

**ERTMS/ETCS****ETCS DRIVER MACHINE INTERFACE****Reference:** ERA_ERTMS_015560**Document type:****Version :** 3.3.0**Date :** 01/03/12

	Edited by	Quality review	Approved by
Name	O. GEMINE	A. CHIAPPINI	P. GUIDO
Position	ERTMS Unit Project Officer	ERTMS Unit Quality Manager	ERTMS Head of Unit
Date & Signat.			

1. AMENDMENT RECORD

Version	Date	Section number	Modification/description	Author(s)
0.1	12/11/07	-	First Draft	OG
0.2	03/12/07	6.2, 7.2.1.1, 7.2.1.6	Main changes concern Supervision status, Speed dial and Release Speed sections	OG
0.3	17/01/08	6.2.4, 7.3.8, 5	Section 6.2.4 deleted, 7.3.8 "Geo Pos" updated, section 5 deletion of non requirements	OG
0.4	24/01/08	5. 6.2 6.1.3 7.2.3.1 7.2.3.2	Updated according to meeting review Updated according to meeting review 6.1.3 "use of areas" updated Override in B7 and not in C1 Description improved and rule for STM abbreviation added	OG
0.5	31/01/08	5. 6.2 5. to 7.2.2	Revision marks accepted up to 5.3.3 Revision marks accepted, supervision status for RSM updated Updated according to meeting review	OG
0.6	07/02/08	5. to 7.2.2 7.2.2 to 7.5	Revision marks accepted Updated according to meeting review	OG
0.7	12/02/08	All	Revision marks accepted	OG
0.8	07/03/08	All 11	Updated according to review comments Table of operational texts updated	OG
0.9	20/03/08	All	Sections fully restructured Data Entry section added	OG
0.10	21/03/08	All	Updated according to meeting 19-20/03	OG
0.11	28/03/08	All	See revision marks added during the meeting 28-03-08	OG
0.12	17/04/08	All	See revision marks (mainly based on comments received on v0.10) numbering of figures, tables and their cross-references updated Symbols fully renumbered and their cross-references updated Layout improved: A2 split in A2/A3 and A3 renumbered A4, D1 to D8 extended by 5 cells height, other areas D9 to D14 addapted accordingly Geo Pos: no more part of planning info, moved from D9 to G12	OG
0.13	19/05/08	All	Updated according to meeting 07-08/05/08	OG

ERA ERTMS unit
ETCS Driver Machine Interface

Version	Date	Section number	Modification/description	Author(s)
0.14	17/06/08	All	See revision marks	OG
0.15	31/07/08	All	Most of the figures updated Chapter 3 "Introduction" added See revision marks (mainly based on comments received on v0.14)	OG
0.16	29/08/08	All	see revision marks based on "action list – 080829.xls"	OG
0.17	30/09/08	All	see revision marks based on "action list – 080930.xls"	OG
1.0	30/09/08	All	version delivered to the CG (revision marks in v0.17 accepted)	OG
1.1	04/11/08	All	See revision marks based on "action list – 081104.xls" following review meeting on 081031	OG
1.2	28/11/08	All	See revision marks based on "action list – 081128.xls" following review meeting on 081028	OG
2.0	04/12/08	8.2.2.2.7, 8.2.2.4 8.5.1.6, 9.2.2.10, 10.5.2.3.3	Target distance (digital) restored for OS/SR modes Editorial improvements	OG
2.1	23/02/09	7.3.2.1, 8.3.1.1, tables 25/26 10.1.1.6 10.4.1.3 13	Editorial improvements missing condition for "Start" and "Shunting" buttons deleted "Balise error" changed to "Balise read error" references moved from "Balise error" to "SH stop order"/"SR stop order"	OG
2.2	23/03/09	All	see revision marks based on "action list – 090320.xls"	OG
2.3	14/04/09	All	see revision marks based on "action list – 090414.xls"	OG
2.4	08/05/09	All	First draft for baseline 300. See revision marks based on "action list – 090508.xls"	OG
2.5	07/07/09	All	see revision marks based on "action list – 090707.xls"	OG
2.6	29/08/09	All	see revision marks based on "action list – 090829.xls" and on agreed comments in "ERA DMI Specification (v2.5)_consolidated.doc"	OG
2.7	10/11/09	All	see revision marks based on "action list – 091110.xls"	OG
2.8	08/12/09	All	see revision marks based on "action list – 091208.xls"	DL

ERA ERTMS unit
ETCS Driver Machine Interface

Version	Date	Section number	Modification/description	Author(s)
2.9	18/12/09	All	see revision marks based on "action list – 091218.xls"	OG
3.0	19/02/10	All	see revision marks based on "action list – 100217.xls"	OG
3.1.1	08/11/10	All	see CRs 689, 731, 802, 878, 914, 915, 917, 918, 922, 943, 945, 946, 947, 948, 949, 951, 972, 978, 979, 980, 981, 982, 983, 984, 1000, 1004, 1015	OG
3.2.0	22/12/10	All	CRs 689, 731, 972, 980, 1004 updated CRs 1018, 1048 added	OG
3.2.1	13/12/11	10.3.2.4, 10.3.2.7, 10.3.2.8, 10.3.2.9, 10.3.2.10, 10.3.2.10.1, 10.3.2.11, 10.3.3, 10.6.1.3, 10.7.2.2, 10.7.2.4 S2 & S2-1, 10.7.3.3 S4 & S4-1, tables 37/48/64, Figures 115, 132, 133 (numbering from v3.2.0)	Level inhibition (CR756) removed	OG
		Table 64 (numbering from v3.2.0)	"Juridical recording failure" removed (CR589 rejected)	
		All	See CRs 752, 987, 992, 1036, 1062, 1065, 1068, 1081, 1090, 1096, 1097, 1098, 1134	
3.3.0	01/03/12	Baseline 3 release version		OG,AH
		Tables 1, 35, 43, 44 Figures 112, 128, 129, 131, 132, 134 10.5.1.1, 10.5.1.7 (numbering from v3.2.1)	CR992 updated	
		Table 1	See CR1108	
		10.3.9.9.5	See CR1038	
		Table 15 8.2.3.5.18 10.7.6.3	CR1097 updated	
		Tables 2, 3	See CR1135	
		All	Inclusion of DMI requirements for National Systems interfaced through an STM: see CRs 1066, 1070, 1071, 1074	

2. TABLE OF CONTENTS

1. AMENDMENT RECORD.....	2
2. TABLE OF CONTENTS.....	5
3. INTRODUCTION.....	10
3.1 Foreword	10
3.2 Scope and Field of Application	10
3.3 Document Description	10
4. REFERENCES, TERMS AND ABBREVIATIONS	12
4.1 Reference documents.....	12
4.2 Terms & abbreviations.....	12
5. GENERAL ERGONOMIC PRINCIPLES.....	15
5.1 Principles for presentation	15
5.1.1 Presentation techniques	15
5.1.2 Characters	16
5.1.3 Texts.....	17
5.1.4 Numbers.....	17
5.1.5 Numeric or Alphanumeric data	17
5.1.6 Symbols.....	18
5.1.7 Sounds	18
5.2 Physical parameters	18
5.2.1 General parameters.....	18
5.2.2 Luminance adjustment.....	19
5.2.3 Loudspeaker adjustment	19
5.3 Arrangement of information	19
5.3.1 Windows.....	19
5.3.2 Buttons	20
5.4 Acknowledgements.....	24
5.5 Languages.....	26
5.6 Isolation	26
6. ERGONOMIC ARRANGEMENTS OF AREAS OF THE ETCS LAYOUT	27
6.1 Overview.....	27
6.2 Positioning onto the grid array	29
6.3 Area description.....	30
7. SPEED AND DISTANCE MONITORING – SUPERVISION STATUS.....	33
7.1 Introduction.....	33
7.2 Ceiling Speed Monitoring (CSM).....	34
7.2.1 Normal Status information (NoS)	34
7.2.2 Over-speed Status information (OvS)	36

ERA ERTMS unit
ETCS Driver Machine Interface

7.2.3	Warning Status information (WaS)	36
7.2.4	Intervention Status information (IntS)	36
7.2.5	Order and precedence of Status.....	36
7.3	Pre-Indication Monitoring (PIM)	37
7.3.1	Definition	37
7.3.2	Supervision Status.....	37
7.4	Target Speed Monitoring (TSM)	38
7.4.1	Normal Status information (NoS).....	38
7.4.2	Indication Status information (IndS).....	39
7.4.3	Over-speed Status information (OvS).....	41
7.4.4	Warning Status information (WaS)	41
7.4.5	Intervention Status information (IntS)	42
7.4.6	Order and precedence of Status.....	42
7.5	Release Speed Monitoring (RSM)	43
7.5.1	Indication Status information (IndS).....	43
7.5.2	Intervention Status information (IntS)	43
7.5.3	Order and precedence of Status Indication.....	44
8.	ETCS INFORMATION SHOWN ON THE ETCS DEFAULT WINDOW	45
8.1	Introduction.....	45
8.2	Speed and Supervision information	45
8.2.1	Speed Information	46
8.2.2	Brake Information	67
8.2.3	Supplementary Driving Information.....	73
8.3	Planning Information.....	92
8.3.1	General description.....	92
8.3.2	Layering principles.....	94
8.3.3	Distance scale	94
8.3.4	Orders and announcements	95
8.3.5	Gradient profile	97
8.3.6	Speed profile discontinuity information	98
8.3.7	Planning Area Speed Profile (PASP).....	100
8.3.8	Indication Marker	102
8.3.9	Show and hide planning information	103
8.3.10	Zoom function.....	104
8.4	Monitoring Information	105
8.4.1	Safe radio connection indication	106
8.4.2	Reversing permitted indication.....	107
8.4.3	Local time	109
8.4.4	Geographical position	109

ERA ERTMS unit
ETCS Driver Machine Interface

8.5	Sub-level window selection	111
9.	ETCS AND NTC INFORMATION SHOWN ON A NTC DEFAULT WINDOW	113
9.1	Introduction.....	113
9.2	ETCS objects.....	113
9.3	NTC Objects.....	113
9.3.1	General.....	113
9.3.2	Flashing mode and style	113
9.3.3	Text Messages	114
9.3.4	Indicators.....	114
9.3.5	Buttons	114
9.3.6	Sounds	114
9.3.7	Supervision Information	115
9.4	Customisable DMI service	116
9.5	Unified DMI service.....	116
9.5.1	Introduction.....	116
9.5.2	Requirements	117
10.	SUB-LEVEL WINDOWS – GENERAL REQUIREMENTS.....	118
10.1	Introduction	118
10.2	Menu windows.....	118
10.2.1	Menu windows for touch screen technology	118
10.2.2	Menu windows for soft key technology	119
10.2.3	Layers.....	120
10.3	Data entry windows	120
10.3.1	Input fields	120
10.3.2	Entering characters	123
10.3.3	Echo texts.....	123
10.3.4	Data checks.....	124
10.3.5	Data entry window for touch screen technology.....	127
10.3.6	Data entry window for soft key technology.....	131
10.3.7	Layers.....	136
10.4	Data validation windows	137
10.4.1	Data validation for touch screen technology	137
10.4.2	Data validation for soft key technology	138
10.4.3	Layers.....	139
10.5	Data view windows.....	139
10.5.1	Data view for touch screen technology	139
10.5.2	Data view for soft key technology	140
10.5.3	Layers.....	142
10.6	Data entry / validation process	142

