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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 28029.12-2020

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

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Standardization Administration**

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Foreword

GB/T 28029 "Train Communication Network (TCN) for Rail Transit Electronic Equipment" is divided into the following 12 parts.

- Part 1. Basic structure;
- Part 2-1. Stranded Train Bus (WTB);
- Part 2-2. Conformance Test of Wire Train Bus (WTB)
- Part 2-3. TCN Communication Protocol;
- Part 2-4. TCN Application Specification;
- Part 2-5. Ethernet Train Backbone (ETB);
- Part 2-6. Vehicle-ground communication;
- Part 2-7. Radio-based Wireless Train Backbone Network (WLTB);
- Part 3-1. Multifunctional Vehicle Bus (MVB);
- Part 3-2. Multi-function vehicle bus (MVB) conformance test;
- Part 3-3. CANopen Marshalling Network (CCN);
- Part 3-4. Ethernet Marshalling Network (ECN).

This part is part 3-4 of GB/T 28029.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the redrafting method to modify the adoption of IEC 61375-3-4..2014 "railway electronic equipment train communication network (TCN)

Part 3-4. Ethernet Marshalling Network (ECN).

Compared with IEC 61375-3-4..2014, there are technical differences between this part and the terms involved in these differences have been passed on the outside margin.

The vertical single line (|) in the white position is marked. The specific technical differences and the reasons are as follows.

--- With regard to normative quotation documents, this part has been adjusted with technical differences to adapt to China's technical conditions and adjustments

The situation is reflected in Chapter 2 "Regulatory Reference Documents", with specific adjustments as follows.

* Removed ISO /IEC 7498, ISO /IEC 8824;

* Replace IEC 61156-6 with GB/T 18015.6 equivalent to international standards (see Table 12, 4.9.4.2, Table 14);

* Replace ISO /IEC 11801 with GB/T 18233 equivalent to international standards (see Table 12, 4.9.4.2, Table 14,

4.10.2.2);

* Replace IEC 61375-1 with GB/T 28029.1 modified to adopt international standards (see 3.3, 4.2.2, 4.3, 4.11.1);

* Replace IEC 61375-2-1 with GB/T 28029.2 modified to adopt international standards (see 3.1, 4.12.2, Chapter 5);

* Replace IEC 61375-2-5 with GB/T 28029.6 modified to adopt international standards (see 4.6.2, 4.7.2, 4.7.3, 4.11.2,

4.12.3, Chapter 5);

* IETFRFC768, IETFRFC791, IETFRFC792, IEC 61375-3-4..2014 references

IETFRFC793, IETFRFC826, IETFRFC1918, IETFRFC2236, IETFRFC2365, IETF

RFC3022, IETFRFC3203, IETFRFC3376, IETFRFC4541 are adjusted to normative references, to

Meet the requirements of GB/T 1.1 (see Chapter 2).

--- Deleted the terms and definitions defined in GB/T 28029.2, and directly quoted GB/T 28029.2.

--- Added the term and definition of "group switch" (see 3.1.12);

--- The note in Chapter 5 of IEC 61375-3-4..2014 is adjusted to the main text because it contains requirements.

This section also made the following editorial changes.

--- Added the table number and table title of Table 8 and Table 9;

--- Adjusted some column numbers (see D.1, D.3.2.3.2).

This part is proposed by the State Railway Administration.

This part is under the jurisdiction of the National Technical Committee for Standardization of Traction Electrical Equipment and Systems (SAC/TC278).

This section was drafted by. CRRC Zhuzhou Electric Locomotive Research Institute Co., Ltd., China Railway Science Research Institute Group Co., Ltd. rolling stock

Research Institute, CRRC Changchun Rail Bus Co., Ltd., CRRC Qingdao Sifang Locomotive Co., Ltd., CRRC Zhuzhou Electric Locomotive have

Limited company, CRRC Nanjing Puzhen Vehicle Co., Ltd.

Introduction

The TCN general architecture (see GB/T 28029.1) defines a two-layer network structure. a train backbone network and a marshalling network. The hierarchical structure provides

Based on different technologies such as MVB, CANopen and ECN, they can be connected to the same train backbone network. Based on not

ECNs of the same design and implementation can be interfaced to the same train backbone network, which ensures interoperability between marshalling networks of different implementations.

The general part of this part of GB/T 28029, namely Chapter 1 ~ Chapter 4, defines all ECN implementations, terminal equipment and gateways common

Requirements and specifications.

This general part defines.

- Data communication interface of terminal equipment connected to ECN;
- ECN provides functions and services to terminal equipment;
- Gateway function for data transmission between train backbone network and ECN;
- ECN performance.

Rail Transit Electronic Equipment Train Communication Network (TCN)

Part 3-4. Ethernet Marshalling Network (ECN)

1 Scope

This part of GB/T 28029 specifies the intra-group data communication network based on Ethernet technology, namely the Ethernet group network (ECN).

The application of this part can realize the interoperability of the equipment in each vehicle in the open train.

If the supplier agrees with the user through consultation, this section may also apply to closed trains and multi-unit trains.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article

Pieces. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 18015.6 Pair or star twisted multi-core symmetrical cable for digital communication. Part 6. With 600MHz and below transmission characteristics

Sectional Specification for Symmetrical Twisted or Star Twisted Symmetrical Cable Work Area Cabling Cables (GB/T 18015.6-2007, IEC 61156-6..2002,

IDT)

GB/T 18233 General cabling for information technology user buildings (GB/T 18233-2008, ISO /IEC 11801..2002,

IDT)

GB/T 28029.1 Rail Transit Electronic Equipment Train Communication Network (TCN) Part 1. Basic Structure (GB/T 28029.

1-2020, IEC 61375-1..2012, MOD)

GB/T 28029.2 Rail Transit Electronic Equipment Train Communication Network (TCN) Part 2-1. Stranded Train Bus (WTB)

(GB/T 28029.2-2020, IEC 61375-2-1..2012, MOD)

GB/T 28029.6 Rail Transit Electronic Equipment Train Communication Network (TCN) Part 2-5. Ethernet Train Backbone Network

(ETB) (GB/T 28029.6-2020, IEC 61375-2-5..2014, MOD)

IEC 61076-2-101 Product requirements for connectors for electronic equipment. Part 2-101. Circular connectors with thread locking

Detailed specifications of M12 connectors

(Connectorsforelectronicequipment-Productrequirements-Part 2-101.

Circularconnectors-DetailspecificationforM12connectorswithscrew-locking)

IEC 61076-3-104 Connector product requirements for electrical and electronic equipment Part 3-104. Frequency at.2000MHz and below

Detailed specifications of 8-way unshielded and fixed connectors for data transmission