

# SLOVENSKI STANDARD

## SIST EN 61158-4-11:2012

01-julij-2012

Nadomešča:

SIST EN 61158-4-11:2008

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**Industrijska komunikacijska omrežja - Specifikacije za procesna vodila - 4-11. del: Specifikacija protokola na nivoju podatkovnih povezav - Elementi tipa 11 (IEC 61158-4-11:2010)**

Industrial communication networks - Fieldbus specifications - Part 4-11: Data-link layer protocol specification - Type 11 elements (IEC 61158-4-11:2010)

**iTeh STANDARD PREVIEW**

Industrielle Kommunikationsnetze - Feldbusse - Teil 4-11: Protokollspezifikation des Data Link Layer (Sicherheitsschicht) - Typ 11- Elemente (IEC 61158-4-11:2010)

[SIST EN 61158-4-11:2012](#)

Réseaux de communication industriels - Spécifications de bus de terrain - Partie 4-11: Spécification du protocole de couche de liaison de données - Eléments de Type 11 (CEI 61158-4-11:2010)

**Ta slovenski standard je istoveten z: EN 61158-4-11:2012**

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**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 61158-4-11:2012**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 61158-4-11**

May 2012

ICS 25.040.40; 35.100.20; 35.110

Supersedes EN 61158-4-11:2008

English version

**Industrial communication networks -  
Fieldbus specifications -  
Part 4-11: Data-link layer protocol specification -  
Type 11 elements  
(IEC 61158-4-11:2010)**

Réseaux de communication industriels -  
Spécifications de bus de terrain -  
Partie 4-11: Spécification du protocole de  
couche de liaison de données -  
Éléments de Type 11  
(CEI 61158-4-11:2010)

Industrielle Kommunikationsnetze -  
Feldbusse -  
Teil 4-11: Protokollspezifikation des Data  
Link Layer (Sicherungsschicht) -  
Typ 11-Elemente  
(IEC 61158-4-11:2010)

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SIST EN 61158-4-11:2012

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 65C/605/FDIS, future edition 2 of IEC 61158-4-11, 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 61158-4-11:2012.

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) 2012-12-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-03-28

This document supersedes EN 61158-4-11:2008.

EN 61158-4-11:2012 includes the following significant technical changes with respect to EN 61158-4-11:2008:

- Introduction has been modified to add the patents related to the loop-architecture
- Addition of loop (ring) architecture
- More details:
  - Subclause 4.4 is extended to cover the loop-architecture as 4.4.3.
  - Subclause 4.6; structure has changed in order to include the loop-architecture, and the data types of variables have been added:
    - 4.6.1 Overview;
    - 4.6.1.2 Summary of variables of existing star-architecture;
    - 4.6.1.3 Summary of variables of additional loop-architecture;
    - 4.6.2 Type 11 common variables, parameters, counters, timers and queues;
    - 4.6.3 Star-architecture specific variables, parameters, counters, timers and queues;
    - 4.6.4 Loop-architecture specific variables, parameters, counters, timers and queues.
  - All variables, parameters, counters, timers and queues are rearranged in alphabetical order.
  - Subclause 5.4 is modified to cover the loop-architecture.
  - Clause 6 is modified to cover the loop-architecture.
  - Explanations of symbols referenced in each figure are modified to appear in the form of Key out of each figure object.
  - Clause 7 is changed in the structure for inclusion and extension of the loop architecture as follows:
    - DLE elements of procedure for existing star-architecture are maintained in 7.1 after restructuring with no change to the existing specification;
    - DLE elements of procedure for loop-architecture are added in 7.2;

- Serializer and deserializer is maintained in 7.3 after restructuring;
- DLL management protocol is in 7.4 after restructuring, and
- DLL management protocol for star-architecture is maintained in 7.4.1 without change,
- DLL management protocol for loop-architecture is added in 7.4.2.

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

### Endorsement notice

The text of the International Standard IEC 61158-4-11:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC/TR 61158-1:2010      NOTE Harmonized as CLC/TR 61158-1:2010 (not modified).