ERA ERTMS unit
ETCS Driver Machine Interface

11.	ERTMS/ETCS SUB-LEVEL WINDOWS	144
11.1	Introduction	144
11.2	Menu Windows.....	144
11.2.1	Main window	144
11.2.2	Override window	147
11.2.3	Special window	148
11.2.4	Settings window.....	150
11.2.5	RBC contact window.....	152
11.3	Data entry Windows	154
11.3.1	Train running number window.....	154
11.3.2	ERTMS/ETCS level window.....	155
11.3.3	Driver ID window.....	157
11.3.4	Radio network ID window	159
11.3.5	RBC data window	160
11.3.6	Language window.....	162
11.3.7	Volume window.....	163
11.3.8	Brightness window	164
11.3.9	Train data window(s)	164
11.3.10	SR speed / distance window	173
11.3.11	Adhesion window	174
11.3.12	Set VBC window	176
11.3.13	Remove VBC window.....	178
11.4	Data validation windows	179
11.4.1	Train data validation window.....	179
11.4.2	Set VBC validation window	180
11.4.3	Remove VBC validation window	181
11.5	Data view windows	182
11.5.1	Data view window	183
11.5.2	System version window	187
11.6	Parent/child relationship	188
11.7	Dialogue sequences.....	190
11.7.1	Introduction.....	190
11.7.2	Start Up	191
11.7.3	Main window	199
11.7.4	Shunting	208
11.7.5	Override window	210
11.7.6	Special window	212
11.7.7	Settings window.....	214
12.	NTC X SUB-LEVEL WINDOWS	218

ERA ERTMS unit
ETCS Driver Machine Interface

12.1	Introduction	218
12.2	Menu Windows.....	218
12.2.1	NTC data entry selection window.....	218
12.3	Data entry Windows	220
12.3.1	NTC X data window(s)	220
12.4	Data validation windows	221
12.4.1	NTC X data validation window	221
12.5	Data view windows	222
12.5.1	NTC X data view window	223
12.6	Parent/child relationship	225
12.7	Dialogue sequences.....	225
12.7.1	Introduction.....	225
12.7.2	NTC data dialogue sequence	226
13.	SYMBOLS	233
13.1	Introduction	233
13.2	Level Symbols	233
13.3	Mode Symbols	236
13.4	Status Symbols	239
13.5	Orders and Announcement of Track Condition Symbols	240
13.6	Planning Information Symbols.....	244
13.7	Navigation Symbols.....	247
13.8	Settings Symbols	250
13.9	Driver Request Symbols.....	250
13.10	Level Crossing Symbol.....	251
14.	AUDIBLE INFORMATION	252
14.1	Introduction	252
14.2	Feedback Audible information	252
14.2.1	click	252
14.3	ERTMS/ETCS Audible information.....	252
14.3.1	Sinfo - Information on DMI	252
14.3.2	S1 - Over-speed	252
14.3.3	S2 - Warning	252
15.	LIST OF SYSTEM STATUS MESSAGES.....	253

3. INTRODUCTION

3.1 Foreword

- 3.1.1.1 A clear and consistent definition of the ERTMS/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 ERTMS/ETCS onboard equipment, hence reducing the probability of human errors in application of the operational rules.
- 3.1.1.2 Moreover, harmonising 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.

3.2 Scope and Field of Application

- 3.2.1.1 This document defines the interface between the driver and the ERTMS/ETCS onboard by detailing:
- a) information to be displayed to the driver in response to operational situations. This includes visual information for speed and distance monitoring, the symbols and text messages as well as audible information.
 - b) the interactions between the driver and the ERTMS/ETCS onboard. This includes the dialogue sequences used during data entry.
- 3.2.1.2 The DMI related interfaces inside the ERTMS/ETCS on-board equipment, the interfaces between the driver and the ERTMS/GSM-R and between the driver and any other non ERTMS/ETCS application, are outside of the scope of this specification.
- 3.2.1.3 The main part of the interface between the driver and the National System(s) is outside of the scope of this specification. In case a National System is interfaced to the ERTMS/ETCS onboard through an STM, a limited number of requirements are specified in the present document (see chapters9 & 12).
- 3.2.1.4 Cab integration issues (e.g. which screen(s) is/are used for the interface between the driver and the ERTMS/ETCS onboard, the position of this/these screens inside the driver's cab, as well as which non ERTMS/ETCS applications are integrated onto the same screen(s) as the one(s) used by the ERTMS/ETCS onboard) are also outside of the scope of this specification.
- 3.2.1.5 Even though this specification allows two possible technologies, namely touch screen or soft key, the specific hardware solutions (e.g. the number of screens, the size of hard keys,...) used to achieve the ERTMS/ETCS DMI are outside of the scope of this specification.

3.3 Document Description

- 3.3.1.1 This specification describes two possible technologies for implementing the ERTMS/ETCS DMI, namely touch screen or soft key.
- 3.3.1.2 Any other technology shall be precluded.
- 3.3.1.3 Combining both technologies with the full freedom is not permitted by this specification. However, this specification allows to design a hybrid solution by adding sensitive areas / buttons on a soft key based layout.
- 3.3.1.4 Should this hybrid solution be retained, the added sensitive areas or buttons shall comply with the corresponding requirements specified for the touch screen technology but respecting the dimensions of the soft key based layout..
- 3.3.1.4.1 Note: It means that, for instance, the areas A/B can be sensitive for the “toggling function for speed supervision” by applying the requirement 8.2.2.4.2.
- 3.3.1.5 Chapter 5 defines general ergonomic principles used throughout the document.
- 3.3.1.6 Chapter 6 details the various areas of the ETCS layout for both technologies. The following chapters extensively refer to these areas when defining the displayed objects.
- 3.3.1.7 Chapter 7 introduces the supervision status with regards to the braking curves. Some objects (e.g. speed pointer, circular speed gauge) will refer to them when defining their displayed colour(s).
- 3.3.1.8 Chapter 8 details the ETCS objects forming the ETCS default window.
- 3.3.1.9 Chapter 9 details the STM objects forming the NTC default window.
- 3.3.1.10 Chapter 10 describes general (graphical) requirements for the sub-level windows.
- 3.3.1.11 Chapter 11 details the ERTMS/ETCS sub-level windows using the general requirements of chapter10
- 3.3.1.12 Chapter 12 details the NTC sub-level windows using the general requirements of chapter 10.
- 3.3.1.13 Chapter 13 details all symbols used throughout the document.
- 3.3.1.14 Chapter 14 details the sounds used throughout the document.
- 3.3.1.15 Chapter 15 details the text messages to be displayed with regards to certain system statuses.
- 3.3.1.16 Throughout the document, when a specific technology is not explicitly mentioned, then the concerned requirement shall apply to both technologies.

4. REFERENCES, TERMS AND ABBREVIATIONS

4.1 Reference documents

Table 1 : reference documents

Ref. N°	Document Reference	Title
[1]	SUBSET-023	Glossary of Terms and Abbreviations
[2]	SUBSET-026	System Requirements Specification
[3]	SUBSET-035	Specific Transmission Module FFFIS
[4]	SUBSET-040	Dimensioning and Engineering rules

4.2 Terms & abbreviations

4.2.1.1 For general terms, definitions and abbreviations refer to document [1]. New terms and abbreviations used in this document are specified here.

Table 2 : Terms

Term	Definition
Border	rectangle surrounding objects in order to create 3 dimensional impression on the total image display area
Button	object shown to the driver through which a driver action is possible to give input to the ERTMS/ETCS onboard. The object is identified by a label. When using a touch screen technology, the driver action is done via the associated sensitive area on the display area. When using a soft key technology, the driver action is done via the hard key adjacent to the label
Cell	basic unit to define the shape of DMI objects and the proportions of areas. Depending on the resolution of the total image display area, a cell can consist of one or more pixels.
Dialogue Sequence	is a mechanism by which the DMI guides the driver through a set of windows in order to fulfil a specific task.
Disabled	means the related button cannot go to the “pressed” state. A disabled button does not respond to any driver actions.
Display area	zone displaying a piece of visual information and defined by a size (in cells) and a position relative to the positions of the other display areas. It is more commonly named “area” in this specification.
Enabled	means the related button can go to the “pressed” state. An enabled button does respond to a driver action.
Frame	conspicuous rectangle surrounding an object

ERA ERTMS unit
ETCS Driver Machine Interface

Table 2 : Terms

Term	Definition
Grid array	area grid pattern on the total image display area consisting of cells which results in a visual appearance of information in certain proportions
Hard key	physical key not part of the total image display area. This key can also have a text label or symbol
Input field	object shown to the driver to echo a data. It is composed of a label part giving the topic of the data and of a data part showing the data itself.
Label	symbol or text indication on a button or associated to an input field
Layer	groups all areas with the same impression of depth using the border technique
Pressed	means a driver action on the button is ongoing.
Sensitive area	area on which a driver can make a physical action to give input to the ERTMS/ETCS onboard
Soft key	context-dependent key which consists of a hard key with an associated label on the total image display area
Symbol	presentation of information in graphical form instead of using text
Total image display area	Image formed by the contribution of all individual display areas
Touch screen	Using the display area for driver's inputs by means of programmable sensitive areas
Window	a presentation of objects, text messages, input fields and/or buttons related to a single topic.

Table 3 : Abbreviations

Abbreviation	Definition
AIIS	All Status
CSG	Circular Speed Gauge
IF	Input Field
IndS	Indication Status
IntS	Intervention Status
NoS	Normal Status
OvS	Over-speed Status
PASP	Planning Area Speed Profile
PIM	Pre-Indication Monitoring
RGB	Red Green Blue
V _{FLOI}	FLOI speed

Table 3 : Abbreviations

Abbreviation	Definition
Vperm	Permitted speed
Vrelease	Release speed
Vtarget	Target speed
WaS	Warning Status
(w x h)	(width x height)

5. GENERAL ERGONOMIC PRINCIPLES

5.1 Principles for presentation

5.1.1 Presentation techniques

5.1.1.1 Borders

5.1.1.1.1 To structure the presentation of the different objects, a three dimensional impression is created by surrounding areas, buttons and input fields with a border.

