

**Industrial communication networks - Fieldbus  
specifications - Part 4-3: Data-link layer protocol  
specification - Type 3 elements**

## EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 61158-4-3:2014 sisaldab Euroopa standardi EN 61158-4-3:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 61158-4-3:2014 consists of the English text of the European standard EN 61158-4-3:2014.
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ICS 25.040.40, 35.100.20, 35.110

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English Version

**Industrial communication networks - Fieldbus specifications -  
Part 4-3: Data-link layer protocol specification - Type 3 elements  
(IEC 61158-4-3:2014)**

Réseaux de communication industriels - Spécifications des  
bus de terrain - Partie 4-3: Spécification du protocole de la  
couche liaison de données - Éléments de type 3  
(CEI 61158-4-3:2014)

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-3:  
Protokollspezifikation des Data Link Layer  
(Sicherheitsschicht) - Typ 3-Elemente  
(IEC 61158-4-3:2014)

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of document 65C/762/FDIS, future edition 3 of IEC 61158-4-3, 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 61158-4-3:2014.

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) 2015-06-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-09-19

This document supersedes EN 61158-4-3:2012

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

IEC 60870-5-1	NOTE	Harmonised as EN 60870-5-1
IEC 61158-1	NOTE	Harmonised as EN 61158-1
IEC 61158-5-3	NOTE	Harmonised as EN 61158-5-3
IEC 61158-6-3	NOTE	Harmonised as EN 61158-6-3
IEC 61784-1	NOTE	Harmonised as EN 61784-1
IEC 61784-2	NOTE	Harmonised as EN 61784-2

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61131-3	-	Programmable controllers Part 3: Programming languages	EN 61131-3	-
IEC 61158-2	2014	Industrial communication networks - Fieldbus specifications Part 2: Physical layer specification and service definition	EN 61158-2	2014
IEC 61158-3-3	-	Industrial communication networks - Fieldbus specifications Part 3-3: Data-link layer service definition - Type 3 elements	EN 61158-3-3	-
ISO/IEC 2022	-	Information technology - Character code structure and extension techniques	-	-
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 10731	-	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services	-	-
ISO 1177	-	Information processing - Character structure for start/stop and synchronous character-oriented transmission	-	-

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## INTRODUCTION

This part of IEC 61158 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.

The data-link protocol provides the data-link service by making use of the services available from the physical layer. The primary aim of this standard is to provide a set of rules for communication expressed in terms of the procedures to be carried out by peer data-link entities (DLEs) at the time of communication. These rules for communication are intended to provide a sound basis for development in order to serve a variety of purposes:

- a) as a guide for implementors and designers;
- b) for use in the testing and procurement of equipment;
- c) as part of an agreement for the admittance of systems into the open systems environment;
- d) as a refinement to the understanding of time-critical communications within OSI.

This standard is concerned, in particular, with the communication and interworking of sensors, effectors and other automation devices. By using this standard together with other standards positioned within the OSI or fieldbus reference models, otherwise incompatible systems may work together in any combination.

**NOTE** Use of some of the associated protocol types is restricted by their intellectual-property-right holders. In all cases, the commitment to limited release of intellectual-property-rights made by the holders of those rights permits a particular data-link layer protocol type to be used with physical layer and application layer protocols in Type combinations as specified explicitly in its profile parts. Use of the various protocol types in other combinations may require permission from their respective intellectual-property-right holders.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning Type 3 elements and possibly other types given in the normative elements of this standard.

The following patent rights for Type 3 have been announced by [SI]:

Publication	Title
EP 1253494	Control device with fieldbus

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[SI]: Siemens AG  
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## **INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –**

### **Part 4-3: Data-link layer protocol specification – Type 3 elements**

#### **1 Scope**

##### **1.1 General**

The data-link layer provides basic time-critical messaging communications between devices in an automation environment.

This protocol provides communication opportunities to a pre-selected “master” subset of data-link entities in a cyclic asynchronous manner, sequentially to each of those data-link entities. Other data-link entities communicate only as permitted and delegated by those master data-link entities.

For a given master, its communications with other data-link entities can be cyclic, or acyclic with prioritized access, or a combination of the two.

This protocol provides a means of sharing the available communication resources in a fair manner. There are provisions for time synchronization and for isochronous operation.

##### **1.2 Specifications**

This standard specifies

- a) procedures for the timely transfer of data and control information from one data-link user entity to a peer user entity, and among the data-link entities forming the distributed data-link service provider;
- b) the structure of the fieldbus DLPDUs used for the transfer of data and control information by the protocol of this standard, and their representation as physical interface data units.

##### **1.3 Procedures**

The procedures are defined in terms of

- a) the interactions between peer DL-entities (DLEs) through the exchange of fieldbus DLPDUs;
- b) the interactions between a DL-service (DLS) provider and a DLS-user in the same system through the exchange of DLS primitives;
- c) the interactions between a DLS-provider and a Ph-service provider in the same system through the exchange of Ph-service primitives.

##### **1.4 Applicability**

These procedures are applicable to instances of communication between systems which support time-critical communications services within the data-link layer of the OSI or fieldbus reference models, and which require the ability to interconnect in an open systems interconnection environment.

Profiles provide a simple multi-attribute means of summarizing an implementation's capabilities, and thus its applicability to various time-critical communications needs.