



**NSAI**  
Standards

Irish Standard  
I.S. EN IEC 61158-3-4:2019

Industrial communication networks -  
Fieldbus specifications - Part 3-4: Data-  
link layer service definition - Type 4  
elements

**I.S. EN IEC 61158-3-4:2019**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN IEC 61158-3-4:2019 is the adopted Irish version of the European Document EN IEC 61158-3-4:2019, Industrial communication networks - Fieldbus specifications - Part 3-4: Data-link layer service definition - Type 4 elements

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EUROPEAN STANDARD

**EN IEC 61158-3-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2019

ICS 25.040.40; 35.100.20; 35.110

Supersedes EN 61158-3-4:2014

English Version

**Industrial communication networks - Fieldbus specifications -  
Part 3-4: Data-link layer service definition - Type 4 elements  
(IEC 61158-3-4:2019)**

Réseaux de communication industriels - Spécifications des  
bus de terrain - Partie 3-4: Définition des services de la  
couche liaison de données - Eléments de type 4  
(IEC 61158-3-4:2019)

Industrielle Kommunikationsnetze - Feldbusse - Teil 3-4:  
Dienstfestlegungen des Data Link Layer  
(Sicherheitsschicht) - Typ 4-Elemente  
(IEC 61158-3-4:2019)

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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.

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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**

## **EN IEC 61158-3-4:2019 (E)**

### **European foreword**

The text of document 65C/945/FDIS, future edition 3 of IEC 61158-3-4, 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 61158-3-4:2019.

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) 2020-02-29
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-05-29

This document supersedes EN 61158-3-4:2014.

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### **Endorsement notice**

The text of the International Standard IEC 61158-3-4:2019 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 61158-1:2019 NOTE Harmonized as EN IEC 61158-1:2019 (not modified)
- IEC 61158-2 NOTE Harmonized as EN 61158-2
- IEC 61158-4-4:2019 NOTE Harmonized as EN IEC 61158-4-4:2019 (not modified)
- IEC 61158-5-4:2019 NOTE Harmonized as EN IEC 61158-5-4:2019 (not modified)
- IEC 61784-1:2019 NOTE Harmonized as EN IEC 61784-1:2019 (not modified)
- IEC 61784-2:2019 NOTE Harmonized as EN IEC 61784-2:2019 (not modified)

## 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.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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	1994	Information technology - Open Systems-Interconnection - Basic Reference Model - Conventions for the definition of OSI services		-

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**IEC 61158-3-4**

Edition 3.0 2019-04

# **INTERNATIONAL STANDARD**

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**Industrial communication networks – Fieldbus specifications –  
Part 3-4: Data-link layer service definition – Type 4 elements**





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**IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)**

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.



**IEC 61158-3-4**

Edition 3.0 2019-04

# **INTERNATIONAL STANDARD**

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**Industrial communication networks – Fieldbus specifications –  
Part 3-4: Data-link layer service definition – Type 4 elements**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 25.040.40; 35.100.20; 35.110

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –  
FIELDBUS SPECIFICATIONS –****Part 3-4: Data-link layer service definition –  
Type 4 elements**

## FOREWORD

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

International Standard IEC 61158-3-4 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the second edition published in 2014. This edition constitutes a technical revision.

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

- a) additional user parameters to services;
- b) additional services to support distributed objects;
- c) additional secure services;

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

FDIS	Report on voting
65C/945/FDIS	65C/954/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with 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 website.

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.

A bilingual version of this publication may be issued at a later date.

## 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.



## INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

### Part 3-4: Data-link layer service definition – Type 4 elements

## 1 Scope

### 1.1 General

This part of IEC 61158 provides common elements for basic time-critical messaging communications between devices in an automation environment. The term “time-critical” is used to represent the presence of a time-window, within which one or more specified actions are required to be completed with some defined level of certainty. Failure to complete specified actions within the time window risks failure of the applications requesting the actions, with attendant risk to equipment, plant and possibly human life.

This International Standard defines in an abstract way the externally visible services provided by the Type 4 fieldbus data-link layer in terms of

- a) the primitive actions and events of the services;
- b) the parameters associated with each primitive action and event, and the form which they take; and
- c) the interrelationship between these actions and events, and their valid sequences.

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

- the Type 4 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.

### 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-critical communications. A secondary objective is to provide migration paths from previously-existing industrial communications protocols.

This specification may 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;
- 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.

There is no conformance of equipment to this data-link layer service definition standard. Instead, conformance is achieved through implementation of the corresponding data-link protocol that fulfills the Type 1 data-link layer services defined in this document.

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