5.1.1.1.2 The border of an area shall be drawn as follows to give the impression of depth:

- a) Left and top lines of the area: 1 cell width, black colour
- b) Right and bottom lines of the area: 1 cell width, shadow colour

5.1.1.1.3 Unless stated otherwise, the border of a button (touch screen technology) or the border of the label part of a button (soft key technology) shall be drawn as follows to give the impression it is lifted:

- a) Left and top outer lines of the button: 1 cell width, black colour
- b) Left and top inner lines of the button (adjacent to the outer line): 1 cell width, shadow colour
- c) Right and bottom outer lines of the button: 1 cell width, shadow colour
- d) Right and bottom inner lines of the button (adjacent to the outer line): 1 cell width, black colour

5.1.1.1.4 The border of an input field shall be drawn as follows to delimit the concerned input field from the other ones:

- a) Left/Top/Right/Bottom lines of the area: 1 cell width, medium grey colour

5.1.1.2 Layers

5.1.1.2.1 Areas displayed with the same impression of depth shall form a layer (see Figure 1).

5.1.1.2.1.1 Note: The colours used in Figure 1 intentionally differ from the mandatory colours of Table 4. They are optimised only for a printed copy of this specification.

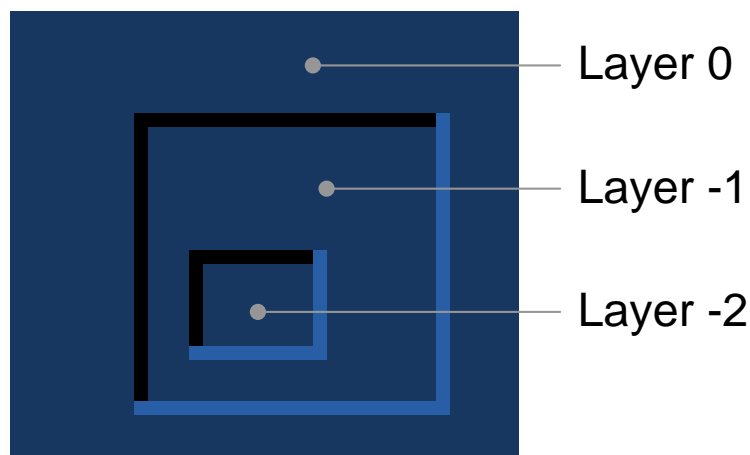


Figure 1 – Layer definition

5.1.1.2.2 The areas without border shall form the layer 0.

5.1.1.2.3 The areas with a border and inside layer 0 shall form layer -1.

5.1.1.2.4 The areas with a border and inside layer -1 shall form layer -2.

5.1.1.2.5 When an area is allocated to the layer -1 or layer -2, a border shall be drawn around this area.

5.1.1.3 Frames

5.1.1.3.1 When a flashing frame is required as specified in the following chapters, it shall replace the border of the concerned area/button and it shall be drawn as follows:

a) Left/Top/Right/Bottom lines of the area: 2 cells width, yellow

5.1.1.3.2 The frame(s) shall flash by toggling every 0.25 seconds between visible and not visible (e.g. background colour) starting with the visible state.

5.1.2 Characters

5.1.2.1 Character type

5.1.2.1.1 The character type shall not use serifs.

5.1.2.1.2 The character type shall use a proportionally spaced font.

5.1.2.1.3 The character spacing shall be the normal spacing as defined by the chosen font.

5.1.2.1.4 Note: Chicago, Helvetica, Swiss or Verdana are recommended fonts.

5.1.2.1.5 When the dot character '.' is used in a keyboard (see 10.3.5 & 10.3.6), it shall be presented in bold style.

5.1.2.2 Character height

5.1.2.2.1 The height of the characters (see H in Figure 2) shall refer to the height of the capital characters.

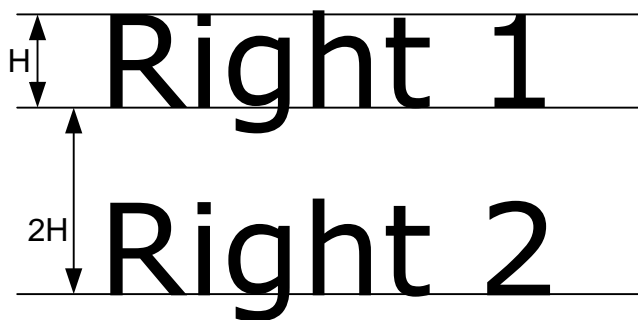


Figure 2 – Height of characters and line spacing

5.1.2.2.2 Note: The lower case characters and numbers are derived from the chosen font type.

5.1.2.2.3 The height of the characters shall be:

- a) speed scale numbers, numbers for numeric/enhanced numeric/alphanumeric keyboards, numbers on F areas for dedicated keyboards (soft key technology): 16 cells,
- b) current speed (digital): 18 cells,
- c) release speed (digital): 17 cells,
- d) numbers for the kilometres part of the geographical position, for the remaining distance to the tunnel stopping area: 12 cells,
- e) numbers for the target distance digital, in the planning information, for the metres part of the geographical position: 10 cells,
- f) local time of text messages: 10 cells,
- g) letters for alphanumeric keyboards and for the label of the Train running number (i.e. 'TRN'): 10 cells,
- h) other characters (e.g. used for input fields, text messages, echo texts, etc.): 12 cells

5.1.3 Texts

5.1.3.1 Unless stated otherwise, texts shall be left aligned inside its allocated area.

5.1.3.2 Unless stated otherwise, an indent of 3 cells shall be used from the limit of the area when aligning a text.

5.1.3.3 Unless stated otherwise, texts shall be vertically centred inside its allocated area.

5.1.3.4 Unless stated otherwise, texts shall be in grey.

5.1.3.5 Unless stated otherwise, the line spacing of texts shall be 2 times the height of characters (see 2H in Figure 2).

5.1.4 Numbers

5.1.4.1 When using numbers, leading zeros shall not be shown (e.g. show 80 km/h not 080 km/h), unless it is essential (e.g. telephone number).

5.1.5 Numeric or Alphanumeric data

5.1.5.1 If a data contains more than 5 (alpha)numeric characters on a text line, a single 'space' character shall be introduced to create 2 separate groups of characters when displaying this data. The length of each group of characters shall not exceed 5 characters.

5.1.5.2 A 'line break' shall be introduced every 8 characters when displaying this data i.e. not more than 8 characters shall be presented on the same text line.

5.1.5.2.1 Note: the space characters and the line breaks are not part of the data value. They are only used to ease the readability of long data.

5.1.5.2.2 Note: A data for which the range is limited to dedicated values (i.e. with a dedicated keyboard, see 10.3 for more details) is not considered as a numeric or alphanumeric data.

5.1.6 Symbols

- 5.1.6.1 When a symbol is referenced in this specification, it shall be displayed according to the form/shape, colour and size as specified in chapter 12.
- 5.1.6.2 The pixels of the bitmap files specified in chapter 12 shall be understood as cells.
- 5.1.6.3 Every symbol shall be centred in its area.

5.1.7 Sounds

- 5.1.7.1 When a sound is referenced in this specification, it shall be played as specified in chapter 14.

5.2 Physical parameters

5.2.1 General parameters

5.2.1.1 Display size

- 5.2.1.1.1 The minimum size of the total image display area shall be 180 mm x 135 mm (w x h).

5.2.1.2 Display resolution

- 5.2.1.2.1 The minimum resolution of the total image display area shall be based on a total grid array of 640 x 480 square cells.
- 5.2.1.2.2 This 640 x 480 ratio shall form the basis for all object proportions independently of the resolution and of the size of the total image display area.

5.2.1.3 Colours

- 5.2.1.3.1 The following 24-bit RGB colour values shall be used.
- 5.2.1.3.2 Any reference in the specification to a colour shall be deemed to be a reference to this Table 4.
- 5.2.1.3.3 The background colour shall always be the colour #6 “dark blue (background)”.

Nr	Colour name	Red	Green	Blue
1	white	255	255	255
2	black	0	0	0
3	grey	195	195	195
4	medium grey	150	150	150
5	dark grey	85	85	85
6	dark blue (background)	3	17	34
7	shadow	8	24	57
8	yellow	223	223	0
9	orange	234	145	0
10	red	191	0	2

11	PASP dark	33	49	74
12	PASP light	41	74	107

Table 4 - 24-bit RGB colour scheme

5.2.2 Luminance adjustment

5.2.2.1 It shall be possible for the driver to adjust the luminance.

5.2.2.1.1 Note: Additionally, this adjustment may be done automatically.

5.2.2.2 The last stored luminance shall be used when opening the desk. In case no luminance is stored onboard, the median value of the range shall be used as the default luminance.

5.2.2.3 Note: The range in which the luminance can be adjusted is outside the scope of the present document.

5.2.2.4 In addition to the brightness window (see chapter 11.2.4), the ERTMS/ETCS DMI may offer the following possibility to adjust the luminance: other means positioned on an ergonomic location on the driver's desk.

5.2.3 Loudspeaker adjustment

5.2.3.1 It shall be possible for the driver to adjust the volume of the loudspeaker.

5.2.3.2 The last stored volume shall be used when opening the desk. In case no volume is stored onboard, the median value of the range shall be used as the default volume.

5.2.3.3 Note: The range in which the volume can be adjusted is outside the scope of the present document.

5.2.3.4 In addition to the volume window (see chapter 11.2.4), the ERTMS/ETCS DMI may offer the following possibility to adjust the loudspeaker: other means positioned on an ergonomic location on the driver's desk.

5.3 Arrangement of information

5.3.1 Windows

5.3.1.1 General Requirements

5.3.1.1.1 The presentation of objects, text messages and buttons shall be possible on several levels. Within those levels, they shall be allocated to areas of the ERTMS/ETCS DMI.

5.3.1.1.2 Objects, text messages and buttons presented within the same level shall form a 'window'.

5.3.1.1.3 The default windows of the ERTMS/ETCS DMI shall be the total image display area with the allocation of objects, text messages and buttons as described in chapters 8 and 9.

