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

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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

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European Committee for Electrotechnical Standardization
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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.

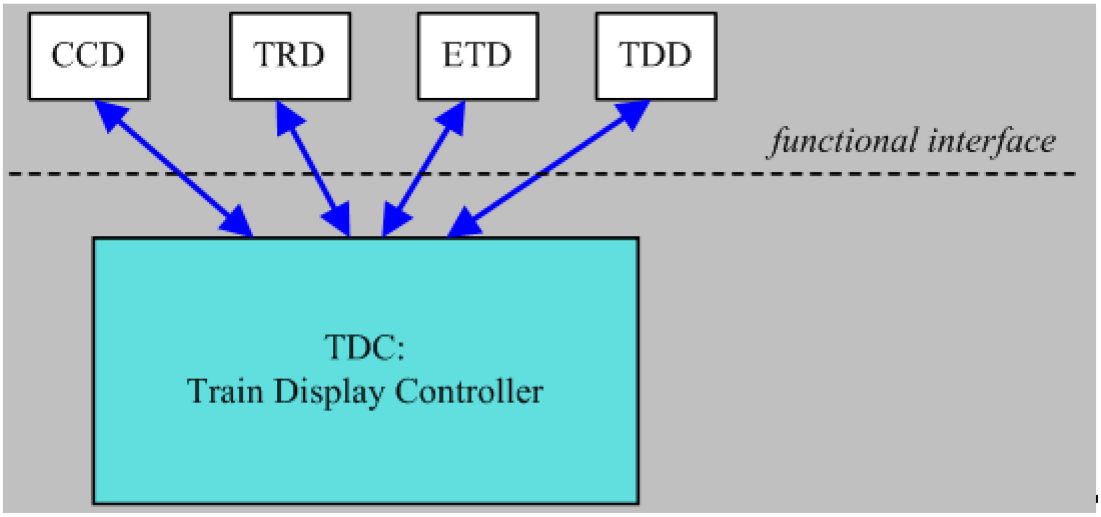

Figure 1 — TDC DMI functional architecture

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.