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

GB/T 28029.9-2020

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

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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. Grouped Ethernet (ECN).

This part is Part 3-1 of GB/T 28029.

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

This part replaces Chapter 3 in GB/T 28029.1-2011 "Train Bus for Traction Electrical Equipment Part 1. Train Communication Network"

The contents of "Multifunctional Vehicle Bus", 5.3.3 "MVB Link Object", 5.4.3 "MVB Link Service", and GB/T 28029.1-2011

The main technical changes are as follows.

--- Modify the "normative references", add the national standards that need to be quoted in this section, and delete the international standards that are not quoted in this section

Standards (see Chapter 2, version 1.2 of.2011);

--- Delete the terms and definitions and directly quote the terms and definitions defined in GB/T 28029.2 (see 3.1,.2011 edition)

1.3);

--- Removed abbreviations not used in this section (see 3.2, version 1.4 of.2011);

--- Modify the "partition" in Figure 3 to "bus section" (see Figure 3, Figure 44 of the.2011 edition);

--- Modify "conductor" in Figure 5 to "conductor" and "connector" to "tap" (see Figure 5, Figure 46 of the.2011 edition);

--- Modify the "male, female" in Figure 7 to "pin, hole" (see Figure 7,.2011 version of Figure 48);

--- Modify the "fastening method" in 4.4.6.3 to "thread" (see 4.4.6.3, 3.2.4.5.2 of the.2011 edition);

--- Amend "polar sensitivity" in 4.5.3.1 to "require polarity" (see 4.5.3.1, 3.2.5.2.1 of the.2011 edition);

--- Modify "capacitive unbalance" to "capacitive unbalance" (see 4.5.5.7,.2011 version 3.2.5.4.6);

--- Deleted the definition of "overshoot" in item e) of 4.5.10.1 (see 4.5.10.1,.2011 version 3.2.5.9.2);

--- Change "multimode step index silica fiber" in 4.6.3 to "multimode step quartz fiber" (see 4.6.3, 3.2.6.2 of.2011 edition);

--- Modify "low energy level" in Figure 24 to "power level" and "energy level" to "power level" (see Figure 24, Figure 68 in the.2011 edition);

--- Modify item "-10.0dBm (63.0μW)" in 4.6.7.1 to "-10.0dBm (100.0μW)" (see 4.6.7.1,.2011 Annual version 3.2.6.6.1);

--- Modified the contents of the notes in 4.6.9 (see 4.6.9, 3.2.6.8 in the.2011 version);

--- Modify "pseudo noise" to "spurious noise" (see 5.2.8, 5.2.9,.2011 version 3.3.1.8, 3.3.1.9);

--- Amend item (h) of 5.4.2 "(see 5.2.11)" to "(see note and 5.3.11)" (see 5.4.2, 3.3.3.1 of the.2011 edition);

--- Modify the "T_reply = 44μs" to "T_reply = 42μs" for the 2.0km bus with two repeaters in the 6.2.2 example (see

6.2.2, 3.4.2.2 of the.2011 version);

--- Modify "Individual_Event_Response" to "Single_Event_Response" (see 6.3.2,.2011 edition

3.4.3.2);

--- Modify the 0 of Figure 63 in 9.4.1 from "X" to "0" (see 9.4.1, 3.7.3.1 of the.2011 edition);

--- Deleted the MVB guidance chapter content (see A.3 of the.2011 edition).

This part uses the redrafting method to modify the adoption of IEC 61375-3-1..2012 "railway electronic equipment train communication network (TCN)

Part 3-1. Multifunctional Vehicle Bus (MVB) ".

Compared with IEC 61375-3-1..2012, this part has more structural adjustments. Appendix A lists this part and IEC 61375-3-1.

A comparison list of chapter numbers in.2012.

Compared with IEC 61375-3-1..2012, there are technical differences between this part and the clauses 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.

--- Added the content of "Regulations" in the scope to meet the requirements of GB/T 1.1 (see Chapter 1).

--- 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.

* Replaced IEC 60245-1 with GB/T 5013.1 equivalent to international standards.

* Replace ISO /IEC 8482 with GB/T 15127 equivalent to the international standard.

* Replace ISO /IEC 8802-2 with GB/T 15629.2 equivalent to the international standard.

* Replaced ISO /IEC 8824 (all parts) with GB/T 16262 (all parts), the agreement between the parts of the two standards

The degree of sex is as follows.

* GB/T 16262.1-2006 Information Technology Abstract Syntax Notation One (ASN.1) Part 1. Basic Notation

Specification (ISO /IEC 8824-1..2002, IDT);

* GB/T 16262.2-2006 Information Technology Abstract Syntax Notation One (ASN.1) Part 2. Information Object

Specification (ISO /IEC 8824-2..2002, IDT);

* GB/T 16262.3-2006 Information Technology Abstract Syntax Notation One (ASN.1) Part 3. Constraint Specification

Equivalent (ISO /IEC 8824-3..2002, IDT);

* GB/T 16262.4-2006 Information Technology Abstract Syntax Notation One (ASN.1) Part 4. ASN.1 Regulation

Fan's parameterization is equivalent (ISO /IEC 8824-4..2002, IDT).

* Replaced IEC 60332-1-1 with GB/T 18380.11 which is equivalent to the international standard (see 4.6.3).

* Replace IEC 60870-5-1 with GB/T 18657.1-2002 equivalent to the international standard (see 6.1.3).

* Replaced IEC 60794-1-1 with GB/T 7424.1 modified to adopt international standards (see 4.6.3).

* IEC 60571 (see 4.5.8.3, 4.6.3) is replaced by GB/T 25119, which is modified to adopt international standards.

* Replaced IEC 61375-2-1 with modified GB/T 28029.2-2020 adopting international standards (see 3.1, 3.3.5, 10.1,

10.2, 10.3.1, 10.4.1, Chapter 11, 12.1).

* Deleted ISO /IEC 8825, ISO /IEC 9646, ISO /IEC 13239 and ITU-T Recommendation Z.100.

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

--- Removed acronyms not used in this section (see 3.2).

--- Modify the potential of Data_P at least $0.750 \times (1 \pm 10\%)$ V lower than Data_N when no transmitter is activated in 4.4.3.4

Change to "The potential of Data_P is at least 0.750V lower than Data_N when no transmitter is activated", and a note is added for explanation

The deviation of $\pm 10\%$ is convenient to resolve the descriptive conflicts of "at least" and " $\pm 10\%$ "