5.3.1.1.4 A default window shall not cover any other window.

- 5.3.1.1.5 While a sub-level window is activated, it shall cover the parent level window. A window shall be covered partially or totally by the sub-level window depending on the size of the sub-level window. The latest sub-level window shall be active meaning that all other windows shall not respond to any driver input.
- 5.3.1.1.6 A window shall be composed of:
- a) a unique window title giving the topic of the window (e.g. Train data) ;
 - b) one or several areas for the content of the window e.g. input fields, buttons,... ;
 - c) a [Close] button closing the window and returning to the parent window ;
 - d) possibly, a [Next] button: to be used to select the next window related to the same topic ;
 - e) possibly, a [Previous] button: to be used to select the previous window related to the same topic.
- 5.3.1.1.7 Exception: On a default window, 5.3.1.1.6 shall not apply.
- 5.3.1.1.8 Exception: When using a soft key technology, if there are several windows related to the same topic (e.g. Train data), the [Close] button shall be replaced by the [Previous] button on the windows following the first one. (see chapter 10.3.6).
- 5.3.1.1.8.1 Note: When using a soft key technology, for this kind of windows, there are not enough keys to present all necessary navigation buttons. Consequently, the driver will have to go back to the first window of the topic to find the [Close] button.
- 5.3.1.1.9 The scrolling between various windows related to the same topic shall not be circular i.e. the first window shall not scroll to the last one and vice-versa.
- 5.3.1.1.10 Note: For more details about the navigation buttons, see chapter 5.3.2.7.

5.3.1.2 Window title

- 5.3.1.2.1 A window title area shall meet the following requirements:
- a) the height shall be 24 cells;
 - b) the background colour shall be black;
 - c) it shall contain a text label identifying the window;
 - d) the text label on the window title area shall be grey;
 - e) it shall be positioned at the top of the window;
 - f) it shall cover the width of the window, unless stated otherwise for specific windows;
 - g) if the number of DMI objects (e.g. buttons, text messages, input data fields) related to the topic of a window cannot fit on the window area(s), the text label on the window title shall include between brackets the sequence number of the current window and the total number of windows related to the same topic separated by a slash e.g. (1/2).

5.3.2 Buttons

5.3.2.1 Size of a button

5.3.2.1.1 When using a touch screen technology, the size of the touch sensitive surface of the button shall be equal to the size of the visible surface of the button, unless stated otherwise for specific buttons.

5.3.2.2 Button operation feedback

5.3.2.2.1 Activation of a button shall be accompanied by feedback:

- a) visual, and
- b) tactile and/or audible.

5.3.2.3 Button labels

5.3.2.3.1 The buttons shall be labelled with a language dependent text or with a symbol (see chapter 12).

5.3.2.3.2 The text label or the symbol shall be centred on the button, unless stated otherwise for specific buttons.

5.3.2.4 Button colour

5.3.2.4.1 The background colour of a button shall be the Dark Blue (background) colour, unless stated otherwise for specific buttons.

5.3.2.5 Button states

5.3.2.5.1 A button may have three different states: “enabled”, “disabled” and “pressed”.

5.3.2.5.2 An “enabled” button shall be shown slightly lifted from the background by displaying a border (see 5.1.1.1.3).

5.3.2.5.3 A “pressed” button shall be shown slightly into the background by not displaying its border.

5.3.2.5.4 Only one button shall be in the “pressed” state at the same time.

5.3.2.5.5 A “disabled” button shall be:

- a) shown as an “enabled” button with the text label in dark grey or with a specific symbol, or
- b) not shown at all.

5.3.2.5.6 Note: For soft key technology, the border of the button refers to the border around its label part.

5.3.2.6 Button types

5.3.2.6.1 There are three ways in which an “enabled” button can react to driver selections (up, down or delay).

5.3.2.6.2 On selection by the driver, the up-type button (see Figure 3) shall change to the “pressed” state and the ‘click’ sound shall be played. As long as the button remains pressed by the driver, the button shall remain in the “pressed” state. After releasing the

selection, the button state shall exit the “pressed” state and a valid button activation shall be considered by the onboard (implying that the function associated to the button is initiated).

- 5.3.2.6.3 If, when using touch screen technology, the driver selection continues, but outside the up-type button itself (the finger slides out of the sensitive area of the button) the button shall return to the “enabled” state and no valid button activation shall be considered by the onboard. When the driver selection moves back to the button (the finger slides back onto the sensitive area of the button) the button shall be shown in the “pressed” state again, but this time without the ‘click’ sound played.

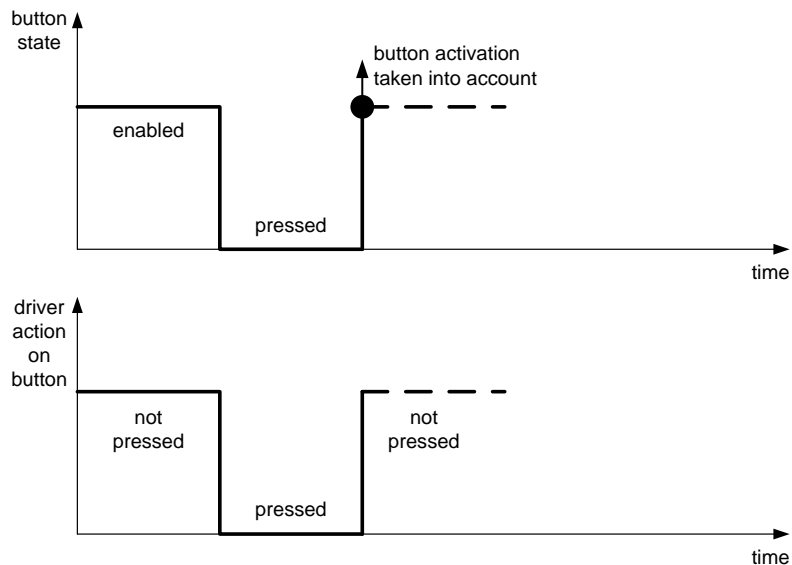


Figure 3 - Activation of an up-type button

- 5.3.2.6.4 On selection by the driver, the down-type button (see Figure 4) shall alter from “enabled” to “pressed” and immediately back to the “enabled” state. The ‘click’ sound shall be played and a valid button activation shall be considered by the onboard.
- 5.3.2.6.5 A down-type button can have a repeat function if the button remains pressed by the driver for longer than 1.5 seconds. After 1.5 seconds, the repeat function shall consider valid button activations each 0.3 sec; the visual and audible indications are as if the driver was pressing on the button every 0.3 sec.

ERA ERTMS unit

ETCS Driver Machine Interface

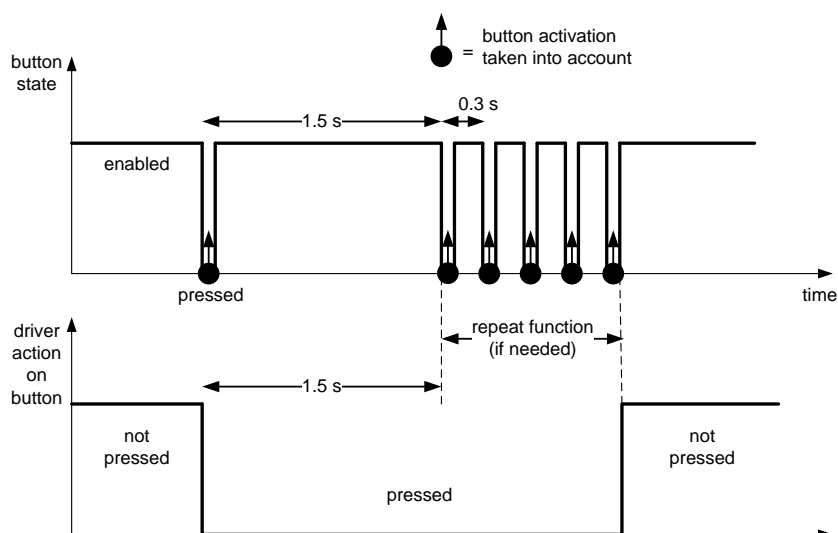


Figure 4 - Activation of a down-type button

5.3.2.6.6 The delay-type button is similar to the up-type button but with a delay (see Figure 5). On selection by the driver, the delay-type button shall change to the “pressed” state and the ‘click’ sound shall be played. The button shall then toggle every 0.25 seconds between the “pressed” and “enabled” states as long as the button remains pressed by the driver. After 2 seconds, if the button is still pressed by the driver, the button shall change again to the “pressed” state and the procedure according to the up-type button shall be followed. If the button is pressed by the driver for less than the 2 seconds, the button shall return to the “enabled” state, the procedure with the 2 seconds timer shall be reset and no valid button activation shall be considered by the onboard

5.3.2.6.7 If, when using touch screen technology, the driver selection continues, but outside the delay-type button itself (the finger slides out of the sensitive area of the button) the button shall return to the “enabled” state, the procedure with the 2 seconds timer shall be reset and no valid button activation shall be considered by the onboard. When the driver selection moves back to the delay-type button (the finger slides back onto the sensitive area of the button), the procedure with the 2 seconds timer shall start again but this time without the ‘click’ sound played.

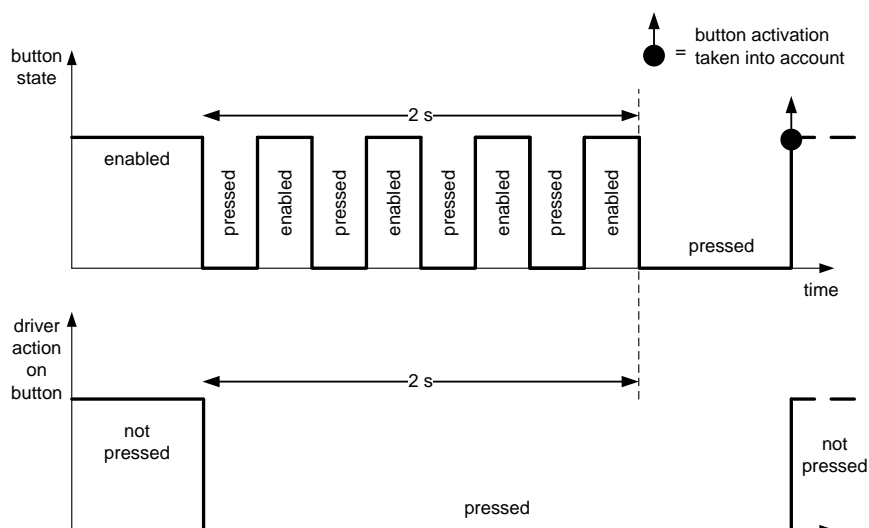


Figure 5 - Activation of a delay-type button

5.3.2.7 Navigation buttons

5.3.2.7.1 The following navigation buttons shall be used where appropriate:

- a) [Close] button: to be used for closing a window and returning to the parent window; symbols NA11 of chapter 12 shall be used.
- b) [Enter] button: to be used to accept the input field data value; the [Enter] button finishes the handling of the current selection; symbol NA20 of chapter 12 shall be used (soft key technology).
- c) [Next] button: to be used to select the next window related to the same topic using the symbol NA17.
- d) [Previous] button: to be used to select the previous window related to the same topic using the symbols NA18.
- e) [Delete] button: to be used to delete the just entered character, symbol NA21 of chapter 12 shall be used.
- f) [Up] or [Down] button: to be used to scroll respectively up and down in lists; symbols NA13 and NA14 of chapter 12 shall be used.
- g) [Scale Up] or [Scale Down] button: to be used respectively to shorten/enlarge a distance scale; symbols NA03, NA04 (touch screen technology) and NA07, NA08 (soft key technology) of chapter 12 shall be used.
- h) [Show] or [Hide] button: to be used to show/hide objects; symbols NA01 (touch screen technology) and NA02 (soft key technology) of chapter 12 shall be used.
- i) [More] button: to be used to present the next predefined choices of a dedicated keyboard, symbol NA23 of chapter 12 shall be used.

