SVENSK STANDARD SS-EN 61375-2-5

| Fastställd | Utgåva | Sida | Ansvarig kommitté |
|---|---|---|---|
| 2015-04-15 | 1 | 1 (1+125) | SEK TK 9 |




# Elektronisk utrustning för järnvägar – Kommunikationsnätverk för tåg (TCN) – Del 2-5: Stamnät för Ethernet i tåg

*Electronic railway equipment –*
*Train communication network (TCN) –*
*Part 2-5: Ethernet train backbone*

Som svensk standard gäller europastandarden EN 61375-2-5:2015. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61375-2-5:2015.

**Nationellt förord**

Europastandarden EN 61375-2-5:2015

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61375-2-5, First edition, 2014 - Electronic railway equipment - Train communication network (TCN) - Part 2-5: Ethernet train backbone**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 45.060.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 61375-2-5

February 2015

ICS 45.060

English Version

# Electronic railway equipment - Train communication network (TCN) - Part 2-5: Ethernet train backbone (IEC 61375-2-5:2014)

Matériel électronique ferroviaire - Réseau embarqué de train (TCN) - Partie 2-5: Réseau central de train Ethernet (IEC 61375-2-5:2014)

Elektronische Betriebsmittel für Bahnen - Zug-Kommunikations-Netzwerk - Teil 2-5: ETB - Ethernet Train Backbone (IEC 61375-2-5:2014)

This European Standard was approved by CENELEC on 2014-09-29. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, 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: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 61375-2-5:2015 E

SEK Svensk Elstandard

## Foreword

The text of document 9/1933/FDIS, future edition 1 of IEC 61375-2-5, prepared by IEC/TC 9 "Electrical equipment and systems for railways" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61375-2-5:2015.

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) | 2015-08-27 |
| • latest date by which the national standards conflicting with the document have to be withdrawn | (dow) | 2017-09-29 |

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 61375-2-5:2014 was approved by CENELEC as a European Standard without any modification.

| | | |
|---|---|---|
| IEC 61375-2-1:2012 | NOTE | Harmonized as EN 61375-2-1:2012. |
| IEC 61784-2 | NOTE | Harmonized as EN 61784-2. |
| IEC 61918 | NOTE | Harmonized as EN 61918. |

## 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 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 61076-2-101 | 2012 | Connectors for electronic equipment - Product requirements -- Part 2-101: Circular connectors - Detail specification for M12 connectors with screw-locking | EN 61076-2-101 | 2012 |
| IEC 61156 | series | Multicore and symmetrical pair/quad cables for digital communications | - | series |
| IEC 61156-1 | 2007 | Multicore and symmetrical pair/quad cables for digital communications - Part 1: Generic specification | - | - |
| IEC 61156-5 | - | Multicore and symmetrical pair/quad cables for digital communications - Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz - Horizontal floor wiring - Sectional specification | - | - |
| IEC 61375-1 | 2012 | Electronic railway equipment - Train communication network (TCN) -- Part 1: General architecture | EN 61375-1 | 2012 |
| IEC 61375-2-3 | - | Electronic railway equipment - Train Communication Network (TCN) - Part 2-3: TCN communication profile | FprEN 61375-2-3 | - |
| IEC 61375-3-4 | - | Electronic railway equipment - Train Bus - Part 3-4: ECN - Ethernet Consist Network | EN 61375-3-4 | - |
| IEC 62236-3-2 | - | Railway applications - Electromagnetic compatibility -- Part 3-2: Rolling stock - Apparatus | - | - |
| ISO/IEC 7498 | series | Information processing systems - Open systems interconnection - Basic reference model | - | series |
| ISO/IEC 8824 | series | Information technology - Abstract Syntax Notation One (ASN.1) | - | series |
| ISO/IEC 9646 | series | Information technology - Open Systems Interconnection | EN ISO/IEC 9646 | series |
| ISO/IEC 11801 | 2002 | Information technology - Generic cabling for customer premises | - | - |
| IEEE 802.1AB | - | IEEE Standard for Local and Metropolitan Area Networks - Station and Media Access Control Connectivity Discovery | - | - |
| IEEE 802.1AX | 2008 | IEEE Standard for Local and metropolitan area networks - Link Aggregation | - | - |

| | | | | |
|---|---|---|---|---|
| IEEE 802.1D | 2012 | IEEE Standard for local and metropolitan area networks - Media Access Control (MAC) Bridges | - | - |
| IEEE 802.1Q | - | IEEE Standard for Local and metropolitan area networks - Media Access Control (MAC) Bridges and Virtual Bridges | - | - |
| IEEE 802.2 | - | IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 2: Logical Link Control | - | - |
| IEEE 802.3 | 2012 | IEEE Standard for Ethernet | - | - |

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

## Part 2-5: Ethernet train backbone

## 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 61375-2-5 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

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

| FDIS | Report on voting |
|---|---|
| 9/1933/FDIS | 9/1961/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 in the IEC 61375 series, published under the general title *Electronic railway equipment – Train communication network (TCN)*, can be found on the IEC website.

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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

# INTRODUCTION

IEC 61375-2-5 defines the Ethernet Train Backbone so as to achieve interoperability between Consists of different types when coupled in the same train composition.

The standard follows the ISO-OSI model and specifies the whole protocols stack from the physical layer up to the application layer.

A Protocol Implementation Conformance Statement (PICS) pro-forma allows suppliers to state their conformity to this standard. The PICS pro-forma specification and the related conformity test are not in the scope of this standard.

# ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

# Part 2-5: Ethernet train backbone

## 1 Scope

This part of IEC 61375 defines Ethernet Train Backbone (ETB) requirements to fulfil open train data communication system based on Ethernet technology.

Respect of this standard ensures interoperability between local Consist subnets whatever Consist network technology (see IEC 61375-1 for more details).

All Consist network definitions should take into account this standard to preserve interoperability.

This standard may be additionally applicable to closed trains and multiple-unit trains when so agreed between purchaser and supplier.

## 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.

IEC 61076-2-101:2012, *Connectors for electronic equipment – Product requirements – Part 2-101: Circular connectors – Detail specification for M12 connectors with screw-locking*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61156-1:2007, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-5, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Horizontal floor wiring – Sectional specification*

IEC 61375-1:2012, *Electronic railway equipment – Train communication network (TCN) – Part 1: General architecture*

IEC 61375-2-3, *Electronic railway equipment – Train communication network (TCN) – Part 2-3: TCN communication profile* (to be published)

IEC 61375-3-4, *Electronic railway equipment – Train communication network (TCN) – Part 3-4: Ethernet Consist Network (ECN)*

IEC 62236-3-2, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

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

ISO/IEC 8824 (all parts), *Information technology – Abstract Syntax Notation One (ASN.1)*

ISO/IEC 9646 (all parts), *Information technology – Open Systems Interconnection – Conformance testing methodology and framework*

ISO/IEC 11801:2002, *Information technology – Generic cabling for customer premises*

IEEE 802.1AB, *IEEE Standard for Local and metropolitan area networks – Station and Media Access Control Connectivity Discovery*

IEEE 802.1AX:2008, *IEEE Standard for Local and metropolitan area networks – Link Aggregation*

IEEE 802.1D:2012, *IEEE Standard for Local and metropolitan area networks – Media Access Control (MAC) Bridges*

IEEE 802.1Q, *IEEE Standard for Local and metropolitan area networks – Virtual Bridged Local Area Networks*

IEEE 802.2, *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 2: Logical Link Control*

IEEE 802.3:2012, *IEEE Standard for 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*