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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

Part 2-8: TCN conformance test

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 61375-2-8 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
9/2746/FDIS	9/2758/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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 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 document 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 vehicles or consist, and

b) between equipment and devices located within the same vehicle or consist.

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

In this part of IEC 61375, the conformance testing of the ECN and ETB defined in IEC 61375-2-3:2015, IEC 61375-2-5:2014 and IEC 61375-3-4:2014 is specified.

ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

Part 2-8: TCN conformance test

1 Scope

This part of IEC 61375 applies to all equipment and devices implemented according to IEC 61375-2-3:2015, IEC 61375-2-5:2014 and IEC 61375-3-4:2014, i.e. it covers the procedures to be applied to such equipment and devices when the conformance should be proven.

The applicability of this document 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.

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 60571:2012, *Railway applications – Electronic equipment used on rolling stock*

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

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 61076-3-104, *Connectors for electrical and electronic equipment – Product requirements – Part 3-104: Detail specification for 8-way, shielded free and fixed connectors for data transmissions with frequencies up to 2 000 MHz*

IEC 61156-6, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Work area wiring – Sectional specification*

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

IEC 61375-2-1:2012, *Electronic railway equipment – Train communication network (TCN) – Part 2-1: Wire Train Bus (WTB)*

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

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

IEC 61375-3-4:2014, *Electronic railway equipment – Train Communication Network (TCN) – Part 3-4: Ethernet Consist Network (ECN)*

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

ISO/IEC 11801 (all parts), *Information technology – Generic cabling for customer premises*

IEEE 802.1AB: 2009*, Station and Media Access Control Connectivity Discovery*

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

IEEE 802.1Qaz:2011*, IEEE Standard for Local and metropolitan area networks – Enhanced Transmission Selection*

IEEE 802.1D:1990, *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*, Logical Link Control*

IEEE 802.3:2012, *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 802.3az*, Energy Efficient Ethernet*

IETF RFC 768, *User Datagram Protocol*

IETF RFC 791*, INTERNET PROTOCOL*

IETF RFC 792, *INTERNET CONTROL MESSAGE PROTOCOL*

IETF RFC 793, *TRANSMISSION CONTROL PROTOCOL*

IETF RFC 826, *An Ethernet Address Resolution Protocol*

IETF RFC 1034, *DOMAIN NAMES – CONCEPTS AND FACILITIES*

IETF RFC 1035, *DOMAIN NAMES – IMPLEMENTATION AND SPECIFICATION*

IETF RFC 1213*, Management Information Base for Network Management of TCP/IP-based internets: MIB-II*

IETF RFC 1305, *Network Time Protocol (Version 3) Specification,* Implementation and Analysis

IETF RFC 1361, *Simple Network Time Protocol (SNTP)*

IETF RFC 1901, *Introduction to Community-based SNMPv2*

IETF RFC 1905, *Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)*

IETF RFC 1906, *Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)*

IETF RFC 1918*, Address Allocation for Private Internets*

IETF RFC 2131, *Dynamic Host Configuration Protocol*

IETF RFC 2236*, Internet Group Management Protocol, Version 2*

IETF RFC 2365, *Administratively Scoped IP Multicast*

IETF RFC 2474, *Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers*

IETF RFC 2544, *Benchmarking Methodology for Network Interconnect Devices*

IETF RFC 3203, *DHCP reconfigure extension*

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

IETF RFC 4122*, A Universally Unique IDentifier (UUID) URN Namespace*

TIA/EIA-568-B*, Commercial Building Telecommunications Cabling Standard*

ANSI X3.263:1995, *Information Technology – Fibre Distributed Data Interface (FDDI) – Token Ring Twisted Pair Physical Layer Medium Dependent (TP-PMD)*