BS EN 61158-6-4:2014



BSI Standards Publication

Industrial communication networks — Fieldbus specifications

Part 6-4: Application layer protocol specification — Type 4 elements

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National foreword

This British Standard is the UK implementation of EN 61158-6-4:2014. It is identical to IEC 61158-6-4:2014. It supersedes BS EN 61158-6-4:2008 which is withdrawn.

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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Industrielle Kommunikationsnetze - Feldbusse - Teil 6-4: Protokollspezifikation des Application Layer (Anwendungsschicht) - Typ 4-Elemente (IEC 61158-6-4:2014)

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Foreword

The text of document 65C/764/FDIS, future edition 2 of IEC 61158-6-4, 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 61158-6-4:2014.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-09-23

This document supersedes EN 61158-6-4:2008.

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

IEC 61158-1	NOTE	Harmonized as EN 61158-1.
IEC 61158-4-4	NOTE	Harmonized as EN 61158-4-4.
IEC 61784-1	NOTE	Harmonized as EN 61784-1.
IEC 61784-2	NOTE	Harmonized 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.

Publication	Year	Title	EN/HD	Year
IEC 61158-3-4	-	Industrial communication networks - Fieldbus specifications - Part 3-4: Data-link layer service definition - Type 4 elements	EN 61158-3-4	-
IEC 61158-5-4	-	Industrial communication networks - Fieldbus specifications - Part 5-4: Application layer service definition - Type 4 elements	EN 61158-5-4	-
IEC 61158-6	2003 [1)]	Digital data communications for measurement and control - Fieldbus for use in industrial control systems - Part 6: Application layer protocol specification	EN 61158-6	2004 [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 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	-	-

1) Superseded by the IEC 61158-6 series.

2) Superseded by the EN 61158-6 series (IEC 61158-6 series).

Publication	Year	Title	EN/HD	Year
ISO/IEC 9545	-	Information technology - Open Systems Interconnection - Application Layer structure	-	-
ISO/IEC 10731	-	Information technology - Open Systems Interconnection - Basic Reference Model - Conventions for the definition of OSI services	-	-

CONTENTS

INTRODUCTION 7
1 Scope 8
1.1 General 8
1.2 Specifications 8
1.3 Conformance 9
2 Normative references 9
3 Terms, definitions, symbols, abbreviations and conventions 9
3.1 Referenced terms and definitions 9
3.2 Abbreviations and symbols 11
3.3 Conventions 11
4 FAL syntax description 13
4.1 FAL-AR PDU abstract syntax 13
4.2 Data types 15
5 Transfer syntaxes 15
5.1 APDU encoding 15
5.2 Variable object encoding and packing 19
5.3 Error codes 22
6 FAL protocol state machines 22
7 AP-context state machine 23
8 FAL service protocol machine (FSPM) 24
8.1 Primitives exchanged between FAL User and FSPM 24
8.2 FSPM states 24
9 Application relationship protocol machine (ARPM) 29
9.1 Primitives exchanged between ARPM and FSPM 29
9.2 ARPM States 30
10 DLL mapping protocol machine (DMPM) 32
10.1 Data-link Layer service selection 32
10.2 Primitives exchanged between ARPM and DLPM 32
10.3 Primitives exchanged between DLPM and data-link layer 32
10.4 DLPM states 33
11 Protocol options 35
Bibliography 36

Figure 1 – State transition diagram 12
Figure 2 – APDU header structure 15
Figure 3 – Instruction subfield of ControlStatus 16
Figure 4 – Errorcode subfield of ControlStatus 16
Figure 5 – Remaining subfields of ControlStatus 17
Figure 6 – DataFieldFormat encoding 17
Figure 7 – Structure of request APDU body 17
Figure 8 – Structure of response APDU body 18
Figure 9 – Variable identifier 18
Figure 10 – Code subfield of variable identifier 18
Figure 11 – Summary of FAL architecture 23
Figure 12 – FSPM proxy object state machine 25
Figure 13 – FSPM real object state machine 28
Figure 14 – ARPM state machine 30
Figure 15 – DLPM state machine 33

Table 1 – State machine description elements 12
Table 2 – APDU header 13
Table 3 – APDU body 14
Table 4 – Transfer syntax for Array 20
Table 5 – Transfer syntax for Structure 21
Table 6 – Common variable object attributes 21
Table 7 – Variable type identifiers 21
Table 8 – FIFO variable object attributes 22
Table 9 – Error codes 22
Table 10 – Primitives exchanged between FAL-User and FSPM 24
Table 11 – REQUEST.req FSPM constraints 25
Table 12 – REQUEST.req FSPM actions 25
Table 13 – RESPONSE.cnf FSPM constraints 27
Table 14 – RESPONSE.cnf FSPM actions 27
Table 15 – AR Send.ind proxy FSPM constraints 28
Table 16 – AR Send.ind proxy FSPM actions 28
Table 17 – AR Send.ind real FSPM constraints 29
Table 18 – AR Send.ind real FSPM Actions 29
Table 19 – Primitives issued by FSPM to ARPM 29
Table 20 – Primitives issued by ARPM to FSPM 30

Table 21 – Primitives issued by ARPM to ARPM 30
Table 22 – AR Send.req ARPM constraints 30
Table 23 – AR Send.req ARPM actions 30
Table 24 – AR Acknowledge.req ARPM constraints 31
Table 25 – AR Acknowledge.req ARPM actions 31
Table 26 – AR Send.ind ARPM constraints 31
Table 27 – AR Send.req ARPM actions 31
Table 28 – Primitives issued by ARPM to DLPM 32
Table 29 – Primitives issued by DLPM to ARPM 32
Table 30 – Primitives issued by DLPM to data-link layer 33
Table 31 – Primitives issued by data-link layer to DLPM 33
Table 32 – AR Send.req DLPM constraints 33
Table 33 – AR Send.req DLPM actions 34
Table 34 – AR Acknowledge.req DLPM constraints 34
Table 35 – AR Acknowledge.req DLPM actions 34
Table 36 – DL-UNITDATA.ind DLPM constraints 34
Table 37 – DL-UNITDATA.ind DLPM actions 35

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 protocol provides the application service by making use of the services available from the data-link or other immediately lower 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 application entities (AEs) 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:

- as a guide for implementors and designers;
- for use in the testing and procurement of equipment;
- as part of an agreement for the admittance of systems into the open systems environment;
- 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.

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 6-4: Application layer protocol specification – 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 specifies interactions between remote applications and defines the externally visible behavior provided by the Type 4 fieldbus application layer in terms of

a) the formal abstract syntax defining the application layer protocol data units conveyed between communicating application entities;
b) the transfer syntax defining encoding rules that are applied to the application layer protocol data units;
c) the application context state machine defining the application service behavior visible between communicating application entities;
d) the application relationship state machines defining the communication behavior visible between communicating application entities.

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

1) define the wire-representation of the service primitives defined in IEC 61158-5-4, and
2) define the externally visible behavior associated with their transfer.

This standard specifies the protocol 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).

1.2 Specifications

The principal objective of this standard is to specify the syntax and behavior of the application layer protocol that conveys the application layer services defined in IEC 61158-5-4.

A secondary objective is to provide migration paths from previously-existing industrial communications protocols. It is this latter objective which gives rise to the diversity of protocols standardized in IEC 61158-6 series.