5.3.2.7.2 The [Delete], [Up] and [Down] buttons shall be down-type buttons with a repeat function.

5.3.2.7.3 The [Enter] button shall be an up-type unless an operational data check rule is not satisfied in which case it becomes a delay-type button (see 10.3.4 for further details).

5.3.2.7.4 The [Next], [Previous], [Scale Up], [Scale Down], [Show], [Hide] and [More] navigation buttons shall always be up-type buttons.

5.3.2.7.5 For the [Up], [Down], [Scale Up], [Scale Down], [Next] and [Previous] buttons, they shall be disabled if their respective function does not lead to any change in the display.

5.3.2.7.6 In some situations, the [Close] button (see 11.7) and the [Enter] button (see 10.3.4) shall also be disabled.

5.3.2.7.7 If the buttons in “disabled” state are shown (see 5.3.2.5.5), the symbols NA05, NA06, NA09, NA10, NA12, NA15, NA16, NA18.2, NA19 and NA22 shall respectively replace the symbols NA03, NA04, NA07, NA08, NA11, NA13, NA14, NA17, NA18 and NA20.

5.4 Acknowledgements

- 5.4.1.1 When using touch screen technology, when a driver's acknowledgement is required and can be displayed, the ERTMS/ETCS DMI shall always offer an acknowledgement (Ack) located on the total image display area itself. In addition, it may offer the following possibility for the acknowledgement (Ack): a button positioned in an ergonomic location on the driver's desk.
- 5.4.1.1.1 Note: The location of the acknowledgement button onto the total image display area varies depending on the object to be acknowledged. See chapter 8 for the specific area(s) becoming the acknowledgement button.
- 5.4.1.1.2 Note: Depending on the situation, it may happen that a driver's acknowledgement is required but cannot be displayed yet ; see 5.4.1.9 and 5.4.1.11.
- 5.4.1.2 When using soft key technology, when a driver's acknowledgement is required and can be displayed, the ERTMS/ETCS DMI shall always offer an acknowledgement (Ack) via the soft key H7 showing the symbol DR04. In addition, it may offer the following possibility for the acknowledgement (Ack): a button positioned on an ergonomic location on the driver's desk.
- 5.4.1.3 Unless stated otherwise, the Ack-button shall be an up-type button.
- 5.4.1.4 When using touch screen technology, the area displaying the related object or text message shall become the Ack-button.
- 5.4.1.5 When a driver's acknowledgement is displayed, a yellow flashing frame shall be used to surround the related object or text message and sound Sinfo (see chapter 14) shall be played.
- 5.4.1.6 When using soft key technology, an additional frame around H7 (i.e. the 'Ack' label) shall also flash.
- 5.4.1.6.1 Note: in the soft key technology, 2 flashing frames are displayed.
- 5.4.1.7 Only one request for Acknowledgement (Ack) at any given time shall be presented to the driver.
- 5.4.1.8 As soon as the current object or text message has been acknowledged, the Ack-button and the yellow flashing frame(s) related to this object or text message shall disappear.
- 5.4.1.9 If there is more than one object or text message for which a driver's acknowledgement is required, they shall be managed according to a FIFO principle with a delay of 1 sec between their display i.e. the next object or text message and its related request of Acknowledgement shall be displayed 1 second after the current object or text message has been acknowledged.
- 5.4.1.10 The ERTMS/ETCS DMI shall display text messages that do not have to be acknowledged only when the FIFO list does not contain any text message(s) which has to be acknowledged (see 8.2.3.4 for details about display of text messages).
- 5.4.1.11 If a driver's acknowledgement is required when a data entry window is displayed, see 11.7.1.8 and 11.7.1.9.

5.5 Languages

- 5.5.1.1 The ERTMS/ETCS DMI shall be able to display text in all languages pre-configured onboard.
- 5.5.1.2 In addition to the settings menu allowing access to the language window (see chapter 11.2.4), the ERTMS/ETCS DMI may offer the following possibility to access it: a button positioned on an ergonomic location on the driver's desk.
- 5.5.1.3 The text labels displayed on buttons, text messages (except plain text messages given from trackside), the window titles and text labels for the input fields, the echo texts and the data view items shall be displayed in the selected language.

5.6 Isolation

- 5.6.1.1 The ERTMS/ETCS DMI shall offer a means to isolate the ERTMS/ETCS on-board equipment.
 - 5.6.1.1.1 Note: The location and form of this are implementation dependent.

6. ERGONOMIC ARRANGEMENTS OF AREAS OF THE ETCS LAYOUT

6.1 Overview

6.1.1.1 Figure 6 and Figure 7 show the naming and the ergonomic arrangement of the different areas of the ETCS layout using the touch screen technology.

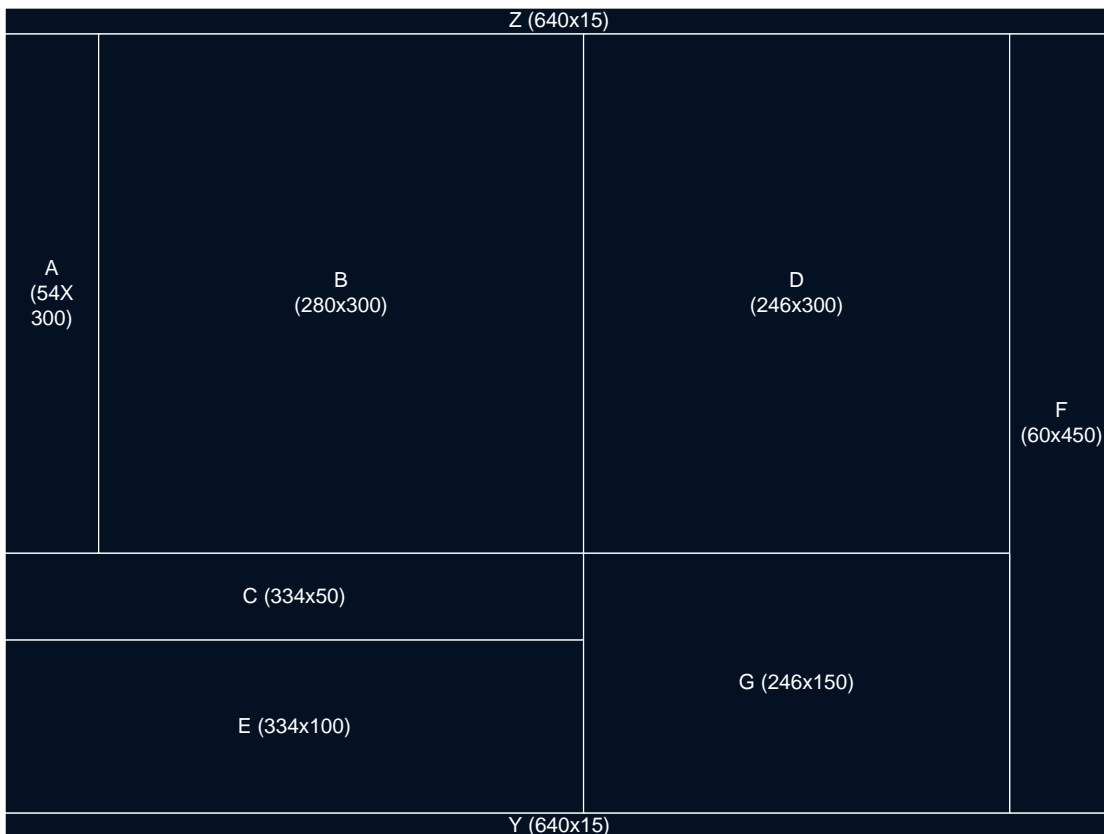


Figure 6 – The main areas of the ETCS layout (touch screen technology)

ERA ERTMS unit

ETCS Driver Machine Interface

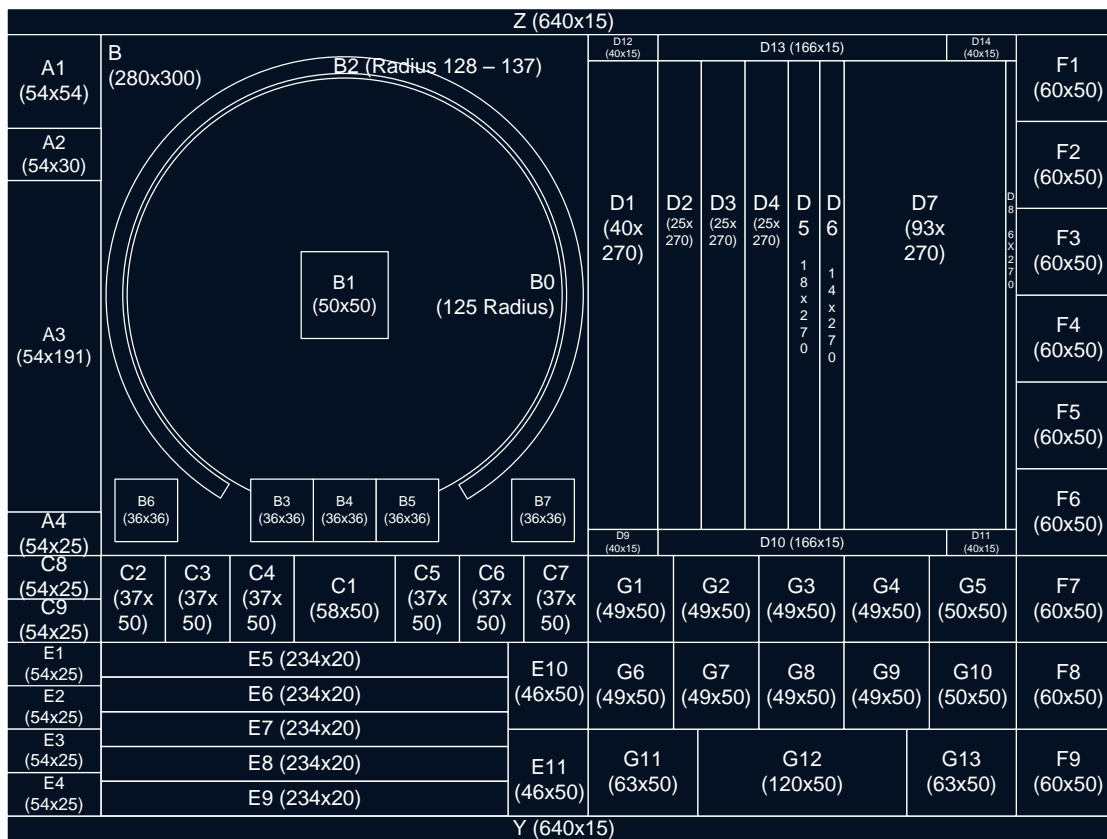


Figure 7 – The sub areas of the ETCS layout (touch screen technology)

6.1.1.2 Figure 8 and Figure 9 show the naming and the ergonomic arrangement of the different areas of the ETCS layout using the soft key technology.

