SLOVENSKI STANDARD
SIST EN 61158-1:2015

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Industrijska komunikacijska omrežja - Specifikacije za procesna vodila - 1. del: Pregled in navodila za skupini IEC 61158 in IEC 61784 (IEC 61158-1:2014)

Industrial communication networks - Fieldbus specifications - Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series (IEC 61158-1:2014)

Industrielle Kommunikationsnetze - Feldbusse - Teil 1: Überblick und Leitfaden zu den Normen der Reihe IEC 61158 und IEC 61784 (IEC 61158-1:2014)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 1: Séries CEI 61158 et CEI 61784 - Présentation et lignes directrices (CEI 61158-1:2014)

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ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.110	Omreževanje	Networking

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EN 61158-1

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Supersedes CLC/TR 61158-1:2010

English Version

Industrial communication networks - Fieldbus specifications - Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series (IEC 61158-1:2014)

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Industrielle Kommunikationsnetze - Feldbusse - Teil 1: Überblick und Leitfaden zu den Normen der Reihe IEC 61158 und IEC 61784 (IEC 61158-1:2014)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 65C/757/FDIS, future edition 1 of IEC 61158-1, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61158-1:2014.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-03-27
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-06-27

This document supersedes CLC/TR 61158-1:2010.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 61158-1:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60793-2-30:2012	NOTE	Harmonized as EN 60793-2-30:2013 (not modified).
IEC 60793-2-40:2009	NOTE	Harmonized as EN 60793-2-40:2011 (not modified).
IEC 61000-6-2	NOTE	Harmonized as EN 61000-6-2.
IEC 61131-2	NOTE	Harmonized as EN 61131-2.
IEC 61158 Series	NOTE	Harmonized as EN 61158 Series (not modified).
IEC 61158-2:2014	NOTE	Harmonized as EN 61158-2 [1)] (not modified).
IEC 61158-3-1:2014	NOTE	Harmonized as EN 61158-3-1 [1)] (not modified).
IEC 61158-3-2:2014	NOTE	Harmonized as EN 61158-3-2 [1)] (not modified).
IEC 61158-3-3:2014	NOTE	Harmonized as EN 61158-3-3 [1)] (not modified).
IEC 61158-3-4:2014	NOTE	Harmonized as EN 61158-3-4 [1)] (not modified).
IEC 61158-3-7:2007	NOTE	Harmonized as EN 61158-3-7:2008 (not modified).
IEC 61158-3-8:2007	NOTE	Harmonized as EN 61158-3-8:2008 (not modified).
IEC 61158-3-11:2007	NOTE	Harmonized as EN 61158-3-11:2008 (not modified).
IEC 61158-3-12:2014	NOTE	Harmonized as EN 61158-3-12 [1)] (not modified).
IEC 61158-3-13:2014	NOTE	Harmonized as EN 61158-3-13 [1)] (not modified).
IEC 61158-3-14:2014	NOTE	Harmonized as EN 61158-3-14 [1)] (not modified).
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IEC 61158-3-17:2007	NOTE	Harmonized as EN 61158-3-17:2008 (not modified).
IEC 61158-3-18:2007	NOTE	Harmonized as EN 61158-3-18:2008 (not modified).
IEC 61158-3-19:2014	NOTE	Harmonized as EN 61158-3-19 [1)] (not modified).
IEC 61158-3-20:2014	NOTE	Harmonized as EN 61158-3-20 [1)] (not modified).
IEC 61158-3-21:2010	NOTE	Harmonized as EN 61158-3-21:2012 (not modified).
IEC 61158-3-22:2014	NOTE	Harmonized as EN 61158-3-22 [1)] (not modified).
IEC 61158-3-24:2014	NOTE	Harmonized as EN 61158-3-24 [1)] (not modified).
IEC 61158-4-1:2014	NOTE	Harmonized as EN 61158-4-1 [1)] (not modified).
IEC 61158-4-2:2014	NOTE	Harmonized as EN 61158-4-2 [1)] (not modified).
IEC 61158-4-3:2014	NOTE	Harmonized as EN 61158-4-3 [1)] (not modified).
IEC 61158-4-4:2014	NOTE	Harmonized as EN 61158-4-4 [1)] (not modified).
IEC 61158-4-7:2007	NOTE	Harmonized as EN 61158-4-7:2008 (not modified).
IEC 61158-4-8:2007	NOTE	Harmonized as EN 61158-4-8:2008 (not modified).
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IEC 61158-5-8:2007	NOTE	Harmonized as EN 61158-5-8:2008 (not modified).
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IEC 61158-5-10:2014	NOTE	Harmonized as EN 61158-5-10 [1)] (not modified).
IEC 61158-5-11:2007	NOTE	Harmonized as EN 61158-5-11:2008 (not modified).
IEC 61158-5-12:2014	NOTE	Harmonized as EN 61158-5-12 [1)] (not modified).
IEC 61158-5-13:2014	NOTE	Harmonized as EN 61158-5-13 [1)] (not modified).
IEC 61158-5-14:2014	NOTE	Harmonized as EN 61158-5-14 [1)] (not modified).
IEC 61158-5-15:2010	NOTE	Harmonized as EN 61158-5-15:2012 (not modified).
IEC 61158-5-16:2007	NOTE	Harmonized as EN 61158-5-16:2008 (not modified).
IEC 61158-5-17:2007	NOTE	Harmonized as EN 61158-5-17:2008 (not modified).
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IEC 61158-6-23:2014	NOTE	Harmonized as EN 61158-6-23 [1] (not modified).
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IEC 61784-3:2010	NOTE	Harmonized as EN 61784-3:2010 (not modified).
IEC 61784-3-1:2010	NOTE	Harmonized as EN 61784-3-1:2010 (not modified).
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[2)] At draft stage.

