

STN	Elektronické železničné zariadenia Vlaková komunikačná sieť (TCN) Časť 2-6: Komunikácia medzi palubnými a pozemnými systémami	STN EN IEC 61375-2-6 34 2675
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Electronic railway equipment - Train communication network (TCN) - Part 2-6: On-board to ground communication

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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**Electronic railway equipment - Train communication network
(TCN) - Part 2-6: On-board to ground communication
(IEC 61375-2-6:2018)**

Matériel électronique ferroviaire - Réseau embarqué de
train (TCN) - Partie 2-6: Communication train-sol
(IEC 61375-2-6:2018)

Elektronische Betriebsmittel für Bahnen - Zug-
Kommunikations-Netzwerk (TCN) - Teil 2-6: Kommunikation
vom Zug zur Landseite
(IEC 61375-2-6:2018)

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EN IEC 61375-2-6:2018 (E)**European foreword**

The text of document 9/2374/FDIS, future edition 1 of IEC 61375-2-6, 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 IEC 61375-2-6:2018.

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) 2019-05-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-11-16

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For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 61375-2-6:2018 was approved by CENELEC as a European Standard without any modification.

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>
IEC 61375-1	2012	Electronic railway equipment - Train communication network (TCN) - Part 1: General architecture	EN 61375-1	2012
IEC 61375-2-3	2015	Electronic railway equipment - Train communication network (TCN) - Part 2-3: TCN communication profile	EN 61375-2-3	2015
-	-		+ A11	2017
IEC 61375-3-4	-	Electronic railway equipment - Train communication network (TCN) - Part 3-4: Ethernet Consist Network (ECN)	EN 61375-3-4	2014
			+A11	2017
IEC 62280	2014*	Railway applications - Communication, signalling and processing systems - Safety related communication in transmission systems	-	-
IEC 62443	series	Industrial communication networks - Network and system security - Part 2-1: Establishing an industrial automation and control system security program	EN 62443	series
IEC 62443-3-3	2013*	Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels	-	-
IEC 62580-1	-	Electronic railway equipment - On-board multimedia and telematic subsystems for railways - Part 1: General architecture	EN 62580-1	2016
			+A11	2017

* Dated as no equivalent European Standard exists

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ISO/IEC 20922	2016	Information technology - Message Queuing Telemetry Transport (MQTT) v3.1.1	-	-
IEEE 802.3	2015*	IEEE Standard for Information technology - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications	-	-
IEEE 802.11	2016	IEEE Standard for Information technology - Telecommunications and information exchange between systems Local and metropolitan area networks - Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	-	-
IEEE 802.1X	2010	IEEE Standard for Local and metropolitan area networks - Port-Based Network Access Control	-	-
RFC 2136	1997*	Dynamic Updates in the Domain Name System (DNS UPDATE)	-	-
RFC 2616	1999*	Hypertext Transfer Protocol -- HTTP/1.1	-	-
RFC 2818	2000*	HTTP Over TLS	-	-
RFC 3986	2005*	Uniform Resource Identifier (URI): Generic Syntax	-	-
RFC 4627	2006*	The application/json Media Type for JavaScript Object Notation (JSON)	-	-
RFC 7159	2014*	The JavaScript Object Notation (JSON) Data Interchange Format	-	-

* Dated as no equivalent European Standard exists

Annex ZZ (informative)

Relationship between this European standard and the essential requirements of EU Directive 2016/797/EU [2016 OJ L138] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Interoperability of the rail system within the European Union, M/483, to provide one voluntary means of conforming to essential requirements of Directive 2016/797/EU of the European Parliament and of the Council of 11 May 2016 on the harmonization of the laws of the Member States relating to the interoperability of the rail system within the European Union [2016 OJ L138/44].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 for "Locomotives and Passenger Rolling Stock", Table ZZ.2 for "Energy", Table ZZ.3 for "Telematics Applications for Passenger Services", confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZ.1 - Correspondence between this European Standard, the TSI "Locomotives and Passenger Rolling Stock" (REGULATION (EU) No 1302/2014 of 18 November 2014) and Directive 2016/797/EU [2016 OJ L138]

Essential Requirements of Directive 2016/797/EU	Chapter / § / points / of LOC & PAS TSI	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1.5 Technical compatibility 2. Requirements specific to each subsystem 2.4. Rolling Stock 2.4.2. Reliability and availability 2.4.3. Technical compatibility	4.2.8.2.8 On-board energy measurement system 4.2.12.2 General documentation: - description of computerised on board systems Appendix D - On-board energy measurement system	Clause 4 Clause 5 Clause 6 Annex A Annex B	The TSI does not impose any technical solution regarding physical interfaces between units. This standard offers a general multi-purpose solution for the digital communication between on-board networked applications and ground applications, so it is relevant to equipment and train interoperability. This standard closes an Open Point in the TSI