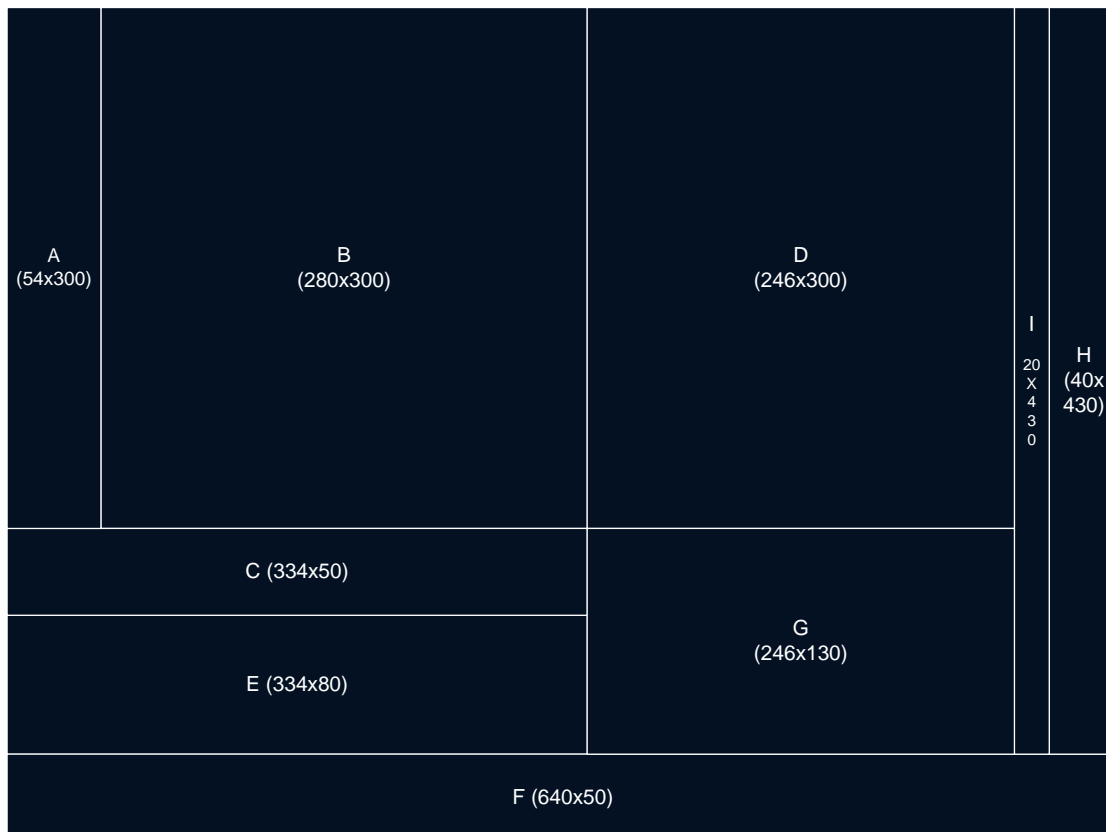


Figure 8 – The main areas of the ETCS layout (soft key technology)

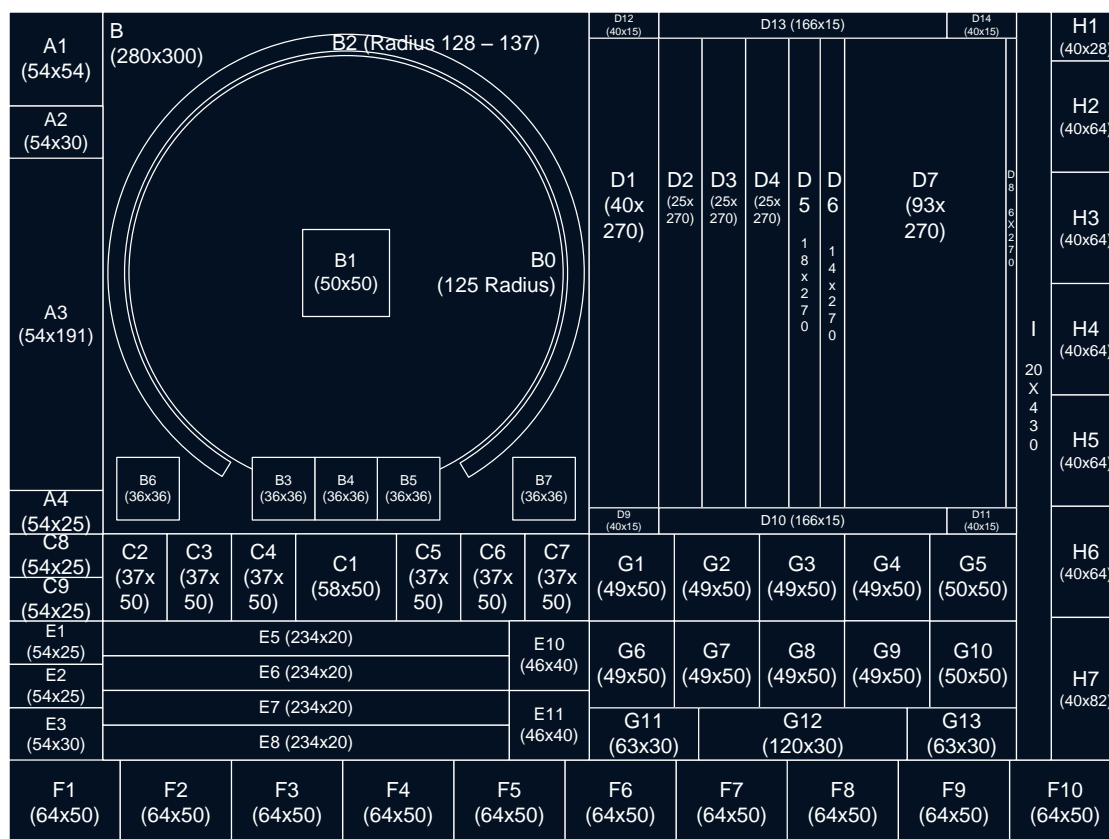


Figure 9 – The sub areas of the ETCS layout (soft key technology)

6.2 Positioning onto the grid array

- 6.2.1.1 In order to position areas, objects and buttons onto the total grid array, a cartesian coordinate system shall be used with the direction of the horizontal axis (X) from left to right and with the direction of the vertical axis (Y) from top to bottom.
- 6.2.1.2 Unless stated otherwise, the origin of the coordinate system shall be the top left corner of the area or of the group of areas containing the (sub)area, the object or the button.
- 6.2.1.3 Unless stated otherwise, the position of an area, an object or a button shall be given by the coordinates (X,Y) of its top left corner.
- 6.2.1.4 Figure 10 illustrates how to position an area and an object inside their parent area.

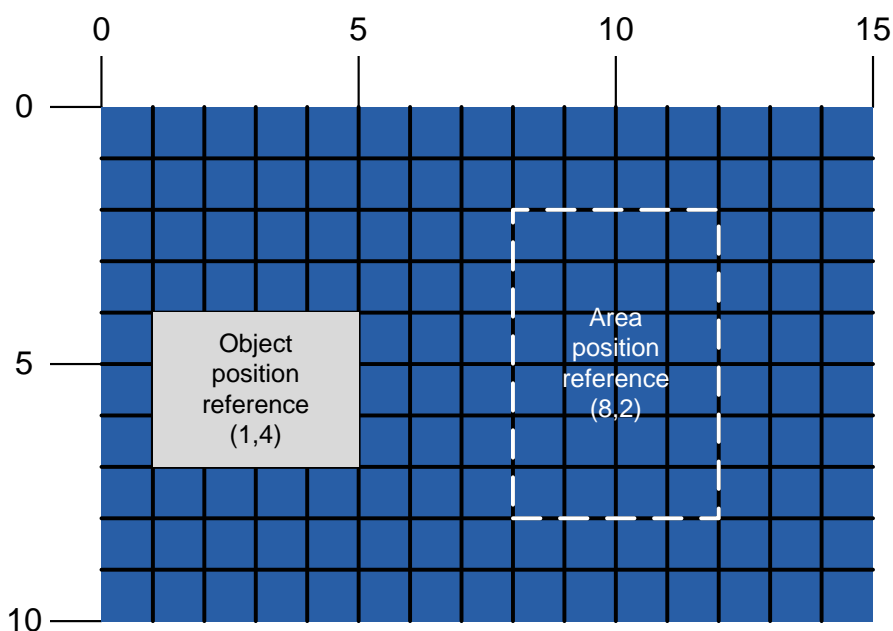


Figure 10 – Positioning onto the grid array

6.3 Area description

6.3.1.1 Area A (total size: 54 x 300 cells (w x h)) shall be composed of:

- a) A1 (54x54),
- b) A2 (54x30),
- c) A3 (54x191) and
- d) A4 (54x25).

6.3.1.2 Area B (total size: 280 x 300 cells (w x h)) shall be composed of:

- a) B0 (circle with a radius of 125 cells centred in B),
- b) B1 (50 x 50 cells (w x h) centred in B),
- c) B2 (segment of a ring centred in B with an inner radius of 128 cells, an outer radius of 137 cells and going from -149 degrees to +149 degrees with the zero degree on top),
- d) B3/4/5 (3x (36x36)) (the center of B4 is positioned (140,274), B3 and B5 are adjacent to B4),
- e) B6 (36x36) (the center of B6 is positioned (26,274)) and
- f) B7 (36x36) (the center of B7 is positioned (254,274)).

6.3.1.3 Area C (total size: 334 x 50 cells (w x h)) shall be composed of:

- a) C1 (58x50),
- b) C2/3/4 (3x (37x50)),
- c) C5/6/7 (3x (37x50)),
- d) C8 (54x25) and
- e) C9 (54x25).

