SLOVENSKI STANDARD
SIST EN 61158-5-17:2008

01-julij-2008

Nadomešča:
SIST EN 61158-5:2004

Industrijska komunikacijska omrežja - Specifikacije za procesno vodilo - 5-17. del: Definicija opravil na aplikacijskem nivoju - Elementi tipa 17 (IEC 61158-5-17:2007)

Industrial communication networks - Fieldbus specifications - Part 5-17: Application layer service definition - Type 17 elements

Industrielle Kommunikationsnetze - Feldbusse - Teil 5-17: Dienstfestlegungen des Application Layer (Anwendungsschicht) - Typ 17-Elemente

Réseaux de communication industriels - Spécifications des bus de terrain - Partie 5-17: Définition des services des couches d'application - Eléments de type 17

Ta slovenski standard je istoveten z: EN 61158-5-17:2008

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.100.70	Uporabniški sloj	Application layer
35.110	Omreževanje	Networking

SIST EN 61158-5-17:2008   **en,de**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61158-5-17

March 2008

ICS 35.100.70; 25.040.40

Partially supersedes EN 61158-5:2004

English version

Industrial communication networks - Fieldbus specifications - Part 5-17: Application layer service definition - Type 17 elements
(IEC 61158-5-17:2007)

Réseaux de communication industriels -
Spécifications des bus de terrain -
Partie 5-17: Définition des services
des couches d'application -
Eléments de type 17
(CEI 61158-5-17:2007)

Industrielle Kommunikationsnetze -
Feldbusse -
Teil 5-17: Dienstfestlegungen
des Application Layer
(Anwendungsschicht) -
Typ 17-Elemente
(IEC 61158-5-17:2007)

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This European Standard was approved by CENELEC on 2008-02-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61158-5-17:2008 E

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Foreword

The text of document 65C/475/FDIS, future edition 1 of IEC 61158-5-17, 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 was approved by CENELEC as EN 61158-5-17 on 2008-02-01.

This and the other parts of the EN 61158-5 series supersede EN 61158-5:2004.

With respect to EN 61158-5:2004 the following changes were made:

– deletion of Type 6 fieldbus for lack of market relevance;

– addition of new fieldbus types;

– partition into multiple parts numbered 5-2, 5-3, …, 5-20.

The following dates were fixed:

– latest date by which the EN has to be implemented
  at national level by publication of an identical
  national standard or by endorsement   (dop)   2008-11-01

– latest date by which the national standards conflicting
  with the EN have to be withdrawn   (dow)   2011-02-01

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 EN 61784 series. Use of the various protocol types in other combinations may require permission from their respective intellectual-property-right holders.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61158-5-17:2007 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 61158-6-17   NOTE Harmonized as EN 61158-6-17:2008 (not modified).
>
> IEC 61784-1   NOTE Harmonized as EN 61784-1:2008 (not modified).
>
> IEC 61784-2   NOTE Harmonized as EN 61784-2:2008 (not modified).

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Annex ZA
(normative)

Normative references to international publications
with their corresponding European publications

The following referenced documents are indispensable for the application 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   When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC/TR 61158-1	2007	Industrial communication networks - Fieldbus specifications - Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series	-	-
ISO/IEC 7498	Series	Information technology - Open Systems Interconnection - Basic Reference Model	EN ISO/IEC 7498	Series
ISO/IEC 9545	-[1]	Information technology - Open Systems Interconnection - Application Layer structure	-	-
ISO/IEC 10731	-[1]	Information technology - Open Systems Interconnection - Basic reference model - Conventions for the definition of OSI services	-	-

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[1] Undated reference.

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IEC 61158-5-17

Edition 1.0   2007-12

INTERNATIONAL
STANDARD

Industrial communication networks – Fieldbus specifications –
Part 5-17: Application layer service definition – Type 17 elements

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE   **XA**

ICS 35.100.70; 25.040.40

ISBN 2-8318-9469-7

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INDUSTRIAL COMMUNICATION NETWORKS – FIELDBUS SPECIFICATIONS –

Part 5-17: Application layer service definition – Type 17 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 61158-5-17 has been prepared by subcommittee 65C: Digital communications, of IEC technical committee 65: Industrial-process measurement and control.

This first edition and its companion parts of the IEC 61158-5 subseries cancel and replace IEC 61158-5:2003. This edition of this part constitutes a technical addition. This part and its Type 17 companion parts also cancel and replace IEC/PAS 62405.

This edition of IEC 61158-5 includes the following significant changes from the previous edition:

a) deletion of the former Type 6 fieldbus for lack of market relevance;

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b) addition of new types of fieldbuses;

c) partition of part 5 of the third edition into multiple parts numbered -5-2, -5-3, …

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

FDIS	Report on voting
65C/475/FDIS	65C/486/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

The list of all the parts of the IEC 61158 series, under the general title *Industrial communication networks – Fieldbus specifications*, can be found on the IEC web site.

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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 application service is provided by the application protocol making use of the services available from the data-link or other immediately lower layer. This standard defines the application service characteristics that fieldbus applications and/or system management may exploit.

