

ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 62453-309:2017

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

Field Device Tool (FDT)-
Schnittstellenspezifikation - Teil 309:
Integration von Kommunikationsprofilen
- Kommunikationsprofilfamilie (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

National Foreword

This European Standard EN 62453-309:2017 was adopted as Luxembourgish Standard ILNAS-EN 62453-309:2017.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

**NORME EUROPÉENNE
EUROPÄISCHE NORM**

December 2017

ICS 25.040.40; 35.100.05; 35.110

Supersedes EN 62453-309:2009

English Version

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

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 309: Intégration des profils de communication - CPF 9 de l'IEC 61784
(IEC 62453-309:2016)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 309: Integration von Kommunikationsprofilen - Kommunikationsprofilfamilie (CPF) 9 nach IEC 61784
(IEC 62453-309:2016)

This European Standard was approved by CENELEC on 2016-07-19. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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

European foreword

The text of document 65E/336/CDV, future edition 1 of IEC 62453-309:2016, 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 62453-309:2017.

The following dates are fixed:

- latest date by which this document has (dop) 2018-06-08
to be implemented at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-12-08

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.

Endorsement notice

The text of the International Standard IEC 62453-309:2016 was approved by CENELEC as a European Standard without any modification.

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<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	-	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 61784-1	-
IEC 62453-1	-	Field Device Tool (FDT) interface specification -- Part 1: Overview and guidance	EN 62453-1	-
IEC 62453-2	-	Field Device Tool (FDT) Interface Specification - Part 2: Concepts and detailed Description	EN 62453-2	-



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**

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms, definitions, symbols, abbreviated terms and conventions.....	8
3.1 Terms and definitions	8
3.2 Abbreviated terms	9
3.3 Conventions	9
3.3.1 Data type names and references to data types	9
3.3.2 Vocabulary for requirements.....	9
3.3.3 Use of UML.....	9
4 Bus category	9
5 Access to instance and device data.....	11
5.1 General.....	11
5.2 Process Channel objects provided by DTM	11
5.3 DTM services to access instance and device data.....	12
6 Protocol-specific behavior.....	12
6.1 Overview.....	12
6.2 Burst mode subscription	12
6.3 Usage of device addressing information.....	13
6.4 Extended Command Numbers	14
6.5 Handling of communication failures and time-outs.....	14
6.6 Handling of Delayed Responses	14
6.7 Topologies with mixed HART protocols	16
6.7.1 General	16
6.7.2 Behavior of DTMs supporting ‘Extended_HART’ only	16
6.7.3 Behavior of DTMs supporting ‘Extended_HART’ and ‘HART’	16
6.7.4 Behavior of DTMs that requires ‘Extended_HART’ or ‘HART’	17
6.8 Nested communication with multiple gateways	18
6.9 Communication- and network structures in WirelessHART.....	18
6.9.1 General	18
6.9.2 Network topology	19
7 Protocol-specific usage of general data types.....	21
8 Protocol-specific common data types	22
9 Network management data types	22
9.1 General.....	22
9.2 Addressing modes.....	22
9.3 Address information	23
9.4 Additional address information for ‘Extended HART’ protocols.....	23
10 Communication data types	25
10.1 General.....	25
10.2 Protocol-specific Addressing Information	26
10.3 Datatype definitions	26
11 Channel parameter data types	30
12 Device identification	33

12.1	Protocol-specific handling of data type STRING	33
12.2	Address Range for Scan.....	33
12.3	Support for Extended Manufacturer and Device Type Code.....	33
12.4	Device type identification data types for protocol ‘HART’	33
12.5	Common device type identification data types for ‘Extended_HART’ protocols.....	37
12.6	Topology scan data types.....	42
12.7	Scan identification data types for protocol ‘HART’	43
12.8	Scan identification data types for ‘Extended_HART’ protocols	45
12.9	Device type identification data types – provided by DTM	47
	Bibliography	49
	 Figure 1 – Part 309 of the IEC 62453 series	7
	Figure 2 – Burst mode subscription	13
	Figure 3 – Handling of Delayed Reponses (scenario 1).....	15
	Figure 4 – Handling of Delayed Reponses (scenario 2).....	15
	Figure 5 – Behavior of DTMs supporting ‘Extended_HART’ and ‘HART’	17
	Figure 6 – Behavior of DTMs requires ‘Extended_HART’ or ‘HART’	18
	Figure 7 – Host connected to a WirelessHART gateway device	19
	Figure 8 – FDT Topology of a WirelessHART network.....	20
	Figure 9 – Host connected to HART FSK.....	20
	Figure 10 – FDT Topology when directly connected to a WirelessHART adapter device.....	21
	 Table 1 – Protocol identifiers.....	9
	Table 2 – Definition of PhysicalLayer.....	10
	Table 3 – Protocol specific usage of general data types.....	22
	Table 4 – Relation of ProtocolId and supported features	23
	Table 5 – Simple address information data types	24
	Table 6 – Structured address information data types	25
	Table 7 – Simple communication data types	26
	Table 8 – Structured communication data types.....	28
	Table 9 – Simple channel parameter data types	31
	Table 10 – Structured channel parameter data types	31
	Table 11 – Address range for device identification	33
	Table 12 – Identification data types with protocol-specific mapping for protocol ‘HART’	34
	Table 13 – Identification data types with semantics for protocol ‘HART’.....	36
	Table 14 – Simple identification data types for protocol ‘HART’ with protocol independent semantics	37
	Table 15 – Structured identification data types for protocol ‘HART’ with protocol independent semantics	37
	Table 16 – Identification data types for ‘Extended_HART’ protocols with protocol-specific mapping.....	38
	Table 17 – Identification data types for ‘Extended_HART’ protocols without protocol independent semantics	41
	Table 18 – Simple identification data types for ‘Extended_HART’ protocols with protocol independent semantics	42

Table 19 – Structured identification data types for ‘Extended_HART’ protocols with protocol independent semantics	42
Table 20 – Structured device type identification data types	43
Table 21 – Simple scan identification data types for protocol ‘HART’	43
Table 22 – Structured scan identification data types for protocol ‘HART’	43
Table 23 – Simple scan identification data types for ‘Extended_HART’ protocols	45
Table 24 – Structured scan identification data types for ‘Extended_HART’ protocols	45
Table 25 – Structured device type identification data types	47