PD CLC/TS 50459-3:2016

BSI Standards Publication

Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System — Driver-Machine Interface

Part 3: Ergonomic arrangements of non ETCS information

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National foreword

This Published Document is the UK implementation of CLC/TS 50459-3:2016. It supersedes DD CLC/TS 50459-3:2005 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GEL/9, Railway Electrotechnical Applications, to Subcommittee GEL/9/1, Railway Electrotechnical Applications - Signalling and communications.

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

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Bahnanwendungen - Telekommunikationstechnik, Signaltechnik und Datenverarbeitungssysteme - Europäisches Leitsystem für den Schienenverkehr - Mensch-Maschine Schnittstelle - Teil 3: Ergonomische Anordnung der Nicht-ETCS Informationen

This Technical Specification was approved by CENELEC on 2015-12-07.

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European foreword

This document (CLC/TS 50459-3:2016) has been prepared by CLC/SC 9XA “Communication, signalling and processing systems”, of Technical Committee CLC/TC 9X “Electrical and electronic applications for railways”.

This document supersedes CLC/TS 50459-3:2005.

The main changes with respect to the previous edition are listed below:

- Update general principles for the presentation of non ETCS information correlated with ERA document ERA_ERTMS_015560.

- Update ergonomic arrangements with prEN 16186 series.

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.

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.

Introduction

This Technical Specification should be read in conjunction with ERA_ERTMS_015560:2014 "ETCS Driver Machine Interface" and prEN 16186 series, "Railway applications — Driver's Cab".

This Technical Specification is Part 3 of a series with the following parts:

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

CLC/TS 50459-2 Ergonomic arrangements of ERTMS/GSM-R information

CLC/TS 50459-3 Ergonomic arrangements of non ETCS information

This part of this Technical Specification contains the ergonomic arrangements of non ETCS information. Annex A of this part shows examples of existing NTC DMI layouts.

Annex B of this part lists the sound examples for NTC and other train functions (not exhaustive).

1 Scope

This Technical Specification describes from an ergonomic point of view how non ETCS information are arranged and displayed on the CCD. More specifically, it covers information that is not within the scope of ERA document ERA_ERTMS_015560.

This Technical Specification describes two possible technologies for implementing the ETCS DMI namely touch screen and soft key.

National systems not integrated within ETCS DMI are not within the scope of this specification.

Redundancy concepts are not within the scope of this document.

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.

prEN 16186-3:2014, *Railway applications — Driver's cab — Part 3: Design of displays*

CLC/TS 50459-1:2015, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information*

EUROPEAN RAILWAY AGENCY - ERTMS/ETCS - ETCS Driver Machine Interface - Reference: ERA_ERTMS_015560 - Version 3.4.0 - 2014-05-12

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1
ETCS DMI
CCD that allows communication between ETCS on-board equipment and the driver

3.1.2
ETCS DMI default window
total image display area with the allocation of objects, text messages and buttons as described in ERA ERTMS 015560 chapter 8 and 9

3.1.3
NTC default window
a NTC default window is shown in NTC operation (Level NTC, modes SN or NL)

Note 1 to entry: The layout of a NTC default window may differ to an ETCS default window.

3.2 Abbreviated terms

For the purpose of this document, the abbreviated terms given in CLC/TS 50459-1, CLC/FprTS 50459-2 and _ERTMS_015560 and the following apply.

ASC Automatic Speed Control
ATC2 Swedish/Norwegian ATP system
ATO Automatic Train Operation
ATP Automatic Train Protection
ATTO Activated Train Trip Override
AWS Automatic Warning System (UK)
DAC Driver Activity Control
DAS Driver Advisory System
DMI Driver-Machine Interface
JKV Junien Kulunvalvonta (Finnish ATP system)
LZB Linienzugbeeinflussung (German ATP system)
NL Non Leading mode
NTC National Train Control
OM Operative Mode
PZB Punktzugbeeinflussung (German ATP system)
PLZB LZB/PZB or PZB
SCMT Sistema Controllo Marcia Treno (Italian ATP system)
SHP Samoczynne Hamowanie Pociągu (Polish ATP system)
SN National System mode
SSC Sistema di Supporto alla Condotta (Italian ATP System)
STM Specific Transmission Module
TPWS Train Protection and Warning System (UK)

4 General principles

4.1 Purpose of document

4.1.1 General

A clear and consistent definition of the non ETCS driver machine interface helps the driver to better understand the tasks he has to perform. This increases the speed and the accuracy of interactions between the driver and the non ETCS on-board equipment (NTC and/or other on-board systems), hence reducing the probability of human errors.

Moreover, harmonizing the presentation of displayed information and the driver's interactions with the equipment, contributes to a unified operation of the trains regardless of which suppliers products they are fitted with. This reduces further the potential for human errors, reduces the driver training requirement and facilitates cross-acceptance of equipment.

Annex A gives existing examples for the integration of NTC and/or other on-board systems.

Annex B gives existing examples of the sounds for NTC and other train functions.

The lists given in Annex A and Annex B are not exhaustive.

4.1.2 Ergonomic arrangements of areas of the ETCS layout

For the definition of non ETCS screen layouts (NTC or other on-board systems) the basic layouts described in CLC/TS 50459-1 and ERA ERTMS 015560 should apply.

The basic layouts apply for a 'Unified DMI' as defined in ERA ERTMS 015560. For a 'Customised DMI' it is possible to modify these layouts for NTC operation.

The basic layouts for touch screen technology and soft key technology are shown in Figure 1 and Figure 2. These layouts are taken from the ERA ERTMS 015560 document to aid the use of this document.

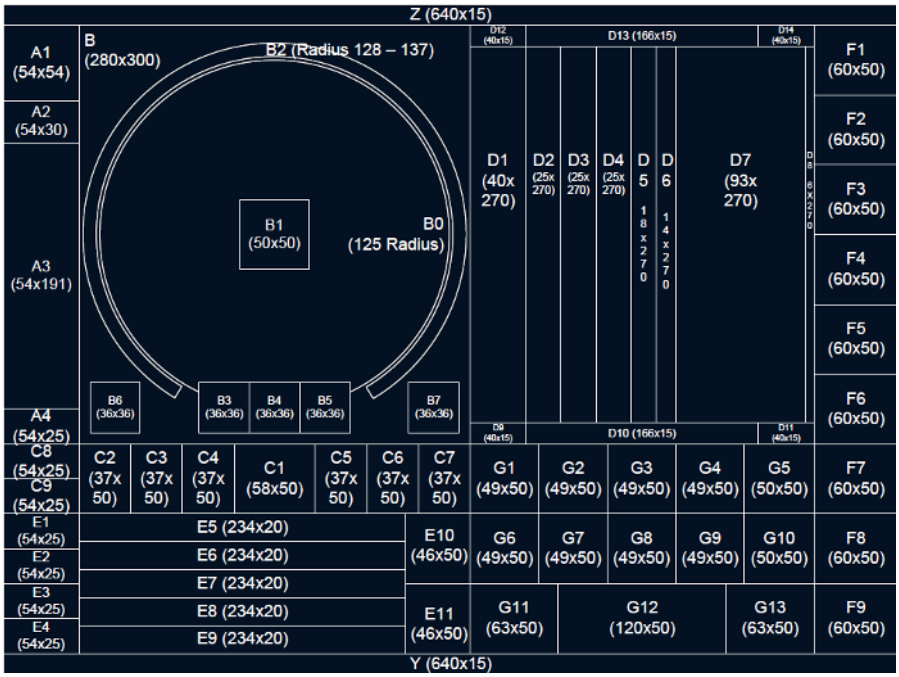


Figure 1 — The sub areas of the ERTMS/ETCS layout (touch screen technology)

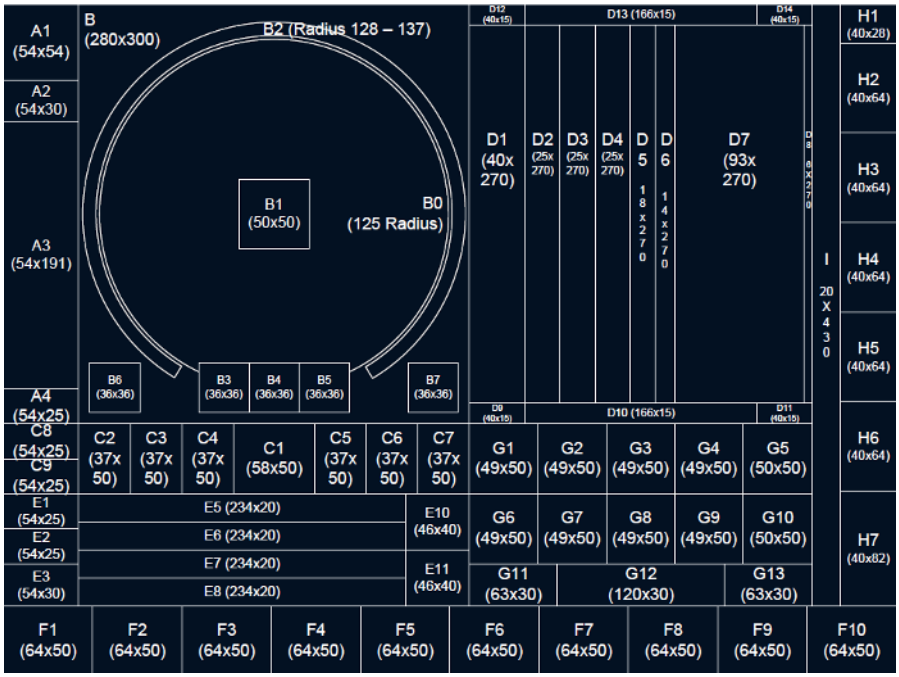


Figure 2 — The sub areas of the ERTMS/ETCS layout (soft key technology)

4.1.3 ETCS objects

Even if authorized by other standards, for ergonomic reasons the size and location of ETCS objects should not be changed.

4.1.4 Non ETCS objects

For displaying a NTC and other on-board systems (e.g. DAC) together, the position and size of the objects shall be arranged to prevent overlapping.

4.2 Audible information for non ETCS systems

According to ERA ERTMS 015560 audible information for a non ETCS system should be sent specified by a sequence of segments defined by a duration and an associated frequency sent to the ERTMS/ETCS on-board system (Unified DMI).

For a customized DMI the audible information should be sent by *.wav files.

If a non ETCS system requires its own audible information this is mentioned in the corresponding section.

Examples of audible information mentioned in this document are described in Annex B.

4.3 Data entry

Data entry repetition of same data should be avoided.

5 Non ETCS symbols

5.1 General requirements for unified DMI service

According to ERA ERTMS 015560 only areas of the ETCS DMI default window that are not used for ETCS information in NTC levels and modes NL or SN can be used for NTC buttons and indicators.

The available areas for buttons are

- for soft key technology: F8, F9, F10, H2, H3, H4;
- for touch screen technology: F8, F9, C2, C3, C4, C5, C6, G1-G10.

The available areas for indicators are

- for soft key technology:B3, B4, B5, C2, C3, C4, C5, C6, G1-G13, H1;
- for touch screen technology: B3, B4, B5, C2, C3, C4, C5, C6G1-G13.

The available button and indicator areas shall be mapped to a corresponding position identifier (see Figure 1 and Figure 2).

Speed and distance supervision information sent by the NTC shall be displayed by the ETCS DMI according to ERA ERTMS 015560.

NOTE For touch screen technology, some areas can be used for buttons or indicators, depending on the need of the National System.

5.2 Symbols for other train functions

The symbols for other train functions (e.g. DAC, Passenger Alarm initiated brake application, Open Door Alarm, Main Circuit Breaker) may be displayed in area G.

The usage of area G shall not be in contradiction with prEN 16186-3:2014, Annex A.

Annex A
(informative)

Integration of NTC and/or other on-board systems

A.1 Usage of screen areas

All areas marked in yellow colour are used by NTC and/or other on-board systems as shown in the examples.

The ergonomics of the examples are based on the area arrangements for the ETCS layout (see Figure 1 and Figure 2).

A.2 LZB/PZB NTC

A.2.1 Scope and field of specification

This example shows the interface between the driver and the LZB/PZB on-board regarding to the use in context with ERTMS/ETCS and as standalone system (LZB/PZB in fallback mode).

The specification describes two possible technologies for implementing the LZB/PZB DMI, namely touch screen or soft key.

The requirements regarding LZB/PZB are defined in [20], [21], [28] and [29].

A.2.2 Overview

Figure A.1 and Figure A.2 explain the usage of the ETCS DMI areas.

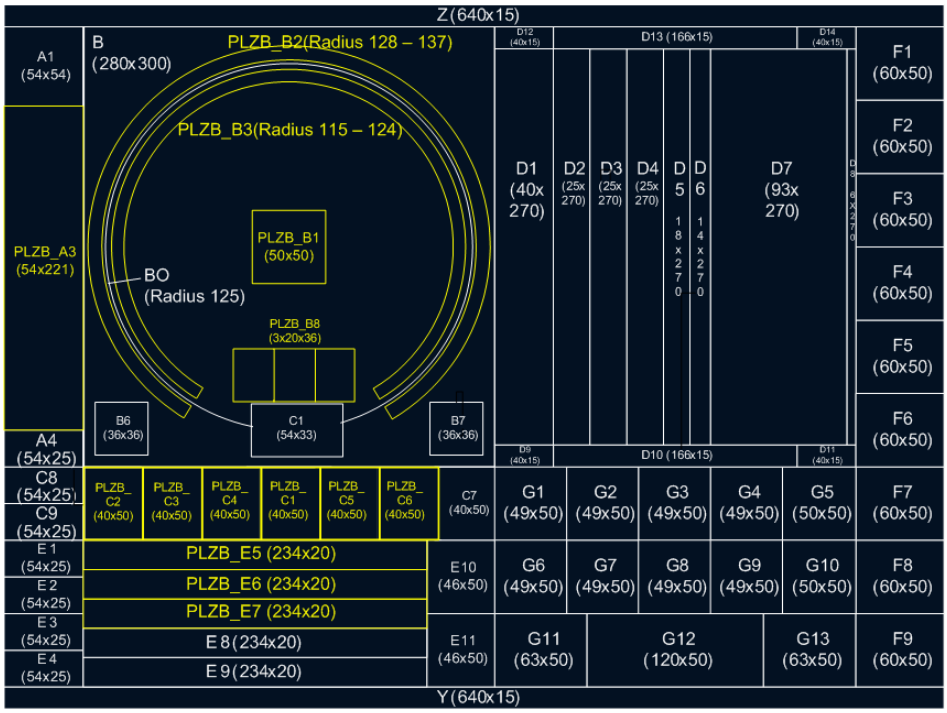


Figure A.1 — The sub areas of the LZB/PZB layout (touch screen technology)

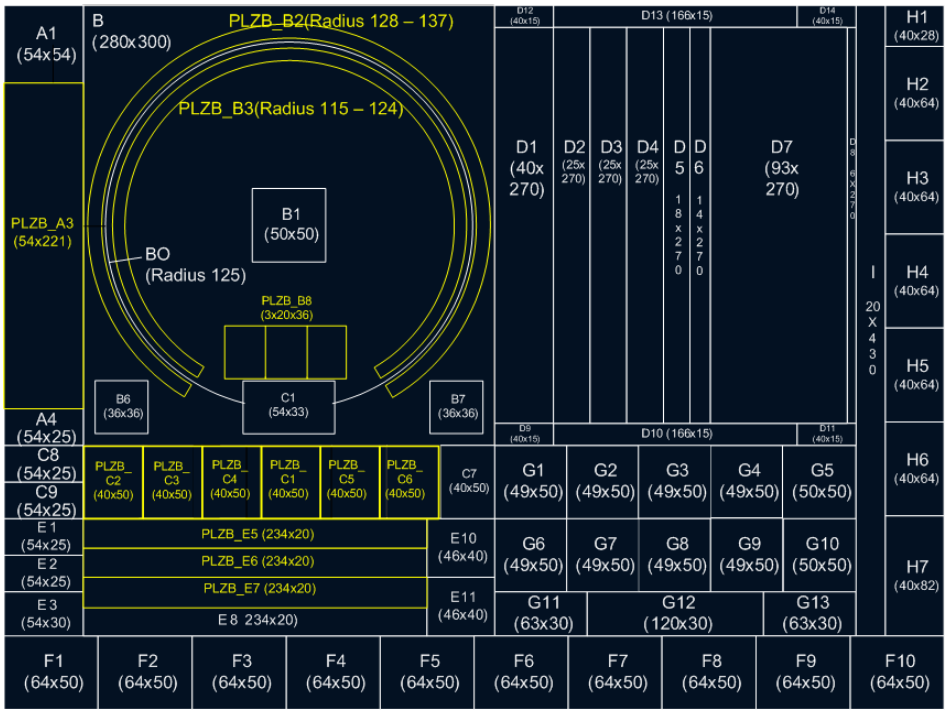


Figure A.2 — The sub areas of the LZB/PZB layout (soft key technology)

To avoid competitive use of the text area, the LZB/PZB text messages are displayed as private areas (PLZB_E5/6/7) outside ETCS scrolling. For ETCS messages only areas E8/9 (touch screen technology) respectively area E8 (soft key technology) are available.

A.2.3 Positioning onto the grid array

A.2.3.1 Area description

All areas not defined here are in positions and dimension according to ERA ERTMS 015560.

Area A (total size: 54 x 300 cells (w x h)) is composed of:

- PLZB_A3 instead of A2 and A3 (54x221).

Area B (total size: 280 x 300 cells (w x h)) is composed of:

- PLZB_B2 (radius 128 to 137);
- PLZB_B3 (radius 115 to 124);
- PLZB_B8 (60x36) (the centre of PLZB_B8 is positioned (140,239));
- C1 (54x33) (the centre of C1 is positioned (140,277)).

NOTE B3/4/5 are not described in this layout because currently not used.

Area C (total size: 334 x 50 cells (w x h)) is composed of:

- C1 (58x50) not used in area C, is defined in area B;
- PLZB_C2/3/4/1/5/6 (6x (40x50));
- C7(40x50).

For touch screen technology:

Area E (total size 334 x 100 cells (w x h)) are composed of:

- PLZB_ E5/6/7 (3x (234x20)) placed instead of E5/6/7;
- E8/9 (2x (234x20)).

For soft key technology:

Area E (total size 334 x 80 cells (w x h)) are composed of:

- PLZB_ E5/6/7 (3x (234x20)) placed instead of E5/6/7;
- E8 (234x20).

A.2.3.2 Speed and distance monitoring – supervision status

For the speed and distance monitoring on touch screen and soft key technology the following areas are used:

- PLZB_ B1 (50x50) placed instead of B1 showing actual speed;
- PLZB_B8 (3x20x36) placed above C1 showing the target speed of LZB;
- PLZB_B2 (radius 128 to 137) showing the permitted speed of LZB;

- PLZB_B3 (radius 115 to 124) showing the permitted speed of ASC or the permitted speed of Cruise Control.

A.2.4 ETCS and LZB/PZB information shown on a LZB/PZB default window

A.2.4.1 Introduction

The layers on the LZB/PZB default window have different or additional requirements to ERA ERTMS 015560 as follows:

- Layer 0: no change;
- Layer -1: PLZB_A3, PLZB_C2, PLZB_C3, PLZB_C4, PLZB_C1, PLZB_C5, PLZB_C6;
- Layer -2: PLZB_B8, C1 (in area B).

A.2.4.2 ETCS objects

The area C1 is moved to area B.

A.2.4.3 NTC objects

A.2.4.3.1 General

The LZB/PZB text messages are displayed in area PLZB_E5/6/7.

The cursor buttons E10 and E11 are without effect to the area PLZB_E5/6/7. The scrolling has only effect to the text messages in area E8/9 (touch screen technology) respectively in area E8 (soft key technology).

The LZB/PZB text messages have to remain different from ETCS text messages, because they always have to be seen in the context of the indicators in PLZB_C2/3/4/5/6.

A.2.4.3.2 Indicators PLZB_C2/3/4/5/6

The indicators PLZB_C2/3/4/5/6 are displayed according to [21] and [28].

A.2.4.3.3 Supervision information

A.2.4.3.3.1 Current train speed pointer

The current speed is displayed in area PLZB_B1 as grey needle object. The dimension of the needle object is according to ERA ERTMS 015560.

A.2.4.3.3.2 Vperm of LZB

Vperm of LZB is displayed in area PLZB_B2 as red equilateral triangle with needle in direction to the centre of PLZB_B1.

A.2.4.3.3.3 Vtarget of LZB

Vtarget of LZB is displayed in PLZB_B8 as three digit value in yellow.

A.2.4.3.3.4 Vperm of ASC

Vperm of ASC is displayed in PLZB_B3 as a yellow rhombus pointing to the centre of PLZB_B1.

A yellow rhombus means: Dynamic brake and pneumatic brake are involved.

A.2.4.3.3.5 Vperm of 'Cruise Control'

Vperm of 'Cruise Control' is displayed in PLZB_B3 as a magenta circle.

A magenta filled circle means: Only the dynamic brake is involved.

A.2.5 LZB/PZB sub-level windows

A.2.5.1 Introduction

For all equipment where the LZB and PZB function is implemented, all requirements in ERA ERTMS 015560 described with the label "NTC X" are described with the label "LZB/PZB".

For all equipment where the PZB function is implemented only, all requirements in ERA ERTMS 015560, described with the label "NTC X" are described with the label "PZB".

In the following figures of this annex for all equipment where the LZB and PZB function is implemented the following replacements are used:

Table A.1 — LZB/PZB terms in figures

Term in Figures	Term in LZB/PZB
NTC X	LZB/PZB
label 1	BRA
label 2	BRH
label 3	ZL
label 4	VMZ
data 1	value BRA
data 2	value BRH
data 3	value ZL
data 4	value VMZ

For all equipment where only the PZB function is implemented the following replacements will be used**:**

Table A.2 — PZB terms in figures

Term in Figures	Term in PZB
NTC X	PZB
label 1	BRA
label 2	BRH
data 1	value BRA

Term in Figures	Term in PZB
data 2	value BRH

A.2.5.2 Menu windows

A.2.5.2.1 LZB/PZB data entry windows)

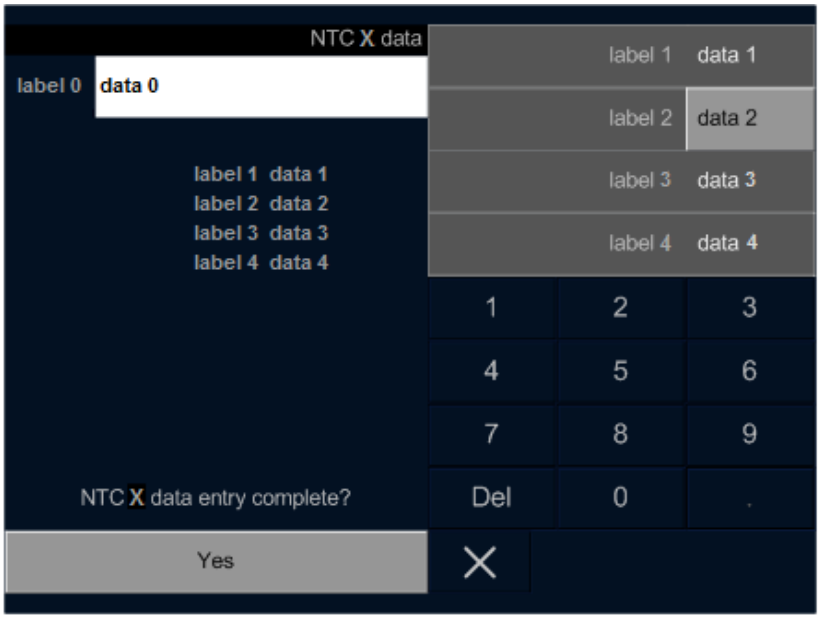


Figure A.3 — LZB/PZB data entry window (1st window) in touch screen technology

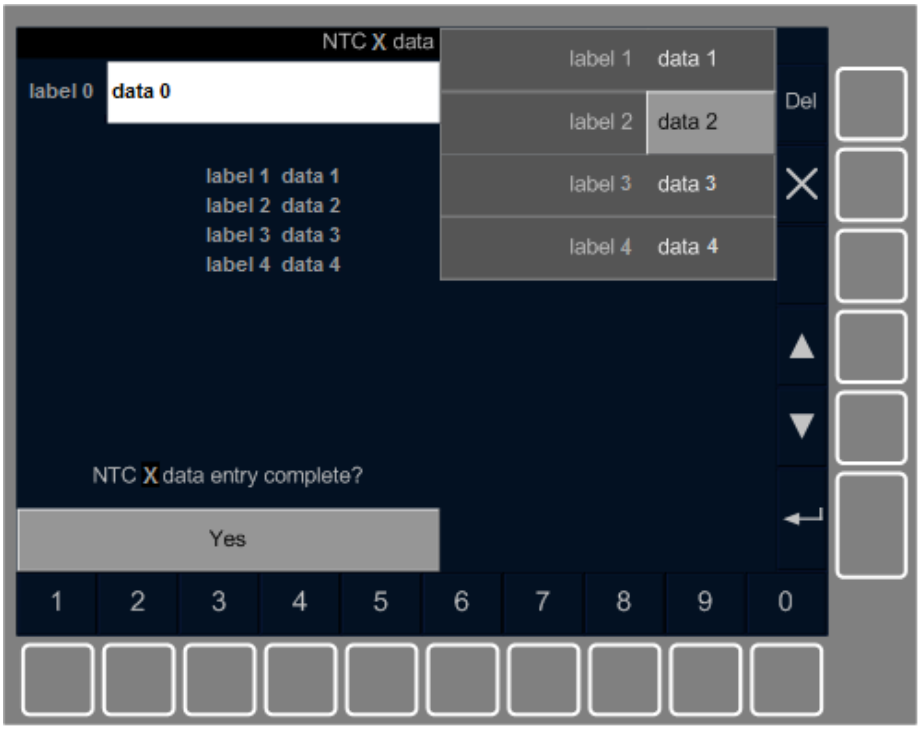


Figure A.4 — LZB/PZB data entry window (1st window) in softkey technology

A.2.5.2.2 LZB/PZB data validation windows

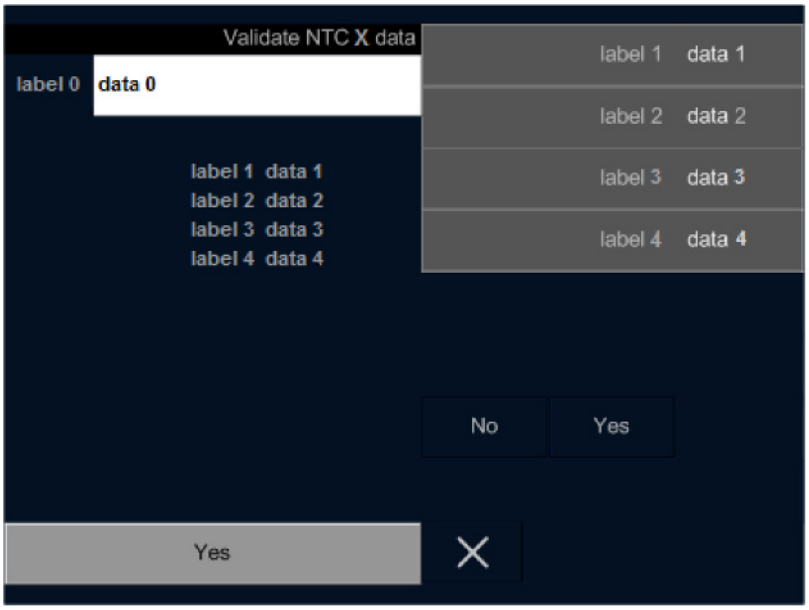


Figure A.5 — LZB/PZB data validation window in touch screen technology

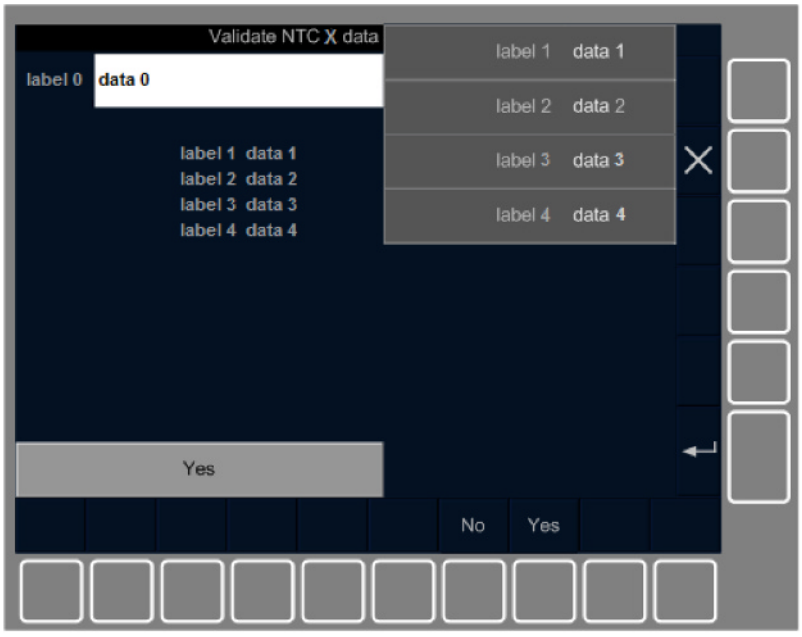


Figure A.6 — LZB/PZB data validation window in softkey technology

To inform the driver about LZB adjustment proposals in soft key technology the ‘info’ hard key button is used.

For touch screen technology an info button is inside an unused area of the data window.

A.2.5.2.3 LZB/PZB data view window

The red equilateral triangle with needle in direction to the centre of the speedometer represents Vperm of LZB.

Vtarget of LZB is displayed as three digit value in yellow.

Vperm of ASC is displayed as a rhombus, see A.2.4.3.3.4.

Vperm of ‘Cruise Control’ is displayed as magenta filled circle, see A.2.4.3.3.5.

In case an ASC or ‘Cruise Control’ system is active, Vperm of ASC or Vperm of Cruise Control respectively is shown together with Vperm of LZB.

Figure A.7 — LZB/PZB data view window in touch screen technology

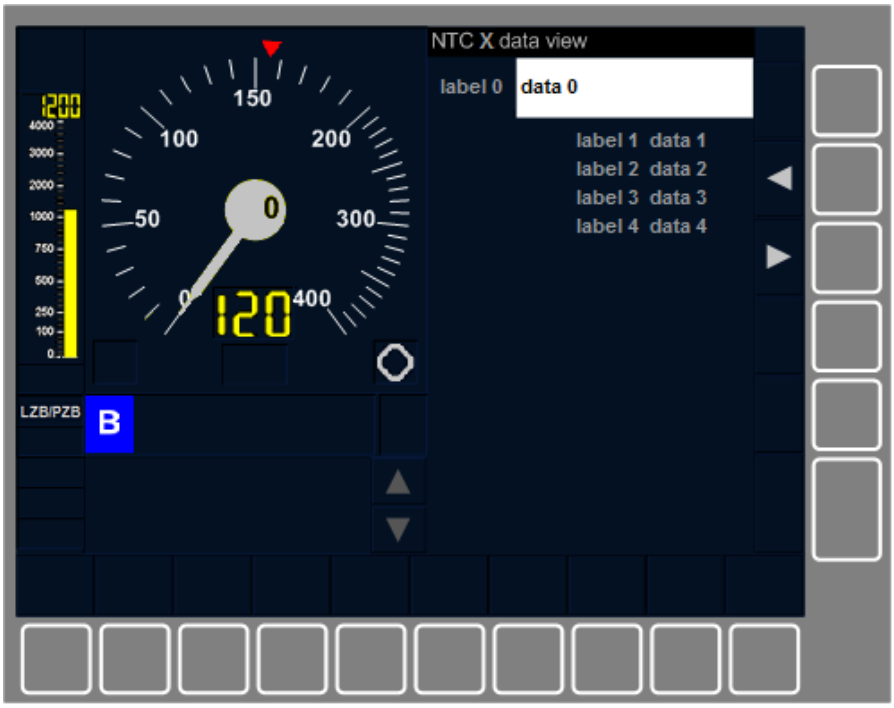


Figure A.8 — LZB/PZB data view window in softkey technology

A.2.6 LZB/PZB symbols

A.2.6.1 Level symbols

Level symbols according to ERA_ERTMS_015560 for LZB/PZB are presented in Table A.3.

Table A.3 — Level symbols for LZB/PZB

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
A01	PZB/LZB	lev01.bmp	level LZB/PZB; grey	52 x 21	C8	For National System where LZB and PZB functions are available
A02	PZB	lev02.bmp	level PZB; grey	52 x 21	C8	For National System where only PZB functions are available

A.2.6.2 Mode symbols

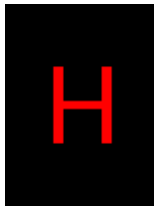
No different or additional requirements to ERA_ERTMS_015560.

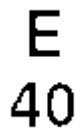
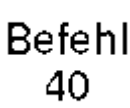
A.2.6.3 Status symbols

The following special status symbols are used in ERTMS/ETCS level LZB/PZB or PZB in mode SN or in LZB/PZB fallback mode.

Table A.4 — Status symbols for LZB/PZB

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
1a		lzb01a.bmp	LM_B ; **white on blue**	37x50	PLZB_C2 to C6	
1b		lzb01b.bmp	LM_B ; **white on black**	37x50	PLZB_C2 to C6	
2a		lzb02a.bmp	LM_85_1 white on blue	37x50	PLZB_C2 to C6	
2b		lzb02b.bmp	LM_85_2 ; white	37x50	PLZB_C2 to C6	
3a		lzb03a.bmp	LM_70_1 ; white on blue	37x50	PLZB_C2 to C6	
3b		lzb03b.bmp	LM_70_2 ; white	37x50	PLZB_C2 to C6	
4a		lzb04a.bmp	LM_55_1 ; white on blue	37x50	PLZB_C2 to C6	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
4b		lzb04b.bmp	LM_55_2 ; white	37x50	PLZB_C2 to C6	
5a		lzb05a.bmp	LM_PZB_1 ; white on blue	37x50	PLZB_C2 to C6	
5b		lzb05b.bmp	LM_PZB_2 ; white	37x50	PLZB_C2 to C6	
6a		lzb06a.bmp	LM_S ; white on red	37x50	PLZB_C2 to C6	
6b		lzb06b.bmp	LM_S ; red on black	37x50	PLZB_C2 to C6	
7a		lzb07a.bmp	LM_H_1 ; white on red	37x50	PLZB_C2 to C6	
7b		lzb07b.bmp	LM_H_2 ; red	37x50	PLZB_C2 to C6	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
8a		lzb08a.bmp	LM_G_1 ; white on red	37x50	PLZB_C2 to C6	
8b		lzb08b.bmp	LM_G_2 ; red	37x50	PLZB_C2 to C6	
9a		lzb09a.bmp	LM_E40_1 ; black on white	37x50	PLZB_C2 to C6	
9b		lzb09b.bmp	LM_E40_2 ; white	37x50	PLZB_C2 to C6	
10a		lzb010a.bmp	LM_V40_1 ; black on white	37x50	PLZB_C2 to C6	
10b		lzb010b.bmp	LM_V40_2 ; white	37x50	PLZB_C2 to C6	
11a		lzb011a.bmp	LM_B40_1 ; black on white	37x50	PLZB_C2 to C6	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
11b		lzb011b.bmp	LM_B40_2 ; white	37x50	PLZB_C2 to C6	
12a		lzb012a.bmp	LM_1000 ; black on yellow	37x50	PLZB_C2 to C6	
12b		lzb012b.bmp	LM_1000 ; white on black	37x50	PLZB_C2 to C6	
13a		lzb013a.bmp	LM_500 ; black on red	37x50	PLZB_C2 to C6	
13b		lzb013b.bmp	LM_500 ; red on black	37x50	PLZB_C2 to C6	
14a		lzb014a.bmp	LM_EL_1 ; white on blue	37x50	PLZB_C2 to C6	
14b		lzb014b.bmp	LM_EL_2xx ; white	37x50	PLZB_C2 to C6	

NOTE Pending updates of [21] and [28] are already taken into account in Table A.4.

A.2.6.4 Orders and announcement of track condition symbols

Orders and announcement of track conditions are not used in

- ERTMS/ETCS level LZB/PZB in mode SN;
- ERTMS/ETCS level PZB in mode SN;
- LZB/PZB fallback mode.

A.2.6.5 Planning information symbols

Planning Information Symbols are not used in

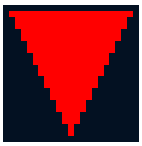
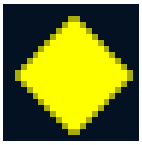
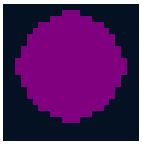
- ERTMS/ETCS level LZB/PZB in mode SN;
- ERTMS/ETCS level PZB in mode SN;
- LZB/PZB fallback mode.

A.2.6.6 Navigation symbols

No different or additional requirements to ERA ERTMS 015560 according navigation.

A.2.6.7 Supervision symbols

Table A.5 — LZB supervision symbols

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
A11		lzb21.bmp	V perm of LZB ; **red**	10x 10	PLZB_B2	equilateral triangle with needle in direction to the centre of PLZB_B1
A12		lzb22.bmp	V target of LZB; **yellow**	60 x 36	PLZB_B8	
A13		lzb23.bmp	V perm of ASC; **yellow**	10 x 10	PLZB-B3	Inside circle B0, pointing in direction to the center of PLZB_B1
A14		lzb24.bmp	V perm of Cruise Control; **magenta**	10 x 10	PLZB-B3	Inside circle B0

A.2.6.8 Driver request symbols

Driver request symbols are not used in

- ERTMS/ETCS level LZB/PZB in mode SN;

- ERTMS/ETCS level PZB in mode SN;
- LZB/PZB fallback mode.

A.2.7 LZB/PZB audible information

A.2.7.1 General

The text messages for LZB/PZB are defined in [20], [21], [28] and [29].

A.2.7.2 PLZB_S1 - SCHNARRE

The PLZB_S1 sound is played initiated by LZB/PZB once or intermittently according to [21].

This is to draw the driver's attention that the current train speed/position has exceeded the 'Permitted Supervision Limit'.

A.2.7.3 PLZB_S2 - HUPE

The PLZB_S2 sound is played initiated by LZB/PZB according to [21].

This is to draw the driver's attention that the LZB/PZB system has intervened.

If the sound PLZB_S2 is played as voice output "Zugbeeinflussung", it is played once-only, otherwise the sound PLZB_S2 is played as continuous tone or as intermittent tone.

A.2.7.4 PLZB_S3 - EMERGENCY_BRAKE_INTERVENTION

The PLZB_S3 sound is played initiated by LZB/PZB according to [21].

This is to draw the driver's attention that the LZB/PZB system has forced an emergency brake.

The sound PLZB_S3 is played as voice output "Zwangsbremsung".

A.2.8 LZB/PZB List of system status messages

The list of system status messages is not used in

- ERTMS/ETCS level LZB/PZB in mode SN;
- ERTMS/ETCS level PZB in mode SN;
- LZB/PZB fallback mode.

A.3 AWS/TPWS NTC with DAS/ATO

A.3.1 Scope and field of specification

This specification sample defines the interface between the driver and the AWS/TPWS onboard system combined with a DAS/ATO system regarding to the use in context with ERTMS/ETCS.

This specification describes two possible technologies for implementing the AWS/TPWS DMI, namely touch screen or soft key.

This specification describes only requirements that are different or additional to the specification ERA ERTMS 015560.

A.3.2 Overview

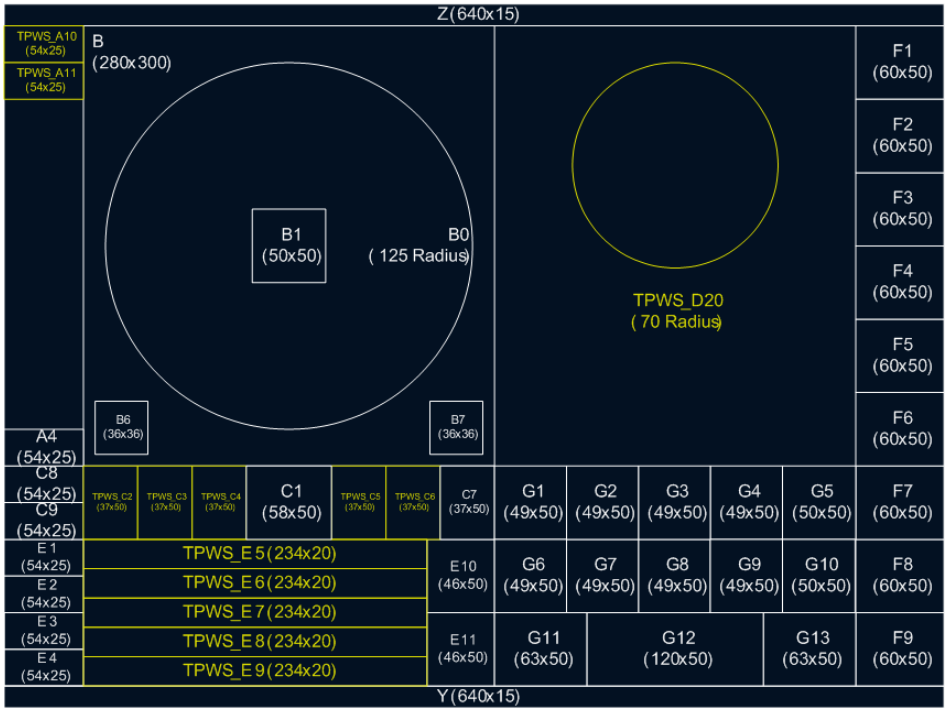


Figure A.9 — The sub areas of the AWS/TPWS layout (touch screen technology)

NOTE DAS/ATO will also use area G2/G4.

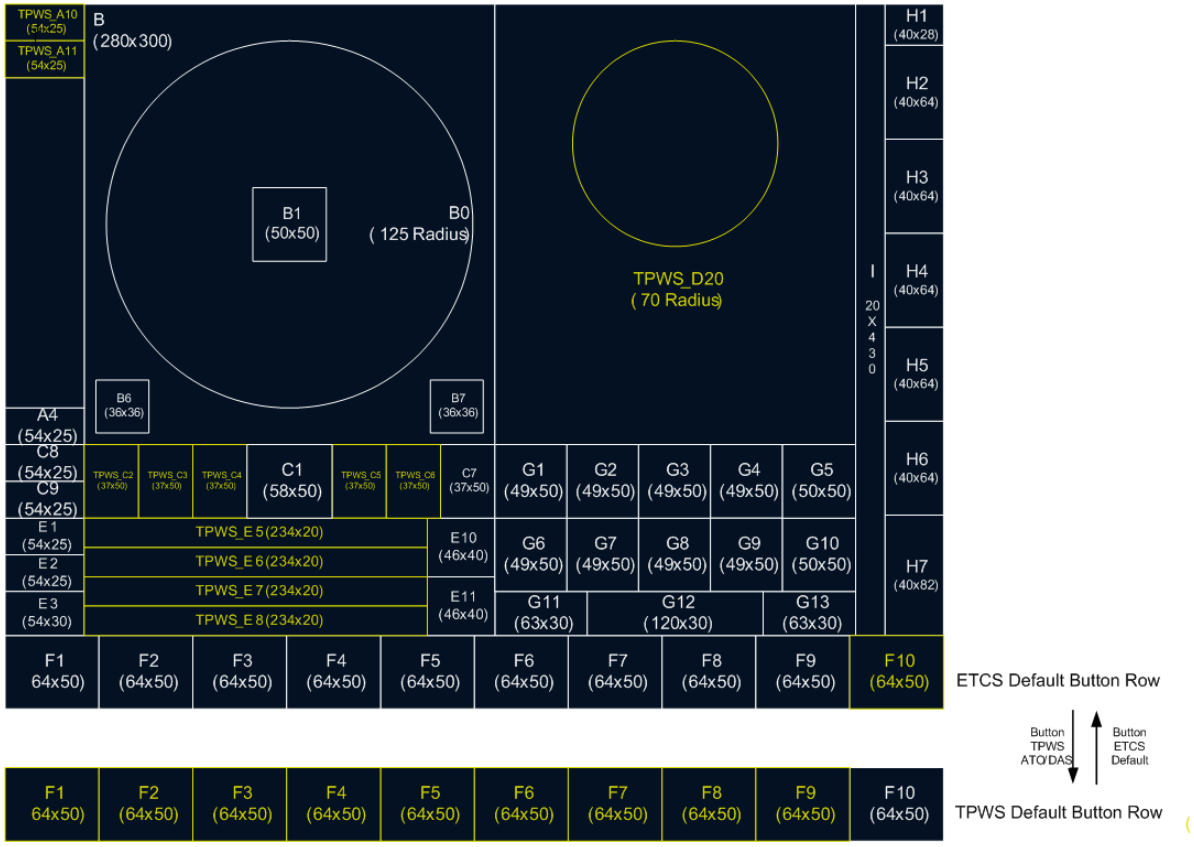


Figure A.10 — The sub areas of the AWS/TPWS layout (soft key technology)

NOTE DAS/ATO will also use area G2 / G4.

A.3.3 Area description

All areas not defined here are in positions and dimension according to ERA ERTMS 015560.

Area A (total size: 54 x 300 cells (w x h)) are composed of:

- TPWS_A10 instead of A1 (54x25) – Temporary Isolation (steady) / Fault (flashing);
- TPWS_A11 instead of A154x25) – AWS Isolation (steady) / Fault (flashing).

Area C (total size: 334 x 50 cells (w x h)) are composed of:

- TPWS_C2 instead of C2 (37x50) – SPAD;
- TPWS_C3 instead of C3 (37x50) – Overspeed;
- TPWS_C4 instead of C4 (37x50) – AWS;
- TPWS_C5 instead of C5 (37x50) – Train Stop Override;
- TPWS_C6 instead of C6 (37x50) – Brake Release;

TPWS_C2 to TPWS_C6 are visible when in level NTC only, blanked out if not.

Area D (total size: 334 x 50 cells (w x h)) are composed of:

- TPWS_D20 (D70 radius) The sunflower is visible when in level NTC only, blanked out if not.

Area E (total size: 334 x 100 cells (w x h)) are composed of:

- TPWS_E5 instead of E5 (234x20);
- TPWS_E6 instead of E6 (234x20);
- TPWS_E7 instead of E7 (234x20);
- TPWS_E8 instead of E8 (234x20);
- TPWS_E9 instead of E9 (234x20) – only for touch screen technology.

A.3.4 ETCS and AWS/TPWS information shown on a AWS/TPWS default window

A.3.4.1 Introduction

The layers on the AWS/TPWS default window have different or additional requirements to ERA ERTMS 015560 as follows:

- Layer 0: no change;
- Layer -1: TPWS_D20 exclusively in area D.

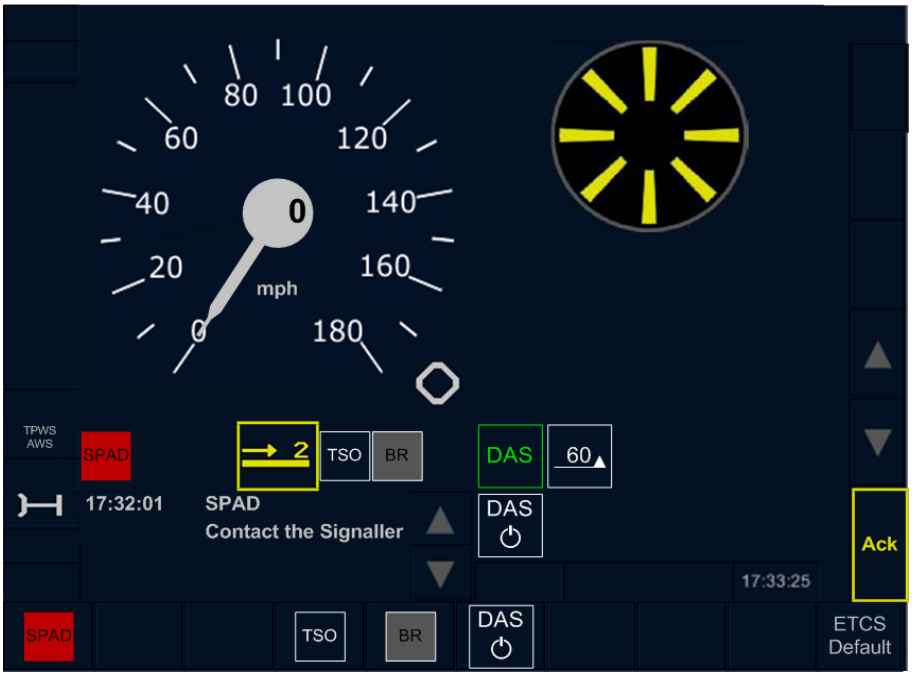


Figure A.11 — ETCS and AWS/TPWS window in soft key technology

Figure A.11 shows an example of ETCS and AWS/TPWS information including DAS/ATO on the same screen where an ETCS symbol is shown on C1.

For the use of buttons see A.3.4.3.3.

A.3.4.2 ETCS objects

No different or additional requirements to ERA ERTMS 015560.

A.3.4.3 Non ETCS Objects

A.3.4.3.1 General

No different or additional requirements to ERA ERTMS 015560 according to

- flashing mode and style;
- text messages.

The AWS/TPWS text messages are displayed together with ERTMS/ETCS text messages according to ERA ERTMS 015560.

A.3.4.3.2 Indicators TPWS_C2/3/4/5/6 and TPWS_D20

The indicators TPWS_C2/3/4/5/6 are displayed according to [22].

Indicators for DAS/ATO are displayed in area G1 … G10.

The ‘Sunflower’ indicator is displayed in area TPWS_D20.

A.3.4.3.3 Buttons

For releasing the brake (e.g. after passing a signal at danger), the AWS/TPWS expects a simultaneous pressing of the SPAD, the OSS or the AWS button and the Brake release button.

Due to /ERA_ERTMS_015560/ §5.3.2.5.4 "Only one button shall be in the “pressed” state at the same time.", the DMI has implemented a solution where a time slot starts after pressing the first button, and the second button is pushed during this time slot. This action sequence is accepted as two-button operation.

A.3.5 AWS/TPWS sub-level windows

A.3.5.1 Introduction

For all equipment where the AWS/TPWS function is implemented, all requirements in specifications ERA ERTMS 015560 described with the term “NTC X” shall use the term “AWS/TPWS”.

In the following figures of this chapter for all equipment where the AWS/TPWS function is implemented the following replacements is used:

Table A.6 — AWS/TPWS terms in figures

Term in Figures	Term in AWS/TPWS
NTC X	AWS/TPWS

A.3.5.2 AWS/TPWS window

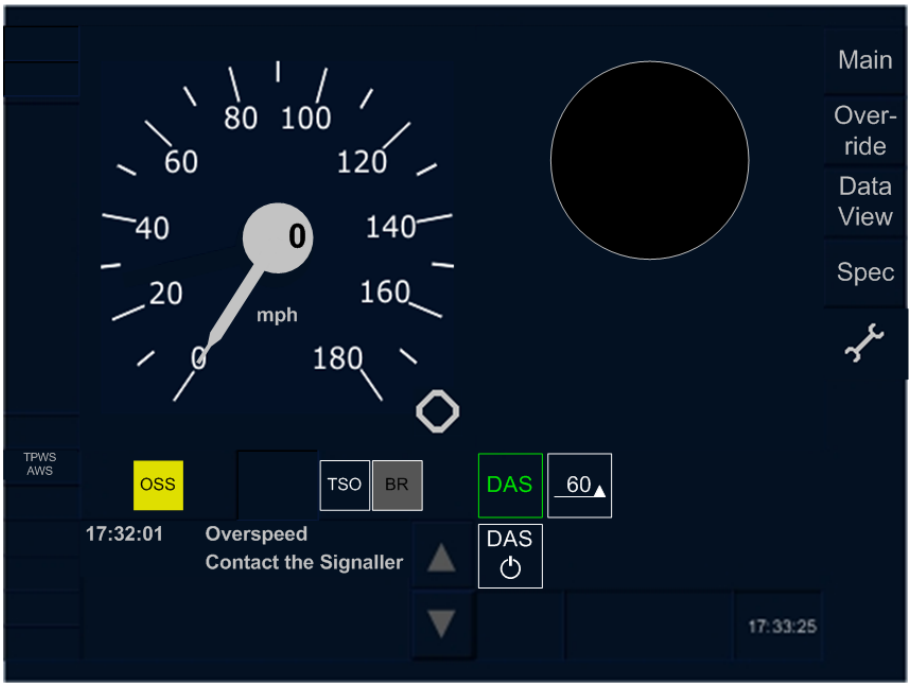


Figure A.12 — AWS/TPWS window in touch screen technology

Figure A.13 — AWS/TPWS window in softkey technology

A.3.6 AWS/TPWS symbols

A.3.6.1 Level symbols

Level symbols according to ERA ERTMS 015560 for AWS/TPWS are presented in Table A.7.

Table A.7 — Level symbols for AWS/TPWS

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarksg5
B01		lev04.bmp	level AWS/TPWS; grey	52 x 21	C8	For National System where AWS/TPWS functions are available

A.3.6.2 AWS/TPWS mode symbols

Table A.8 — Symbols for AWS/TPWS mode indication (TPWS_A10/11)

This field shows the TPWS mode information.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B02a		L100_1.bmp	Temporary Isolation (steady) / Fault (flashing); **yellow**	54 x 25	TPWS **_A10**	
B02b		L100_2.bmp	AWS Isolation (steady) / Fault (flashing) **yellow**	54 x 25	TPWS **_A11**	

Table A.9 — Symbols for AWS/TPWS mode indication (G)

This field shows the current and next mode indications.

In ATO mode this field shows the state of the motoring and braking. In DAS mode, the field shows the DAS advice for the next and current mode the driver should consider. The current suggested mode is indicated by a static symbol. The next suggested mode will be indicated by a flashing symbol with 2 Hz about 3 sec before the next mode will become valid.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B04a		L106_1.bmp	Motoring (ATO) ; **grey**	49 x 50	G2	
B04b		L106_2.bmp	Coasting (ATO) ; **grey**	49 x 50	G2	
B04c		L106_3.bmp	Braking (ATO) ; **grey**	49 x 50	G2	
B04d		L106_4.bmp	Acceleration advice (DAS) up to the suggested speed ; **grey**	49 x 50	G2	
B04e		L106_5.bmp	Cruise advice (DAS) with the suggested speed ; **grey**	49 x 50	G2	
B04f		L106_6.bmp	Coast advice (DAS) PBC in zero position; **grey**	49 x 50	G2	
B04g		L106_7.bmp	Brake advice (DAS) Only for driving time adjustment, the driver shall brake until the suggested speed is achieved; **grey**	49 x 50	G2	

A.3.6.3 AWS/TPWS status symbols

Table A.10 — Symbols for status indication and buttons (C2..C6)

This field shows the symbols for status information which are also used as buttons (in touch screen technology).

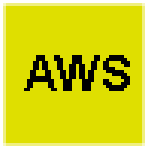
Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B05a		L101_1.bmp	Signal Passed At Danger ; **red**	37 x 50	TPWS **_C2**	
B05b		L101_5.bmp	Overspeed; **yellow**	37 x 50	TPWS **_C3**	
B05c		L101_7.bmp	AWS mode; yellow	37 x 50	TPWS **_C4**	
B05d		L101_2.bmp	Train Stop Override; **black**	37 x 50	TPWS **_C5**	
B05e		L101_3.bmp	Train Stop Override; **yellow**	37 x 50	TPWS **_C5**	
B05f		L101_6.bmp	Brake Release ; **light grey**	37 x 50	TPWS **_C6**	
B05g		L102_1.bmp	Sunflower; Yellow	70 x 70	TPWS _D20	

Table A.11 — Symbols for AWS/TPWS door close counter (G3)

This field shows the door close counter during standstill.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B06a		L107_1.bmp	Time remaining <= 1 minute and > 0; **grey**	49 x 50	G3	
B06b		L107_2.bmp	Time remaining > 1 minute; **grey**	49 x 50	G3	
B06c		L107_3.bmp	Time remaining >= 10 minutes (Station hold); **grey**	49 x 50	G3	

Table A.12 — Symbols for AWS/TPWS door close advice (G4)

This information shows the door close advice during standstill.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B07		L107_4.bmp	Door close advice; **grey**	49 x 50	G4	

A.3.6.4 ATO/DAS mode symbols

Table A.13 — Symbols for ATO/DAS mode indication (G1)

This field shows the ATO/DAS mode information.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B03a		L105_1.bmp	ATO and DAS not available ; **orange**	49 x 50	G1	
B03b		L105_2.bmp	ATO engaged ; **grey**	49 x 50	G1	
B03c		L105_3.bmp	DAS not ready TRN not valid or DAS not located (GPS); **orange**	49 x 50	G1	
B03d		L105_4.bmp	DAS available TRN valid & DAS located; **grey**	49 x 50	G1	
B03e		L105_5.bmp	DAS available Real-time update from ATS/TMS related to the next timing/station; **green**	49 x 50	G1	
B03f		L105_6.bmp	DAS inhibited. DAS advices are not shown ; **yellow**	49 x 50	G1	

Table A.14 — Symbols for (F)ASDO stopping accuracy details (G5)

This information shows whether the unit was stopped within or outside the (F)ASDO stopping window.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B08a		L108_1.bmp	Outside (F)ASDO stop-ping window ; **orange**	49 x 50	G5	
B08b		L108_2.bmp	Inside (F)ASDO stop-ping window; **green**	49 x 50	G5	

Table A.15 — Symbols for AWS/TPWS inhibition of driving advice (G6)

This button is used for the inhibition of the DAS driving advice information in G2 (DAS mode only).

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B09a		L108_3.bmp	Enable DAS, only shown if DAS is inhibited (G1); **yellow**	49 x 50	G6	
B09b		L108_4.bmp	Enable DAS, only shown if DAS is inhibited (G1). ; **grey**	49 x 50	G6	

Table A.16 — Symbols for AWS/TPWS skip station (G7)

This field button can be used for skipping a station (ATO mode only).

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B10a		L109_1.bmp	Skip command is active; **yellow**	49 x 50	G7	
B10b		L109_2.bmp	Skip stop is not active; **grey**	49 x 50	G7	

Table A.17 — Symbols for AWS/TPWS line code (G8)

This cell informs the driver about the current track segment name as seen by DAS.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
B11		L109_3.bmp	Line code as stored in the track database, e.g. fast line (FL); **grey**	49 x 50	G8	

A.3.6.5 Planning information symbols

Planning Information Symbols are not used in ERTMS/ETCS level AWS/TPWS in modes SN or NL.

A.3.6.6 Driver request symbols

Driver request symbols are not used in ERTMS/ETCS level AWS/TPWS in modes SN or NL.

A.3.7 Audible information

All audible information from AWS/TPWS as well as for DAS/ATO will be generated in a separate ‘Audible indicator with voice unit’.

A.3.8 AWS/TPWS list of system status messages

System status messages (text messages) appear in case of

- SPAD;
- AWS;
- Overspeed (displayed when event active);

- AWS fault;
- AWS isolation;
- TPWS fault;
- TPWS temporary isolation.

The status messages are displayed in TPWS_E5 to TPWS_E8 (for soft key technology) respectively TPWS_E5 to TPWS_E9 (for touch screen technology)

A.4 ATC2

A.4.1 Scope and field of specification

This specification sample defines the interface between the driver and the ATC2 onboard regarding to the use in context with ERTMS/ETCS.

This specification describes two possible technologies for implementing the ATC2 DMI, namely touch screen or soft key.

This specification describes only requirements that are different or additional to the specifications ERA ERTMS 015560.

A.4.2 Overview

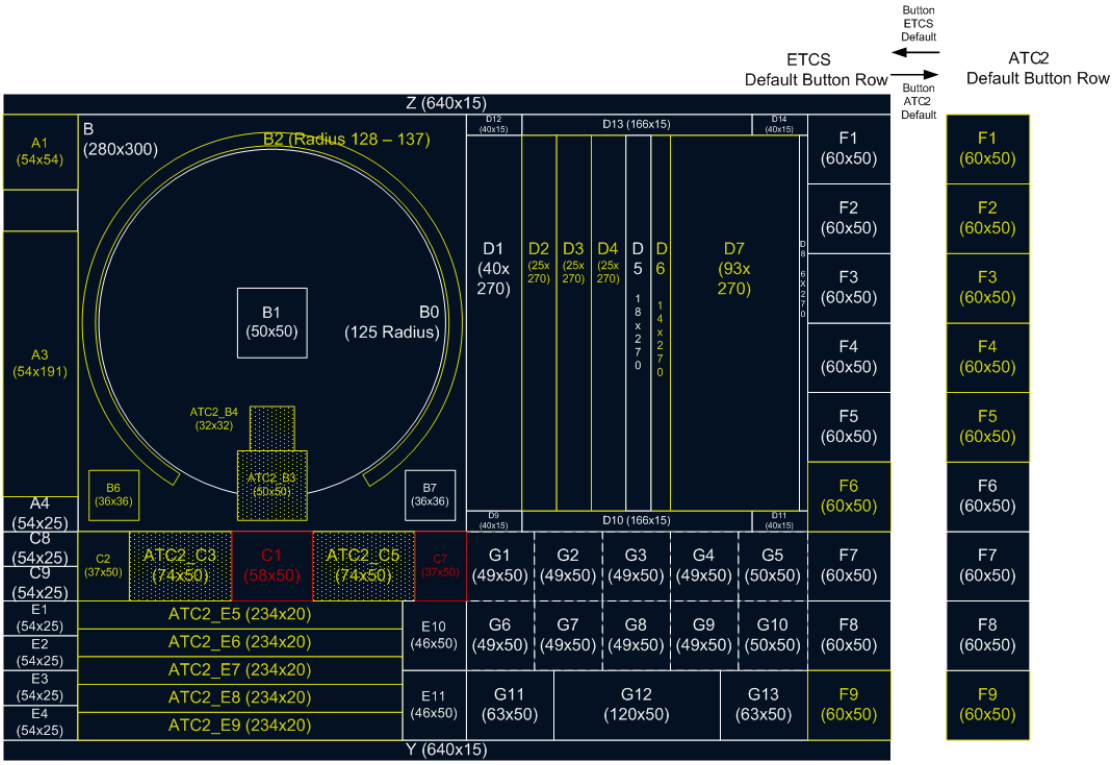


Figure A.14 — The sub areas of the ATC2 layout (touch screen technology)

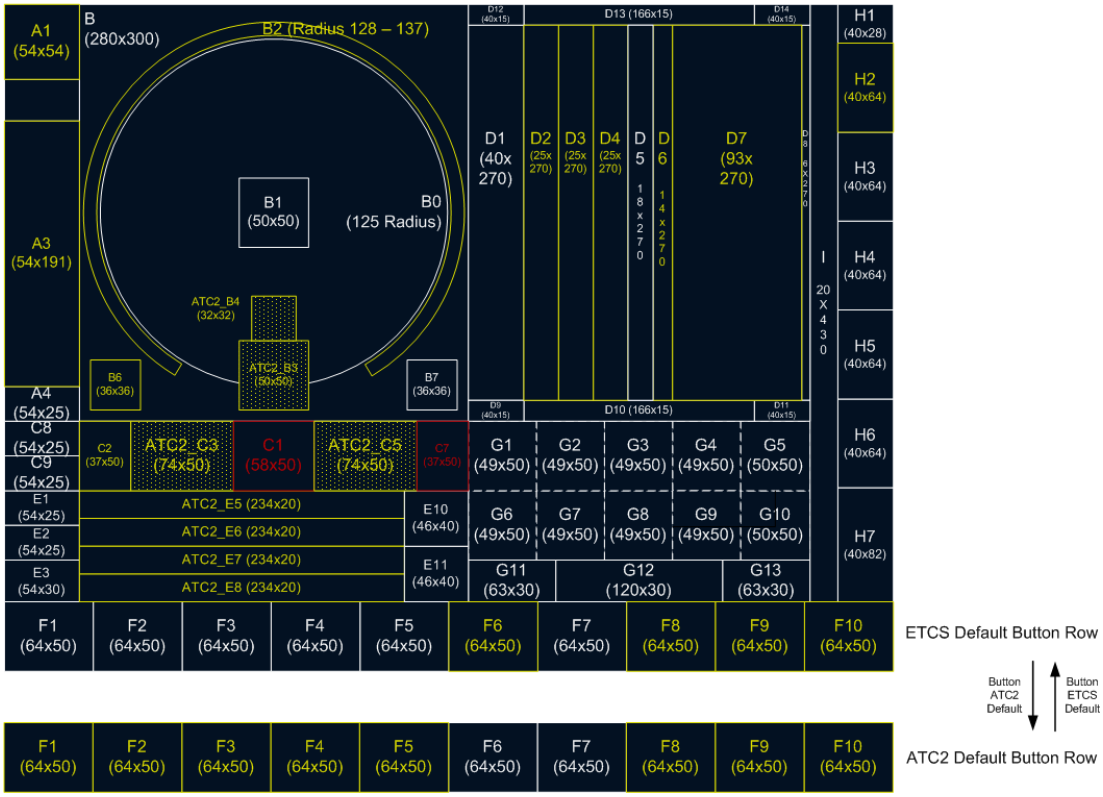


Figure A.15 — The sub areas of the ATC2 layout (soft key technology)

A.4.3 Area description

All areas not defined here are in positions and dimension according to CLC/TS 50459-1 and ERA ERTMS 015560.

Area B (total size: 280 x 300 cells (w x h)) are composed of:

- ATC2_B3 (50x50) instead of B3/B4/B5 is positioned above C1.
- ATC2_B4 (32x32) above ATC_B3.

NOTE B4/5 do not exist in this layout because currently not used.

Area C (total size: 334 x 50 cells (w x h)) are composed of:

- ATC2_C3 (54x50) is composed of C3 and C4;
- ATC2_C5 (54x50) is composed of C5 and C6.

Area E (total size: 334 x 100 cells (w x h)) are composed of:

- ATC2_E5 instead of E5 (234x20);
- ATC2_E6 instead of E6 (234x20);
- ATC2_E7 instead of E7 (234x20);
- ATC2_E8 instead of E8 (234x20);

- ATC2_E9 instead of E9 (234x20) – only for touch screen technology.

A.4.4 ATC2 sub-level windows

A.4.4.1 Introduction

For all equipment where the ATC2 function is implemented, all requirements in specification ERA ERTMS 015560 described with the term “NTC X” will use the term “ATC2”.

In the following figures of this chapter for all equipment where the ATC2 function is implemented the following replacements are used:

Table A.18 — ATC2 terms in figures

Term in Figures	Term in ATC2
NTC X	ATC2

A.4.4.2 NTC objects

No different or additional requirements to ERA ERTMS 015560 according to

- flashing mode and style;
- text messages.

A.5 SCMT

A.5.1 Scope and field of specification

This specification sample defines the interface between the driver and the SCMT on-board regarding to the use in context with ERTMS/ETCS.

This specification describes only requirements that are different or additional to the specifications ERA ERTMS 015560.

A.5.2 Overview

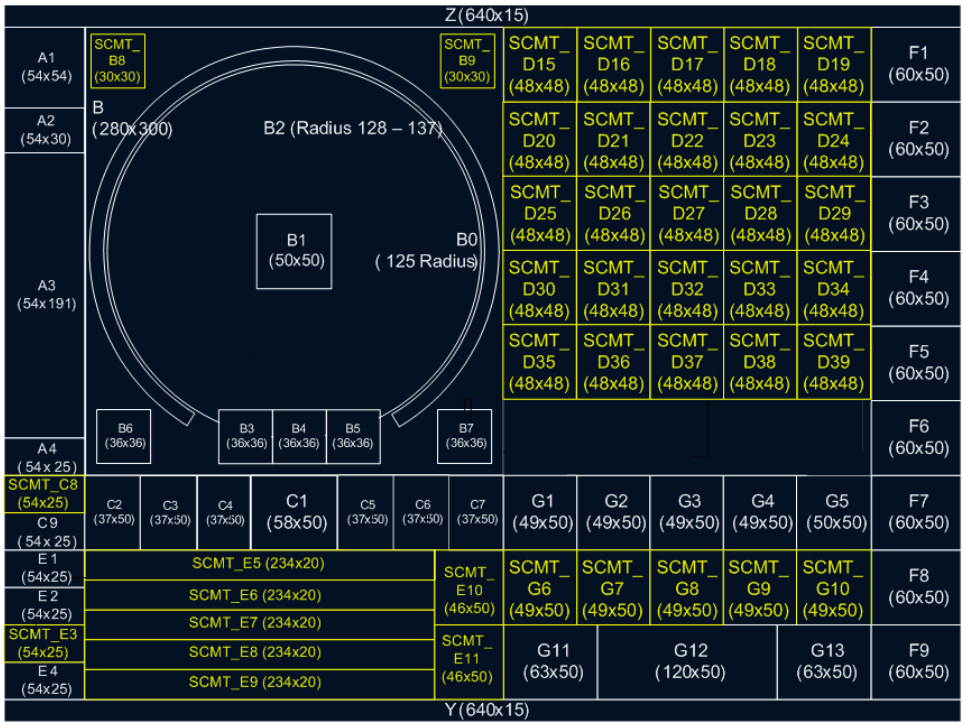


Figure A.16 — The sub areas of the SCMT layout (touch screen technology)

NOTE According to [39] no definition for the SCMT layout in soft key technology is defined.

A.5.3 Area description

All areas not defined here are in positions and dimension according to CLC/TS 50459-1 and ERA ERTMS 015560.

Area B (total size: 280 x 300 cells (w x h)) are composed of:

- SCMT_B8 (30x30) in the upper left corner of area B;
- SCMT_B9 (30x30) in the upper right corner of area B.

Area C (total size: 334 x 50 cells (w x h)) are composed of:

- SCMT_C8 (54x24) instead of C8

Area D (total size: 246 x 300 cells (w x h)) are composed of:

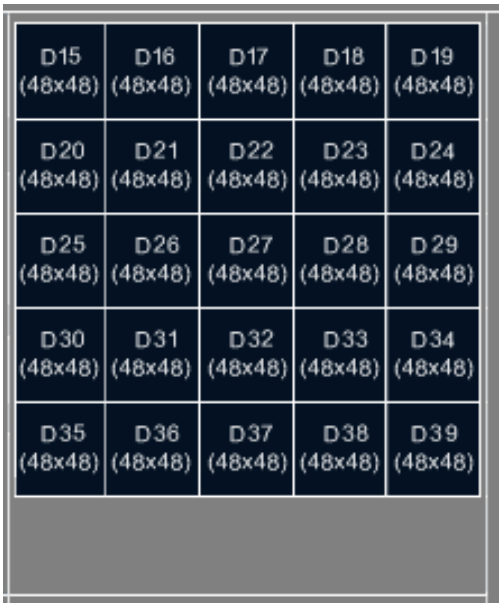


Figure A.17 — SCMT arrangement of area D

Area E (total size: 334 x 100 cells (w x h)) are composed of:

- SCMT_E5 instead of E5 (234x20);
- SCMT_E6 instead of E6 (234x20);
- SCMT_E7 instead of E7 (234x20);
- SCMT_E8 instead of E8 (234x20);
- SCMT_E9 instead of E9 (234x20);
- SCMT_E10 instead of E10 (46x50);
- SCMT_E11 instead of E11 (46x50).

Area G (total size: 246 x 150 cells (w x h)) are composed of:

- SCMT_G6 instead of G6 (49x50);
- SCMT_G7 instead of G7 (49x50);
- SCMT_G8 instead of G8 (49x50);
- SCMT_G9 instead of G9 (49x50);
- SCMT_G10 instead of G10 (49x50).

A.5.4 ETCS and SCMT Information shown on an ETCS default window

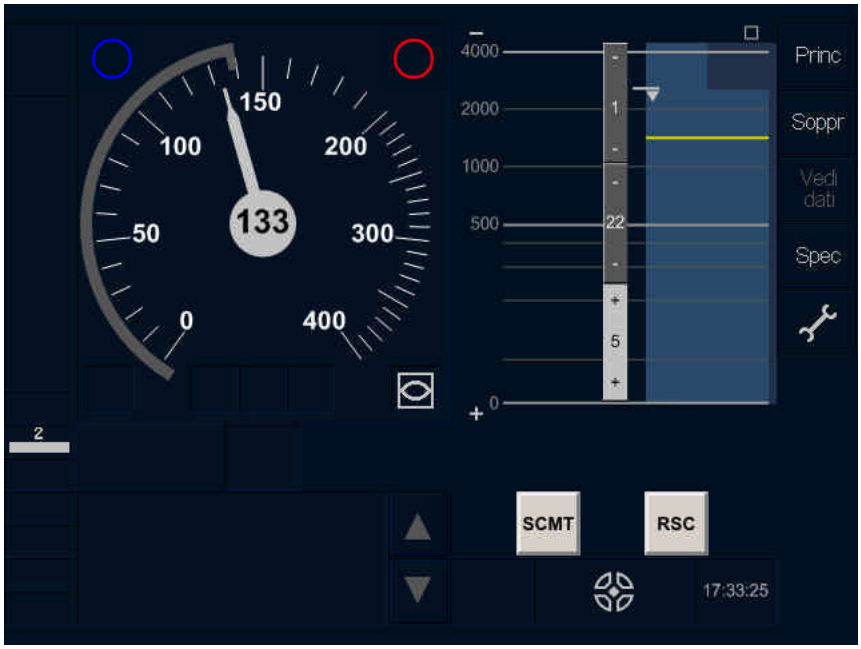


Figure A.18 — SCMT in mode HS before transistion

A.5.5 SCMT Sub-Level Windows

A.5.5.1 Introduction

For all equipment where the SCMT function is implemented, all requirements in specification ERA ERTMS 015560 described with the term “NTC X” use the term “SCMT”.

In the following figures of this chapter for all equipment where the SCMT function is implemented the following replacements are used:

Table A.19 — SCMT terms in figures

Term in Figures	Term in SCMT
NTC X	SCMT

A.5.5.2 ETCS objects

No different or additional requirements to ERA ERTMS 015560

A.5.5.3 NTC objects

No different or additional requirements to ERA ERTMS 015560 according to

- flashing mode and style;
- text messages.

A.5.5.4 SCMT window

Table A.21 shows the SCMT buttons necessary to change the operational mode STM:

- MAN: change the mode to national shunting.
- SCMT: change the mode to SCMT ATP discontinuous subsystem.
- RSC: change the mode to SCMT ATP continuous subsystem.
- SSC: change the mode to SCMT/SSC ATP subsystem.
- VMC: change the maximum speed when the national system start of mission in on-sight mode.

These buttons have two different functions:

- informative when the button is lighted or it has a different icon;
- pushable when the driver wants to change the mode manually.

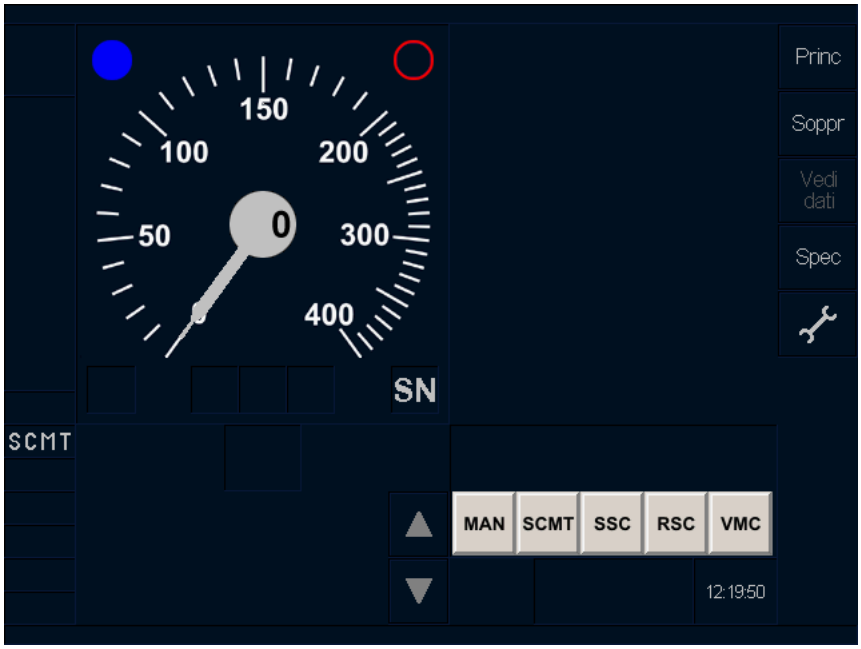


Figure A.19 — SCMT window in touch screen technology

A.5.5.5 SCMT VMC data entry window

In Figure A.20 a sample of the SCMT VMC (Velocità Modulo di Condotta) data entry window during the SCMT data entry procedure is shown.

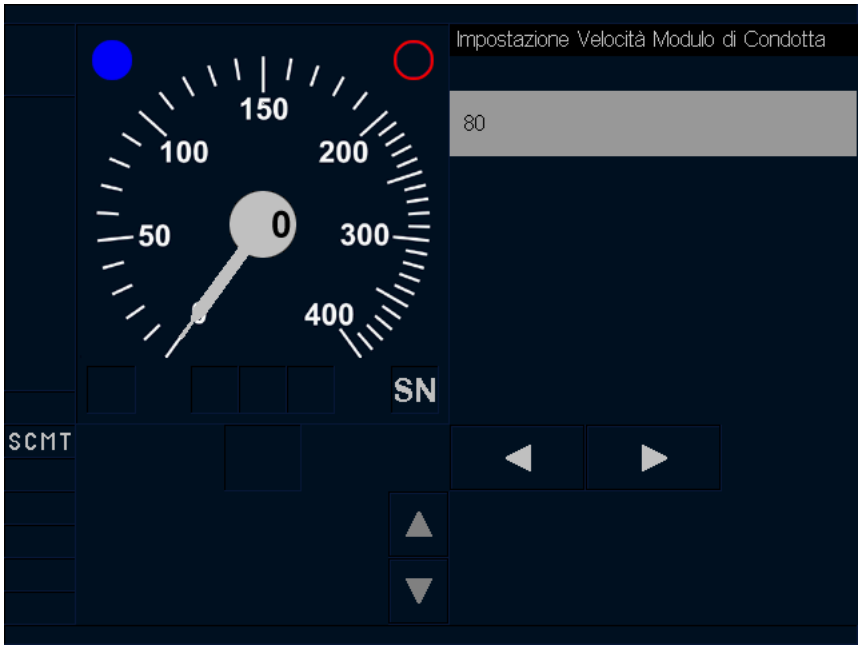


Figure A.20 — SCMT VMC data entry window in touch screen technology

A.5.5.6 SCMT OM window

Figure A.21 presents a sample of the SCMT OM window.

This sample shows the SCMT buttons necessary to change the operational mode STM and the continuous code push buttons.

The buttons MAN,SCMT,RSC and VMC have two different functions:

- informative when the button is lighted (SCMT and RSC in this sample) or it has a different icon
- “pushable” when the driver wants to change the mode manually.

The continuous code push buttons have two different functions:

- informative when the button is lighted (in this sample RV is the active continuous code
- “pushable” in order to allow driver actions related to the SCMT functions.

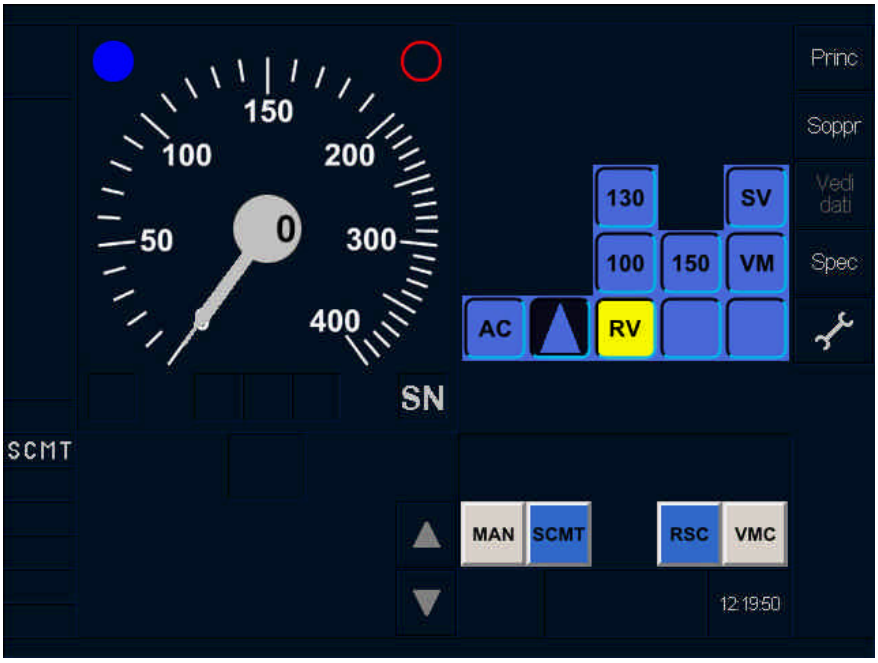


Figure A.21 — SCMT OM window in touch screen technology

A.5.5.7 SCMT ATTO window

Figure A.22 presents a sample of the SCMT ATTO window.

This sample shows the SCMT buttons necessary to change the operational mode STM, the continuous code push buttons and the icon related to the Override function.

The buttons SCMT and RSC have two different functions

- informative when the button is lighted (SCMT and RSC in this sample) or it has a different icon
- “pushable” when the driver wants to change the mode manually.

The continuous code push buttons have two different functions

- informative when the button is lighted (in this sample the continuous code reports AC)
- “pushable” in order to allow driver actions related to the SCMT functions.

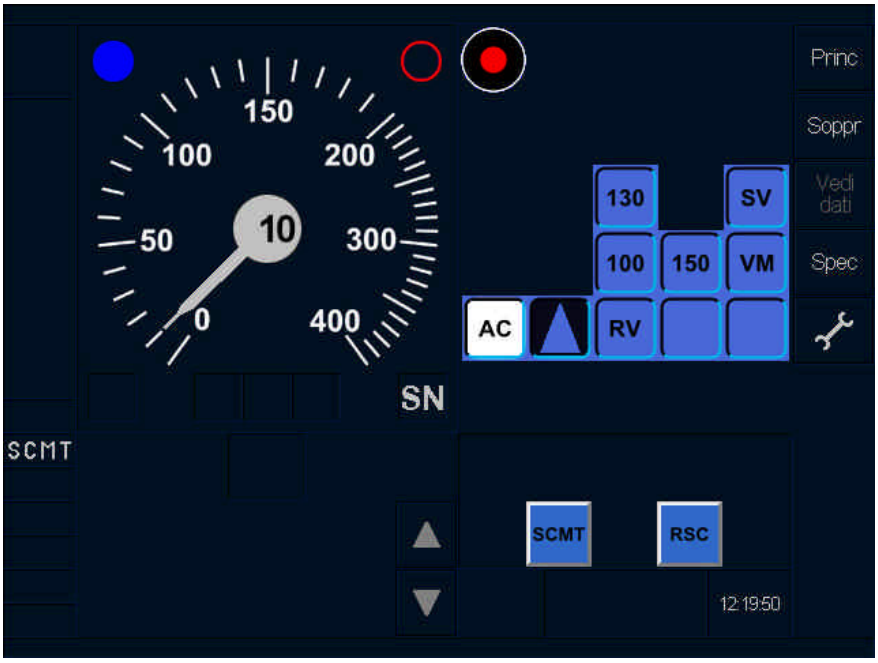


Figure A.22 — SCMT ATTO window in touch screen technology

A.5.5.8 SCMT TRIP window

Figure A.23 presents a sample of the SCMT TRIP window.

This sample shows, the continuous code push buttons and the SR icon related to the SCMT Trip function.

The SR icon informs the driver that SCMT TRIP function is active.

The continuous code push buttons have two different functions

- informative when the button is lighted (AC in this sample)
- “pushable” in order to allow driver actions related to the SCMT functions.

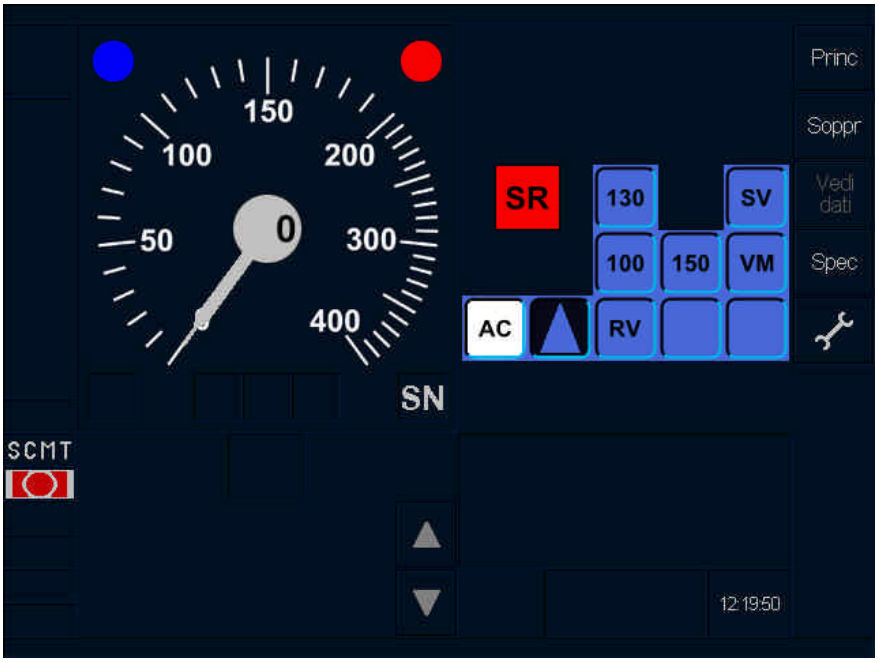


Figure A.23 — SCMT TRIP window in touch screen technology

A.5.5.9 SCMT announcement window

Figure A.24 presents a sample of the SCMT announcement window.

This sample shows the planning area and the buttons necessary to change the operational mode STM (SCMT,RSC).

The buttons SCMT and RSC have two different functions

- informative when the button is lighted (SCMT and RSC are not active in this sample) or it has a different icon
- “pushable” when the driver wants to change the mode manually

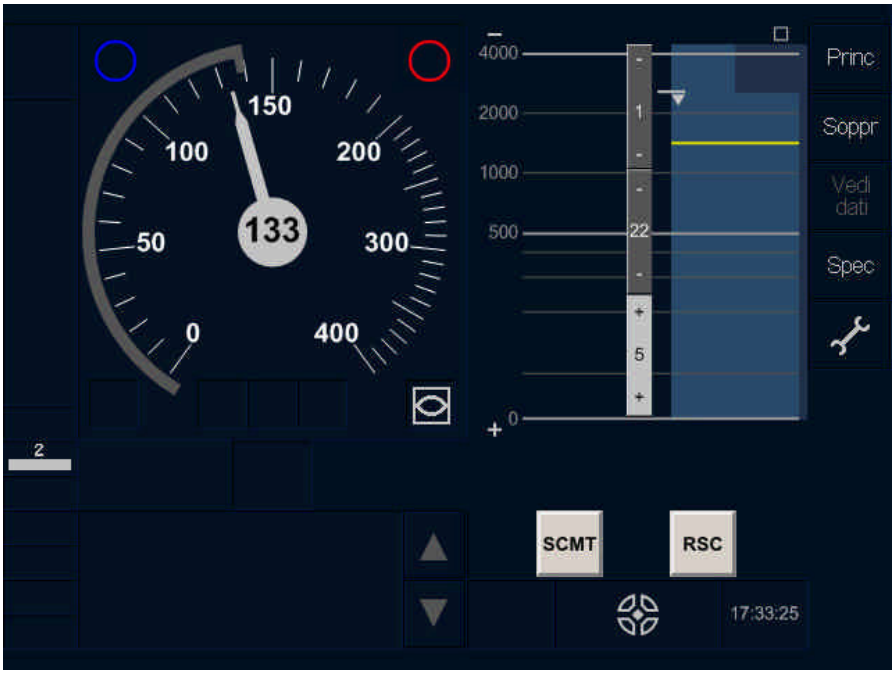


Figure A.24 — SCMT in mode HS before transistion

A.5.6 SCMT symbols

A.5.6.1 Level symbols

Level symbols for SCMT according to ERA ERTMS 015560 are presented in Table A.20.

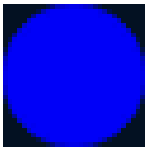
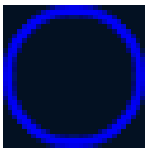
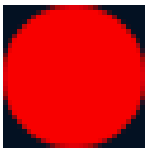
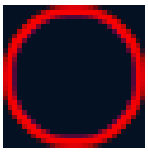
Table A.20 — Level symbols for SCMT (C8)

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D01	SCMT	lev05.bmp	level SCMT; grey	52 x 21	C8	For National System where SCMT functions are available

A.5.6.2 Mode symbols

The fields described in Table A.21 show the actual SCMT mode.

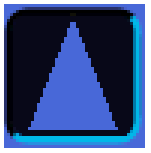
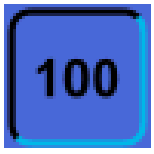
Table A.21 — Mode symbols for SCMT (B8 / B9)

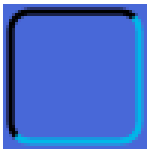
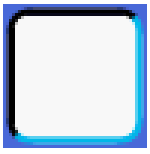
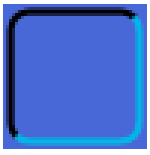
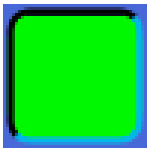
Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D02a		scmt_ico_l_blu_accesa.bmp	SCMT release speed active when is blinking, fixed blue when SCMT normal operation; **blue**	48x48	SCMT_B8	
D02b		scmt_ico_l_blu_spenta.bmp	level SCMT announcement ; **blue border**	48x48	SCMT_B8	
D02c		scmt_ico_l_rossa_accesa .bmp	SCMT emergency brake active when is blinking, fixed red when SCMT service brake active ; **red**	48x48	SCMT_B9	
D02d		scmt_ico_l_rossa_spenta.bmp	level SCMT announcement; **red border**	48x48	SCMT_B9	

This fields show information related to continuous code and infill; trip and override functions, vigilance function; brake activation causes; shunting activation in mode NTC.

Continuous code push buttons are also used as indicators.

Table A.22 — Symbols for SCMT_D15 .. 39

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D031		scmt_ico_sr.bmp	SCMT override active; **red**	48 x 48	SCMT_D15	
D032		scmt_ico_rilascio.bmp	SCMT reduced release speed active; **grey**	48 x 48	SCMT_D19	
D033		scmt_l_off.bmp	SCMT 75 continuous code present (phase OFF of blinking); **black**	48 x 48	SCMT_D15..39	
D0331a		scmt_p_ac_spento.bmp	SCMT AC continuous code not present; **blue**	48 x 48	SCMT_D35	
D0331b		scmt_p_ac_acceso.bmp	SCMT AC continuous code present; **white**	48 x 48	SCMT_D35	
D0332a		scmt_p_75_spento.bmp	SCMT 75 continuous code not present; **blue**	48 x 48	SCMT_D36	
D0332b		scmt_p_75_acceso.bmp	SCMT 75 continuous code present (phase ON of blinking); **yellow**	48 x 48	SCMT_D36	
D0333a		scmt_p_120_spento.bmp	SCMT 120 continuous code not present; **blue**	48 x 48	SCMT_D37	
D0333b		scmt_p_120_acceso.bmp	SCMT 120 continuous code present; **yellow**	48 x 48	SCMT_D37	
D0333c		scmt_p_120x_spento.bmp	SCMT 120* continuous code not present; **blue**	48 x 48	SCMT_D32	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D0333d		scmt_p_120x_acceso.bmp	SCMT 120* continuous code present; **yellow**	48 x 48	SCMT_D32	
D0333e		scmt_p_120xx_spento.bmp	SCMT 120** continuous code not present; **blue**	48 x 48	SCMT_D26	
D0333f		scmt_p_120xx_acceso.bmp	SCMT 120** continuous code present; **yellow**	48 x 48	SCMT_D26	
D0332a		scmt_p_180_spento.bmp	SCMT 180 continuous code not present; **blue**	48 x 48	SCMT_D38	
D0332b		scmt_p_180_acceso.bmp	SCMT 180 continuous code present; **white**	48 x 48	SCMT_D38	
D0332c		scmt_p_180x_spento.bmp	SCMT 180* continuous code not present; **blue**	48 x 48	SCMT_D33	
D0332d		scmt_p_180x_acceso.bmp	SCMT 180* continuous code present; **white**	48 x 48	SCMT_D33	
D0333a		scmt_p_270_spento.bmp	SCMT 270 continuous code not present; **blue**	48 x 48	SCMT_D39	
D0333b		scmt_p_270_acceso.bmp	SCMT 270 continuous code present; **green**	48 x 48	SCMT_D39	
D0333c		scmt_p_270x_spento.bmp	SCMT 270* continuous code not present; **blue**	48 x 48	SCMT_D34	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D0333d		scmt_p_270x_acceso.bmp	SCMT 270* continuous code present; **green**	48 x 48	SCMT_D34	
D0333e		scmt_p_270xx_spento.bmp	SCMT 270** continuous code not present; **blue**	48 x 48	SCMT_D29	
D0333f		scmt_p_270xx_acceso.bmp	SCMT 270** continuous code present; **green**	48 x 48	SCMT_D29	
D034a		scmt_ico_infill_60.bmp	SCMT in fill 60 speed present ; **white**	48 x 48	SCMT_D20..21	
D034b		scmt_ico_infill_100.bmp	SCMT in fill 30 speed present; **white**	96 x 48	SCMT_D20..21	
D034c		scmt_ico_infill_200.bmp	SCMT in fill 200 present; **green**	48 x 48	SCMT_D20.21	
D034d		scmt_ico_infill_nv.bmp	SCMT in fill no speed restriction present; **white**	96 x 48	SCMT_D20..21	
D035a		scmt_ico_tt.bmp	SCMT trip present; **red**	96 x 48	SCMT_D20..21	
D035b		scmt_p_tt.bmp	SCMT trip present and waiting for acknowledgment; **red**	96 x 48	SCMT_D20..21	Alternatevly in position D25..26
D036a		scmt_ico_vigilante.bmp	SCMT brake active for vigilance; **yellow**	96 x 27	SCMT_D25..26	
D036b		scmt_ico_vigilante_2.bmp	SCMT brake active for vigilance and not rearmed; **red**	96 x 27	SCMT_D25..26	
D037		scmt_ico_vigilante_2.bmp	Brake active for vigilance in mode not NTC; **red**	50 x 18	SCMT_E3	

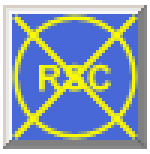
Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D038a	Attesa PI	scmt_ico_attesa_pl.bmp	Brake active for SCMT balise group lost; **yellow**	96 x 27	SCMT_D25..26	
D038b	Delta Assi	scmt_ico_delta_assi.bmp	Brake active for SCMT slip and slide detection; **light grey**	96 x 27	SCMT_D25..26	
D039	MANOVRA	scmt_testo_manovra.bmp	Shunting active in mode NTC; **yellow**		SCMT_D21..23	

A.5.6.3 Touch key symbols

Table A.23 shows the symbols for the used touch keys. Each touch key is also used as indicator.

Table A.23 — Symbols for touch keys (SCMT_G6..10)

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D041a	SCMT	ico_scmt_e_terra.bmp	SCMT (intermitted) not active in mode NTC; **grey**	48 x 48	SCMT_G7	
D041b	SCMT	ico_scmt_e_bordo.bmp	SCMT (intermitted) active in mode NTC; **light blue**	48 x 48	SCMT_G7	
D042a	RSC	ico_rsc_e_terra.bmp	RSC (continuous) not active in mode NTC; **grey**	48 x 48	SCMT_G9	
D042b	RSC	ico_rsc_e_bordo.bmp	RSC (continuous) active in mode NTC; **light blue**	48 x 48	SCMT_G9	
D043a	SSC	ico_scc_e_terra.bmp	SSC (alternative discontinuous) not active in mode NTC; **grey**	48 x 48	SCMT_G8	

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D043b		ico_scc_e_bordo.bmp	SSC (alternative discontinuous) active in mode NTC; **light blue**	48 x 48	SCMT_G8	
D044		p_man.bmp	Shunting not active in mode NTC; **grey**	48 x 48	SCMT_G6	
D045		p_vmc.bmp	VMC (speed limitation set up by driver) not active in mode NTC; **grey**	48 x 48	SCMT_G10	
D046		p_tt.bmp	SCMT trip present and waiting for acknowledgment pushing; **red**	48 x 48	SCMT_D20..21	
D047		p_rsce_t.bmp	Exclusion RSC (continuous) for ground fault in mode NTC; **light blue**	48 x 48	SCMT_G9	
D048		p_rsce_g.bmp	Exclusion RSC (continuous) for board fault in mode NTC; **light blue**	48 x 48	SCMT_G9	
D049		p_cmte_t.bmp	Exclusion SCMT (intermitted) for ground fault in mode NTC; **light blue**	48 x 48	SCMT_G7	
D050		p_cmte_g.bmp	Exclusion SCMT (intermitted) for board fault in mode NTC; **light blue**	48 x 48	SCMT_G7	

A.5.6.4 Orders and announcements

Orders and announcements symbols are not used in ERTMS/ETCS level SCMT in modes SN or NL.

A.5.6.5 Planning information symbols

Planning Information symbols are not used in ERTMS/ETCS level SCMT in modes SN or NL.

A.5.6.6 Navigation symbols

No different or additional requirements to ERA ERTMS 015560 according navigation.

A.5.6.7 Settings symbols

No different or additional requirements to ERA ERTMS 015560.

A.5.6.8 Driver request symbols

Driver request symbols are used in ERTMS/ETCS level SCMT in modes SN or NL to release an applied brake and for warning acknowledgement (yellow framed area in examples in the next figures).

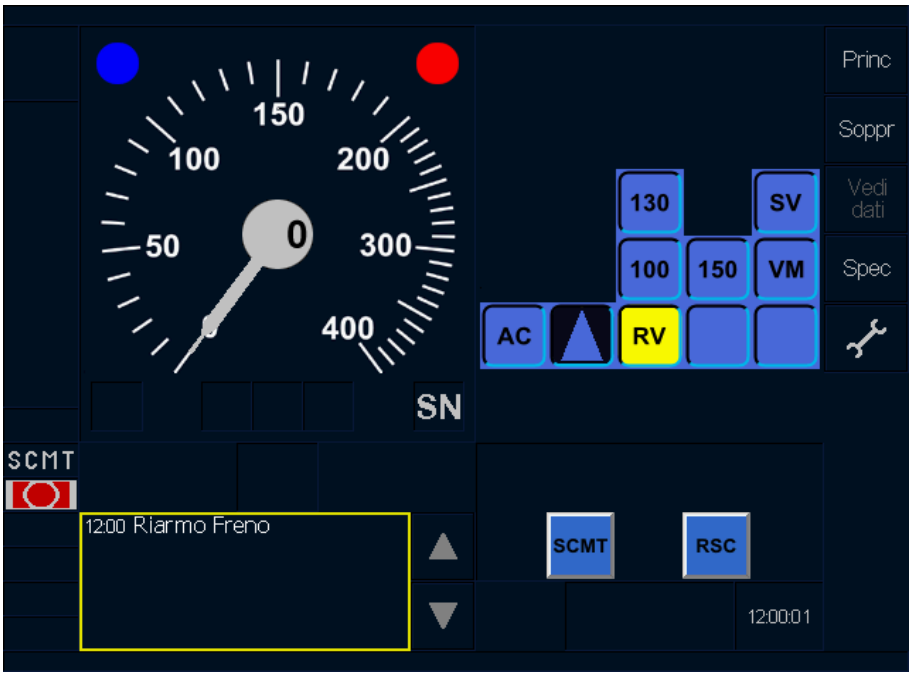


Figure A.25 — SCMT brake release example window in touch screen technology

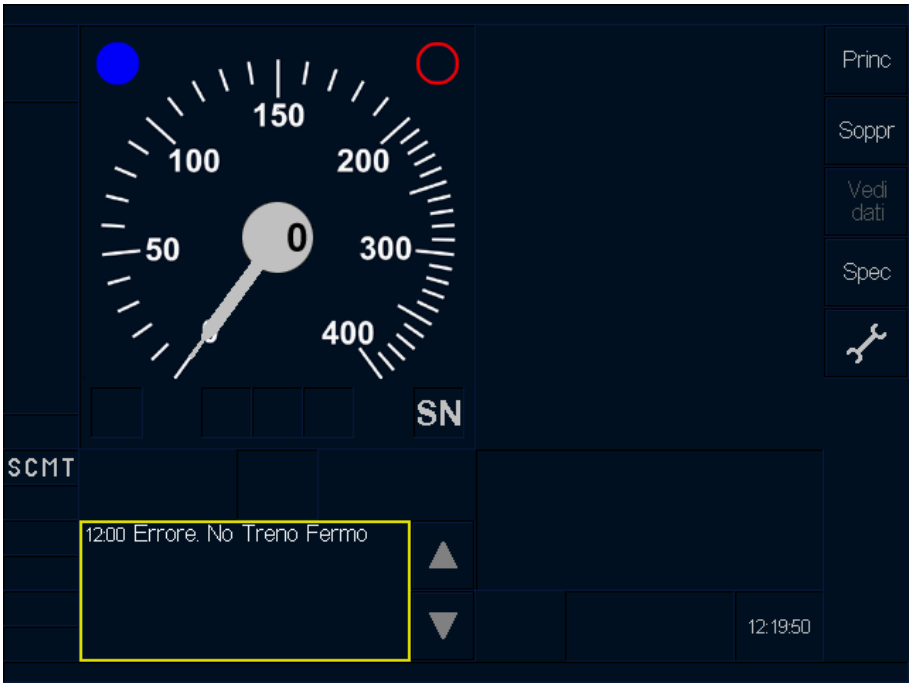


Figure A.26 — SCMT warning acknowledgement example window in touch screen technology

A.5.7 SCMT audible information

For SCMT nine different audible information formed of two different frequencies and different sequences are used.

