



BSI Standards Publication

Railway applications — Requirements for ERTMS Trackside Boards

National foreword

This British Standard is the UK implementation of EN 16494:2025. It supersedes BS EN 16494:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RAE/4/-/7, Railway Applications - Lighting.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2025
Published by BSI Standards Limited 2025

ISBN 978 0 539 16829 7

ICS 03.220.30; 33.070.50

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2025.

Amendments/corrigenda issued since publication

Date	Text affected

English Version

Railway applications - Requirements for ERTMS Trackside Boards

Applications ferroviaires - Exigences relatives aux
pancartes ERTMS

Bahnanwendungen - Anforderungen an ERTMS-
Strecken- und Signaltafeln

This European Standard was approved by CEN on 24 February 2025.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

European foreword 3

Introduction 4

1 Scope..... 5

2 Normative references..... 6

3 Terms and definitions 7

4 Symbols and abbreviations 7

5 Requirements..... 8

5.1 General..... 8

5.2 Physical requirements for ERTMS trackside boards 8

5.2.1 General..... 8

5.2.2 Design..... 8

5.2.3 Dimensions..... 25

5.3 Optical properties..... 29

5.3.1 Optical properties of trackside boards..... 29

5.3.2 Optical properties of the rear of trackside boards 30

5.4 Durability in environmental conditions..... 30

5.5 Maintenance requirements..... 30

5.6 Location and alignment of trackside boards 30

6 Test methods 31

6.1 Test samples 31

6.2 Test for dimensions 31

6.3 Test for optical properties..... 31

6.4 Test for environmental properties..... 31

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive (EU) 2016/797 aimed to be covered 32

Bibliography 34

European foreword

This document (EN 16494:2025) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2025, and conflicting national standards shall be withdrawn at the latest by October 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 16494:2015.

This document includes the following changes with respect to EN 16494:2015:

- clarification of the scope to exclude mobile, backlit and temporary signs;
- dimensional corrections to the ETCS Stop Marker and ETCS Location Marker;
- new trackside boards were introduced (traction system 25 kV, 15 kV, 3000 V, 1500 V and 750 V, audible warning device, safe stopping area, non-stopping area, inhibition of magnetic shoe brake, inhibition of eddy current brake, inhibition of regenerative brake, close air-conditioning, open air-conditioning, and level crossing marker);
- an option for diamond-shaped trackside boards (electric traction MBs only);
- clarification to existing maintenance requirements;
- revision of the options for standard dimensions.

This document has been prepared under a standardization request addressed to CEN and CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document was produced for the specification and harmonization of a specific set of ERTMS trackside boards to support ETCS and GSM-R operations.

1 Scope

This document is applicable to the heavy rail system.

This document defines the requirements for the provision, visibility, readability, maintenance and testing of a specific set of ERTMS trackside boards associated with the following DMI and ETCS track conditions:

- ETCS stop marker;
- ETCS location marker;
- level transition, corresponding to transitions between ETCS levels;
- lower pantograph;
- pantograph lowered;
- raise pantograph;
- neutral section announcement;
- neutral section;
- end of neutral section;
- GSM-R network border marker;
- no traction system fitted announcement;
- no traction system fitted indication;
- traction system AC 25 kV 50 Hz announcement;
- traction system AC 25 kV 50 Hz indication;
- traction system AC 15 kV 16,7 Hz announcement;
- traction system AC 15 kV 16,7 Hz indication;
- traction system DC 3 kV announcement;
- traction system DC 3 kV indication;
- traction system DC 1,5 kV announcement;
- traction system DC 1,5 kV indication;
- traction system DC 600/750 V announcement;
- traction system DC 600/750 V indication;
- activate the audible warning device (horn) indication;
- safe stopping area announcement;
- safe stopping area indication for start;

- safe stopping area indication for end;
- inhibition of brake announcement/indication for start/indication for revocation;
- level crossing marker.

NOTE The brake MBs apply for any of the three brake types (eddy current, magnetic shoe, regenerative), whereas the exact type concerned would be known by the driver via existing Route knowledge.

The following ETCS track conditions are outside the scope of this document:

- safe stopping area semi-continuous indication for in-between;
- non-stopping area announcement;
- non-stopping area indication for start;
- non-stopping area indication for end;
- non-stopping area semi-continuous indication for in-between;
- close air conditioning intake announcement;
- close air conditioning intake indication;
- open air conditioning intake announcement;
- open air conditioning intake indication.

