BSI Standards Publication

Railway applications — Driver's cab Train Display Controller (TDC)

Part 2: Display systems FIS

bsi.

National foreword

This Published Document is the UK implementation of CLC/TR 50542-2:2016.

The UK participation in its preparation was entrusted to Technical Committee GEL/9, Railway Electrotechnical Applications.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2017.

Amendments/corrigenda issued since publication

Date	Text affected

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 50542-2

December 2016

ICS 35.240.60; 45.020

English Version

Railway applications - Driver's cab Train Display Controller (TDC) - Part 2: Display systems FIS

Bahnanwendungen - Train Display Controller (TDC) im
Führerraum - Teil 2: Spezifikation der Funktionalen
Schnittstelle(FIS) Anzeigesysteme

This Technical Report was approved by CENELEC on 2016-11-21.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (CLC/TR 50542-2:2016) has been prepared by CLC/TC 9X "Electrical and electronic applications for railways".

This document is currently submitted to voting in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 (simple majority) for acceptance as a CENELEC Technical Report.

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

Introduction

The perimeter of CLC/TR 50542-2 is the functional interface between the TDC and the displays. The functional definition of this interface is a key feature in the process to increase market development, for instance:

— by introducing more suppliers for new rolling stock development and for driver's cab refurbishment;

— by easing the control of maintenance and the replacement processes;

— by decreasing the related equipment Life cycle cost.

In this document the display and the TDC are considered only regarding their functionalities and not as physical devices.

The CLC/TR 50542 series consists of three documents:

— this document

— CLC/TR 50542-1 Railway applications — Driver's cab Train Display Controller (TDC) — Part 1: General architecture.

— CLC/TR 50542-3 Railway applications — Driver's cab Train Display Controller (TDC) — Part 3: Other train systems FIS.

These documents should not be interpreted as standards but as a study on the future view of the system. They do not describe an existing solution for the TDS.

These documents are not written to be used in call for tenders because they are not sufficient. However, they can serve as a basis for future development and standardization including new technologies. These documents are a first step, and may be completed later.

NOTE   In case of existing discrepancies between CLC/TR 50542–1:2014 and CLC/TR 50542–2:2016, the present document prevails.

1 Scope

The scope of this Technical Report is the definition of the functional interface between TDC and DMIs. See Figure 1.
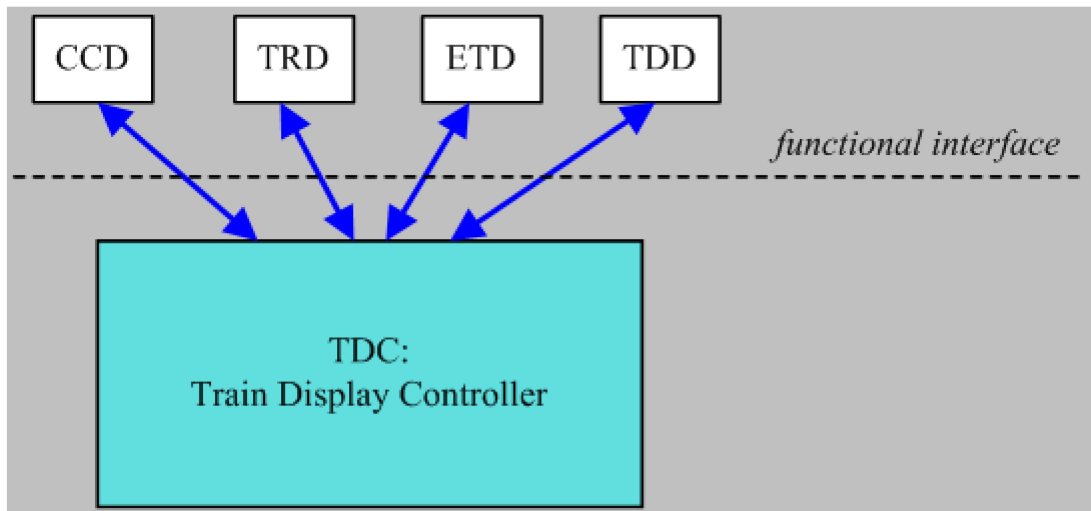
Figure 1 — TDC DMI functional architecture

The DMIs are those defined and considered in CLC/TR 50542-1.

The TDC is defined in document CLC/TR 50542-1.