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Table ZZ.2 - Correspondence between this European Standard, the TSI “Energy” (REGULATION (EU) No 1301/2014 of 18 November 2014) and Directive 2016/797/EU [2016 OJ L138]

Essential Requirements of Directive 2016/797/EU	Chapter / § / points / of ENE TSI	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1.5 Technical compatibility	4.2.17. On-ground energy data collecting system	Clause 4 Clause 5 Clause 7 Annex A Annex B	This standard closes an Open Point in the TSI

Table ZZ.3 - Correspondence between this European Standard, the TSI “Telematics Applications for Passenger Services” (published in the Official Journal L 123 on 12 May 2011, p. 11) and Directive 2016/797/EU [2016 OJ L138]

Essential Requirements of Directive 2016/797/EU	Chapter / § / points / of ENE TSI	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1.2 Reliability and availability 2. Requirements specific to each subsystem 2.7. Telematics applications for freight and passengers 2.7.1. Technical compatibility 2.7.2. Reliability and availability	4.2.21. Networking and communication 4.2.21.1. General architecture	Clause 4 Clause 5 Clause 6 Clause 7 Annex A	The solution specified in this standard can be part of the general Information Exchange Architecture

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.



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**Matériel électronique ferroviaire – Réseau embarqué de train (TCN) –
Partie 2-6: Communication train-sol**





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**ELECTRONIC RAILWAY EQUIPMENT –
TRAIN COMMUNICATION NETWORK (TCN) –****Part 2-6: On-board to ground communication**

FOREWORD

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International Standard IEC 61375-2-6 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

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

FDIS	Report on voting
9/2374/FDIS	9/2402/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 document 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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document 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

Considering that the TCN series includes IEC 61375-2-3: *Electronic railway equipment – Train communication network (TCN) – Part 2-3: TCN communication profile*, references to this document are given when the case applies.

This document follows the ISO-OSI model.

This document does not cover the specification of the radio technologies and protocols relevant to the wireless communication between train and ground.

In the preparation of this document, the following main use cases, which the train to ground communication applies to, were considered:

- a) Commissioning application
 - 1) Operational Application.
 - 2) Mission data application.
 - 3) Driver Assistance Application.
 - 4) Energy Meter Application.
- b) Maintenance application
 - 1) Configuration data application.
 - 2) Monitoring train status (e.g. telemetry).
 - 3) Diagnostic data application.
 - 4) Event Recorder Application.
- c) Multimedia application
 - 1) Passenger information application.
 - 2) Passenger entertainment application.
 - 3) Electronic ticketing application.
 - 4) CCTV and video-surveillance.

ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

Part 2-6: On-board to ground communication

1 Scope

This part of IEC 61375 establishes the specification for the communication between the on-board subsystems and the ground subsystems.

The communication system, interfaces and protocols are specified as a mobile communication function, using any available wireless technology.

This document provides requirements in order to:

- a) select the wireless network on the basis of QoS parameters requested by the application;
- b) allow TCMS and/or OMTS applications, installed on-board and communicating on the on-board communication network, to have a remote access to applications running on ground installations;
- c) allow applications running on ground installations to have a remote access to the TCMS and/or OMTS applications installed on-board.

This document specifies further requirements which allow the applications running on-board and the applications running on ground to connect each other applying the virtual/functional addressing mechanism specified by IEC 61375-2-3 and exchanging application data sets produced or consumed by the on-board functions implemented in the devices attached to the TCN network.

Furthermore, this document covers the security requirements in order to grant the access only to authenticated and authorised applications and to allow encryption of exchanged data.

The communication of safety related data between on-board applications and ground applications are out of the scope of this International Standard as well as Internet connectivity service for passengers.

2 Normative references

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.

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

IEC 61375-2-3:2015, *Electronic railway equipment – Train communication network (TCN) – Part 2-3: TCN communication profile*

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

IEC 62280, *Railway applications – Communication, signalling and processing systems – Safety related communication in transmission systems*

IEC 62443 (all parts), *Industrial communication networks – Network and system security*

IEC 62443-3-3, *Industrial communication networks – Network and system security – Part 3-3: System security requirements and security levels*

IEC 62580-1, *Electronic railway equipment – On-board multimedia and telematic subsystems for railways – Part 1: General architecture*

ISO/IEC 20922:2016, *Information technology – Message Queuing Telemetry Transport (MQTT) v3.1.1*

IEEE 802.3, *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*

IEEE 802.11:2016, *IEEE Standard for Information technology – Telecommunications and information exchange between systems Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*

IEEE 802.1X:2010, *IEEE Standard for Local and metropolitan area networks – Port-Based Network Access Control*

RFC 2136, *Dynamic Updates in the Domain Name System (DNS UPDATE)*

RFC 2616, *Hypertext Transfer Protocol – HTTP/1.1*

RFC 2818, *HTTP Over TLS*

RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*

RFC 4627, *The application/json Media Type for JavaScript Object Notation (JSON)*

RFC 7159, *The JavaScript Object Notation (JSON) Data Interchange Format*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN