SLOVENSKI STANDARD
SIST EN IEC 61158-4-21:2019

01-november-2019

Nadomešča:
SIST EN 61158-4-21:2012

Industrijska komunikacijska omrežja - Specifikacije za procesna vodila - 4-21. del: Specifikacija protokola na ravni podatkovnih povezav - Elementi tipa 21 (IEC 61158 -4-21:2019)

Industrial communication networks - Fieldbus specifications - Part 4-21: Data-link layer protocol specification - Type 21 elements (IEC 61158-4-21:2019)

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-21: Protokollspezifikation des Data Link Layer (Sicherungsschicht) - Typ 21-Elemente (IEC 61158-4-21:2019)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 4-21: Spécification du protocole de la couche de liaison de données - Eléments de Type 21 (IEC 61158-4-21:2019)

Ta slovenski standard je istoveten z: **EN IEC 61158-4-21:2019**

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.100.20	Podatkovni povezovalni sloj	Data link layer
35.110	Omreževanje	Networking

SIST EN IEC 61158-4-21:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61158-4-21

June 2019

ICS 25.040.40; 35.100.20; 35.110

Supersedes EN 61158-4-21:2012

English Version

Industrial communication networks - Fieldbus specifications - Part 4-21: Data-link layer protocol specification - Type 21 elements (IEC 61158-4-21:2019)

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 4-21: Spécification du protocole de la couche de liaison de données - Eléments de Type 21 (IEC 61158-4-21:2019)

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-21: Protokollspezifikation des Data Link Layer (Sicherungsschicht) - Typ 21-Elemente (IEC 61158-4-21:2019)

This European Standard was approved by CENELEC on 2019-05-15. 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/946/FDIS, future edition 2 of IEC 61158-4-21, 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 61158-4-21:2019.

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) 2020-02-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-05-15

This document supersedes EN 61158-4-21:2012.

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 61158-4-21:2019 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 61158-1:2019	NOTE Harmonized as EN IEC 61158-1:2019 (not modified)
IEC 61158-2:2014	NOTE Harmonized as EN 61158-2:2014 (not modified)
IEC 61158-5-21:2019	NOTE Harmonized as EN IEC 61158-5-21:2019 (not modified)
IEC 61784-2:2019	NOTE Harmonized as EN IEC 61784-2:2019 (not modified)
IEC 61918:2018	NOTE Harmonized as EN IEC 61918:2018 (not modified)

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.

Publication	Year	Title	EN/HD	Year
IEC 61158-3-21	2019	Industrial communication networks - Fieldbus specifications - Part 3-21: Data-link layer service definition - Type 21 elements	EN IEC 61158-3-21	2019
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/IEC/IEEE 8802-2017 3		Standard for Ethernet	-	-

IEC 61158-4-21

Edition 2.0 2019-04

INTERNATIONAL STANDARD

Industrial communication networks – Fieldbus specifications – Part 4-21: Data-link layer protocol specification – Type 21 elements

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 25.040.40; 35.100.20; 35.110

ISBN 978-2-8322-6777-6

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 4-21: Data-link layer protocol specification – Type 21 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 61158-4-21 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

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

- added Frame control Value, DLM function and DLL constants;
- changed NCM_RETRY_RNMS to NCM_CHECK_NET_INTEGRITY_REQ;
- updated DLM state table;
- miscellaneous editorial corrections.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
65C/946/FDIS	65C/955/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.

INTRODUCTION

This document 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 document 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 document is concerned, in particular, with the communication and interworking of sensors, effectors and other automation devices. By using this document 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 the profile parts. Use of the various protocol types in other combinations may require permission of their respective intellectual-property-right holders.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning Type 21 elements and possibly other types given in Subclause 4.1, 4.2 and 7.3 as follows:

KR 0789444	[LS]	A communication packet processing apparatus and method for ring topology Ethernet network capable of preventing permanent packet looping
KR 0732510	[LS]	Network system
KR 0870670	[LS]	Method for determining a Ring Manager Node

IEC takes no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of these patent rights is registered with IEC. Information may be obtained from:

[LS]: LS Industrial Systems Co., Ltd.
LS Tower 1026-6
Hogye-dong, Dongan-gu,
Anyang-si, Gyeonggi-do 431-848
Republic of Korea

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

ISO (www.iso.org/patents) and IEC (http://www.iec.ch/tctools/patent_decl.htm) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.