

**Raudtee elektroonikaseadmed. Rongisisene
kommunikatsioonivõrk. Osa 3-1: Mitmeotstarbeline
sõidukisiin**

**Electronic railway equipment - Train communication
network (TCN) - Part 3-1: Multifunction Vehicle Bus
(MVB)**

EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 61375-3-1:2012 sisaldab Euroopa standardi EN 61375-3-1:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 61375-3-1:2012 consists of the English text of the European standard EN 61375-3-1:2012.
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**Electronic railway equipment -
Train communication network (TCN) -
Part 3-1: Multifunction Vehicle Bus (MVB)
(IEC 61375-3-1:2012)**

Matériel électronique ferroviaire -
Réseau embarqué de train (TCN) -
Partie 3-1: Bus de Véhicule Multifonctions
(MVB)
(CEI 61375-3-1:2012)

Elektronische Betriebsmittel für Bahnen -
Zug-Kommunikations-Netzwerk -
Teil 3-1: Multipurpose Vehicle Bus (MVB)
(IEC 61375-3-1:2012)

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

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Foreword

The text of document 9/1644/FDIS, future edition 1 of IEC 61375-3-1, 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 61375-3-1:2012.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-07-26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 61375-3-1:2012 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 60332-1-2	NOTE	Harmonized as EN 60332-1-2.
IEC 60870 series	NOTE	Harmonized in EN 60870 series.
IEC 61158-2	NOTE	Harmonized as EN 61158-2.

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 60245-1	-	Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 1: General requirements	-	-
IEC 60304	-	Standard colours for insulation for low-frequency cables and wires	HD 402 S2	-
IEC 60332-1-1	-	Tests on electric and optical fibre cables under fire conditions - Part 1-1: Test for vertical flame propagation for a single insulated wire or cable - Apparatus	EN 60332-1-1	-
IEC 60571	-	Electronic equipment used on rail vehicles	-	-
IEC 60794-1-1	-	Optical fibre cables - Part 1-1: Generic specification - General	EN 60794-1-1	-
IEC 60807	Series	Rectangular connectors for frequencies below 3 MHz	-	-
IEC 60870-5-1	-	Telecontrol equipment and systems - Part 5: Transmission protocols - Section 1: Transmission frame formats	EN 60870-5-1	-
IEC 61375-2-1	-	Electronic railway equipment - Train communication network (TCN) - Part 2-1: Wire Train Bus (WTB)	EN 61375-2-1	-
ISO/IEC 8482	-	Information technology - Telecommunications - and information exchange between systems - Twisted pair multipoint interconnections	-	-
ISO/IEC 8802-2	-	Information technology - Telecommunications - and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 2: Logical link control	-	-
ISO/IEC 8824	Series	Information technology - Abstract Syntax Notation One (ASN.1)	-	-
ISO/IEC 8825	Series	Information technology - ASN.1 encoding rules	-	-
ISO/IEC 9646	Series	Information technology - Open Systems Interconnection - Conformance testing methodology and framework	-	-
ISO/IEC 13239	-	Information technology - Telecommunications - and information exchange between systems - High-level data link control (HDLC) procedures	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ITU-T Recommendation Z.100	-	Specification and Description Language (SDL)-	-	-

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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INTRODUCTION

This part of IEC 61375 specifies one component of the Train Communication Network, the Multifunction Vehicle Bus (MVB), a serial data communication bus designed primarily, but not exclusively, for interconnecting equipment where interoperability and interchangeability are needed.

This part specifies:

- a) the physical media in single-line and double-line configurations;
- b) the signalling and the redundancy handling;
- c) the format and timing of the transmitted frame and telegrams;
- d) the organisation of the bus traffic;
- e) the allocation of Mastership;
- f) the management of the bus;
- g) the Link Layer interface and the layer management interface.

This part is structured following the OSI layers of a reference MVB device as shown in Figure 1:

Caluse 4 Physical Layer

- Electrical medium for short distance (RS-485, 20,0 m)
- Electrical medium for middle distance (transformer-coupled, 200,0 m)
- Optical fibre for long distances (glass fibres, 2,0 km)

Clause 5 Medium-dependent signalling

- Frame encoding and decoding
- Line Unit interface
- Physical redundancy handling

Clause 6 Frames and telegrams

- Master Frame and Slave Frame encoding, Telegram timing

Clause 7 Link Layer Control

- Addressing
- Master Frame and Slave Frame format

Clause 8 Medium allocation

- Periodic Polling
- Event Polling
- Devices Scan

Clause 9 Mastership transfer

- Regular and exceptional mastership transfer

Clause 10 Link Layer Interface

- Link Process Data Interface (LPI),
- Link Message Data Interface (LMI),
- Link Supervision Interface (LSI).