This document includes the arrangement of the boards and their interface with existing systems (track, cab design including cab sight lines, visibility by the driver and train head lamps).

Mobile, backlit and temporary signs are not within the scope of this document.

The application of ERTMS trackside boards is not within the scope of this document.

Sighting requirements are not within the scope of this document. The sighting process needs to be implemented in accordance with national rules.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 12899-1:2007, *Fixed, vertical road traffic signs - Part 1: Fixed signs*

EN 50125-3:2003,¹ *Railway applications - Environmental conditions for equipment - Part 3: Equipment for signalling and telecommunications*

¹ Document impacted by EN 50125-3:2003/AC:2010.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

cab sight lines

viewing directions achievable by the driver in the normal driving position

3.2

ETCS track conditions

ETCS operating conditions which include the normal and degraded mode

3.3

ERTMS trackside boards

fixed permanent boards which provide trackside visual information to train drivers operating under ERTMS

3.4

readability

characteristic of a sign by which, when it is viewed under the conditions defined for the sign by a person just meeting the relevant eyesight standard, the message it conveys is understandable

4 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply:

DMI	Driver-Machine Interface
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
GSM-R	Global System for Mobile communication — Rail
LT	Level Transition
MB	Marker Board
TSI	Technical Specification for Interoperability

5 Requirements

5.1 General

To assist in readability, the ERTMS trackside boards shall comply with the following:

- physical requirements for the trackside boards, as set out in 5.2;
- optical requirements, as set out in 5.3;
- mechanical performance in environmental conditions, as set out in 5.4;
- maintenance requirements, as set out in 5.5.

The installation of a given trackside board shall require an assessment to determine:

- location, as set out in 5.6;
- selection of the appropriate size from the alternatives given in Tables 4, 5 and 6;
- alignment, as set out in 5.6.

5.2 Physical requirements for ERTMS trackside boards

5.2.1 General

The design and dimensions of the ERTMS trackside boards shall be as specified in 5.2.2 and 5.2.3.

All characters shall be a sans-serif typeface the same as or equivalent to “Arial Bold”.

By agreement between contractors the format of the trackside boards associated with electric traction (i.e. Table 1 and Table 3, as applicable) may be modified such that they are diamond-shaped. In this case, the icons and characters shall be the same as shown in Tables 1, 2 and 3; only the background areas shall change in format. In all cases of diamond-shaped trackside boards, the correct proportions shown in Tables 1, 2 and 3 shall be preserved. The dimensions of diamond-shaped trackside boards shall be agreed between contractors.

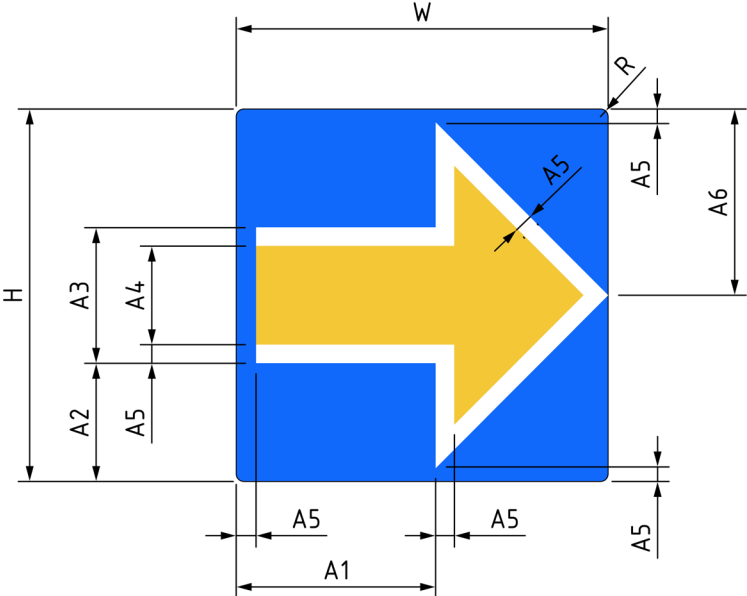
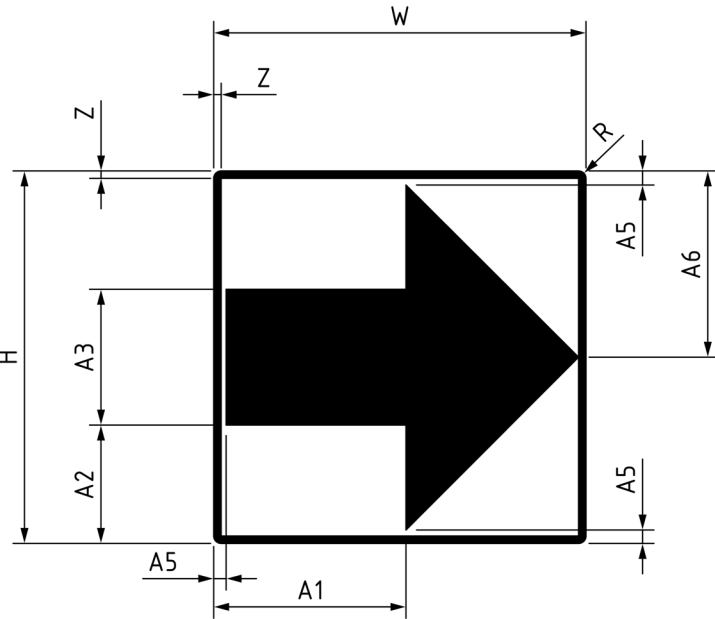
5.2.2 Design