NOTE 1   The conversion of physical signals into numerical representation is out of scope.

NOTE 2   The term DMI is used in this clause as synonym for display (see Clause 5).

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.

CLC/TR 50542-1:2014, *Railway applications - Driver's cab train display controller (TDC) - Part 1: General architecture*

3 Terms and definitions

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

3.1
input
information going from display to TDC

3.2
output
information going from the TDC to display

3.3
display screen organisation
delimitation and naming of screen's areas

3.4
display
hardware device or system that shows text and/or graphic information to the user combined with input device. It may include the sound interface

[SOURCE: EN 16186-3:2016; modified "combined with input device"]

Note 1 to entry: The sounds may be played by a separated sound generator.

4   Symbols and abbreviations

CCD   Control Command Display

CCTV   Closed Circuit Television

DMI   Driver Machine Interface

ETCS   European Train Control System

ETD   Electronic Timetable Display

FIS   Functional Interface Specification

TDC   Train Display Controller

TDD   Technical & Diagnostic Display

TDS   Train Display System

TRD   Train Radio Display

TSI CCS   Technical Specification for Interoperability - Control Command System

5   General principles

This document identifies the functions at the interface between the TDC and the displays.

NOTE 1   ETCS related data are out of scope of this FIS. This is to avoid discrepancies with TSI CCS related specifications. The only connection to/from the CCD is through the TDC as described in this document.

The goal of this document is to define functions in order to simplify exchanging or updating the displays (e.g. for maintenance or for obsolescence management purposes).

An important aspect related to the TDC and displays consists in certification. A simple display is assumed to need less integration and certification effort than a more complex one. Therefore, this document is based on the description of the interface of the TDC with a simple display.

This document in combination with CLC/TR 50542-1 intends to simplify exchanging or updating displays (e.g. for maintenance or for obsolescence management purpose).

The ergonomic of information (e.g. width, padding, height, font, text alignment, float, etc.) displayed to the driver is not part of the interface described in this document. The definition of display screen organization and information are found in reference documents (see Bibliography).

NOTE 2   The TDC manages information to be displayed on each displays, in normal as well as in degraded modes, as defined in EN 16186 series.

The documents listed in the Bibliography have been used as reference documents to help writing this Technical Report. They should not be considered as part of the current interface definition.

The performance of the data interface (e.g. transmission speed, availability, etc.) is not defined in this document.

The Annex A lists the remaining open points related to the interface between the TDC and the displays.

6 Functions

6.1 General

The functions described below are those needed to manage the dialogue between TDC and the displays.

Generic template of the functions description:

— Functional description: short description of the function.

— Direction: Input if the function is used from a display to the TDC. Output if the function is used from the TDC to a display. It may also be bidirectional.

— Feedback: information whether the request has been properly processed.

— Flashing: request for a flashing frame or symbol.

NOTE   Detailed flashing information are defined in related standards (e.g. EN 16186–3).

— Safety related: indicates that the function is safety related.

Status: start/stop of the function.

6.2 Operational functions

6.2.1 Display Button

— Functional description: operating element for interaction with the cab display (hard key, soft key, sensitive area). The colour and background are parts of each button definition in related standards.

— Direction: bidirectional.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Button request, Button Deletion Request, Ack and Button event report in CLC/TR 50542–1.

6.2.2 Display Indicator

— Functional description: element showing a system status. It can be a symbol or a text with an associated background. The colour, background and text are parts of each indicator definition in related standards.

— Direction: output.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Indicator request, Indicator Deletion Request, Picture request and Picture deletion request in CLC/TR 50542-1. Picture upload request is not considered as it is a technical solution.

6.2.3   Display Text Message

— Functional description: function showing any text message to the driver. It has an associated background.

— Direction: output.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Text message request and Text message deletion in CLC/TR 50542-1.

6.2.4   Play Sound

— Functional description: function playing a sound to inform the driver. The possible sounds are defined in related standards.

— Direction: output.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: not applicable.

— Status: play or stop play.

Covers Sound on request and Sound off request in CLC/TR 50542-1.

6.2.5   Enter Data

— Functional description: provide a possibility to the driver to enter one or several data.

— Direction: bidirectional.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Data Entry request and Data entry reply in CLC/TR 50542-1.

New function Data Entry deletion in addition to CLC/TR 50542-1.

