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**Železniške naprave – Komunikacijski, signalni in procesni sistemi – Evropski sistem za vodenje železniškega prometa – Vmesnik človek-stroj – 4. del: Vnos podatkov v sistem ERTMS/ETCS/GSM-R**

**(istoveten CLC/TS 50459-4:2005)**

Railway applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 4: Data entry for the ERTMS/ETCS/GSM-R systems

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**Railway applications –  
Communication, signalling and processing systems –  
European Rail Traffic Management System –  
Driver-Machine Interface  
Part 4: Data entry for the ERTMS/ETCS/GSM-R systems**

Applications ferroviaires –  
Systèmes de signalisation, de  
télécommunications et de traitement –  
Système européen de gestion du trafic  
ferroviaire –  
Interface de conduite  
Partie 4: Entrée de données pour les  
systèmes ERTMS/ETCS/GSM-R

Bahnanwendungen –  
Telekommunikationstechnik, Signal-  
technik und Datenverarbeitungssysteme –  
Europäisches Leitsystem für den  
Schienenverkehr –  
Mensch-Maschine Schnittstelle  
Teil 4: Dateneingabe für  
ERTMS/ETCS/GSM-R Systeme

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This Technical Specification was approved by CENELEC on 2005-05-07.

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## CENELEC

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

This Technical Specification 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 vote and was approved by CENELEC as CLC/TS 50459-4 on 2005-05-07.

The following date was fixed:

- latest date by which the existence of the CLC/TS  
has to be announced at national level (doa) 2005-11-07

This Technical Specification has been prepared under mandates M/024 and M/334 given to CENELEC by the European Commission and the European Free Trade Association.

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## Introduction

This Technical Specification forms Part 4 of a series, the other parts being:

CLC/TS 50459-1 for ergonomic principles for the presentation of ERTMS/ETCS/GSM-R information

CLC/TS 50459-2 for ergonomic arrangements of ERTMS/ETCS information

CLC/TS 50459-3 for ergonomic arrangements of ERTMS/GSM-R information

CLC/TS 50459-5 for symbols for ERTMS/ETCS/GSM-R

CLC/TS 50459-6 for audible information for ERTMS/ETCS/GSM-R

These Technical Specifications contain the ergonomic arrangements of information on the ERTMS DMI Display. Most items are illustrated with an example.

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## 1 Scope

This Technical Specification describes from an ergonomic point of view how ERTMS information shall be arranged and displayed. This Technical Specification describes more ergonomic details than currently provided by the ERTMS/ETCS/GSM-R specifications.

This Technical Specification defines the ergonomics for the Driver-Machine Interface (DMI) for the ERTMS/ETCS Train Control System, and for the integrated ERTMS/GSM-R Train Control and Train Radio Systems, and for the stand alone ERTMS/GSM-R Train Radio Systems and for other technical systems currently provided on the engines.

The ergonomics covers the

- general arrangements (dialogue structure, sequences, layout philosophy, colour philosophy),
- symbols,
- audible information,
- data entry arrangements.

The aims of the ERTMS/ETCS/GSM-R Train Control and Train Radio Systems are standardised systems facilitating interoperable movement of trains and permitting economies of scale in procurement and operations. The objective of this Technical Specification is to define the minimum requirements on the DMI that are necessary to enable these objectives to be achieved. Hence the Technical Specification is limited to ergonomic considerations and does not define the technology to be used for the implementation.

The reasons for defining the ergonomics of the DMI are as follows:

- achieving harmonised and coherent presentation for ERTMS/ETCS and STM information. Given the large number of STM's requiring the use of the ERTMS/ETCS DMI, only a harmonised approach is feasible; <https://standards.iteh.ai/catalog/standards/sist/c3379199-eed3-4c17-a278-19e9fe221cfc/sist-ts-clc-ts-50459-4-2006>
- defining Driver-Machine Interface ergonomics that is compatible with agreed interoperable ERTMS specifications;
- to reduce the risk of incorrect operation by a driver working with different trains fitted with ERTMS/ETCS and ERTMS/GSM-R;
- facilitating train operation with a unified ergonomics, hence reducing the cost of driver training.

This Technical Specification is applicable on all trains fitted with the ERTMS/ETCS and also for trains fitted with train radio (GSM-R) DMI.

The scope of Part 4 of the Technical Specification CLC/TS 50459 series is to define data entry principles for the interface between the driver and ERTMS/ETCS/GSM-R.

This specification gives guidelines how to implement different technology (soft keys, touch screen device, LCD, cathode tube, etc.)

## 2 Normative references

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

*Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system, Official Journal L 235 , 17/09/1996 P. 0006 – 0024*

CLC/TS 50459-1, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 1: Ergonomic principles for the presentation of ERTMS/ETCS/GSM-R information*

CLC/TS 50459-2, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 2: Ergonomic arrangements of ERTMS/ETCS information*

CLC/TS 50459-3, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 3: Ergonomic arrangement of ERTMS/GSM-R information*

CLC/TS 50459-5, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 5: Symbols*

CLC/TS 50459-6, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 6: Audible information*

UIC 651, *Layout of driver's cabs in locomotives, railcars, multiple-unit trains and driving trailers*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in CLC/TS 50459-1 and the following apply.

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#### 3.1

##### **accepted data value**

data value that has been taken into account by the On-Board system through the accepting data action

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#### 3.2

##### **accepting data**

driver action to indicate to the On-Board system that the data value of the selected input field should be taken into account by the On-Board system

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#### 3.3

##### **data**

variable of the trainborne system

#### 3.4

##### **data entry**

##### **data entry process**

procedure used by the driver to enter data. It could contain several data entry steps

#### 3.4

##### **data entry step**

phase of the data entry process when a set of data has to be entered by the driver

#### 3.6

##### **data value**

string of number(s) and/or character(s) associated to one data

#### 3.7

##### **input sequence**

sequence of data within a data entry step

## 4 Symbols and abbreviations

For the purposes of this document, symbols and abbreviations given in CLC/TS 50459-1 apply.

## 5 Data entry

### 5.1 Data entry general principles

#### 5.1.1 Data entry operation

The DMI shall allow three types of operations related to data entry:

- data entry/change;
- data view;
- data validation.

The layout used for those operations shall be called “window” associated to the related operation name: data entry/change window, data view window and data validation window. The wording “Data window” shall cover the three types of windows: data entry/change, data view and data validation.

Data windows to be used while the train is moving shall not cover speed and supervision information. This implies that data windows used while the train is moving shall only cover a limited part of the whole grid array (See CLC/TS 50459-1 for the definition of the grid array).

In general, the data entry shall be possible both at standstill and while the train is moving. Depending on the data, some data entry is only possible at standstill.

NOTE 1 Data entry windows allow the driver to enter/change the requested data. Data view windows allow the driver to view entered data. Data validation windows allow the driver to validate data.

To facilitate the driver task, the use of default data values and/or pre-defined data selection shall be possible and should always be used whenever possible.

The amount of data to be entered manually by the driver should be minimised. Automated data entry is preferred.

The requirements for data windows are valid regardless of the technology chosen for driver input and presentation of information.

The driver shall be informed about errors in the data entry process by means of prompt messages. (Refer to CLC/TS 50459–1)

NOTE 2 One can refer to CLC/TS 50459-1 for a detailed description of input fields.

#### 5.1.2 Data entry means

The driver shall have two ways to enter/change data:

- Free data: entered character by character by means of a keyboard,
- Pre-defined data: entered by means of a data value selection.

NOTE Keyboards and pre-defined data selection is described in CLC/TS 50459-1 of this specification.

### 5.1.3 State of a data

For the data entry procedure it is important for the driver to see the progression of the current data entry step. This shall be shown to the driver by means of the "state" of each item of data.

The state shall define if a data value is already accepted by the driver or not during the current data entry step. There shall be three states:

- accepted state,
- not accepted state,
- empty state.

### 5.1.4 Default data

To facilitate the data entry, a default data value shall be presented to the driver if it is available.

Once the input field is selected, the driver shall have two possibilities:

- to accept the default data value by activating the corresponding [Enter] button,
- to erase the whole default data value by typing any new character/selecting a new data value or the [Delete] button.

If the default data value is not available, an empty input field shall be presented to the driver.

NOTE For further details on input fields, see CLC/TS 50459-1.

### 5.1.5 Entry/change sequence

The selected input field shall be shown highlighted. By this means, it shall be clear to the driver which data has to be entered/changed and accepted by the driver.

When the data has been at least accepted once by the driver, the corresponding data value shall be shown in accepted state.

When the data has still to be accepted by the driver, the corresponding data value shall be shown in not accepted state.

The dialogue sequence for the different data entry steps shall be consistent whatever is the step and whatever are the data to be entered.

### 5.1.6 Data entry/change accessibility

The request for data shall be presented to the driver on a data entry window. A data entry window shall be displayed to the driver under the control of the ERTMS/ETCS trainborne system or on request of the driver.

Under the control of the ERTMS/ETCS trainborne system, the data entry windows shall appear automatically to the driver according to the procedure defined within the applicable specifications.

It shall be also possible for the driver to request the display of the appropriate data entry windows by means of menu selection. The menu selection is specified in CLC/TS 50459-1, CLC/TS 50459-2 and CLC/TS 50459-3.

### 5.1.7 Data entry/change window navigation

If necessary the driver shall be able to close the data entry/change window by activating the [close] control button (this may cause an error message, since the data entry has not been finished).

On a window where more than one data value has to be entered, the driver may have the possibility to accept all the data together by the activation of a single control button [enter all] (See CLC/TS 50459-1 for the control button definition and Figure 1).



Figure 1 — Data entry/change window with [enter all] enabled

Once the driver has accepted one data on a window page where more than one data has to be entered, the next data item, according to the predefined input sequence, shall be selected automatically. This shall be also applicable if the next data is on a next data entry/change window and shall trigger the display of the next data entry/change window.

When more than one data has to be entered on the same window page, the driver shall be able to deviate from the predefined input sequence.

The driver shall have the possibility to re-enter a data already entered at any time.

### 5.1.8 Data validation window navigation

The data validation procedure shall use two steps to validate the data. These two steps shall use at least two different key positions. The second step can also be done by an external button or device elsewhere on the driver's desk. If the second validation is dedicated to an external button the DMI shall present the guidance to use this button.

#### Validation steps:

1. First step: The driver shall validate the data values by activating a key "Yes" or shall not validate the data values by activating the key "No". The answer Yes/No shall be echoed in the input field.
2. Second step: The driver shall accept the validation answer Yes/No by activating the corresponding [Enter] button.

NOTE The use of two different keys is an ergonomic way to avoid a reflex response from the driver.