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## 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61158-3-11	2007	Industrial communication networks - Fieldbus specifications - Part 3-11: Data-link layer service definition - Type 11 elements	EN 61158-3-11	2008
IEC 61158-5-11	2007	Industrial communication networks - Fieldbus specifications - Part 5-11: Application layer service definition - Type 11 elements	EN 61158-5-11	2008
IEC 61158-6-11	2007	Industrial communication networks - Fieldbus specifications - Part 6-11: Application layer protocol specification - Type 11 elements	EN 61158-6-11	2008
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 8802-3	2000	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 10731	-	Information technology - Open Systems Interconnection - Basic reference model - Conventions for the definition of OSI services	-	-



IEC 61158-4-11

Edition 2.0 2010-08

# INTERNATIONAL STANDARD

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**Industrial communication networks – Fieldbus specifications –  
Part 4-11: Data-link layer protocol specification – Type 11 elements**

***STANDARD PREVIEW***  
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INTERNATIONAL  
ELECTROTECHNICAL  
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ICS 25.04.40; 35.100.20; 35.110

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**INDUSTRIAL COMMUNICATION NETWORKS –  
FIELDBUS SPECIFICATIONS –**
**Part 4-11: Data-link layer protocol specification –  
Type 11 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.
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International Standard IEC 61158-4-11 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 2007. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- Introduction has been modified to add the patents related to the loop-architecture
- Addition of loop (ring) -architecture
- More details:
  - Subclause 4.4 is extended to cover the loop-architecture as 4.4.3.
  - Subclause 4.6; structure has changed in order to include the loop-architecture, and the data types of variables have been added:

- 4.6.1 Overview;
- 4.6.1.2 Summary of variables of existing star-architecture;
- 4.6.1.3 Summary of variables of additional loop-architecture;
- 4.6.2 Type 11 common variables, parameters, counters, timers and queues;
- 4.6.3 Star-architecture specific variables, parameters, counters, timers and queues;
- 4.6.4 Loop-architecture specific variables, parameters, counters, timers and queues.
- All variables, parameters, counters, timers and queues are rearranged in alphabetical order.
- Subclause 5.4 is modified to cover the loop-architecture.
- Clause 6 is modified to cover the loop-architecture.
- Explanations of symbols referenced in each figure are modified to appear in the form of Key out of each figure object.
- Clause 7 is changed in the structure for inclusion and extension of the loop-architecture as follows:
  - DLE elements of procedure for existing star-architecture are maintained in 7.1 after restructuring with no change to the existing specification;
  - DLE elements of procedure for loop-architecture are added in 7.2;
  - Serializer and deserializer is maintained in 7.3 after restructuring;
  - DLL management protocol is in 7.4 after restructuring, and
  - DLL management protocol for star-architecture is maintained in 7.4.1 without change,
  - DLL management protocol for loop-architecture is added in 7.4.2.

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

<https://standards.iteh.ai/catalog/standards/sist/96db12a0-4e8b-458fb22c-a97d167a10/sist-en-61158-4-11-2012>

FDIS	Report on voting
65C/605/FDIS	65C/619/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 the 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.

NOTE The revision of this standard will be synchronized with the other parts of the IEC 61158 series.

## 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/TR 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 the profile parts. Use of the various protocol types in other combinations may require permission from 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 11 elements and possibly other types given in the subclause 4.2, 4.4, 4.5, 5.4, 6.2 to 6.10, 7.1 and 7.2 as follows:

- US 4,930,121 [TO] Network system using token-passing bus with multiple priority levels
- US 5,414,813 [TO] Direct transfer from a receive buffer to a host in a token-passing type network data transmission system
- US 6,711,131 [TO] Data transmitting apparatus, network interface apparatus, and data transmitting system
- PCT/JP2007/55292 [TO] Double ring network system, communication control method thereof, transmission station, and communication control program of double ring network system
- JP 3,461,954 [TO] Data transmission system

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ISO ([www.iso.org/patents](http://www.iso.org/patents)) and IEC ([http://www.iec.ch/tctools/patent\\_decl.htm](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.

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