



NSAI
Standards

Irish Standard
I.S. EN 61375-2-2:2012

Electronic railway equipment - Train communication network (TCN) -- Part 2-2: Wire Train Bus conformance testing (IEC 61375-2-2:2012 (EQV))

I.S. EN 61375-2-2:2012

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<i>This document replaces:</i>	<i>This document is based on:</i> EN 61375-2-2:2012	<i>Published:</i> 3 August, 2012
This document was published under the authority of the NSAI and comes into effect on: 10 August, 2012		ICS number: 45.060
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61375-2-2

August 2012

ICS 45.060

English version

**Electronic railway equipment -
Train communication network (TCN) -
Part 2-2: Wire Train Bus conformance testing
(IEC 61375-2-2:2012)**

Matériel électronique ferroviaire -
Réseau embarqué de train (TCN) -
Partie 2-2: Bus de Train Filaire -
Essais de conformité
(CEI 61375-2-2:2012)

Elektronische Betriebsmittel für Bahnen -
Zug-Kommunikations-Netzwerk (TCN) -
Teil 2-2: Wire Train Bus
Konformitätsprüfung
(IEC 61375-2-2:2012)

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

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I.S. EN 61375-2-2:2012

EN 61375-2-2:2012

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Foreword

The text of document 9/1643/FDIS, future edition 1 of IEC 61375-2-2, 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 61375-2-2:2012.

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) 2013-04-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-07-26

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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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 61375-2-2:2012 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 61375-1 NOTE Harmonized as EN 61375-1.

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 60571	-	Electronic equipment used on rail vehicles	-	-
IEC 60807	Series	Rectangular connectors for frequencies below 3 MHz	-	-
IEC 61375-2-1	-	Electronic railway equipment - Train communication network (TCN) - Part 2-1: Wire Train Bus (WTB)	EN 61375-2-1	-
ISO/IEC 7498	Series	Information technology - Open Systems Interconnection - Basic Reference Model	-	-
ISO/IEC 9646-1	1994	Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts	-	-
ISO/IEC 9646-7	1995	Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements	-	-
UIC CODE 556	-	Information transmission in the train (train-bus)	-	-

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex III of the EU Directive 2008/57/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-2: Wire Train Bus conformance testing

FOREWORD

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

This first edition cancels the clauses of IEC 61375-2, first edition, published in 2007, relevant to the specification of WTB conformance testing and constitutes a technical revision.

It was prepared taking into account IEC 61375-2-1, first edition.

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

FDIS	Report on voting
9/1643/FDIS	9/1667/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 of IEC 61375 series, 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

TCN is an International Standard with the aim of defining interfaces so as to achieve plug-in compatibility:

- a) between equipment located in different consists, and
- b) between equipment and devices located within the same consist.

One of the key success factors for the deployment of any technology is the standardisation and ensuring interoperability among various implementations. To facilitate interoperability a conformance test should be implemented.

In this part of IEC 61375, the TCN hierarchical structure deals with the train bus called the Wire Train Bus (WTB).

No other busses are taken into consideration even though they are foreseen by IEC 61375.

WTB has real-time protocols, which offer two communication services:

- c) process variables, a distributed, real-time database, periodically refreshed through broadcasting;
- d) messages, transmitted on demand either as:
 - 0. unicast messages (point-to-point) or/and
 - 1. multicast messages.

WTB has a network management, which allows debugging, commissioning and maintenance over the network.

This standard is structured into 8 clauses and 2 annexes.

The clauses and annexes are listed and briefly described in Table 1.

Table 1 – Document structure

Clause	Description
1 Scope	This clause describes the scope of this standard..
2 Normative references	This clause lists the normative references.
3 Terms and definitions, abbreviations, conventions	This clause introduces basic terms and abbreviations not reported in IEC 61375-2-1.
4 Conformance test: approach, requirements and boundaries	<p>This clause is an overview of the methods of TCN implementation verification that are available to the developer and regulatory personnel.</p> <p>Supplies information concerning the ICS and IXITpPro-forma(s).</p>
5 Conformance test of a WTB node, WTB trunk cable, WTB jumper cables, WTB extension cables	<p>Contents: All tests on WTB are classified by nodes related to WTB itself and MVB only. The main contents are:</p> <p>the WTB PICS and PIXIT;</p> <p>the WTB test suites;</p> <p>the WTB test procedures.</p>
6 Conformance test of RTP	This clause lists the tests covered in Clauses 3 and 4 fulfilling the real time protocol.
7 Conformance test of a WTB-equipped consist	This clause covers the Physical Layer while the Services given by the WTB node are covered by the previous clauses. Application profiles are covered by other bodies, like communication profile as described in UIC CODE 556.
8 Conformance test of NM	Partially covered by Clauses 3 and 4. Remaining parts are not covered.
Annex A – Test laboratory and client role	This annex is normative.
Annex B – Test suites standard instrumentation	This annex is informative.

ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

Part 2-2: Wire Train Bus conformance testing

1 Scope

This part of IEC 61375 applies to all equipment and devices implemented according to IEC 61375-2-1, i.e. it covers the procedures to be applied to such equipment and devices when the conformance should be proven.

The applicability of this standard to a TCN implementation allows for individual conformance checking of the implementation itself and is a pre-requisite for further interoperability checking between different TCN implementations.

NOTE For a definition of TCN implementation see IEC 61375-2-1, 1.3.

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 60571: *Electronic equipment used on rail vehicles*

IEC 60807(all parts), *Rectangular connectors for frequencies below 3 MHz*

IEC 61375-2-1: *Electronic railway equipment – Train Communication Network (TCN) – Part 2-1: Wire Train Bus (WTB)*

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

ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts* (Also available as ITU-T Recommendation X.290 (1995))

ISO/IEC 9646-7:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements* (Also available as ITU-T Recommendation X.296 (1995))

UIC CODE 556, *Information transmission in the train (train-bus)*

3 Terms and definitions, abbreviations, conventions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 9646-1 and IEC 61375-2-1 apply.

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