Irish Standard
I.S. EN 50159-1:2001

Railway applications - Communication, signalling and processing systems -- Part 1: Safety-related communication in closed transmission systems

I.S. EN 50159-1:2001

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EUROPEAN STANDARD **EN 50159-1**

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English version

Railway applications - Communication, signalling and processing systems Part 1: Safety-related communication in closed transmission systems

Applications ferroviaires - Systèmes de signalisation, de télécommunication et de traitement Partie 1: Communication de sécurité sur des systèmes de transmission fermés

Bahnanwendungen - Telekommunikationstechnik, Signaltechnik und Datenverarbeitungssysteme Teil 1: Sicherheitsrelevante Kommunikation in geschlossenen Übertragungssystemen

This European Standard was approved by CENELEC on 1999-01-01. CENELEC 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 Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

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Foreword

This European Standard was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50159-1 on 1999-09-01.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2001-10-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2001-10-01

This standard is in close relation to EN 50128:2001, ENV 50129:1998 and EN 50159-2:2001.

The applicability of the standard was also extended from a vehicle bus to all closed transmission systems with a known maximum number of connectable participants and known topographical structure.

Annexes designated “informative” are given for information only.
In this standard, annex A is informative.

The contents of the corrigendum of May 2010 have been included in this copy.

Contents

Introduction

This European Standard deals with safety-related communication between safety-related equipment using a closed transmission system. For those transmission systems which cannot be considered as closed, EN 50159-2 shall be applied.

Both, safety-related and non safety-related equipment can be connected to the transmission system.

In the case of errors affecting safety-related communication it is necessary:

- to detect errors
- to initiate a safety reaction

This standard does not impose safety requirements on the non-trusted transmission system itself, but its properties and its physical characteristics shall be defined.

For safety purposes as considered here, one physical transmission path is sufficient. Safety aspects are covered by applying safety procedures and a safety code which are implemented inside safety-related equipment – on top of a non-trusted communication protocol in a transmission system.

Although reliability is not considered in this standard it is recommended to keep in mind that reliability is a major aspect of the global safety.

1 Scope

This European Standard is applicable to safety-related electronic systems using a closed transmission system for communication purposes. It gives the basic requirements needed in order to achieve safety-related communication between safety-related equipment connected to the transmission system.

This standard is applicable to the safety requirement specification and design of the communication system in order to obtain the assigned safety integrity level (SIL).

The safety requirement specification is a precondition of the safety case of a safety-related electronic system for which the required evidence is defined in EN 50129. Evidence of safety management and quality management has to be taken form EN 50129. Evidence of functional and technical safety is the subject of this standard.

This standard is not applicable to existing systems which had already been accepted prior to the release of this standard. However, as far as is reasonably practicable, this standard shall be applied to modifications and extensions to existing systems, subsystems and equipment.

This standard applies to a closed transmission system with the following preconditions, for which evidence shall be provided:

1 Only approved access is permitted.
2 There is a known maximum number of connectable participants.
3 The transmission media is known and fixed.

Closed transmission systems are not necessarily data buses. They can also include for instance balise links or simple serial links between two safety-related computers.

In particular this standard does not define:

- The transmission system.
- The equipment connected to the transmission system.
- Specific solutions (e.g. for interoperability).
- Which kinds of data are safety-related and which aren’t.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50126 Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)

EN 50128 Railway applications – Software for railway control and protection systems

EN 50129 (*) Railway applications – Safety related electronic systems for signalling

(*) In preparation, use ENV 50129:1998.