6.3.1.4 Area D (total size 246 x 300 cells (w x h)) shall be composed of:

- a) D1 (40x270),
- b) D2/3/4 (3x (25x270)),
- c) D5 (18x270),
- d) D6 (14x270),
- e) D7 (93x270),
- f) D8 (6x270),
- g) D9/11/12/14 (4x (40x15)) and
- h) D10/13 (166x15).

6.3.1.5 For touch screen technology:

- Area E (total size 334 x 100 cells (w x h)) shall be composed of:
 - a) E1, E2, E3, E4 (4x (54x25)),
 - b) E5/6/7/8/9 (5x (234x20)) and
 - c) E10/11 (2x (46x50)).
- Area F (total size: 60 x 450 (w x h)) shall be composed of:
 - a) F1, F2, F3, F4 and F5/6/7/8/9 (9x (60 x 50)).
- Area G (total size 246 x 150 cells (w x h)) shall be composed of:
 - a) G1/2/3/4/6/7/8/9 (49x50),
 - b) G5/10 (50x50),
 - c) G11 (63x50),
 - d) G12 (120x50) and
 - e) G13 (63x50).
- Area Y (total size 640 x 15 cells (w x h))
- Area Z (total size 640 x 15 cells (w x h))

6.3.1.6 For soft key technology:

- Area E (total size 334 x 80 cells (w x h)) shall be composed of:
 - a) E1, E2 (2x (54x25)),
 - b) E3 (54x30),
 - c) E5/6/7/8 (4x (280x20))and
 - d) E10/11 (2x (46x40)).
- Area F (total size 640 x 50 cells (w x h)) shall be composed of:
 - a) F1/2/3/4/5/6/7/8/9/10 (10x (64x50))
- Area G (total size 246 x 130 cells (w x h)) shall be composed of:
 - a) G1/2/3/4/6/7/8/9 (49x50),
 - b) G5/10 (50x50),
 - c) G11 (63x30),
 - d) G12 (120x30) and
 - e) G13 (63x30).

- Area H (total size: 40 x 430 (w x h)) shall be composed of:
 - a) H1 (40x28),
 - b) H2/3/4/5/6 (5x (40x64)) and
 - c) H7 (40x82).
- Area I (total size: 20 x 430 (w x h))

6.3.1.6.1 Note: For soft key technology, E4 and E9 are intentionally missing.

6.3.1.7 For soft key technology, when a button in the following chapter refers to area F or H, it shall be understood that this area F or H contains the label part (text or symbol) of the concerned button.

6.3.1.8 The hard keys attached to the soft keys F or H2/3/4/5/6/7 shall have a minimum size of 14 x 14 mm (w x h).

6.3.1.9 The hard keys attached to the soft keys F or H2/3/4/5/6/7 shall be centred with regards to the position of their corresponding label areas.

6.3.1.10 Note: It is recommended that the hard keys are squares except for the hard key attached to H7 for which a rectangle is preferred.

6.3.1.11 Note: No hard key is attached to the area H1.

7. SPEED AND DISTANCE MONITORING – SUPERVISION STATUS

7.1 Introduction

7.1.1.1 The speed and distance monitoring function including the definition of the supervision statuses as well as the conditions for activating / deactivating them is fully specified in chapter 3.13 of document [2]. However, since these supervision statuses are extensively used in chapter 8 with regards to the colours of the displayed objects, they are briefly described in the next sections of this chapter 7. Consequently, only few clauses using the word “shall” provide additional requirements.

7.1.1.2 Figure 11 and Figure 12 illustrate the colours in relation to the supervision statuses. These figures only give a general overview, they are not related to any specific object of the default window. The exact colours of each object are defined in chapter 8.

7.1.1.3 The figures are divided in the following sections:

- two Ceiling Speed Monitoring sections (CSM);
- two Pre-Indication Monitoring sections (PIM);
- two Target Speed Monitoring sections (TSM) to explain how to manage the colours when two targets are defined, one being an EOA with release speed;
- one Release Speed Monitoring section (RSM).

7.1.1.3.1 Note: in document [2], the PIM is considered as a sub-area of the Target Speed Monitoring area and is called “pre-indication display area”.

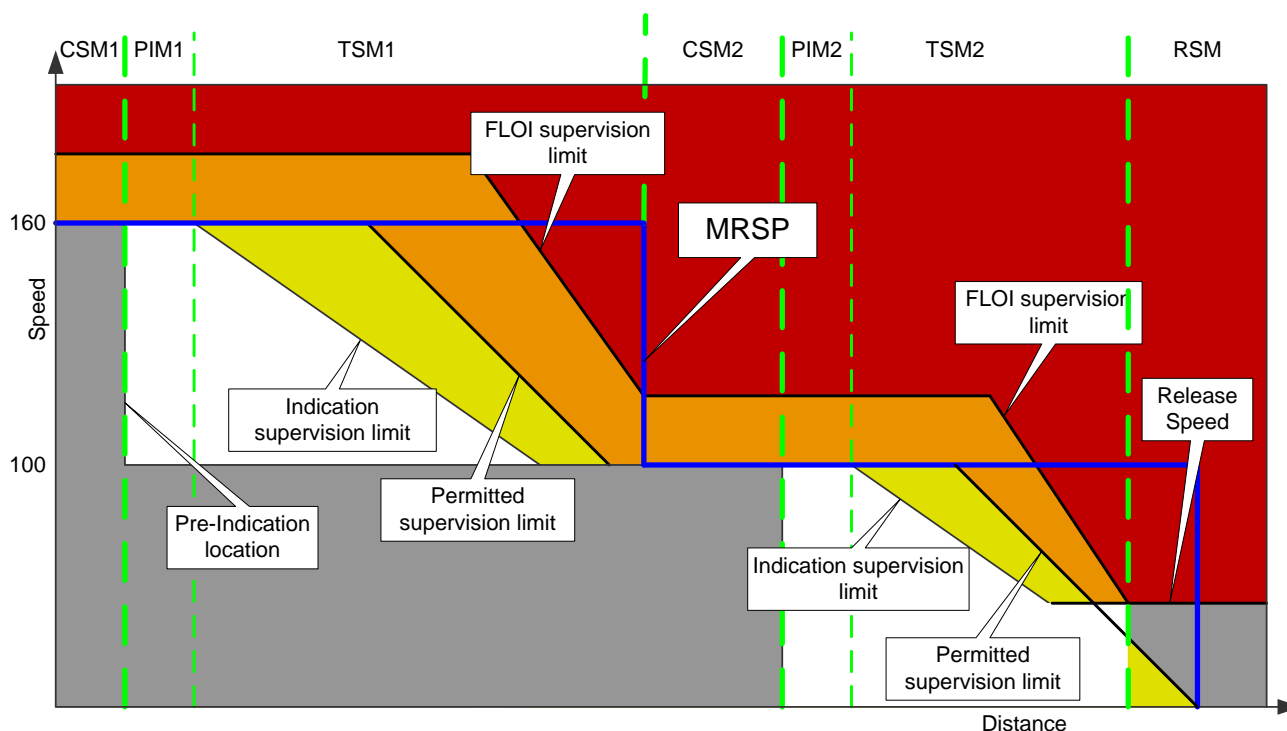


Figure 11 – Colour philosophy and supervision limits

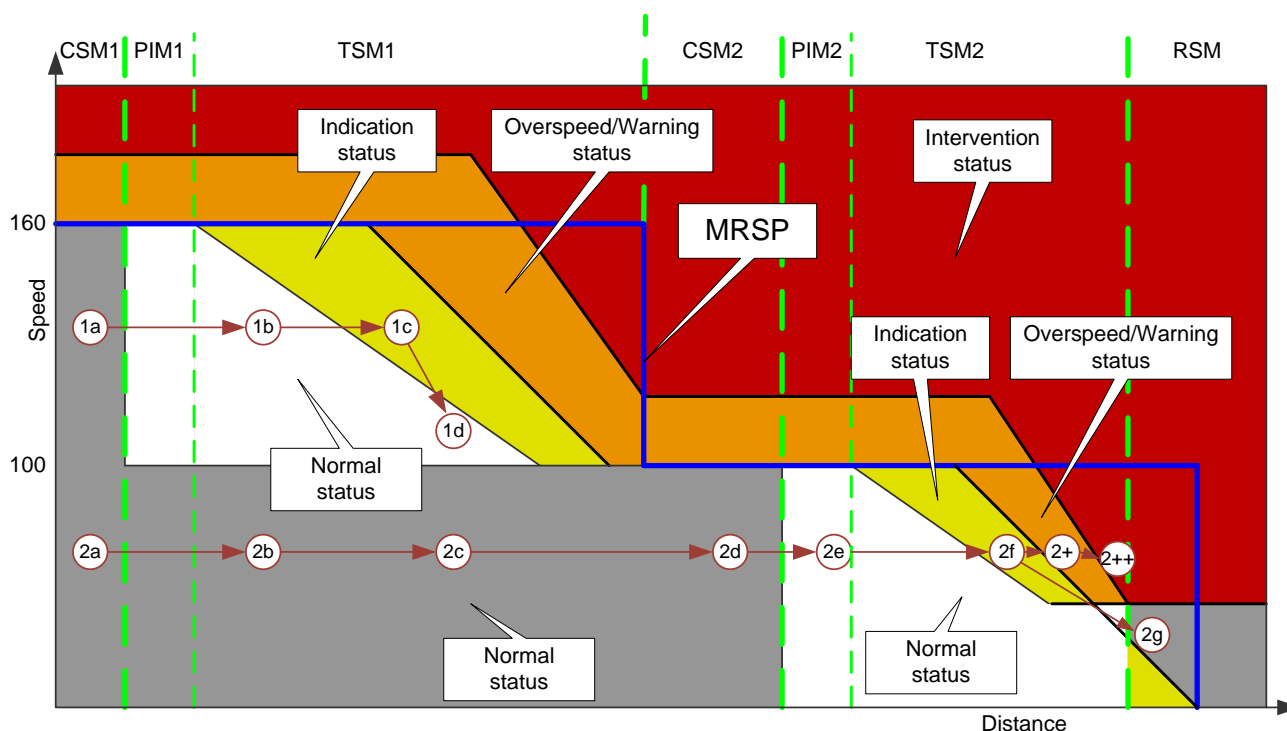


Figure 12 – Colour philosophy depending on supervision status

7.1.1.4 The bubbles including a reference in Figure 12 illustrate three different scenarios. The figures corresponding to these bubbles are detailed in the next sections of this chapter 7.