6.2.6   Confirm Data

— Functional description: request to the driver to validate one or several data.

— Direction: bidirectional.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Data Confirmation request and Data confirmation reply in CLC/TR 50542-1.

New function Data Confirmation deletion in addition to CLC/TR 50542-1.

6.2.7   Display Values

— Functional description: show one or several values to the driver. Values may be displayed to the driver by means different from a collection of numbers, e.g. by a bargraph. Therefore display Values function is not the same as displaying a text or an indicator.

— Direction: output.

— Feedback: optional.

— Flashing: optional.

— Safety related: optional.

— Status: request or deletion.

Covers Dataview request, Dataview deletion request, Continuous dataview request and Continuous dataview deletion request: in CLC/TR 50542-1.

EXAMPLE   Possible values may be time tables, speed, pressure, voltage, traction/braking effort, train composition with device status …

6.2.8   Show Video

— Functional description: show CCTV (internal or external) to the driver.

— Direction: output.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: not applicable.

— Status: start showing or stop showing.

Additional function to CLC/TR 50542-1.

6.3 Display Management functions

6.3.1 Display Status

6.3.1.1 Display Status Request

— Functional description: TDC requests display status.

— Direction: output.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: optional.

— Status: request.

Covers Status request in CLC/TR 50542-1.

6.3.1.2 Display Status Report

— Functional description: supply of display availability information to the TDC.

— Direction: input.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: optional.

— Status: not applicable.

Covers Status answer in CLC/TR 50542-1.

6.3.2 Window Management

— Functional description: TDC requests or deletes a window on a display.

— Direction: output.

— Feedback: optional.

— Flashing: not applicable.

— Safety related: not applicable.

— Status: request or deletion.

Additional function to CLC/TR 50542-1.

NOTE   Redundancy management may be performed by the TDC by using the status and the Window Management functions.

6.3.3   Display Parameters

6.3.3.1   General

Additional functions to CLC/TR 50542-1 used to set and report the common displays parameters.

EXAMPLE   Luminance, loudspeaker volume, screen configuration, language...

6.3.3.2   Display Parameters Settings

— Functional description: TDC sets common display parameters.

— Direction: output.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: not applicable.

— Status: request.

6.3.3.3   Display Parameters Report

— Functional description: the display reports driver selected display parameters or initial display parameters to the TDC.

— Direction: input.

— Feedback: not applicable.

— Flashing: not applicable.

— Safety related: not applicable.

— Status: not applicable.

Annex A
(informative)

Open points

Ergonomic feedback (e.g. tactile feedback for displays without loudspeakers and visual feedback) remains an open point, mainly due to performance issues.

Bibliography

CLC/TR 50542-3:2016, *Railway applications — Driver's cab Train Display Controller (TDC) — Part 3: Other train systems FIS*

Subset 121, *DMI-EVC interface*

UIC 612 series, *Driver Machine Interfaces for EMU/DMU, Locomotives and driving coaches*

CLC/TS 50459 series, *Railway application – Communication, signalling and processing systems – ERTMS – Driver-Machine Interface*

EN 16186 (series), *Railway applications - Driver's cab*

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Copyright in BSI publications

All the content in BSI publications, including British Standards, is the property of and copyrighted by BSI or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use.

Save for the provisions below, you may not transfer, share or disseminate any portion of the standard to any other person. You may not adapt, distribute, commercially exploit, or publicly display the standard or any portion thereof in any manner whatsoever without BSI's prior written consent.

Storing and using standards

Standards purchased in soft copy format:

*   A British Standard purchased in soft copy format is licensed to a sole named user for personal or internal company use only.

*   The standard may be stored on more than 1 device provided that it is accessible by the sole named user only and that only 1 copy is accessed at any one time.

*   A single paper copy may be printed for personal or internal company use only.

Standards purchased in hard copy format:

*   A British Standard purchased in hard copy format is for personal or internal company use only.

*   It may not be further reproduced – in any format – to create an additional copy. This includes scanning of the document.

If you need more than 1 copy of the document, or if you wish to share the document on an internal network, you can save money by choosing a subscription product (see 'Subscriptions').

Reproducing extracts

For permission to reproduce content from BSI publications contact the BSI Copyright & Licensing team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email subscriptions@bsigroup.com.

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Useful Contacts

Customer Services
Tel: +44 345 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 345 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK