BSI Standards Publication

Railway Application — Communication, signalling and processing system — Safety related electronic systems for signalling

National foreword

This British Standard is the UK implementation of EN 50129:2026. It supersedes BS EN 50129:2018, which will be withdrawn on 31 May 2029.

The UK participation in its preparation was entrusted to Technical Committee GEL/9/1, Railway Electrotechnical Applications - Signalling and communications.

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

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English Version

Railway Application - Communication, signalling and processing system - Safety related electronic systems for signalling

Applications ferroviaires - Systèmes de signalisation, de télécommunications et de traitement - Systèmes électroniques de sécurité pour la signalisation

Bahnanwendungen - Telekommunikationstechnik, Signaltechnik und Datenverarbeitungssysteme - Sicherheitsbezogene elektronische Systeme für Signaltechnik

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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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (EN 50129:2026) has been prepared by CLC/SC 9XA “Communication, signalling and processing systems” of CLC/TC 9X “Electrical and electronic applications for railways”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2027-05-31
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2029-05-31

This document supersedes EN 50129:2018 and all of its amendments and corrigenda (if any).

EN 50129:2026 includes the following significant technical changes with respect to EN 50129:2018.

Requirements and guidance have been added on the following topics:

— Clause 5: update of requirements and guidance on safety qualification tests;

— Clause 6: update of requirements and guidance on safety-related tools, cybersecurity;

— Clause 7: update of requirements and guidance on cybersecurity; a significant portion of 7.2 has been incorporated into Table 2;

— Annex C: update of insulation coordination requirements for better readability;

— Annex E: a new column has been added for Basic Integrity.

A more detailed comparison of changes between EN 50129:2018 and this document can be found in Annex G.

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

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

Introduction

This document defines requirements for the development and acceptance of safety-related electronic systems in the railway signalling field.

Safety-related electronic systems for signalling include hardware and software aspects. To develop complete safety-related systems, both aspects need to be taken into account throughout the whole life cycle of the system. The requirements for the overall safety-related electronic system and for its hardware aspects are defined in this document. Other requirements are defined in associated CENELEC standards.

General requirements for a consistent approach to the management of RAMS are given in EN 50126-1:2017 and EN 50126-2:2017. For safety-related systems which include software, additional requirements are defined in EN 50716:2023. Additional requirements for safety-related communication are defined in EN 50159:2010.

Cyberattacks can affect the safety of a system, but this document does not specify the cybersecurity requirements for the development, implementation, maintenance and operation of security policies, services, or systems. For cybersecurity, appropriate standards apply.

NOTE ISO/IEC and CEN/CENELEC publications that address cybersecurity in depth are EN ISO/IEC 27000 and ISO/IEC TR 19791. In the field of industrial automation and control systems, the EN IEC 62443 series have been defined. CLC/TS 50701:2023 addresses cybersecurity for the railway domain and was derived from the EN IEC 62443 series.

The aim of European railway duty holders and of European railway industry is to develop compatible railway systems based on common standards. Therefore cross-acceptance of safety approvals for systems, subsystems or equipment by the different national railway duty holders is needed. This document is the common European base for safety acceptance of electronic systems for railway signalling applications.

Cross-acceptance is aimed at the acceptance of generic products or generic applications that can be used for a number of different specific applications, and not at the acceptance of any single specific application. Public procurement within the European Community concerning safety-related electronic systems for railway signalling applications will refer to this document.

This document is concerned with the evidence to be presented for the acceptance of safety-related systems. However, it specifies not only those life cycle activities which need to be completed before the system acceptance phase, but also the additional planned activities to be carried out afterwards. In this way, safety justification will cover the whole life cycle.

This document is concerned with what evidence is to be presented. Except where considered appropriate, it does not specify who carries out the necessary work. The necessary work can be carried out by different people, in different circumstances or organisational structures, provided that independence of roles is respected.

This document consists of Clause 1 to Clause 8, which form the main part, and Annexes A, B, C, D, E, F and G . The requirements defined in Clause 5 to Clause 8 and in Annexes A, B, C and E are normative, whilst Annexes D, F and G are informative.

This document is in line with, and contains references to:

— EN 50126-1:2017, Railway Applications — The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) — Part 1: Generic RAMS Process,

— EN 50126-2:2017, Railway Applications — The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) — Part 2: Systems Approach to Safety.

