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

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This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/15

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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 (Sicherungsschicht) - Typ 3-Elemente (IEC 61158-4-3:2014)

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• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-09-19

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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

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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 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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INTERNATIONAL STANDARD

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

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

IEC 61158-4-3:2014-08(en-fr)

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

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

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CONTENTS

FOREWORD 6
INTRODUCTION 8
1 Scope 9
1.1 General 9
1.2 Specifications 9
1.3 Procedures 9
1.4 Applicability 9
1.5 Conformance 10
2 Normative references 10
3 Terms, definitions, symbols and abbreviations 10
3.1 Reference model terms and definitions 10
3.2 Service convention terms and definitions 12
3.3 Common terms and definitions 13
3.4 Additional Type 3 definitions 15
3.5 Common symbols and abbreviations 17
3.6 Type 3 symbols and abbreviations 18
4 Common DL-protocol elements 22
4.1 Frame check sequence 22
5 Overview of the DL-protocol 25
5.1 General 25
5.2 Overview of the medium access control and transmission protocol 25
5.3 Transmission modes and DL-entity 26
5.4 Service assumed from the PhL 31
5.5 Operational elements 35
5.6 Cycle and system reaction times 50
6 General structure and encoding of DLPDUs, and related elements of procedure 53
6.1 DLPDU granularity 53
6.2 Length octet (LE, LEr) 54
6.3 Address octet 54
6.4 Control octet (FC) 57
6.5 DLPDU content error detection 61
6.6 DATA_UNIT 61
6.7 Error control procedures 62
7 DLPDU-specific structure, encoding and elements of procedure 63
7.1 DLPDUs of fixed length with no data field 63
7.2 DLPDUs of fixed length with data field 65
7.3 DLPDUs with variable data field length 67
7.4 Token DLPDU 68
7.5 ASP DLPDU 69
7.6 SYNCH DLPDU 69
7.7 Time Event (TE) DLPDU 69
7.8 Clock Value (CV) DLPDU 70
7.9 Transmission procedures 70
8 Other DLE elements of procedure 73
8.1 DL-entity initialization 73
8.2 States of the media access control of the DL-entity 74

8.3 Clock synchronization protocol 80
Annex A (normative) DL-Protocol state machines 85
A.1 Overall structure 85
A.2 Variation of state machines in different devices 86
A.3 DL Data Resource 87
A.4 FLC / DLM 91
A.4.1 Primitive definitions 91
A.4.2 State machine description 96
A.5 MAC 115
A.5.1 Primitive definitions 115
A.5.2 State machine description 115
A.6 SRU 141
A.6.1 Overview 141
A.6.2 Character send SM(CTX) 142
A.6.3 Character receive SM (CRX) 143
A.6.4 Timer-SM (TIM) 143
A.6.5 Primitive definition of SRC 144
A.6.6 State machine description 145
Annex B (informative) Type 3 (synchronous): exemplary FCS implementations 160
Annex C (informative) Type 3: Exemplary token procedure and message transfer periods 162
C.1 Procedure of token passing 162
C.2 Examples for token passing procedure 163
C.3 Examples for message transfer periods – asynchronous transmission 168
Bibliography 170

Figure 1 – Relationships of DLSAPs, DLSAP-addresses and group DL-addresses 14
Figure 2 – Logical token-passing ring 28
Figure 3 – PhL data service for asynchronous transmission 32
Figure 4 – Idle time T_{ID1} 37
Figure 5 – Idle time T_{ID2} (SDN, CS) 38
Figure 6 – Idle time T_{ID2} (MSRD) 38
Figure 7 – Slot time T_{SL1} 39
Figure 8 – Slot time T_{SL2} 39
Figure 9 – Slot time T_{SL1} 44
Figure 10 – Slot time T_{SL2} 44
Figure 11 – Token transfer period 50
Figure 12 – Message transfer period 51
Figure 13 – UART character 53
Figure 14 – Octet structure 54
Figure 15 – Length octet coding 54
Figure 16 – Address octet coding 55
Figure 17 – DAE/SAE octet in the DLPDU 56
Figure 18 – Address extension octet 56
Figure 19 – FC octet coding for send/request DLPDUs 58
Figure 20 – FC octet coding for acknowledgement or response DLPDUs 58