The detailed description of the audible information is part of [27] .

A.5.8 SCMT List of system status messages

The detailed description of the System Status Messages is part of [27] .

A.6 SHP

A.6.1 Scope and field of specification

This specification sample defines the interface between the driver and the SHP onboard regarding to the use in context with ERTMS/ETCS.

This specification describes two possible technologies for implementing the SHP DMI, namely touch screen or soft key.

This specification describes only requirements that are different or additional to the specification ERA ERTMS 015560.

A.6.2 Overview

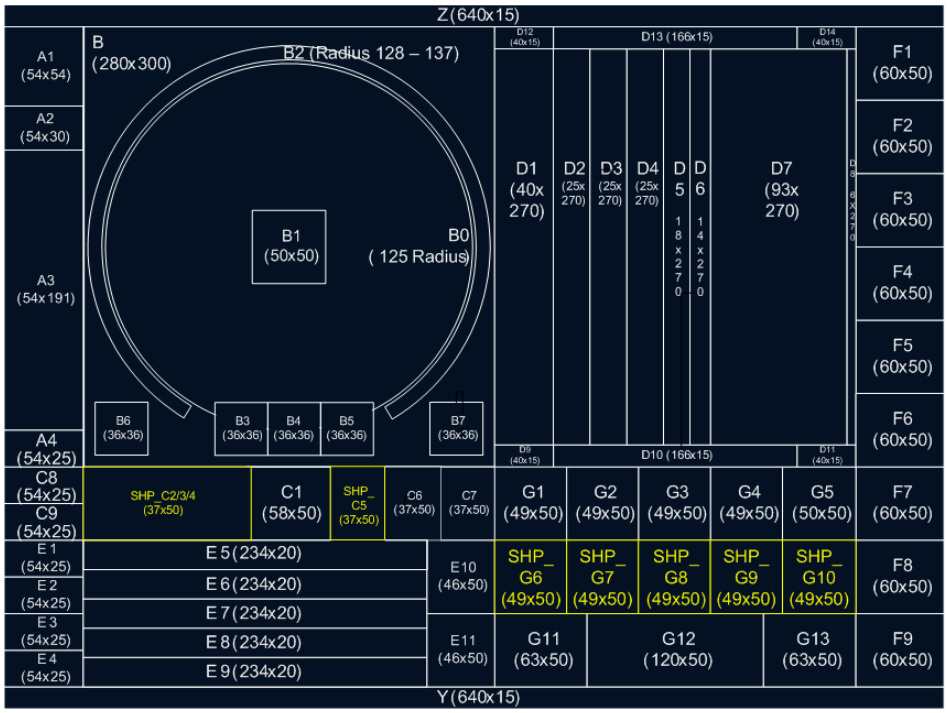


Figure A.27 — The sub areas of the SHP layout (touch screen technology)

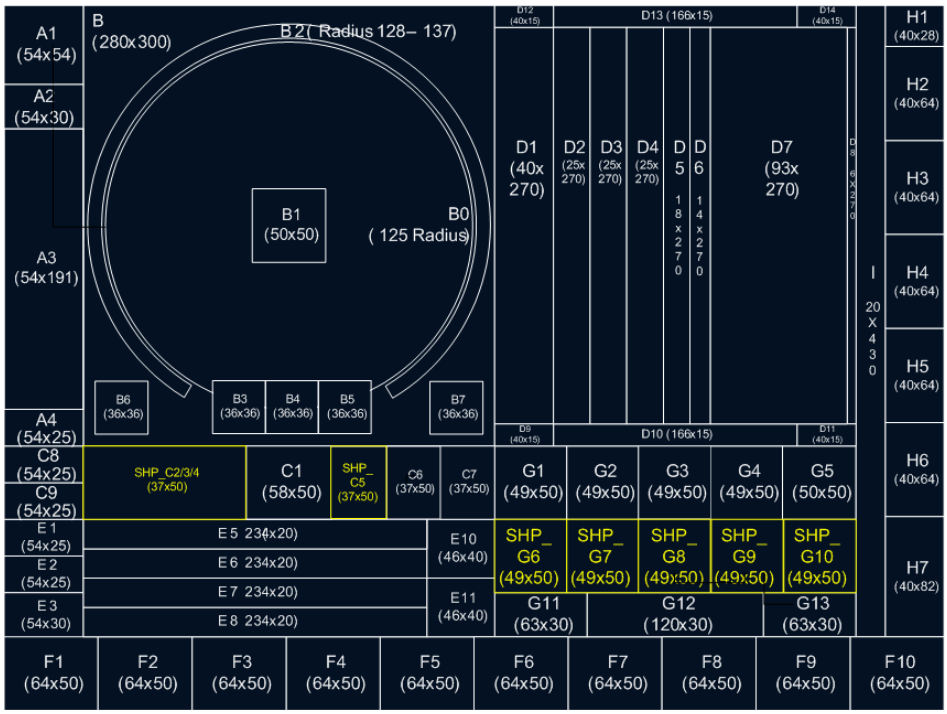


Figure A.28 — The sub areas of the SHP layout (soft key technology)

A.6.3 Area description

All areas not defined here are in positions and dimension according to ERA ERTMS 015560.

Area C (total size: 334 x 50 cells (w x h)) are composed of:

- SHP_C2/3/4 instead of C2/3/4 (each 37x50);
- SHP_C5 instead of C5 (37x50).

Area G (total size: 246 x 100 cells (w x h)) are composed of:

- SHP _G6 (49x50) instead of G5 (49x50) - Radio Stop;
- SHP _G7 (49x50) instead of G5 (49x50) - Radio Stop;
- SHP _G8 (49x50) instead of G5 (49x50) - Radio Stop;
- SHP _G9 (49x50) instead of G5 (49x50) - Radio Stop;
- SHP _G10 (50x50) instead of G5 (50x50)) - Radio Stop.

A.6.4 ETCS and SHP information shown on a SHP default window

A.6.4.1 ETCS objects

No different or additional requirements to ERA ERTMS 015560.

A.6.4.2 NTC objects

A.6.4.2.1 General

No different or additional requirements to ERA ERTMS 015560 according to

- flashing mode and style;
- text messages.

A.6.4.2.2 Indicators

The indicators SHP_C2/3/4, SHP_C5, SHP_G6, SHP_G7, SHP_G8, SHP_G9 and SHP_G10 are displayed according to [26].

The two possible ‘Radio Stop’ indicators (SHP_G6 and SHP_G7) will be displayed in area G6 to G10 using the leftmost unused position.

These positions were selected to enable displaying these Voice Radio indicators even if the train is operating with NTC SHP inside Poland.

A.6.5 SHP sub-level windows

A.6.5.1 Introduction

For all equipment where the SHP function is implemented, all requirements in specification ERA ERTMS 015560 described with the term “NTC X” will use the term “SHP”.

NTC SHP has not train data, therefore no data view will be shown.

A.6.5.2 SHP default window

Figure A.29 — SHP default window in touch screen technology

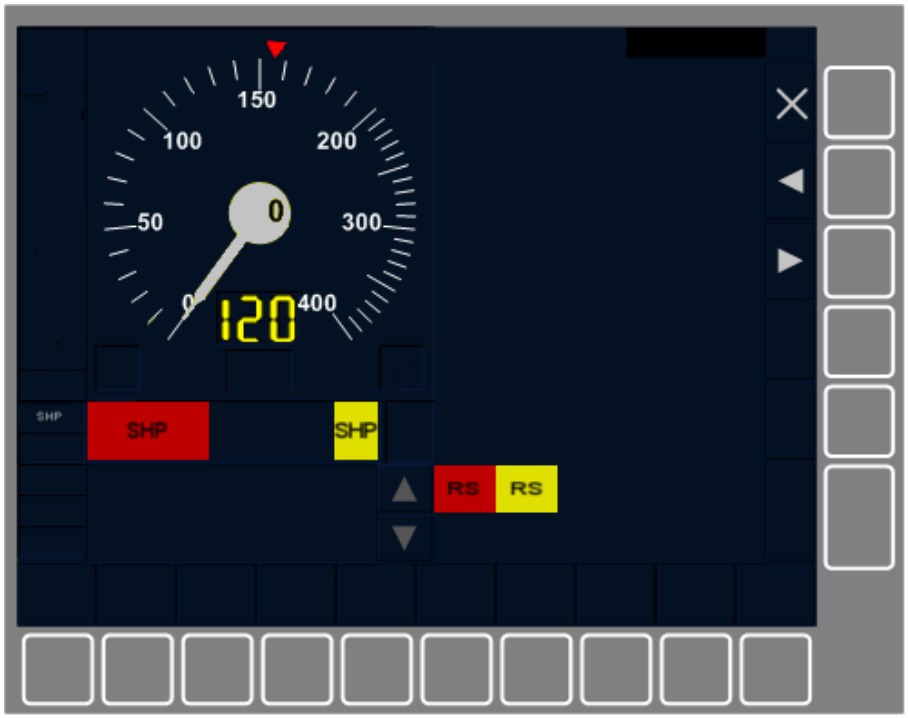


Figure A.30 — SHP default window in softkey technology

A.6.6 SHP symbols

A.6.6.1 Level symbols

Level symbols according to ERA ERTMS 015560 for SHP are presented in Table A.24.

Table A.24 — Level symbols for SHP

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D051		lev03.bmp	level SHP; grey	52 x 21	C8	For National System where SHP functions are available

A.6.6.2 Mode symbols

No different or additional requirements to ERA ERTMS 015560.

A.6.6.3 Status symbols

In ERTMS/ETCS level SHP in modes SN or NL the following Status Symbols will be used:

Table A.25 — Symbols for SHP operation

This field shows the SHP operation status.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D052a		S100_1.bmp	SHP **is awaiting; red**	111 x 50	C2/3/4	
D052b		S100_2.bmp	SHP is inactive; **yellow**	37 x 50	C5	

Table A.26 — Symbols for SHP Radio Stop

This field shows the Radio Stop status.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
D053a		S100_3.bmp	Radio Stop is forcing a emergency brake; red	49 x 50	G6 to G10	
D053b		S100_4.bmp	Radio Stop function is inhibited; yellow	49 x 50	G6 to G10	

A.6.6.4 Orders and announcement of Track Condition Symbols

Orders and announcement of track conditions are not used in ERTMS/ETCS SHP.

A.6.6.5 Planning information symbols

Planning Information symbols are not used in SHP.

A.6.6.6 Driver Request symbols

Driver request symbols are not used in ERTMS/ETCS level SHP.

A.7 JKV

A.7.1 Scope and field of specification

This specification defines the interface between the driver and the JKV (Finnish ATP system VR/RHK; an EBICAB 900 system) on-board regarding to the use in context with ERTMS/ETCS and as standalone system.

This specification describes two possible technologies for implementing the JKV DMI, namely touch screen or soft key.

This specification describes only requirements that are different or additional to the specification ERA ERTMS 015560.

A.7.2 Overview

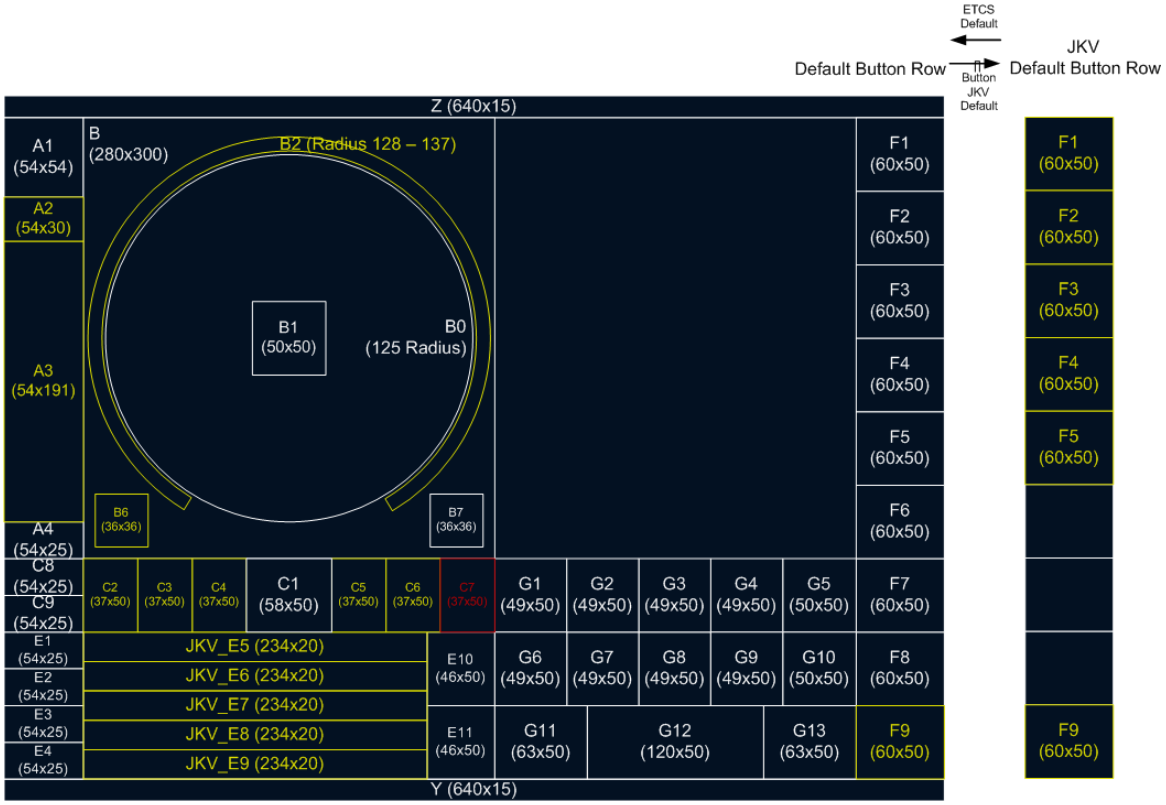


Figure A.31 — The sub areas of the JKV layout (touch screen technology)

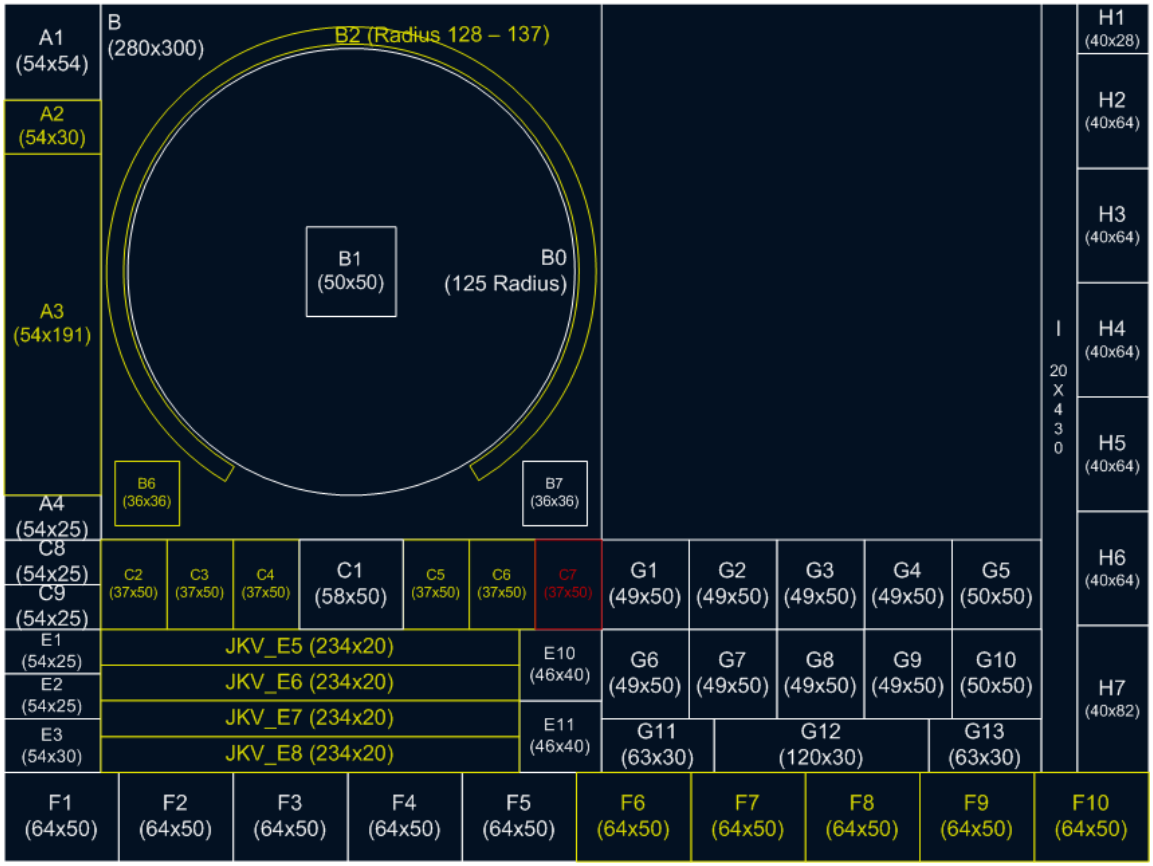


Figure A.32 — The sub areas of the JKV layout (soft key technology)

A.7.3 Area description

All areas not defined here are in positions and dimension according to ERA ERTMS 015560.

Area A (total size: 54 x 300 cells (w x h)) are composed of:

- JKV_A2 instead of A2 (54x30);
- JKV_A3 instead of A3 (54x191).

Area B (total size: 280 x 300 cells (w x h)) are composed of:

- JKV_B2 (radius 127 - 137);
- JKV_B6 (36x36) instead of B6.

Area C (total size: 334 x 50 cells (w x h)) are composed of:

- JKV_C2 instead of C2 (37x50);
- JKV_C3 instead of C3 (37x50);
- JKV_C4 instead of C4 (37x50);
- JKV_C5 instead of C5 (37x50);

- JKV_C6 instead of C6 (37x50);
- JKV_C7 instead of C7 (37x50).

For touch screen technology:

Area F (total size 334 x 100 cells (w x h)) are composed of:

- JKV_F9 instead of F9 (60x50).

For soft key technology:

Area F (total size 334 x 80 cells (w x h)) are composed of:

- JKV_F6 instead of F6 (64x50);
- JKV_F7 instead of F7 (64x50);
- JKV_F8 instead of F8 (64x50);
- JKV_F9 instead of F9 (64x50);
- JKV_F10 instead of F10 (64x50).

Annex B
(informative)

Sounds for NTC and/or other on-board systems

B.1 General

The WAV-format files are only informative. The examples are given only to be sure that the sounds provided by the real system are sufficiently similar to avoid confusion.

The lists of audible information for NTC and other Train functions are not exhaustive.

B.2 Other train functions

B.2.1 S9 - Driver activity warning

This is a warning signal from the supervision of driver activity.

The following table describes the main characteristics of this audible information.

Table B.1 — S9 - Driver activity warning

Supervision of movement authorities	Sound group:	Supervision
Action required – handle “deadman”	Tone(s):	2
	Duration:	3 x 0,1 s. low tone
		+ 0,35 s. high tone = 0,65 s.
Urgency – warning	Frequency sequence:	Low / high
	Intensity sequence:	Increasing
	Tempo:	Every 0,65 s
	Presentation:	As long as necessary until the required action is performed by the driver or until the driver activity supervision system intervenes.

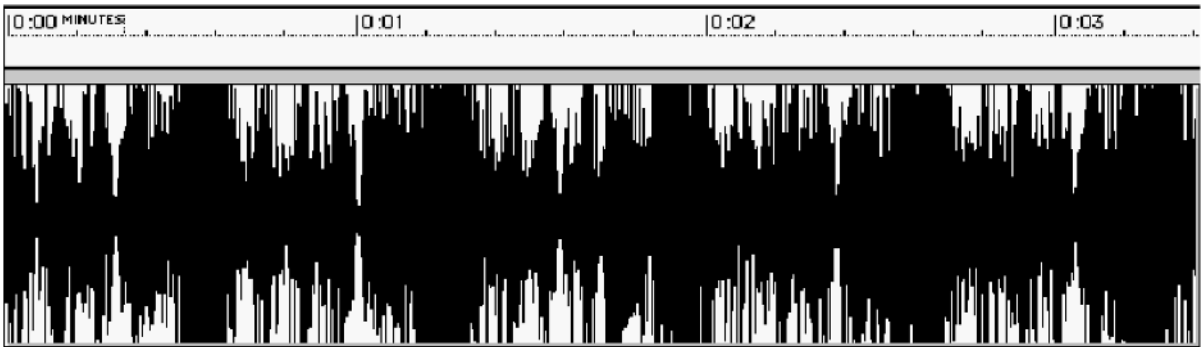


Figure B.1 — Wave of the audible information 'Driver Activity Warning'

Reference information:

The S9 - Driver activity warning sound shall be compliant with the "S9_driver_activity.wav" file.

B.3 NTC

B.3.1 LZB/PZB audible information

B.3.1.1 PLZB_S1 - SCHNARRE

This is a warning signal from the PZB system.

The following table describes the main characteristics of this audible information.

Table B.2 — LPZB_S1 - SCHNARRE

LZB/PZB signal	Sound group:	Supervision
	Duration:	Once short or long
Urgency – warning	Frequency sequence:	Melodic
	Intensity sequence:	None
	Presentation:	As long as necessary until the required action is performed by the driver or until the LZB/PZB intervention has finished.

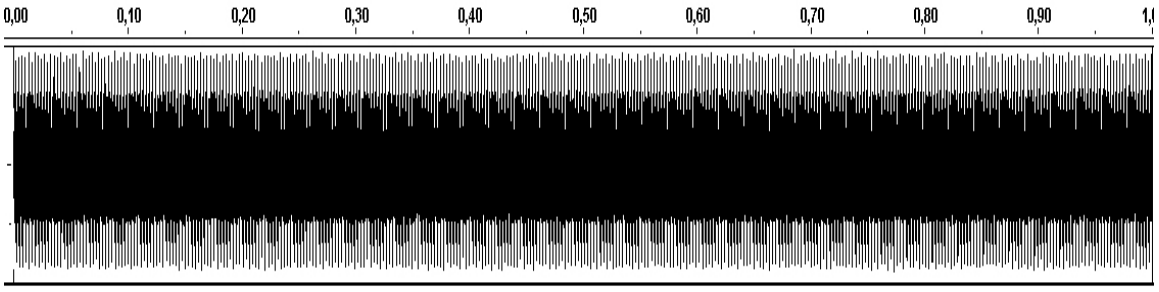


Figure B.2 — Wave of the audible information 'PLZB_S1 – SCHNARRE

Reference information:

Depending of the LZB/PZB system the LPZB_S1 sound is compliant with

- the “lzb-schnarre_dauer.wav” file.

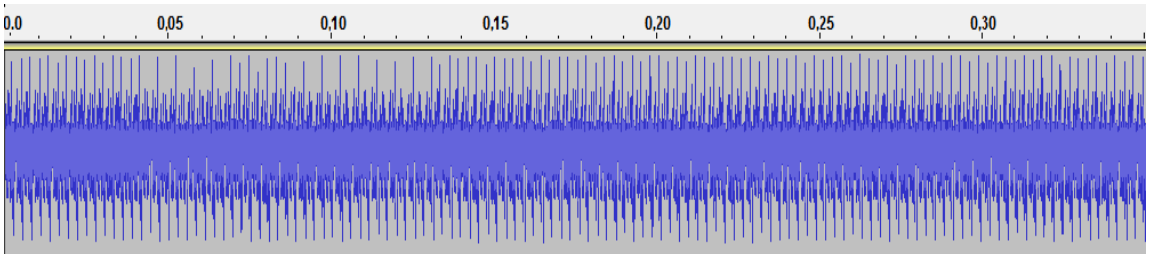


Figure B.3 — Wave of the audible information ‘LZB-SCHNARRE_DAUER

- the “lzb-schnarre_intermit_1.wav” file.

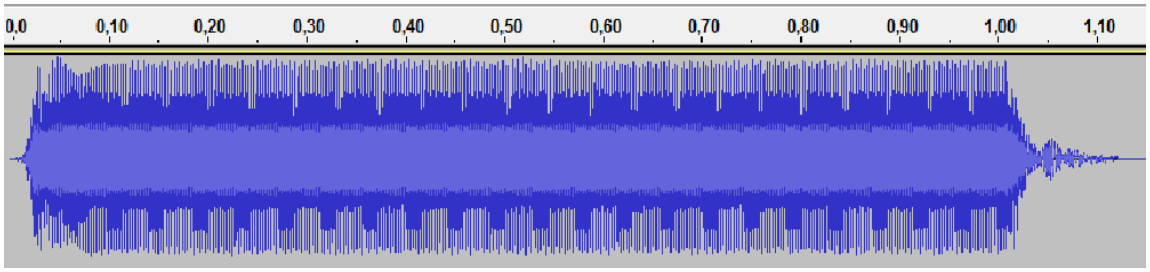


Figure B.4 — Wave of the audible information ‘LZB-SCHNARRE_INTERMIT_1

- the “lzb-schnarre_intermit_2.wav” file.

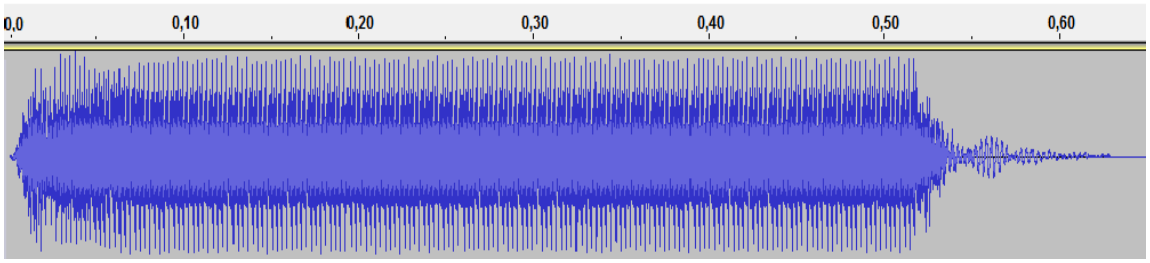


Figure B.5 — Wave of the audible information ‘LZB-SCHNARRE_INTERMIT_2

B.3.1.2 PLZB_S2 - HUPE

This is a warning or activity signal from the LZB/PZB system.

The following table describes the main characteristics of this audible information.

Table B.3 — LPZB_S2 - HUPE

Supervision of movement authorities	Sound group:	Supervision
	Duration:	Once short or long
Urgency – warning	Frequency sequence:	Melodic
	Intensity sequence:	None
	Presentation:	As long as necessary until the required action is performed by the driver or until the system intervention of the LZB/PZB is cancelled or suppressed.

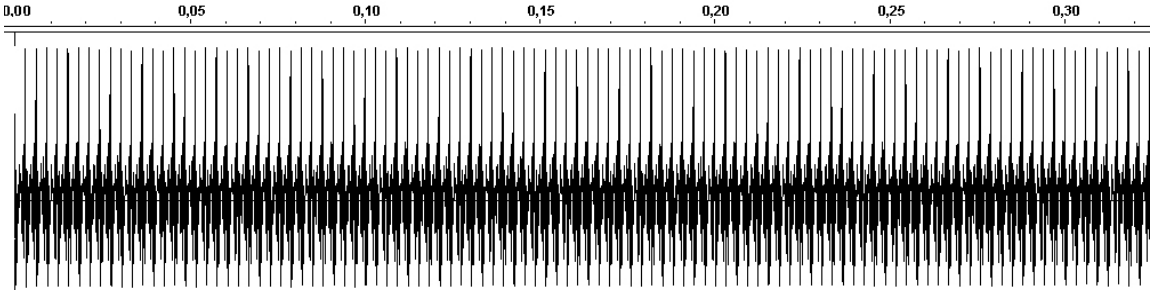


Figure B.6 — Wave of the audible information 'PLZB_S2 – HUPE

Reference information:

Depending of the LZB/PZB system the LPZB_S2 sound is compliant with

- the "lzb_hupe.wav" file.

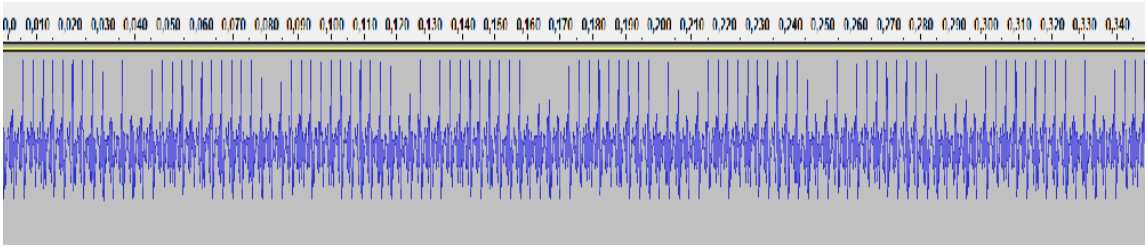


Figure B.7 — Wave of the audible information 'LZB_HUPE

- the "lzb_hupe _f1.wav" file.

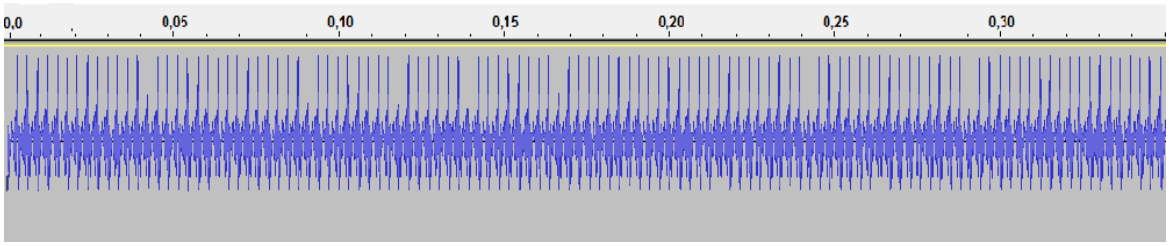


Figure B.8 — Wave of the audible information 'LZB_HUPE_F1

- the "lzb_hupe _f2.wav" file.

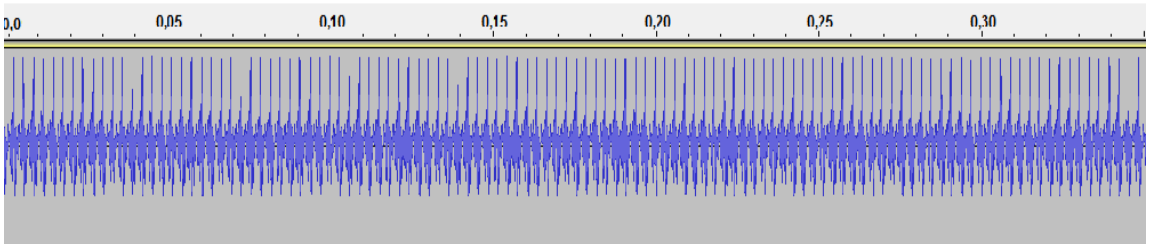


Figure B.9 — Wave of the audible information 'LZB_HUPE_F2

In case of voice output an audio file containing the German text "Zugbeeinflussung" is used.

B.3.1.3 PLZB_S3 - EMERGENCY_BRAKE_INTERVENTION

The LPZB_S3 sound shall be compliant with an audio file containing the German text "Zwangsbremsung".

B.3.2 AWS/TPWS audible information

Because AWS/TPWS is using a separate 'Audible indicator with voice unit' the audible information is not within the scope of this specification.

B.3.3 ATC2 audible information

Reserved for national contributions.

B.3.4 SHP audible information

Reserved for national contributions.

B.3.5 SCMT audible information

All audible information for SCMT is defined in [27].

B.3.6 JKV audible information

Reserved for national contributions.

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