
- amended ps://standards.iteh.ai/catalog/standards/sist/b4012ebe-7678-44a7-8ac3-b18fb3afce79/sist-en-iec-62453-309-2022

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

INTRODUCTION

This part of IEC 62453 is an interface specification for developers of FDT¹ (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 62453-309 is aligned in the structure of the IEC 62453 series.

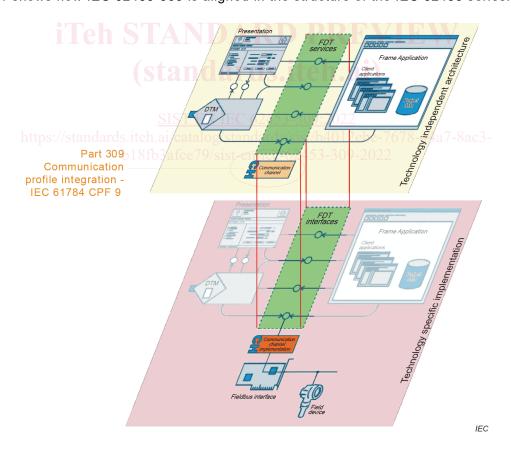


Figure 1 - Part 309 of the IEC 62453 series

FDT® is a trademark of products supplied by FDT Group AISBL. 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.

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION -

Part 309: Communication profile integration – IEC 61784 CPF 9

1 Scope

Communication Profile Family 9 (commonly known as HART 2) defines communication profiles based on IEC 61158-5-20 and IEC 61158-6-20. The basic profile CP 9/1 is defined in IEC 61784-1.

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

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

This document neither contains the FDT specification nor modifies it.

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 61158-5-20, Industrial communication networks — Fieldbus specifications — Part 5-20: Application layer service definition — Type 20 elements

IEC 61158-6-20, Industrial communication networks — Fieldbus specifications — Part 6-20: Application layer protocol specification — Type 20 elements

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

IEC 62453-1:-3, Field device tool (FDT) interface specification – Part 1: Overview and guidance

IEC 62453-2:-3, Field device tool (FDT) interface specification – Part 2: Concepts and detailed description

HART® and WirelessHART® are trade names of products supplied by FieldComm Group. 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.

Under preparation. Respective stage at the time of publication: IEC/CCDV 62453-1:2022 and IEC/RFDIS 62453-2:2022.

IEC 62453-309:2022 © IEC 2022

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

ISO and IEC maintain terminology 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

3.1.1

burst mode

mode in which the field device generates response telegrams without request telegram from the master

3.2 Abbreviated terms

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

BACK Burst ACKnowledge

C8PSK Coherent 8-way Phase Shift Keying,
HART communication layer as defined in HCF_SPEC-60, Revision 1.0

DR delayed response

EDD Electronic Device Description

FSK Frequency Shift Keying,
HART communication layer as defined in HCF_SPEC-54, Revision 8.1

HART Highway Addressable Remote Transducer 2453-309-2023

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 "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 IEC 62453-1:-, Annex A.