IEC 61158-1

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INTERNATIONAL STANDARD

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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 – Partie 1: Vue d'ensemble et recommandations pour les séries IEC 61158 et IEC 61784



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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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

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

IEC 61158-1 has been prepared by subcommittee 65C: Industrial networks, 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 2019. This edition constitutes a technical revision.

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

a) added the new technology AUTBUS specified in Type 28;
b) additional profile within IEC 61784-2-8 referring to Type 23 (CP 8/6, CC-Link IE TSN);
c) additional profile referring to Type 24 (CP 19/3, Σ-LINKII);
d) additional profile within IEC 61784-2-19 referring to a new Type 27 (CP 19/4, MECHATROLINK-4).

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

Draft	Report on voting
65C/1199/FDIS	65C/1240/RVD

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/publications.

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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

1 Scope

This part of IEC 61158 specifies the generic concept of fieldbuses.

This document also presents an overview and guidance for the IEC 61158[1] 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[2] 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 series including the application layer service description concepts and the generic fieldbus data types.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

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

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1 In the following pages of this document, “IEC 61158” will be used as a qualifier for “IEC 61158 (all parts)”.

2 In the following pages of this document, “IEC 61784” will be used as a qualifier for “IEC 61784 (all parts)”.

3.1.3
fieldbus system
system using a fieldbus with connected devices

3.1.4
message
ordered series of octets intended to convey information

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 and symbols

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 IETF 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