



NSAI
Standards

Irish Standard
I.S. EN 61158-6-14:2014

Industrial communication networks -
Fieldbus specifications - Part 6-14:
Application layer protocol specification - Type
14 elements

I.S. EN 61158-6-14:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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Supersedes EN 61158-6-14:2012

English Version

**Industrial communication networks - Fieldbus specifications -
Part 6-14: Application layer protocol specification - Type 14
elements
(IEC 61158-6-14:2014)**

Réseaux de communication industriels - Spécifications des
bus de terrain - Partie 6-14: Spécification du protocole de la
couche application - Eléments de type 14
(CEI 61158-6-14:2014)

Industrielle Kommunikationsnetze - Feldbusse - Teil 6-14:
Protokollspezifikation des Application Layer
(Anwendungsschicht) - Typ 14-Elemente
(IEC 61158-6-14:2014)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Foreword

The text of document 65C/764/FDIS, future edition 3 of IEC 61158-6-14, 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 61158-6-14:2014.

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) 2015-06-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-09-23

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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 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61158-3-14	-	Industrial communication networks - Fieldbus specifications - Part 3-14: Data-link layer service definition - Type 14 elements	EN 61158-3-14	-
IEC 61158-4-14	-	Industrial communication networks - Fieldbus specifications - Part 4-14: Data-link layer protocol specification - Type 14 elements	EN 61158-4-14	-
IEC 61158-5-14	-	Industrial communication networks - Fieldbus specifications - Part 5-14: Application layer service definition - Type 14 elements	EN 61158-5-14	-
IEC 61158-6	series	Industrial communication networks - Fieldbus specifications - Part 6: Application layer protocol specification	EN 61158-6	series
ISO/IEC 646	-	Information technology - ISO 7-bit coded character set for information interchange	-	-
ISO/IEC 2375	-	Information technology - Procedure for registration of escape sequences and coded character sets	-	-
ISO/IEC 7498-1	-	Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model	-	-
ISO/IEC 8802-3	-	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO/IEC 8822	-	Information technology - Open Systems Interconnection - Presentation service definition	-	-
ISO/IEC 8824	1990	Information technology - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1)	-	-
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	-	-
ISO/IEC/IEEE 60559	-	Information technology - Microprocessor Systems - Floating-Point arithmetic	-	-
IEEE 754	-	IEEE Standard for Floating-Point Arithmetic	-	-



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Industrial communication networks – Fieldbus specifications –
Part 6-14: Application layer protocol specification – Type 14 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 6-14: Spécification du protocole de la couche application – Eléments
de type 14**





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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Part 6-14: Application layer protocol specification – Type 14 elements**

**Réseaux de communication industriels – Spécifications des bus de terrain –
Partie 6-14: Spécification du protocole de la couche application – Eléments
de type 14**

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CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	10
1.1 General.....	10
1.2 Specifications.....	10
1.3 Conformance.....	11
2 Normative references.....	11
3 Terms, definitions, symbols, abbreviations and conventions.....	12
3.1 Referenced terms and definitions.....	12
3.2 Fieldbus application layer specific terms and definitions.....	13
3.3 Abbreviations and symbols.....	15
3.4 Conventions.....	17
4 Abstract syntax.....	18
4.1 Fixed format PDU description.....	18
4.2 Object definitions in FAL management ASE.....	27
4.3 Definition of objects used in Type 14 application access entity.....	33
5 Transfer syntax.....	36
5.1 Encoding of basic data types.....	36
5.2 Encoding of Type 14 APDU header.....	42
5.3 Encoding of FAL management entity service parameters.....	43
5.4 Encoding of AAE Services.....	49
6 Structure of FAL protocol state machines.....	58
7 AP-Context state machine.....	59
7.1 Primitives exchanged between ALU and ALE.....	59
7.2 Protocol state machine descriptions.....	59
7.3 State transitions.....	60
7.4 Function descriptions.....	66
8 FAL management state machines.....	66
8.1 Primitives.....	66
8.2 Protocol state machine descriptions.....	67
8.3 State transitions.....	68
8.4 Function descriptions.....	70
9 Application access entity protocol machine.....	74
9.1 Primitives.....	74
9.2 AAE state machine.....	76
9.3 Event ASE protocol machine.....	78
9.4 Domain ASE protocol machine.....	79
9.5 Block ASE protocol machine.....	83
10 Application relationship state machine.....	85
10.1 Primitives.....	85
10.2 AREP state description.....	87
10.3 State transitions.....	87
10.4 Function descriptions.....	88
11 DLL mapping protocol machine.....	88
11.1 Concept.....	88