Clause 11 Real-Time Protocols

Clause 12 Gateway Function

Clause 13 Network Management

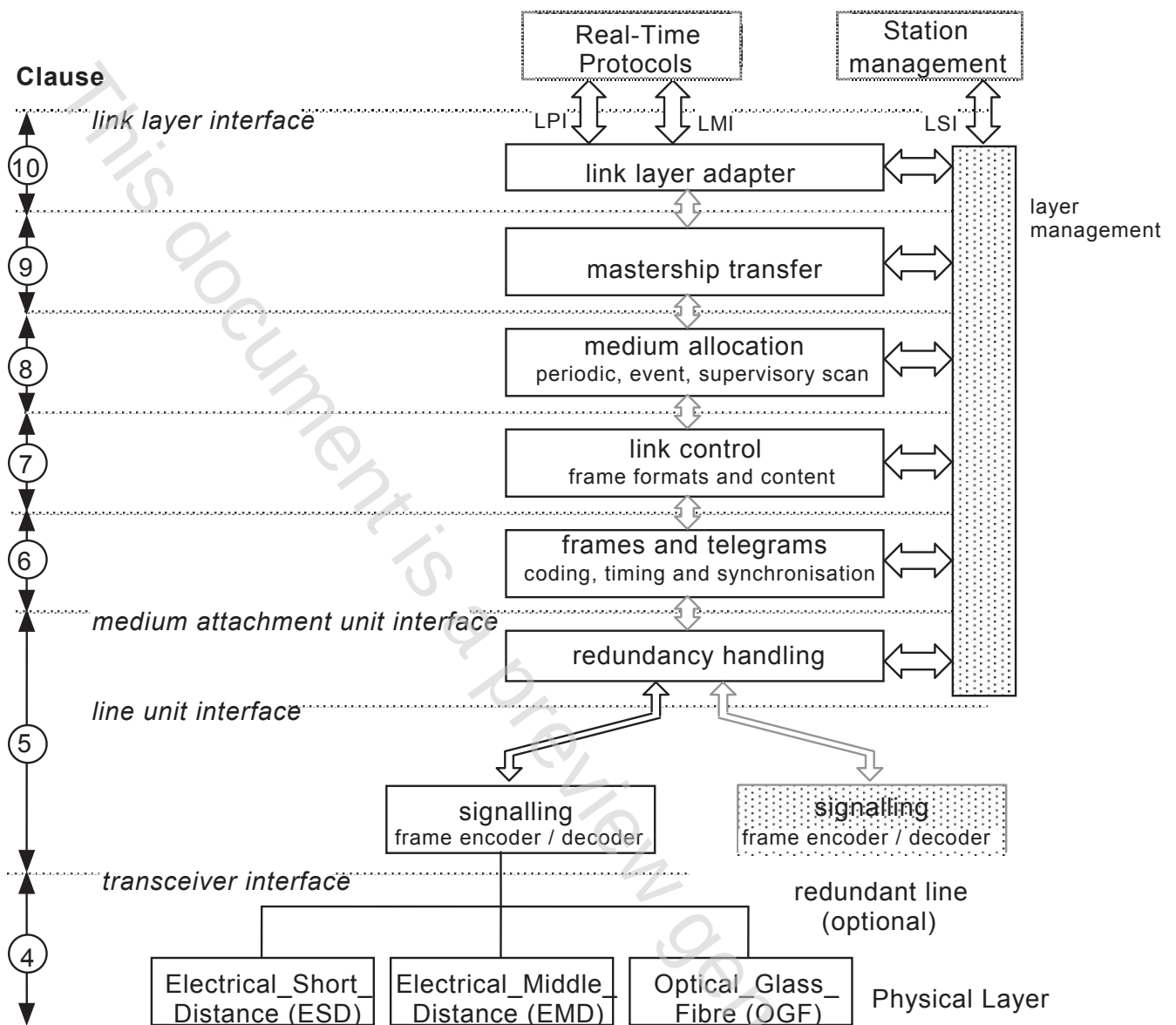


Figure 1 – Reference device and structure of the document

ELECTRONIC RAILWAY EQUIPMENT – TRAIN COMMUNICATION NETWORK (TCN) –

Part 3-1: Multifunction Vehicle Bus (MVB)

1 Scope

This part of IEC 61375 applies where MVB is required.

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 60245-1, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 1: General requirements*

IEC 60304, *Standard colours for insulation for low-frequency cables and wires*

IEC 60332-1-1, *Tests on electric and optical fibre cables under fire conditions – Part 1-1: Test for vertical flame propagation for a single insulated wire or cable – Apparatus*

IEC 60571, *Electronic equipment used on rail vehicles*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification – General*

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

IEC 60870-5-1, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section One: Transmission frame formats*

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

ISO/IEC 8482, *Information technology – Telecommunications and information exchange between systems – Twisted pair multipoint interconnections*

ISO/IEC 8802-2, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 2: Logical link control*

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

ISO/IEC 8825 (all parts), *Information technology – ASN.1 encoding rules*

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

ISO/IEC 13239, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures*

ITU-T Recommendation Z.100, *Specification and Description Language (SDL)*

3 Terms and definitions, abbreviations and conventions

3.1 Terms and definitions

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

NOTE Keywords in this standard are written with the first letter of each word in upper case and, when they are composed of two or several words, these are joined by an underscore. This convention allows keywords to be tracked in the documents.

3.1.1

address

identifier of a communication partner, of which several types exist, depending on the layer

3.1.2

agent

application process in a Station which accesses the local managed objects on behalf of the Manager

3.1.3

Aperiodic Data

transmission of Process Data on a demand basis. This service is not used

3.1.4

Application Layer

upper layer in the OSI model, interfacing directly to the Application

3.1.5

Application Layer Interface

definition of the services offered by the Application Layer

3.1.6

Application Messages Adapter

code directly called by the application implementing the Messages services

3.1.7

Application Messages Interface

definition of the Messages services

3.1.8

Application Process

communicating entity, implemented for instance by a task

3.1.9

Application Processor

processor which runs a communicating Application Process

3.1.10

Application Supervision Interface

definition of the Supervision services available in particular to the Agent