BS EN 61158-5-4:2014



BSI Standards Publication

Industrial communication networks — Fieldbus specifications

Part 5-4: Application layer service definition — Type 4 elements

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The UK participation in its preparation was entrusted to Technical Committee AMT/7, Industrial communications: process measurement and control, including fieldbus.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2014

ISBN 978 0 580 79454 4
ICS 25.040.40; 35.100.70; 35.110

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2014.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61158-5-4

October 2014

ICS 25.040.40; 35.100.70; 35.110

Supersedes EN 61158-5-4:2008

English Version

Industrial communication networks - Fieldbus specifications - Part 5-4: Application layer service definition - Type 4 elements (IEC 61158-5-4:2014)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 5-4: Définition des services de la couche application - Eléments de type 4 (CEI 61158-5-4:2014)

Industrielle Kommunikationsnetze - Feldbusse - Teil 5-4: Dienstfestlegungen des Application Layer (Anwendungsschicht) - Typ 4-Elemente (IEC 61158-5-4:2014)

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Foreword

The text of document 65C/763/FDIS, future edition 2 of IEC 61158-5-4, 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 61158-5-4:2014.

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)	2015-06-22
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-09-22

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

IEC 61158-1:2014	NOTE	Harmonized as EN 61158-1:2014 (not modified).
IEC 61784-1:2014	NOTE	Harmonized as EN 61784-1:2014 (not modified).
IEC 61784-2:2014	NOTE	Harmonized as EN 61784-2 [1)] (not modified).

[1)] To be published.

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

Publication	Year	Title	EN/HD	Year
IEC 61158-3-4	2014	Industrial communication networks - Fieldbus specifications - Part 3-4: Data-link layer service definition - Type 4 elements	EN 61158-3-4 [2)]	-
IEC 61158-4-4	2014	Industrial communication networks - Fieldbus specifications - Part 4-4: Data-link layer protocol specification - Type 4 elements	EN 61158-4-4 [2)]	-
IEC 61158-6-4	2014	Industrial communication networks - Fieldbus specifications - Part 6-4: Application layer protocol specification - Type 4 elements	EN 61158-6-4 [2)]	-
IEC 61158-6	Series	Industrial communication networks - Fieldbus specifications - Part 6: Application layer protocol specification	EN 61158-6	Series
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 8822	-	Information technology - Open Systems Interconnection - Presentation service definition	-	-
ISO/IEC 8824-1	-	Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation	-	-
ISO/IEC 9545	-	Information technology - Open Systems Interconnection - Application layer structure	-	-

[2)] To be published.

Publication	Year	Title	EN/HD	Year
ISO/IEC 10731	-	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services	-	-
ISO/IEC/IEEE 60559	-	Information technology - Microprocessor Systems - Floating-Point arithmetic	-	-

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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 application service is provided by the application protocol making use of the services available from the data-link or other immediately lower layer. This standard defines the application service characteristics that fieldbus applications and/or system management may exploit.

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 application layer service defined in this standard is a conceptual architectural service, independent of administrative and implementation divisions.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 5-4: Application layer service definition – Type 4 elements

1 Scope

1.1 General

The fieldbus application layer (FAL) provides user programs with a means to access the fieldbus communication environment. In this respect, the FAL can be viewed as a “window between corresponding application programs.”

This standard provides common elements for basic time-critical and non-time-critical messaging communications between application programs in an automation environment and material specific to Type 4 fieldbus. 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 standard defines in an abstract way the externally visible service provided by the Type 4 fieldbus application layer in terms of

a) an abstract model for defining application resources (objects) capable of being manipulated by users via the use of the FAL service,
b) the primitive actions and events of the service;
c) the parameters associated with each primitive action and event, and the form which they take; and
d) the interrelationship between these actions and events, and their valid sequences.

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

1) the FAL user at the boundary between the user and the application layer of the fieldbus reference model, and
2) Systems Management at the boundary between the application layer and Systems Management of the fieldbus reference model.

This standard specifies the structure and services of the Type 4 fieldbus application layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498-1) and the OSI application layer structure (ISO/IEC 9545).

FAL services and protocols are provided by FAL application-entities (AE) contained within the application processes. The FAL AE is composed of a set of object-oriented application service elements (ASEs) and a layer management entity (LME) that manages the AE. The ASEs provide communication services that operate on a set of related application process object (APO) classes. One of the FAL ASEs is a management ASE that provides a common set of services for the management of the instances of FAL classes.

Although these services specify, from the perspective of applications, how request and responses are issued and delivered, they do not include a specification of what the requesting and responding applications are to do with them. That is, the behavioral aspects of the applications are not specified; only a definition of what requests and responses they can