11.2 Primitives	89
11.3 State description	89
11.4 State transitions	89
11.5 Function description	90
Bibliography.....	91
Figure 1 – State transition diagram	17
Figure 2 – Exchanged primitives of protocol state machine	59
Figure 3 – ACE protocol state machine	60
Figure 4 – FME protocol state machine.....	68
Figure 5 – AAE state transition diagrams	76
Figure 6 – Event ASE state transition diagrams	78
Figure 7 – Domain ASE state transition diagram	80
Figure 8 – Block ASE state transition diagrams.....	84
Figure 9 – AREP state transition diagrams.....	87
Figure 10 – ESME state transition.....	90
Table 1 – State machine description elements	17
Table 2 – Definition of Type 14 MOB header object	27
Table 3 – Definition of Type 14 device descriptor object	27
Table 4 – Definition of the time synchronization object.....	28
Table 5 – Definition of maximum response time object.....	28
Table 6 – Definition of the Type 14 communication scheduling management object	29
Table 7 – Definition of the device application information object	29
Table 8 – Definition of FB application information header.....	29
Table 9 – Definition of domain application information header.....	30
Table 10 – Definition of Type 14 link object header.....	30
Table 11 – Definition of Type 14 FRT link object header	31
Table 12 – Definition of FB application information object	31
Table 13 – Definition of Type 14 link object	31
Table 14 – Definition of Type 14 FRT link object.....	32
Table 15 – Definition of domain application information object	33
Table 16 – Definition of domain object	33
Table 17 – Definition of simple variable object	34
Table 18 – Definition of event object.....	34
Table 19 – Definition of Type 14 socket mapping object.....	35
Table 20 – Definition of Type 14 socket timer object	35
Table 21 – Definition of ErrorType object	36
Table 22 – Encoding of Boolean value TRUE.....	36
Table 23 – Encoding of Boolean value FALSE	36
Table 24 – Encoding of Unsigned8 data type	37
Table 25 – Encoding of Unsigned16 data type	37
Table 26 – Encoding of Unsigned32 data type	37
Table 27 – Encoding of Unsigned64 data type	37

Table 28 – Encoding of Int8 data type	38
Table 29 – Encoding of Int16 data type	38
Table 30 – Encoding of Int32 data type	38
Table 31 – Encoding of Int64 data type	39
Table 32 – Encoding of Real type	39
Table 33 – Encoding of VisibleString data type	39
Table 34 – Encoding of OctetString data type	40
Table 35 – Encoding of BitString data type	40
Table 36 – Encoding of TimeOfDay data type	40
Table 37 – Encoding of BinaryDate data type	41
Table 38 – Encoding of PrecisionTimeDifference data type	42
Table 39 – Encoding of Type 14 application layer service message header	42
Table 40 – Encoding of EM_DetectingDevice request parameters	43
Table 41 – Encoding of EM_OnlineReply request parameters	43
Table 42 – Encoding of EM_GetDeviceAttribute request parameters	44
Table 43 – Encoding of EM_GetDeviceAttribute positive response parameters	44
Table 44 – Encoding of EM_GetDeviceAttribute negative response parameters	45
Table 45 – Encoding of EM_ActiveNotification request parameters	46
Table 46 – Encoding of EM_ConfiguringDevice request parameters	47
Table 47 – Encoding of EM_ConfiguringDevice positive response parameters	48
Table 48 – Encoding of EM_ConfiguringDevice negative response parameters	48
Table 49 – Encoding of EM_SetDefaultValue request parameters	48
Table 50 – Encoding of EM_SetDefaultValue positive response parameters	48
Table 51 – Encoding of clear device attribute service refuse packet	49
Table 52 – Encoding of DomainDownload request parameters	49
Table 53 – Encoding of domain download service response packet	49
Table 54 – Encoding of DomainDownload negative response parameters	49
Table 55 – Encoding of DomainUpload request parameters	50
Table 56 – Encoding of DomainUpload positive response parameters	50
Table 57 – Encoding of DomainUpload negative response parameters	50
Table 58 – Encoding of EventReport request parameters	51
Table 59 – Encoding of EventReportAcknowledge request parameters	51
Table 60 – Encoding of EventReportAcknowledge positive response parameters	51
Table 61 – Encoding of EventReportAcknowledge negative response parameters	51
Table 62 – Encoding of ReportConditionChanging request parameters	52
Table 63 – Encoding of ReportConditionChanging positive response parameters	52
Table 64 – Encoding of ReportConditionChanging negative response parameters	52
Table 65 – Encoding of Read request parameters	52
Table 66 – Encoding of Read positive response parameters	53
Table 67 – Encoding of Read negative response parameters	53
Table 68 – Encoding of Write request parameters	53
Table 69 – Encoding of Write positive response parameters	53
Table 70 – Encoding of Write negative response parameters	54