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INTERNATIONAL STANDARD

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colour inside

Industrial communication networks – Fieldbus specifications –
Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series

Réseaux de communication industriels – Spécifications des bus de terrain –
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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series

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.

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NOTE Combinations of protocol types are specified in IEC 61784-1 and IEC 61784-2.

International Standard IEC 61158-1 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This first edition cancels and replaces the third edition of IEC/TR 61158-1 published in 2010. This edition constitutes a technical revision.

This first edition includes the following significant changes with respect to the previous Technical Report:

- updates of the references to and information about the IEC 61158 series, IEC 61784-1, IEC 61784-3, IEC 61784-5 series and IEC 61918 throughout the document;
- new Type 23 for profile family 8;
- new Type 24 and the related profile family CPF 19;
- new Subclause 7.7 Communication profiles for wireless communication networks;
- new Clause 11 Fieldbus system requirements;
- new Annex B Media selection for fieldbus systems.

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

FDIS	Report on voting
65C/757/FDIS	65C/767/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 the parts of the IEC 61158 series, published under the general title *Industrial communication networks – Fieldbus specifications*, can be found on the IEC web site.

The committee has decided that the contents of this publication 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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series

1 Scope

This document specifies the generic concept of fieldbuses.

This document also presents an overview and guidance for the IEC 61158 series by:

- explaining the structure and content of the IEC 61158 series;
- relating the structure of the IEC 61158 series to the ISO/IEC 7498-1 OSI Basic Reference Model;
- showing the logical structure of the IEC 61784 series;
- showing how to use parts of the IEC 61158 series in combination with the IEC 61784 series;
- providing explanations of some aspects of the IEC 61158 series that are common to the type specific parts of the IEC 61158-5 including the application layer service description concepts and the generic fieldbus data types.

2 Normative references

None.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
communication system
arrangement of hardware, software and propagation media to allow the transfer of messages from one application to another

3.1.2
fieldbus
communication system based on serial data transfer as typically used in industrial automation and process control applications

3.1.3
fieldbus system
system using a fieldbus with connected devices

3.1.4
message
ordered series of octets intended to convey information

[SOURCE: ISO/IEC 2382-16:1996, 16.02.01, modified]

3.1.5
network
all of the media, connectors, repeaters, routers, gateways and associated node communication elements by which a given set of communicating devices are interconnected

3.2 Abbreviations

For the purposes of this document, the following abbreviations, based partially on the concepts developed in ISO/IEC 7498-1, apply:

AE	application entity
AL	application layer (N = 7)
APDU	application layer protocol data unit
APO	application process object
AR	application relationship
AREP	application relationship endpoint
ASE	application service element
CP	communication profile
CPF	communication profile family
DL-	data-link layer (as a prefix)
DLL	data-link layer (N = 2)
FAL	fieldbus application layer
FSCP	functional safety communication profile
IETF	Internet Engineering Task Force
IO	input output
IP	Internet protocol (see RFC 791)
kbit/s	thousand bit per second
Mbit/s	million bit per second
LME	layer management entity
(*n*)-layer	layer *n* of the OSI basic reference model
OSI	open systems interconnection
Ph-	physical layer (as a prefix)
PhL	physical layer (N = 1)
SIL	safety integrity level

4 Guidelines for implementers and users

4.1 Background and purpose

Communication in global markets requires a global understanding of a specification (standard or not). ISO/OSI related specifications provide a common basis for understanding and acceptance between international experts (manufacturers and end-users).

Examples are

- ISO/IEC 7498-1 for general layering and structuring;
- ISO/IEC 9545 for general application layer modeling;
- ISO/IEC 8886 for data-link layer modeling.