PD CLC/TR 50542-3:2016

BSI Standards Publication

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

Part 3: Other train systems FIS

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National foreword

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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.

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Published by BSI Standards Limited 2017

ISBN 978 0 580 91425 6
ICS 35.240.60; 45.020

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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 50542-3

December 2016

ICS 35.240.60; 45.020

English Version

Railway applications - Driver's cab train Display Controller (TDC) - Part 3: Other train systems FIS

Bahnanwendungen - Train Display Controller (TDC) im Führerraum - Teil 3: Spezifikation der Funktionalen Schnittstelle (FIS) Andere Zugsysteme

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

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

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European foreword

This document (CLC/TR 50542-3:2016) 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 50542-3 is the functional interface between the Other Train Systems (OTS) and the TDC.

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 train borne systems 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 50542-2, Railway applications — Driver's cab Train Display Controller (TDC) — Part 2: Display 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 50542–3:2016, the present document prevails.

1 Scope

The scope of this document is the definition of the functional interface between TDC and other train systems. These “Other Train Systems” are the train systems interfacing with the TDC excluding the displays (CLC/TR 50542-2), ETCS/STM onboard (Subset-121) and already designed class B ATP systems.

The functional interface deals with data exchanged between TDC and these train systems.

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

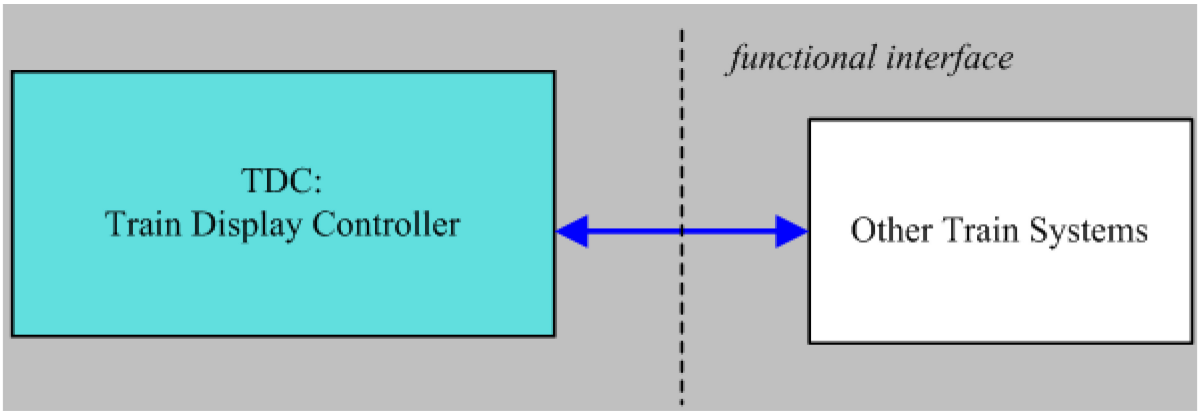

Figure 1 — TDC- OTS functional interface

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

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*

CLC/TR 50542-2:2016, *Railway applications — Driver's cab Train Display Controller (TDC) — Part 2: Display systems FIS*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply in addition to the terms defined in CLC/TR 50542-1:2014 and CLC/TR 50542-2:2016.

3.1
other train systems
train on board systems interfaced with the TDC excluding ETCS/STM onboard, class B ATP systems, and the displays

EXAMPLE Train borne systems could be the train systems interacting with the driver through the TDC (e.g. brake system, HVAC systems, traction system, CCTV).

Note 1 to entry: The interface between the TDC and the ETCS/STM onboard is described in Subset 121 (see Bibliography).

Note 2 to entry: The interface between the TDC and the displays is described in CLC/FprTR 50542–2:2016.

3.2
input
information going from the Other Train Systems (OTS) to TDC. See Figure 2

3.3
output
information going from TDC to the OTS. See Figure 2 — Functional Input and Output definitions

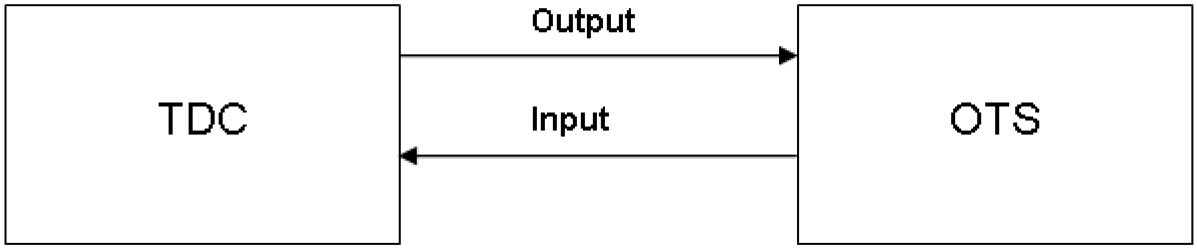

Figure 2 — Functional Input and Output definitions

4 Symbols and abbreviations

ATP	Automatic Train Protection
CCS	Control Command and Signalling
CCTV	Close Control Circuit Television
ETCS	European Train Control System
FIS	Functional Interface Specification
HVAC	Heating Ventilation and Air Conditioning
I	Input
OTS	Other Train Systems
O	Output
STM	Specific Transmission Module
TDC	Train Display Controller
TSI	Technical Specification for Interoperability

5 General principles

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

NOTE 1 From a functional point of view, the OTS are interfacing with the TDC independently from the architecture of the TDS.

NOTE 2 ETCS related data are out of scope of this FIS. This is to avoid discrepancies with TSI CCS related specifications.

The goal of this document is to define functions in order to simplify exchanging or refurbishing OTS or TDCs. This document in combination with CLC/TR 50542-1:2014 and CLC/TR 50542-2:2016 intends to simplify exchanging or updating TDCs (e.g. for maintenance or for obsolescence management purpose).

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.

6 Functions

6.1 General

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

Generic template of the functions description:

— Functional description: short description of the function.

— Direction: Input or Output according definitions in Clause 3. It may also be bidirectional.

— Parameter: single or set of data complementary to the function.

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

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

— Status: start/stop of the function.

NOTE Flashing for a frame or symbol is not useful for the functions above because this is only managed by the TDC.

6.2 State

— Functional description: the OTS sends state information to the TDC. This state information is used by the TDC to send information to the displays.

— Direction: input.

— Parameter: optional.

— Feedback: optional.

— Safety related: optional.

— Status: not applicable.

Corresponding to CLC/TR 50542-2:2016 functions: Display Button (output), Display Indicator (output), Display Text Message (output), Play Sound (output), Display Values (output).

6.3 Command

— Functional description: the TDC sends a request to an OTS.

— Direction: output.

— Parameter: optional.

— Feedback: optional.

— Safety related: optional.

— Status: not applicable.

Corresponding to CLC/TR 50542-2:2016 functions: Display Button (input), Confirm Data (input).

6.4 Provide Video

— Functional description: the OTS provides CCTV (internal or external to the train) to the TDC.

— Direction: input.

— Parameter: not applicable.

— Feedback: not applicable.

— Safety related: not applicable.

— Status: start or stop.

Corresponding to CLC/TR 50542-2:2016 function: Show Video (output).

6.5 Management functions (optional)

6.5.1 TDS Status

— Functional description: the TDC provides TDS status to the OTS.

— Direction: output

— Parameter: optional

— Feedback: not applicable

— Safety related: optional

— Status: not applicable

Not directly corresponding to function of CLC/TR 50542-2:2016.

6.5.2 OTS Status

If needed, the OTS status can be send by the function State.

6.6 Relationship between CLC/FprTR 50542-2:2016 and CLC/FprTR 50542-3:2016

Table 1 provides an overview of the functions defined in the CLC/TR 50542-2:2016 and the corresponding functions described in this document.

Table 1 — Relationship between CLC/TR 50542–2:2016 and CLC/TR 50542–3:2016

Function in CLC/TR 50542–2:2016	**Corresponding function in CLC/TR 50542-3:2016**
Display Button (I)	Command
Display Button (O)	State
Display Indicator (O)	State
Display Text Message (O)	State
Play Sound (O)	State
Enter Data (I)	Command (with use of parameter)
Enter Data (O)	State (with use of parameter)
Confirm Data (I)	Command (optionally with use of parameter)
Confirm Data (O)	State (with use of parameter)
Display Values (O)	State (with use of parameter)
Show Video (O)	Provide Video
Not applicable	TDS Status (optional)

Annex A
(informative)

Examples of OTS functions

Some examples of OTS functions and their use of the interface are given in the table below.

Table A.1 — Examples of OTS functions

OTS	Examples of functions	Function
Brakes	Parking brake applied	State — Functional description: the brake system sends information to the TDC that the parking brake is applied. — Direction: input — Parameter: no — Feedback: no — Safety related: no
Doors system	Open door with movable step	Command — Functional description: the TDC requests to open the door. — Direction: output — Parameter: “with movable step” — Feedback: “in progress” — Safety related: no
CCTV (inside or rear view)	Show left platform	Provide video — Functional description: the external CCTV provides video to the TDC. — Direction: input — Status: start

Bibliography

Subset 121, *DMI-EVC interface*

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

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