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Industrial communication networks - Fieldbus specifications - Part 3-28: Data-link layer service definition - Type 28 elements (IEC 61158-3-28:2023)

Industrielle Kommunikationsnetze - Feldbusse - Teil 3-28: Dienstfestlegungen des Data Link Layer (Sicherheitsschicht) - Typ 28-Elemente (IEC 61158-3-28:2023)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 3-28: Définition des services de la couche liaison de données - Eléments de Type 28 (IEC 61158-3-28:2023)

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**Industrial communication networks - Fieldbus specifications -
Part 3-28: Data-link layer service definition - Type 28 elements
(IEC 61158-3-28:2023)**

Réseaux de communication industriels - Spécifications des
bus de terrain - Partie 3-28: Définition des services de la
couche liaison de données - Eléments de Type 28
(IEC 61158-3-28:2023)

Industrielle Kommunikationsnetze - Feldbusse - Teil 3-28:
Dienstfestlegungen des Data Link Layer
(Sicherheitsschicht) - Typ 28-Elemente
(IEC 61158-3-28:2023)

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EN IEC 61158-3-28:2023 (E)**European foreword**

The text of document 65C/1206/FDIS, future edition 1 of IEC 61158-3-28, 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 IEC 61158-3-28:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2024-01-11 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2026-04-11 document have to be withdrawn

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Endorsement notice

The text of the International Standard IEC 61158-3-28:2023 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 standard indicated:

IEC 61158-1 NOTE Approved as EN IEC 61158-1

<https://standards.iteh.ai/catalog/standards/sist-en-iec-61158-3-28-2023> IEC 61158-5-28 NOTE Approved as EN IEC 61158-5-28

IEC 61158-6-28 NOTE Approved as EN IEC 61158-6-28¹

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IEC 61784-2 (series) NOTE Approved as EN IEC 61784-2 (series)³

¹ To be published. Stage at the time of publication: prEN IEC 61158-6-28:2023.

² To be published. Stage at the time of publication: FprEN IEC 61784-1-X:2023.

³ To be published. Stage at the time of publication: FprEN IEC 61784-2-X:2023.

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.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61158-2	2023	Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition	EN IEC 61158-2	2023
IEC 61158-4-28	2023	Industrial communication networks - Fieldbus specifications - Part 4-28: Data- link layer protocol specification - Type 28 elements	EN IEC 61158-4-28	2023
ISO/IEC 7498-1	-	Information technology - Open Systems Interconnection - Basic reference model: The basic model	-	-
ISO/IEC 7498-3	-	Information technology - Open Systems Interconnection - Basic reference model: Naming and addressing	-	-
ISO/IEC 8886	-	Information technology - Open Systems Interconnection - Data link service definition	-	-
ISO/IEC 10731	1994	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services	-	-
ISO/IEC/IEEE 8802-3	2021	Telecommunications and exchange between information technology systems - Requirements for local and metropolitan area networks - Part 3: Standard for Ethernet	-	-



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**Industrial communication networks – Fieldbus specifications –
Part 3-28: Data-link layer service definition – Type 28 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 3 28: Définition des services de la couche liaison de données – Éléments
de type 28**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 3-28: Data-link layer service definition –
Type 28 elements**

FOREWORD

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

IEC 61158-3-28 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

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

Draft	Report on voting
65C/1206/FDIS	65C/1235/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.

A list of all the parts of the IEC 61158 series, 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 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,
- withdrawn,
- replaced by a revised edition, or
- amended.

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 document is one of a series produced to facilitate the interconnection of automation system components. It is related to other standards in the set as defined by the "three-layer" fieldbus reference model described in IEC 61158-1.

Throughout the set of fieldbus standards, the term "service" refers to the abstract capability provided by one layer of the OSI Basic Reference Model to the layer immediately above. Thus, the data-link layer service defined in this document is a conceptual architectural service, independent of administrative and implementation divisions.

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 3-28: Data-link layer service definition – Type 28 elements

1 Scope

1.1 General

This part of IEC 61158 describes basic packet communication services and models in an automation control industrial field environment. The Type 28 data-link layer provides time-critical and non-time-critical communication services. Time-critical refers to the requirement to complete specified functions between devices in a defined time window in an industrial field environment. Failure to complete specified functions within the time window can lead to failure or harm in industrial production.

This document defines in an abstract way the externally visible service provided by the Type 28 fieldbus data-link layer in terms of

- a) function description;
- b) primitive actions and events with primitive sequence diagram;
- c) the form of externally service interface and related parameters.

The purpose of this document is to define the services provided to:

- the Type 28 fieldbus application layer at the boundary between the application and data-link layers of the fieldbus reference model;
- systems management at the boundary between the data-link layer and systems management of the fieldbus reference model.

Type 28 DL-service provides both a connected and a connectionless subset of those services provided by OSI data-link protocols as specified in ISO/IEC 8886.

1.2 Specifications

The principal objective of this document is to specify the characteristics of conceptual data-link layer services suitable for time-critical communications and thus supplement the OSI Basic Reference Model in guiding the development of data-link protocols for time-sensitive communications. A secondary objective is to provide migration paths from previously-existing industrial communications protocols.

This specification can be used as the basis for formal DL-Programming-Interfaces. Nevertheless, it is not a formal programming interface, and any such interface will need to address implementation issues not covered by this specification, including:

- a) the sizes and octet ordering of various multi-octet service parameters; and
- b) the correlation of paired request and confirm, or indication and response primitives.

1.3 Conformance

This document does not specify individual implementations or products, nor does it constrain the implementations of data-link entities within industrial automation systems.