Throughout the set of fieldbus standards, the term "service" refers to the abstract capability provided by one layer of the OSI Basic Reference Model to the layer immediately above. Thus, the application layer service defined in this standard is a conceptual architectural service, independent of administrative and implementation divisions.

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INDUSTRIAL COMMUNICATION NETWORKS –
FIELDBUS SPECIFICATIONS –

Part 5-17: Application layer service definition – Type 17 elements

1 Scope

1.1 Overview

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 17 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 defines in an abstract way the externally visible service provided by the different Types of the fieldbus Application Layer in terms of

a) an abstract model for defining application resources (objects) capable of being manipulated by users via the use of the FAL service,

b) the primitive actions and events of the service;

c) the parameters associated with each primitive action and event, and the form which they take; and

d) the interrelationship between these actions and events, and their valid sequences.

The purpose of this standard is to define the services provided to

1) the FAL user at the boundary between the user and the Application Layer of the Fieldbus Reference Model, and

2) Systems Management at the boundary between the Application Layer and Systems Management of the Fieldbus Reference Model.

This standard specifies the structure and services of the IEC fieldbus Application Layer, in conformance with the OSI Basic Reference Model (ISO/IEC 7498) and the OSI Application Layer Structure (ISO/IEC 9545).

FAL services and protocols are provided by FAL application-entities (AE) contained within the application processes. The FAL AE is composed of a set of object-oriented Application Service Elements (ASEs) and a Layer Management Entity (LME) that manages the AE. The ASEs provide communication services that operate on a set of related application process object (APO) classes. One of the FAL ASEs is a management ASE that provides a common set of services for the management of the instances of FAL classes.

Although these services specify, from the perspective of applications, how request and responses are issued and delivered, they do not include a specification of what the requesting and responding applications are to do with them. That is, the behavioral aspects of the applications are not specified; only a definition of what requests and responses they can send/receive is specified. This permits greater flexibility to the FAL users in standardizing such object behavior. In addition to these services, some supporting services are also defined in this standard to provide access to the FAL to control certain aspects of its operation.

1.2   Specifications

The principal objective of this standard is to specify the characteristics of conceptual application layer services suitable for time-critical communications, and thus supplement the OSI Basic Reference Model in guiding the development of application layer protocols for time-critical communications.

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 services standardized as the various types of IEC 61158.

This specification may be used as the basis for formal Application Programming-Interfaces. Nevertheless, it is not a formal programming interface, and any such interface will need to address implementation issues not covered by this specification, including

a) the sizes and octet ordering of various multi-octet service parameters, and

b) the correlation of paired request and confirm, or indication and response, primitives.

1.3 Conformance

This standard does not specify individual implementations or products, nor do they constrain the implementations of application layer entities within industrial automation systems.

There is no conformance of equipment to this application layer service definition standard. Instead, conformance is achieved through implementation of conforming application layer protocols that fulfill the Type 17 application layer services as defined in this standard.

2   Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For all other undated references, the latest edition of the referenced document (including any amendments) applies.

IEC/TR 61158-1 (Ed.2.0), *Industrial communication networks – Fieldbus specifications – Part 1: Overview and guidance for the IEC 61158 and IEC 61784 series*

ISO/IEC 7498 (all parts), *Information technology – Open Systems Interconnection – Basic Reference Model*

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*

3   Definitions

For the purposes of this document, the following terms and definitions apply.

3.1   Terms and definitions

3.1.1   ISO/IEC 7498-1 terms

For the purposes of this document, the following terms as defined in ISO/IEC 7498-1 apply:

a) application entity

b) application protocol data unit

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c) application service element

3.1.2   ISO/IEC 10731 terms

a) (N)-connection

b) (N)-entity

c) (N)-layer

d) (N)-service

e) (N)-service-access-point

3.1.3   Other terms and definitions

3.1.3.1
application
function or data structure for which data is consumed or produced

3.1.3.2
application process
part of a distributed application on a network, which is located on one device and unambiguously addressed

3.1.3.3
application relationship
cooperative association between two or more application-entity-invocations for the purpose of exchange of information and coordination of their joint operation

NOTE   This relationship is activated either by the exchange of application-protocol-data-units or as a result of preconfiguration activities

3.1.3.4
application relationship endpoint
context and behavior of an application relationship as seen and maintained by one of the application processes involved in the application relationship

NOTE   Each application process involved in the application relationship maintains its own application relationship endpoint.

3.1.3.5
attribute
description of an externally visible characteristic or feature of an object

NOTE   The attributes of an object contain information about variable portions of an object. Typically, they provide status information or govern the operation of an object. Attributes may also affect the behaviour of an object. Attributes are divided into class attributes and instance attributes.

3.1.3.6
behaviour
indication of how an object responds to particular eventss

3.1.3.7
bridge
intermediate equipment that connects two or more segments using a data-link layer relay function

3.1.3.8
channel
single physical or logical link of an input or output application object of a server to the process

3.1.3.9
class
a set of objects, all of which represent the same kind of system component