Figure 21 – FCS octet coding 61
Figure 22 – Data field 62
Figure 23 – Ident user data 62
Figure 24 – DLPDUs of fixed length with no data field 64
Figure 25 – DLPDUs of fixed length with no data field 65
Figure 26 – DLPDUs of fixed length with data field 66
Figure 27 – DLPDUs of fixed length with data field 66
Figure 28 – DLPDUs with variable data field length 67
Figure 29 – DLPDUs with variable data field length 68
Figure 30 – Token DLPDU 68
Figure 31 – Token DLPDU 69
Figure 32 – Send/request DLPDU of fixed length with no data 70
Figure 33 – Token DLPDU and send/request DLPDU of fixed length with data 71
Figure 34 – Send/request DLPDU with variable data field length 71
Figure 35 – Send/request DLPDU of fixed length with no data 72
Figure 36 – Token DLPDU and send/request DLPDU of fixed length with data 72
Figure 37 – Send/request DLPDU with variable data field length 73
Figure 38 – DL-state-diagram 75
Figure 39 – Overview of clock synchronization 81
Figure 40 – Time master state machine 82
Figure 41 – Time receiver state machine 83
Figure 42 – Clock synchronization 84
Figure A.1 – Structuring of the protocol machines 86
Figure A.2 – Structure of the SRU Machine 142
Figure B.1 – Example of FCS generation for Type 3 (synchronous) 160
Figure B.2 – Example of FCS syndrome checking on reception for Type 3 (synchronous) 160
Figure C.1 – Derivation of the token holding time (T_{TH}) 163
Figure C.2 – No usage of token holding time (T_{TH}) 164
Figure C.3 – Usage of token holding time (T_{TH}) for message transfer (equivalence between T_{TH} of each Master station) 165
Figure C.4 – Usage of token holding time (T_{TH}) in different working load situations 167

Table 1 – FCS length, polynomials and constants by Type 3 synchronous 23
Table 2 – Characteristic features of the fieldbus data-link protocol 25
Table 3 – Transmission function code 59
Table 4 – FCB, FCV in responder 60
Table 5 – Operating parameters 73
Table A.1 – Assignment of state machines 87
Table A.2 – Data resource 88
Table A.3 – Primitives issued by DL-User to FLC 91
Table A.4 – Primitives issued by FLC to DL-User 92
Table A.5 – Primitives issued by DL-User to DLM 94
Table A.6 – Primitives issued by DLM to DL-User 94

Table A.7 – Parameters used with primitives exchanged between DL-User and FLC 95
Table A.8 – Parameters used with primitives exchanged between DL-User and DLM 95
Table A.9 – FLC/DLM state table 96
Table A.10 – FLC / DLM function table 108
Table A.11 – Primitives issued by DLM to MAC 115
Table A.12 – Primitives issued by MAC to DLM 115
Table A.13 – Parameters used with primitives exchanged between DLM and MAC 115
Table A.14 – Local MAC variables 116
Table A.15 – MAC state table 117
Table A.16 – MAC function table 137
Table A.17 – Primitives issued by DLM to SRC 144
Table A.18 – Primitives issued by SRC to DLM 144
Table A.19 – Primitives issued by MAC to SRC 144
Table A.20 – Primitives issued by SRC to MAC 145
Table A.21 – Parameters used with primitives exchanged between MAC and SRC 145
Table A.22 – FC structure 145
Table A.23 – Local variables of SRC 146
Table A.24 – SRC state table 147
Table A.25 – SRC functions 159

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

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

FOREWORD

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

International Standard IEC 61158-4-3 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 changes with respect to the previous edition are listed below:

- Corrections in Table A.15 and Table A.16;
- Expired patent removed and added new patents.

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

FDIS	Report on voting
65C/762/FDIS	65C/772/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 the 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 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.

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

Publication	Title
EP 1253494	Control device with fieldbus

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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.

1.5 Conformance

This standard also specifies conformance requirements for systems implementing these procedures. This standard does not contain tests to demonstrate compliance with such requirements.

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 61131-3, *Programmable controllers – Part 3: Programming languages*

IEC 61158-2:2014, *Industrial communication networks – Fieldbus specifications – Part 2: Physical layer specification and service definition*

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

ISO/IEC 2022, *Information technology – Character code structure and extension techniques*

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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*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN