



SLOVENSKI STANDARD
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Železniške naprave - Potniški alarmni sistem - 1. del: Systemske zahteve za glavni tir

Railway applications - Passenger Alarm System - Part 1: System requirements for mainline rail

Bahnanwendungen - Fahrgastalarmsystem - Teil 1: Systemanforderungen für Vollbahnen

Applications ferroviaires - Système d'alarme passager - Partie 1: Prescriptions relatives au système

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EUROPEAN STANDARD

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Railway applications - Passenger Alarm System - Part 1: System requirements for mainline rail

Applications ferroviaires - Système d'alarme passager -
Partie 1: Prescriptions relatives au système

Bahnanwendungen - Fahrgastalarmsystem - Teil 1:
Systemanforderungen für Vollbahnen

This European Standard was approved by CEN on 22 May 2014 and includes Amendment 1 approved by CEN on 20 March 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 16334:2014+A1:2022 (E)

European foreword

This document (EN 16334:2014+A1:2022) 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of an identical text or by endorsement, at the latest by November 2022 and conflicting national standards shall be withdrawn at the latest by November 2022.

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

This document includes Amendment 1 approved by CEN on 13 March 2022.

This document supersedes A1 EN 16334:2014 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), 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, Turkey and the United Kingdom.

1 Scope

Ⓐ This document specifies the characteristics and the performance requirements of the Passenger Alarm System (PAS). The aim of the PAS is to:

- allow passengers, in case of emergency situations, to inform the driver;
- allow the driver to keep the train moving or to stop the train at a safe location;
- stop the train automatically:
 - a) at a platform,
 - b) if there is no acknowledgement by the driver.

This document covers the PAS fitted to passenger carrying rolling stock and specifies:

- the functional requirements for an alarm triggered in the driving cab (Clause 6);
- the communication channel between the driver and passengers or on-board staff (6.4)
- the dynamic analysis of the PAS (Clause 7);
- the requirements for the degraded modes management (Clause 8);
- the safety related requirements (Clause 9);
- requirements for the Passenger Alarm Device (PAD) and PAD area (Clause 10).

This document applies to heavy rail rolling stock, which is in the field of the EU Directive 2016/797/EU. This document does not apply to metros, trams and light rail, as defined by the CEN/CENELEC Guide 26. Existing passenger alarm systems may require modification to work in conjunction with vehicles that comply with this document.

NOTE Most of the requirements of UIC 541-6 are compliant with this document.

Other communication systems such as “communication device for passengers”, “call for aid”, “emergency call” or “call for assistance” are covered by the EN 16683 series. Ⓐ

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ⓐ EN 13272-1:2019, *Railway applications - Electrical lighting for rolling stock in public transport systems - Part 1: heavy rail* Ⓐ

EN 14478:2005, *Railway applications — Braking — Generic vocabulary*

Ⓐ EN 16186-2:2017, *Railway applications - Driver's cab - Part 2: Integration of displays, controls and indicators*

EN 16186-3:2018, *Railway applications - Driver's cab - Part 3: design of displays*

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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* ^{A1}

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14478:2005 apply.

NOTE The definition for 'passenger alarm' given in EN 14478:2005, 4.9.2.2, is superseded by this document.

3.1**Closed Circuit Television****CCTV**

on board video recording system

3.2**PAD operated**

handle that is operated when it is manipulated in order to change its mechanical status and therefore to send an information to the PAS

3.3**Passenger Alarm Interface****PAI**

arrangement of equipment close to each other or one single equipment, which includes:

- passenger alarm device (see Clause 9);
- microphone;
- loudspeaker;
- visual indicators: lights;
- resetting device(s);
- information labels;
- a seal (optional)

^{A1} Note 1 to entry: For units designed for operation with staff on-board (other than driver), it is permitted to have no microphone and loudspeaker. In that case, the communication link is established between the driver's cab and the staff on-board. ^{A1}

3.4

Passenger Alarm Device

PAD

interface to the PAS through which the requirement for a defined Passenger Alarm System demand is indicated or initiated by passengers or operating staff

Note 1 to entry: The PAD is sometimes called emergency handle or alarm handle. These short-terms should only be used where misunderstanding is not possible or in descriptions prepared for passengers. In this document, 'handle' is used as a generic term and its design is defined in 10.2.

3.5

standstill

when the speed of the train has decreased to 3 km/h or less

4 Symbols and abbreviated terms

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

CCTV Closed Circuit Television (see 3.1)

PAI Passenger Alarm Interface (see 3.3)

PAD Passenger Alarm Device (see 3.4)

PAS Passenger Alarm System (see Clause 6)

TCMS Train Control and Monitoring System

5 System overview, architecture and interfaces

An example of the system overview is described in Annex E.
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6 Functional requirements

6.1 General

The aim of the Passenger Alarm System is:

- a) to permit passengers in case of emergency situation to inform the driver;
- b) to permit the driver to keep the train moving or to stop the train at a safe location;
- c) to stop the train automatically:
 - 1) at a platform,
 - 2) if no acknowledgement by the driver.

The mandatory functions that are set out in this clause are for normal mode operations. They are supplemented by additional optional functions which may be incorporated in the PAS. For degraded modes see Clause 8.

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6.2 Advise the driver (and optionally on board staff members or control centre) of a potential danger

6.2.1 PAD shall be available for passengers and staff (see Clause 10 for PAD installation requirements).

6.2.2 The information that at least one PAD has been operated shall be transmitted to the driver.

6.2.3 An acoustic and flashing visual signal shall be given to the driver when a PAD has been operated. For the duration of signals and triggering conditions see Clause 7.

Colour and frequency of visual and acoustic signals in the driver's cab shall conform to the **A1** EN 16186-2 and EN 16186-3 **A1** requirements.

6.2.4 In addition, if remote resetting of PADs is available, an acoustic signal shall be activated for each new activation of a PAD, in accordance with the safety requirements given in Clause 9.

6.2.5 The maximum permitted delay from any PAD operated and the acoustic and visual signal for the driver is 2 s.

6.2.6 When the driver has acknowledged, each acoustic signal shall be turned off within 1 s, and the visual signal should change from blinking to steady within 1 s. It is permitted to retain a flashing light as a reminder for the driver. A visual signal shall remain until all the PADs operated have been reset.

6.2.7 The system shall indicate to the driver if the PAS is not working properly or is working in limited mode (see Clause 8).

6.2.8 A PAS passenger area module shall not be automatically or remotely isolated.

NOTE This is to ensure a member of the train staff or the driver carries out the isolation.

Colour and frequency of visual and acoustic signals in the driver's cab shall conform to the **A1** EN 16186-2 and EN 16186-3 **A1** requirements.

6.2.9 Additional optional functions

6.2.9.1 There may be a reminder for the driver that a PAD has been operated by repeating the acoustic and flashing signals at intervals until all the PAD have been reset (cycling through 6.2.3 to 6.2.6). The time interval between reminders may be selected having taken into account the proposed train service.

6.2.9.2 The PAS can advise the on board staff by acoustic and/or visual signals that a PAD has been operated. The recommended maximum delay from any PAD operated and the acoustic and/or visual signal for on board staff is 2 s.

6.2.9.3 The PAS may indicate that a PAD has been operated on the outside of the train.

EXAMPLE An external flashing light on the vehicle where the PAD has been operated.

6.2.9.4 For a vehicle with several compartments, PAS may give information to identify the activated PAD.

EXAMPLE For a vehicle with compartments such as a sleeping car or restaurant car, or the train manager's office, a light outside each compartment could be used to identify the activated PAD.

6.2.9.5 If TCMS from each vehicle to the cab is available, PAS may give an output to identify where a PAD has been operated.

EXAMPLE To show the location on a driver's display in the cab or other areas for on board staff.

6.2.9.6 If train CCTV is available, PAS may inform the CCTV system on the location of the PAD that has been operated.

6.2.9.7 If remote resetting of PAD is available, an acoustic signal may be activated for each new activation of a PAD.

6.2.9.8 The acoustic signal can be turned off if the PAS alarm is supported by an emergency brake application by the driver. In this case, if the automatic brake controller is already in emergency brake position, the acoustic signal sounds for at least 5 s.

6.3 Advise the passenger

6.3.1 When a PAD is operated, the PAI shall give local feedback to the passenger within 1 s maximum.

- The PAD shall be latched in the applied position and shall be visibly different to the un-operated normal status.
- A flashing visual signal (red colour recommended) shall be activated on the PAI.
- An acoustic signal shall be activated.
- If another PAD is operated before the driver's acknowledgement the PAI response is the same.

6.3.2 The PAS shall give feedback of driver's acknowledgement by stopping the PAI acoustic signal and changing status of the previous feedback signal from flashing to steady.

The PAI acoustic signal shall not interfere with the ability of the driver to communicate with the passenger.

A1 For units designed for operation with staff on-board (other than driver), it is permitted to have this communication link established between the driver's cab and the staff on-board instead of between the passenger and the driver's cab. **A1**

6.3.3 After the driver's acknowledgement, if another PAD is operated, the PAI flashing signal goes to steady. PAI acoustic signal is managed for a minimum duration of 3 s, unless communication with the driver is already implemented.

6.3.4 It is recommended that the PAI should indicate when audio communication with the driver is available:

- by a steady green indication;
- by a tone feedback signal.

NOTE A possible tone can be two frequencies (1,5 kHz and 4 kHz), alternating at 8 Hz.

The acoustic signal may be complemented by a broadcast announcement.

EXAMPLE To advise the train crew.

6.4 Manage PAS communication

A1) For units designed for operation with staff on-board (other than driver), it is permitted to have this communication link established between the driver's cab and the staff on-board. In that case, the following requirements are not mandatory. **A1)**

6.4.1 PAS shall provide an acoustic link to enable a conversation between the driver and the place where the PAD has been operated. That link shall be initiated and closed by the driver.

6.4.2 The acoustic link shall be available at all locations where a PAD has been operated, permitting the driver to talk to every location where a PAD has been operated (link 'one to many' for the driver).

6.4.3 The system shall enable the driver to manage (simultaneously or sequentially) communications from at least one location and up to a maximum of three locations.

6.4.4 A location shall not hear the communication generated by another location, except from the driver, as shown in Figure 1.

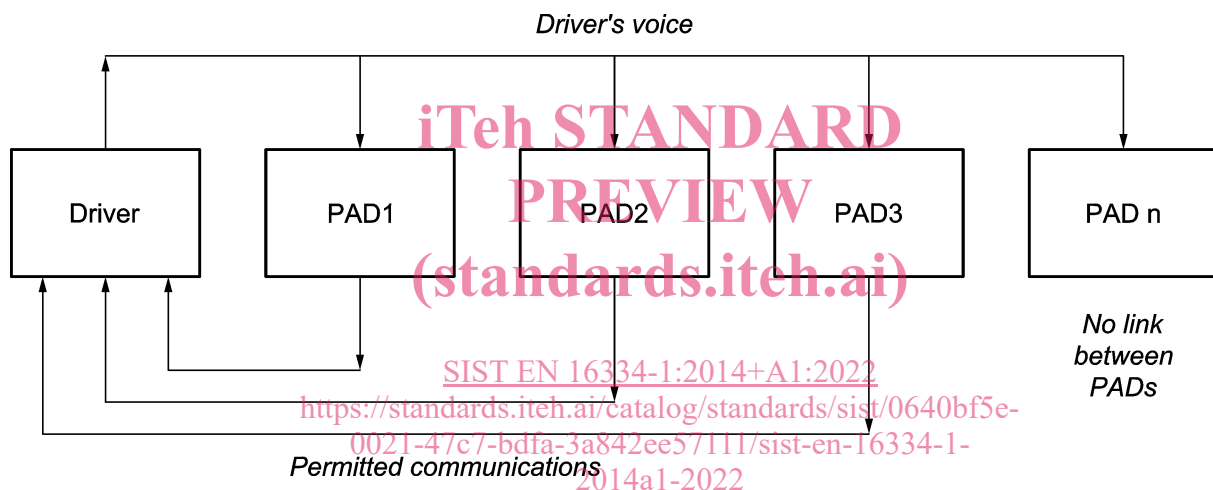


Figure 1 — Permitted communications

6.5 Determine if the train is stopped at a platform or departing from a platform

6.5.1 A train is considered as stopped at a platform if a door 'release' command has been activated and the train is at standstill. A train at a platform where there has not been any door 'release' command is considered as outside a platform area.

6.5.2 PAS shall consider that the train is still at a platform when there has been a change of door status from 'released' to 'closed and locked' and the end of platform has not been passed by the last vehicle.

6.5.3 PAS should have input from an on-board platform detection system.

6.5.4 If the platform is not physically detected, the train shall be considered to have left the platform when either one of the two following requirements is fulfilled:

- the distance covered is (100 ± 30) m; or
- the train travels for a duration of (16 ± 2) s.