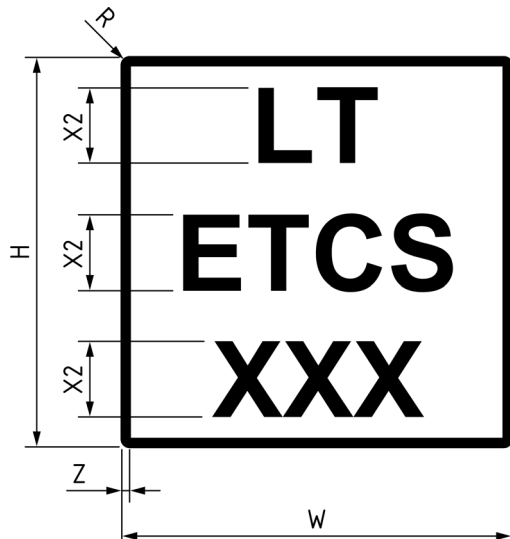
The designs of the ERTMS trackside boards shall be as shown in Table 1 for the ETCS trackside boards and in Table 2 for GSM-R trackside board. The designs of the ETCS track conditions are shown in Table 3.

NOTE 1 This document contains colour images for indicational purposes only. The appearance of the colours in this document is not representative of the specification, which is covered in 5.3.1.

NOTE 2 The drawings shown in Tables 1, 2 and 3 are not to scale.

Table 1 — Design of ETCS trackside boards

Trackside Board Number	Description applicable to DMI	Description provided for information only	Symbol ^a
01	N/A	ETCS Stop Marker	 The diagram shows a square symbol with a blue background and a yellow arrow pointing right. The arrow has a white outline. Dimensions are labeled: W (width), H (height), A1 (arrow body width), A2 (left margin), A3 (top margin), A4 (arrow body height), A5 (margin from arrow body to border), A6 (right margin), and R (corner radius). NOTE 1 Note that the arrow can face to the left, down or to the right, according to the line to which it refers. NOTE 2 In addition to the symbol given above, an identification plate can be provided. NOTE 3 This symbol is reproduced for information only, and has been developed from EEIG 06E068.
02	N/A	ETCS location marker	 The diagram shows a square symbol with a white background and a black arrow pointing right. The arrow has a black outline. Dimensions are labeled: W (width), H (height), A1 (arrow body width), A2 (left margin), A3 (top margin), A5 (margin from arrow body to border), A6 (right margin), Z (border thickness), and R (corner radius). NOTE 1 The arrow can face to the left, down or to the right, according to the line to which it refers.

Trackside Board Number	Description applicable to DMI	Description provided for information only	Symbol ^a
			NOTE 2 In addition to the symbol given above, an identification plate can be provided.
03	N/A	Level transition board XXX represents optional level information and may be up to three characters, to be used as required (or not at all). See Figures 1 and 2.	 In the case where XXX is partially or not used, the information should be vertically centred.
04	Lower pantograph	Lower pantograph Instruction to the driver for the pantograph to be lowered	