



BSI Standards Publication

Industrial communication networks - Fieldbus specifications

Part 3-19: Data-link layer service definition - Type 19 elements

National foreword

This British Standard is the UK implementation of EN IEC 61158-3-19:2019. It is identical to IEC 61158-3-19:2019. It supersedes BS EN 61158-3-19:2014, which will be withdrawn on 29 May 2022.

The UK participation in its preparation was entrusted to Technical Committee GEL/65/3, Industrial communications: process measurement and control, including fieldbus.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2019
Published by BSI Standards Limited 2019

ISBN 978 0 539 04849 0

ICS 35.100.20; 35.110; 25.040.40; 35.240.50

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2019.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

English Version

Industrial communication networks - Fieldbus specifications -
Part 3-19: Data-link layer service definition - Type 19 elements
(IEC 61158-3-19:2019)

Réseaux de communication industriels - Spécifications des
bus de terrain - Partie 3-19: Définition des services de la
couche liaison de données - Eléments de type 19
(IEC 61158-3-19:2019)

Industrielle Kommunikationsnetze - Feldbusse - Teil 3-19:
Dienstfestlegungen des Data Link Layer
(Sicherheitsschicht) - Typ 19-Elemente
(IEC 61158-3-19:2019)

This European Standard was approved by CENELEC on 2019-05-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

European foreword

The text of document 65C/945/FDIS, future edition 4 of IEC 61158-3-19, 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 61158-3-19:2019.

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 61158-3-19:2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61158-3-19:2019 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 61131 series	NOTE Harmonized as EN 61131 series
IEC 61158-1	NOTE Harmonized as EN 61158-1
IEC 61158-4-19	NOTE Harmonized as EN 61158-4-19
IEC 61158-5-19	NOTE Harmonized as EN 61158-5-19
IEC 61158-6-19	NOTE Harmonized as EN 61158-6-19
IEC 61784-1	NOTE Harmonized as EN 61784-1
IEC 61784-2	NOTE Harmonized as EN 61784-2
IEC 61800 series	NOTE Harmonized as EN 61800 series
IEC 61800-7 series	NOTE Harmonized as EN 61800-7 series

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.

<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	-	Information technology - Open Systems-Interconnection - Basic Reference Model - Conventions for the definition of OSI services		-

This page deliberately left blank

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
1.1 General.....	7
1.2 Specifications	7
1.3 Conformance	7
2 Normative references	8
3 Terms, definitions, symbols, abbreviations and conventions	8
3.1 Reference model terms and definitions	8
3.2 Service convention terms and definitions	10
3.3 Data-link service terms and definitions.....	10
3.4 Symbols and abbreviations	13
3.5 Common conventions.....	13
4 Data-link services and concepts	15
4.1 Overview.....	15
4.1.1 General	15
4.1.2 Acknowledged connection oriented data transfer: Read (RD).....	16
4.1.3 Acknowledged connection oriented data transfer: Read (WR).....	16
4.1.4 Acknowledged connection oriented data transfer: Initiate_cyclic_communication (ICC)	17
4.1.5 Acknowledged connection oriented data transfer: Disable_cyclic_communication (DCC).....	17
4.1.6 Unacknowledged connectionless data transfer: Write_cyclic (WRC)	17
4.1.7 Unacknowledged connectionless data transfer: Send_Device_Status (SDS)	17
4.1.8 Unacknowledged connectionless data transfer: Write_Device_Status (WDS)	17
4.2 Service channel services (SVC services)	17
4.2.1 General	17
4.2.2 Read (RD)	17
4.2.3 Write (WR).....	18
4.3 Hot-plug services	19
4.3.1 Enable_Hotplug (EHP).....	19
4.3.2 Notify_Hotplug (NHP)	20
4.4 Realtime channel setup services (RTCS services)	20
4.4.1 General	20
4.4.2 Initiate_cyclic_communication (ICC)	20
4.4.3 Disable_cyclic_communication (DCC).....	21
4.5 RTC services	22
4.5.1 General	22
4.5.2 Notify_Error (NER)	22
4.5.3 Write_cyclic (WRC).....	22
4.5.4 Send_Device_Status (SDS).....	23
4.5.5 Write_Device_Status (WDS)	24
4.5.6 Notify_Network_Status_Change (NNSC)	24
Bibliography.....	25

Figure 1 – Relationships of DLSAPs, DLSAP-addresses and group DL-addresses	15
Table 1 – Summary of DL services and primitives	16
Table 2 – Read (RD)	18
Table 3 – Write (WR)	19
Table 4 – Enable_Hotplug (EHP)	20
Table 5 – Notify_Hotplug (NHP)	20
Table 6 – Initiate_cyclic_communication (ICC)	21
Table 7 – Disable_cyclic_communication (DCC)	22
Table 8 – Notify_Error (NER)	22
Table 9 – Write_cyclic (WRC)	23
Table 10 – Send_Device_Status (SDS)	23
Table 11 – Write_Device_Status (WDS)	24
Table 12 – Notify_Network_Status_Change (NNSC)	24

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –****Part 3-19: Data-link layer service definition –
Type 19 elements**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

Attention is drawn to the fact that the use of the associated protocol type is restricted by its 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 layer protocol type to be used with other layer protocols of the same type, or in other type combinations explicitly authorized by its intellectual-property-right holders.

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

International Standard IEC 61158-3-19 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

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

- improving the hotplug and redundancy features;
- improving the phase switching and the error handling;
- editorial improvements.

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 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.

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