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TB

**RAILWAY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

TB/T 2296-2011

General technical specification for railway axle counters

铁路信号计轴设备通用技术条件

(English Translation)

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Foreword

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

This Standard replaces TB/T 2834-2002 Technical Specification for Radio Marshalling Equipment of Railway Plane. Compared with TB/T 2834-2002, the main technical modifications are as follows.

- added terms and definitions (see Clause 3 of this Edition);
- modified the composition and functions of railway radio shunting equipment (see Clause 4 of this Edition, Clause 3 of Edition 2002);
- modified the content of modulation mode and channel spacing in technical requirements of equipment (see 5.1.1 of this Edition, 4.1.2 of Edition 2002);
- modified power supply requirements and structural requirements of railway radio shunting equipment (see 5.2, 5.3, 5.4 of this Edition, 4.2,

4.3 of Edition 2002);

- added battery requirements (see 5.5 of this Edition);
- modified operation display requirements (see 5.6 of this Edition, Clause 6, Annex B of Edition 2002);
- modified working environment requirements (see 5.7 of this Edition, 4.4 of Edition 2002);

- modified transmitter and receiver electromechanical performance requirements (see 5.8, 5.9 of this Edition, 4.5, 4.6 of Edition 2002);
- modified safety requirements (see 5.10 of this Edition, 4.8 of Edition 2002);
- added electromagnetic compatibility requirements (see 5.12);
- added inspection method of enclosure protection (see 6.1 of this Edition);
- modified equipment electrical performance test method (see 6.2, Annex C, Annex D of this Edition, 5.2 of Edition 2002);
- modified environmental inspection method (see 6.3 of this Edition, 5.4 of Edition 2002);
- added electromagnetic compatibility test method (see 6.4 of this Edition);
- added battery inspection method (see 6.5 of this Edition);

Railway radio shunting equipment

1 Scope

This Standard specifies the terms and definitions, general technical requirements, equipment technical requirements and inspection methods for railway radio shunting equipment.

This Standard is applicable to the design, manufacturing and inspection of railway radio shunting equipment.

2 Normative references

The following referenced documents are indispensable for the application 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.

GB 3836.1-2010, Explosive atmospheres - Part 1. Equipment - General requirements;

GB 3836.4-2010, Explosive atmospheres - Part 4. Equipment protection by intrinsic safety;

GB 4208-2008, Degrees of Protection Provided By Enclosure (IP Code);

GB 9254-2008, Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement;

GB 15842-1995, Mobile radio equipment Safety requirements and testing methods;

GB/T 15844.2-1995, Environmental requirements and test methods for radio transceiver employing F3E emission used in the mobile services;

GB/T 17626.2-2006, Electromagnetic compatibility(EMC) - Testing and measurement techniques - Electrostatic discharge immunity test;

GB/T 17626.3-2006, Electromagnetic compatibility - Testing and measurement techniques - Radiated radio-frequency electromagnetic field immunity test;

GB/T 17626.4-2008, Electromagnetic compatibility - Testing and measurement techniques - Electrical fast transient/burst immunity test;

GB/T 17626.5-2008, Electromagnetic compatibility - Testing and measurement techniques - Surge immunity test;

GB/T 17626.6-2008, Electromagnetic compatibility - Testing and measurement techniques - Immunity to conducted disturbances induced by radio-frequency fields;

GB 17799.4-2001, Electromagnetic compatibility - Generic Standards - Emission Standard for industrial environments;

GB/T 24338.4-2009, Railway applications - Electromagnetic compatibility - Part 3-2. Rolling stock - Apparatus;

GB/T 24338.5-2009, Railway applications - Electromagnetic compatibility - Part 4. Emission and immunity of the signalling and telecommunications apparatus.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 repeater mode operation

an operating mode of which the railway radio shunting equipment communicates with one or more other railway radio shunting equipment via relay equipment transfer

3.2 direct mode operation

an operating mode of which the railway radio shunting equipment directly communicates with one or more other railway radio shunting equipment without the use of relay equipment

3.3 test signal

the communication contact signal transmitted periodically by the shunting hand to the shunting locomotive controller in the advancing state

4.1.1 The operating frequency range shall comply with the relevant provisions of the radio management.

5.1.1 The shunting equipment shall use 4 level shift keying (4FSK) digital modulation. When the channel spacing is 12.5 kHz, it may use the multiple access mode of time division multiple access (TDMA) or frequency division multiple access (FDMA).

5.1.3 The equipment shall have solid structure, good heat dissipation, clear panel logo, easy use and maintenance, external electrical performance measurement interface.

5.2.1 Composition

The locomotive controller can be divided into the fixed one and the portable one.

The fixed locomotive controller consists of host, driver box, display lights, speakers, antenna and feeder. The portable locomotive controller consists of host (with battery), driver box, antenna and train operation monitoring device (LKJ) connection cable.