This document is based on the system life cycle described in EN 50126-1:2017, EN 50126-2:2017 and is in line with the EN 61508 series. EN 50126-1:2017, EN 50126-2:2017, EN 50716:2023 and this document comprise the railway sector equivalent of the EN 61508 series so far as Railway Communication, Signalling and Processing Systems are concerned. Given that compliance with these documents has been demonstrated, there are no requirements in this document for further evaluation of compliance with the EN 61508 series.

1 Scope

This document is applicable to safety-related electronic systems (including subsystems and equipment) for railway signalling applications.

This document applies to generic systems (i.e. generic products or systems defining a class of applications), as well as to systems for specific applications.

The scope of this document and its relationship with other CENELEC standards are shown in Figure 1.

This document is applicable only to the functional safety of systems. It does not deal with other aspects of safety such as occupational health and safety of personnel or potential threats created by the technology regardless of their intended functions (e.g. presence of sharp edges, presence of electric voltage, presence of combustible material). Cybersecurity aspects of functional safety are addressed only to the extent consistent with the application of the relevant standards, where needed.

This document applies to all the phases of the life cycle of a safety-related electronic system, focusing in particular on phases from 4 (specification of system requirements) to 10 (system acceptance) as defined in EN 50126-1:2017.

Requirements for systems which are not related to safety are outside the scope of this document.

This document is not necessarily applicable to systems, subsystems or equipment which had already been accepted prior to the date of withdrawal (dow) of the standards conflicting with this document. However, so far as reasonably practicable, it is applicable to modifications and extensions to such systems, subsystems and equipment.

NOTE In the case of partial modifications, it can happen that the system can no longer be declared compliant with a single version of the standard, meaning that the modified part will be compliant with the current version and the unmodified parts will be compliant with the previous version.

This document is primarily applicable to systems, subsystems or equipment which have been specifically designed and manufactured for railway signalling applications. It is also applicable, to the extent of 6.2, to general-purpose or industrial equipment (e.g. power supplies, display screens, or other commercial off the shelf items) which is procured for use as part of a safety-related electronic system.

This document is aimed at railway duty holders, railway suppliers, and assessors as well as at safety authorities, although it does not define an approval process to be applied by the safety authorities.

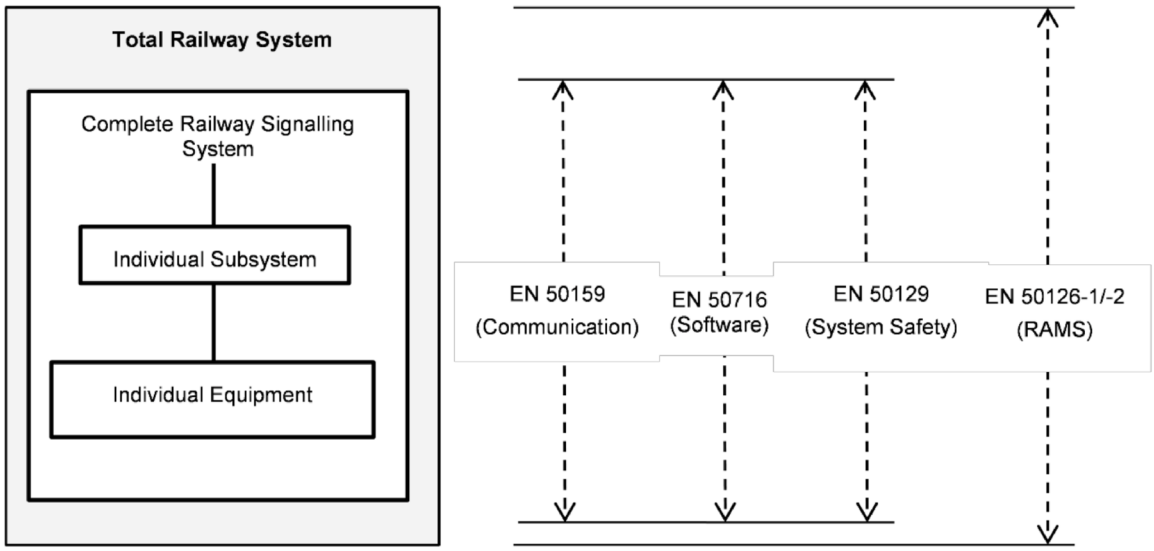

Figure 1 — Scope of the main CENELEC railway application standards