Table 71 – Encoding of VariableDistribute request parameters	54
Table 72 – Encoding of FRTRead request parameters	54
Table 73 – Encoding of FRTRead positive response parameters.....	54
Table 74 – Encoding of FRTRead negative response parameters	55
Table 75 – Encoding of FRTWrite request parameters	55
Table 76 – Encoding of FRTWrite positive response parameters.....	55
Table 77 – Encoding of FRTWrite negative response parameters	55
Table 78 – Encoding of FRTVariableDistribute request parameters.....	56
Table 79 – Encoding of BlockTransmissionOpen request parameters	56
Table 80 – Encoding of BlockTransmissionOpen positive response parameters	56
Table 81 – Encoding of BlockTransmissionOpen negative response parameters.....	56
Table 82 – Encoding of BlockTransmissionClose request parameters	57
Table 83 – Encoding of BlockTransmissionClose positive response parameters	57
Table 84 – Encoding of BlockTransmissionClose negative response parameters	57
Table 85 – Encoding of BlockTransmit request parameters	57
Table 86 – Encoding of BlockTransmissionHeartbeat request parameters.....	58
Table 87 – Primitives delivered by ALU to ALE	59
Table 88 – Primitives delivered by ALE to ALU	59
Table 89 – ACE state descriptions	60
Table 90 – ACE state transitions (sender).....	60
Table 91 – ACE state transitions (receiver).....	63
Table 92 – APSERVICEType() descriptions.....	66
Table 93 – Primitives delivered by application layer user to FME	66
Table 94 – Primitives delivered by FME to application layer user	66
Table 95 – Primitive parameters exchanged between FME and application layer user	67
Table 96 – Primitives delivered by FME to ESME.....	67
Table 97 – Primitives delivered by ESME to FME.....	67
Table 98 – Primitive parameters exchanged between FME and ESME	67
Table 99 – State transitions of Type 14 FME.....	68
Table 100 – RcvNewIpAddress() descriptions	70
Table 101 – Attribute_Set() descriptions	71
Table 102 – RestoreDefaults() descriptions	71
Table 103 – NewAddress() descriptions	71
Table 104 – Restart_Type 14RepeatTimer() descriptions	71
Table 105 – Clear_DuplicatePdTagFlag() descriptions	71
Table 106 – Type 14RepeatTimerExpire() descriptions	72
Table 107 – Send_EM_ReqRspMessage() descriptions	72
Table 108 – Send_EM_CommonErrorRsp() descriptions	72
Table 109 – SntpSyncLost() descriptions	72
Table 110 – IPAddressCollision() descriptions	73
Table 111 – RecvMsg() descriptions	73
Table 112 – QueryMatch() descriptions.....	73
Table 113 – MessageIDMatch() descriptions.....	73

