

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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

**Matériel électronique ferroviaire – Réseau embarqué de train (TCN) –  
Partie 3-4: Réseau Ethernet de Rame (ECN)**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRONIC RAILWAY EQUIPMENT –  
TRAIN COMMUNICATION NETWORK (TCN) –****Part 3-4: Ethernet Consist Network (ECN)**

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## INTRODUCTION

This part of IEC 61375 series of international standards specifies the Consist Network based on Ethernet technology, i.e. the Ethernet Consist Network (ECN) within the TCN architecture as defined in IEC 61375-1, and End Devices which can attach to the ECN. In addition gateway services between Train Backbone and ECN are specified.

The general architecture of the TCN (see IEC 61375-1) defines a hierarchical structure with two levels of networks, Train Backbone(s) and Consist Network(s). This hierarchical structure specifies Consist Networks based on different technologies such as MVB, CANopen and ECN interfacing one Train Backbone. ECNs based on different design and implementation may be interfaced to the same Train Backbone reaching the result that the Train Backbone ensures interoperability between Consist Networks with different implementations.

The common part, consisting of Clauses 1 to 4, defines requirements and specifications which are common to all ECN implementations and End Devices and gateways.

The common part defines

- the data communication interface of End Devices connected to the ECN,
- functions and services provided by the ECN to End Devices,
- the gateway functions for data transfer between Train Backbone and the ECN, and
- performances of the ECN.

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

## Part 3-4: Ethernet Consist Network (ECN)

### 1 Scope

This part of IEC 61375 specifies the data communication network inside a Consist based on Ethernet technology, the Ethernet Consist Network (ECN).

The applicability of this part of IEC 61375 to the Consist Network allows for interoperability of individual vehicles within Open Trains in international traffic.

This part of IEC 61375 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, *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 electronic equipment – Product requirements – Part 3-104: Detail specification for 8-way, shielded free and fixed connectors for data transmissions with frequencies up to 1 000 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, *Electronic railway equipment – Train Communication Network (TCN) – Part 1: General architecture*

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

IEC 61375-2-5, *Electronic railway equipment – Train Communication Network (TCN) – Part 2-5: Ethernet Train Backbone (ETB)*

IEC 62439 (all parts), *Industrial communication networks – High availability automation networks*

ISO/IEC 7498, *Information technology – Open Systems Interconnection (OSI) – The Basic reference model*

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

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