Table 114 – DevId_Match() descriptions	73
Table 115 – PdTag_Match() descriptions	74
Table 116 – Set_Attribute_Data() descriptions	74
Table 117 – Set_DuplicatePdTagFlag() descriptions	74
Table 118 – Primitives issued by ALU to AAE	74
Table 119 – Primitives issued by AAE to ALU	75
Table 120 – Primitives parameters exchanged between AAE and ALU	75
Table 121 – Primitives issued by AAE to ESME	75
Table 122 – Primitives issued by ESME to AAE	75
Table 123 – Primitive parameters exchanged between AAE and ESME	76
Table 124 – AAE state descriptions	76
Table 125 – AAE state transitions (sender)	76
Table 126 – AAE state transitions (receiver)	77
Table 127 – ServiceType() descriptions	78
Table 128 – State value of event management.....	78
Table 129 – Event ASE state transition table	79
Table 130 – Domain state value.....	79
Table 131 – Domain ASE state transition table	80
Table 132 – Domain_DownloadSucceed() description.....	82
Table 133 – Domain_WriteBuffer() description	83
Table 134 – IncrementInvokeDomainCounter() description	83
Table 135 – DecreamentInvokeDomainCounter() description	83
Table 136 – State value of Block transmission	83
Table 137 – Block ASE state transition table.....	84
Table 138 – BlockTransmissionOpenSucceed() descriptions.....	85
Table 139 – BlockTransmissionCloseSucceed() descriptions	85
Table 140 – ReceiveBlockTransmissionHeartbeat_timeout() description	85
Table 141 – Primitives issued by FME(or AAE) to AREP	86
Table 142 – Primitives issued by AREP to FME(or AAE).....	86
Table 143 – Primitives parameters exchanged between AREP and FME(or AAE)	86
Table 144 – Primitives issued by AREP to ESME.....	86
Table 145 – Primitives issued by ESME to AREP	86
Table 146 – Primitive parameters exchanged between AREP and ESME	87
Table 147 – AREP state descriptions	87
Table 148 – AREP state transitions.....	87
Table 149 – AREPType() descriptions.....	88
Table 150 – ServiceType() descriptions	88
Table 151 – The primitives exchanged between transport layer and ESME	89
Table 152 – Primitives parameters exchanged between Transport Layer and ESME	89
Table 153 – ESME state description	89
Table 154 – ECFME state transitions	90
Table 155 – ServiceType()description	90

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 6-14: Application layer protocol specification –
Type 14 elements**

FOREWORD

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

International Standard IEC 61158-6-14 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 2010. This edition constitutes a technical revision. The main changes with respect to the previous edition are listed below:

- corrections of editorial errors;
- specification changes for CPF4;
- update of the requirements for all conformance classes;
- update of the requirements for all conformance services.

The text of this standard is based on the following documents:

FDIS	Report on voting
65C/764/FDIS	65C/774/RVD

Full information on the voting for the approval of this 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 parts of the IEC 61158 series, published 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 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.

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 6-14: Application layer protocol specification – Type 14 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 14 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 14 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

- a) define the wire-representation of the service primitives defined in IEC 61158-5-14, and
- b) define the externally visible behavior associated with their transfer.

This standard specifies the protocol of the Type 14 fieldbus application layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498) 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 61158-5-14.

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 the IEC 61158-6 series.

1.3 Conformance

This standard does not specify individual implementations or products, nor does it constrain the implementations of application layer entities within industrial automation systems. Conformance is achieved through implementation of this application layer protocol specification.

2 Normative references

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 All parts of the IEC 61158 series, as well as IEC 61784-1 and IEC 61784-2 are maintained simultaneously. Cross-references to these documents within the text therefore refer to the editions as dated in this list of normative references.

IEC 61158-3-14, *Industrial communication networks – Fieldbus specifications – Part 3-14: Data-link layer service definition – Type 14 elements*

IEC 61158-4-14, *Industrial communication networks – Fieldbus specifications – Part 4-14: Data-link layer protocol specification – Type 14 elements*

IEC 61158-5-14, *Industrial communication networks – Fieldbus specifications – Part 5-14: Application layer service definition – Type 14 elements*

IEC 61158-6 (all parts), *Industrial communication networks – Fieldbus specifications – Part 6: Application layer protocol specification*

ISO/IEC 646, *Information technology – ISO 7-bit coded character set for information interchange*

ISO/IEC 2375, *Information technology – Procedure for registration of escape sequences and coded character sets*

ISO/IEC 7498-1, *Information technology – Open Systems Interconnection – Basic Reference Model – Part 1: The Basic Model*

ISO/IEC 8802-3, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

ISO/IEC 8822, *Information technology – Open Systems Interconnection – Presentation service definition*

ISO/IEC 8824:1990, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*¹

ISO/IEC 9545, *Information technology – Open Systems Interconnection – Application Layer structure*

¹ Withdrawn.

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