7.2 Ceiling Speed Monitoring (CSM)

7.2.1 Normal Status information (NoS)

7.2.1.1 The Normal Status information is active when the current train speed is below or at the Permitted supervision limit (P).

7.2.1.2 Figure 13, Figure 14 and Figure 15 show respectively the speed and supervision information of bubbles 1a, 2a and 2d.



Figure 13 – Speed and supervision information in CSM / NoS (bubble 1a)



Figure 14 – Speed and supervision information in CSM / NoS (bubble 2a)

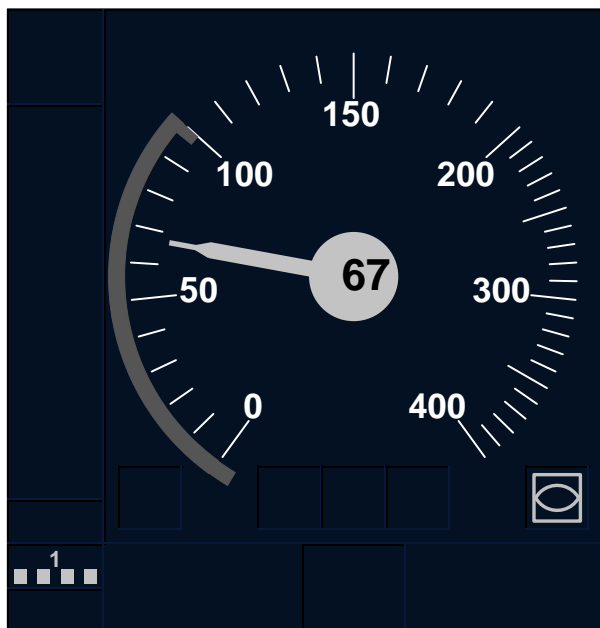


Figure 15 – Speed and supervision information in CSM / NoS (bubble 2d)

7.2.2 Over-speed Status information (OvS)

- 7.2.2.1 The Over-speed Status information is activated as soon as the current train speed is above the Permitted supervision limit (P).
- 7.2.2.2 The Over-speed Status information is deactivated as soon as the current train speed is below or at the Permitted supervision limit (P).

7.2.3 Warning Status information (WaS)

- 7.2.3.1 The Warning Status information is activated as soon as the current train speed is above the Warning supervision limit (W).
- 7.2.3.2 The Warning Status information is deactivated as soon as the current train speed is below or at the Permitted supervision limit (P).
- 7.2.3.3 While the Warning Status information is active, the audible information S2, see chapter 14 shall be played.

7.2.4 Intervention Status information (IntS)

- 7.2.4.1 The Intervention Status information is activated as soon as the current train speed is above the first line of intervention supervision limit (FLOI).
- 7.2.4.2 The Intervention Status information is deactivated as soon as there is no more service or emergency brake command from the speed and monitoring function.
- 7.2.4.2.1 Note: The conditions for brake command revocation are defined in document [3].

7.2.5 Order and precedence of Status

- 7.2.5.1 Under CSM, the order and precedence of a status on the other ones follows the Table 5.

Supersedes → ↓ Information	Intervention Status	Warning Status	Over-speed Status	Normal Status
Intervention Status	-	yes	yes	Yes
Warning Status	no	-	yes	Yes
Over-speed Status	no	no	-	Yes
Normal Status	no	no	no	-

Table 5 – Order and precedence of Status information under CSM

7.3 Pre-Indication Monitoring (PIM)

7.3.1 Definition

- 7.3.1.1 The Pre-Indication Monitoring (PIM) is the sub-area of the target speed monitoring from the pre-indication location to the location where the braking to target indication supervision limit intersects the MRSP.
- 7.3.1.2 When the onboard enters the Pre-Indication Monitoring (PIM), the audible information Sinfo (see chapter 14) shall be played.

7.3.2 Supervision Status

- 7.3.2.1 The same definition of the supervision status and of the order of precedence as for the CSM applies.
- 7.3.2.2 Figure 16 shows the speed and supervision information of bubble 2e.



Figure 16 – Speed and supervision information in PIM / NoS (bubble 2e)

7.4 Target Speed Monitoring (TSM)

7.4.1 Normal Status information (NoS)

- 7.4.1.1 The Normal Status information is active when the current train speed/position does not exceed the Indication supervision limit (I).
- 7.4.1.2 Figure 17, Figure 18 and Figure 19 show respectively the speed and supervision information of bubbles 1b, 2b and 2c.



Figure 17 – Speed and supervision information in TSM / NoS (bubble 1b)

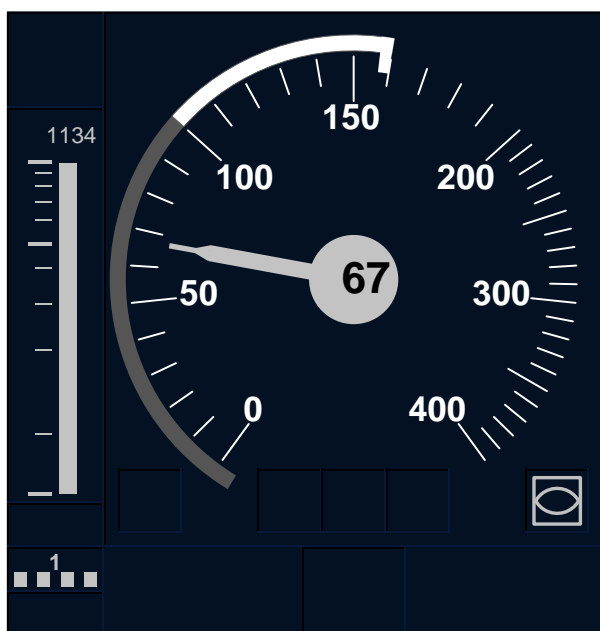


Figure 18 – Speed and supervision information in TSM / NoS (bubble 2b)

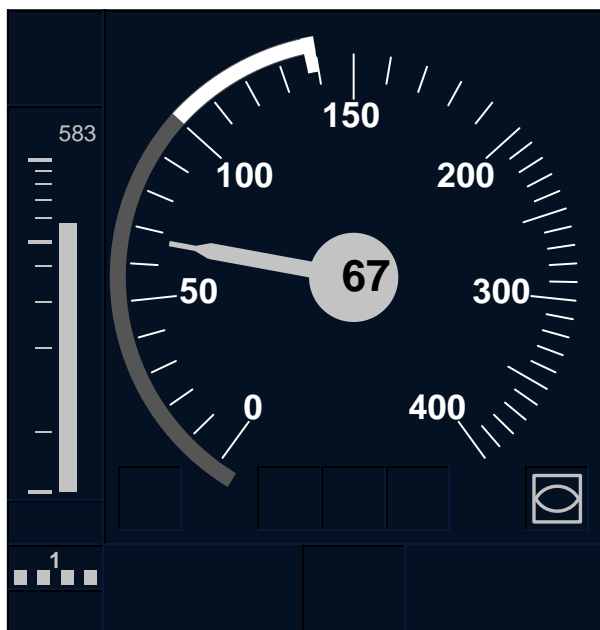


Figure 19 – Speed and supervision information in TSM / NoS (bubble 2c)

7.4.2 Indication Status information (IndS)

- 7.4.2.1 The Indication Status is activated as soon as the current train speed/position exceeds the Indication supervision limit (I).
- 7.4.2.2 The Indication Status is deactivated as soon as the current train speed is below the Target speed (V_{target}).
- 7.4.2.3 Note: If the target is an EOA, once the Indication Status is activated, it is never deactivated since the Target speed (V_{target}) is equal to zero.
- 7.4.2.4 Figure 20, Figure 21 and Figure 22 show respectively the speed and supervision information of bubbles 1c, 1d and 2f.



Figure 20 – Speed and supervision information in TSM / IndS (bubble 1c)



Figure 21 – Speed and supervision information in TSM / IndS (bubble 1d)



Figure 22 – Speed and supervision information in TSM / IndS (bubble 2f)

7.4.3 Over-speed Status information (OvS)

- 7.4.3.1 The Over-speed Status information is activated as soon as the current train speed/position exceeds the Permitted supervision limit (P).
- 7.4.3.2 The Over-speed Status information is deactivated as soon as the current train speed/position does not exceed anymore the Permitted supervision limit (P).
- 7.4.3.3 As soon as the Over-speed Status is activated, the audible information S1, see chapter 14 shall be played.

7.4.4 Warning Status information (WaS)

- 7.4.4.1 The Warning Status information is activated as soon as the current train speed/position exceeds the Warning supervision limit (W).
- 7.4.4.2 The Warning Status information is deactivated as soon as the current train speed/position does not exceed anymore the Permitted supervision limit (P).
- 7.4.4.3 While the Warning Status is active, the audible information S2, see chapter 14 shall be played.
- 7.4.4.4 Figure 23 shows the speed and supervision information of bubble 2+.



Figure 23 – Speed and supervision information in TSM / WaS (bubble 2+)

7.4.5 Intervention Status information (IntS)

7.4.5.1 The Intervention Status information is activated as soon as the current train speed/position exceeds the first line of intervention supervision limit (FLOI).

7.4.5.2 The Intervention Status information is deactivated as soon as there is no more service or emergency brake command from the speed and monitoring function.

7.4.5.2.1 Note: The conditions for brake command revocation are defined in document [3].

7.4.5.3 Figure 24 shows the speed and supervision information of bubble 2++.

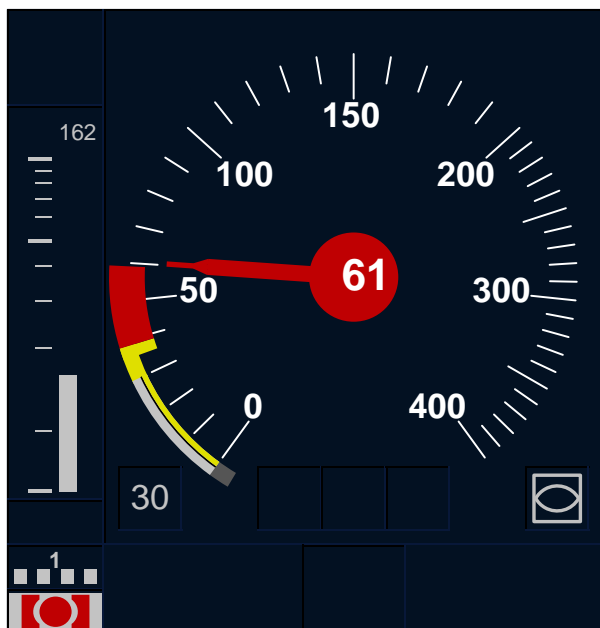


Figure 24 – Speed and supervision information in TSM / IntS (bubble 2++)

7.4.6 Order and precedence of Status

7.4.6.1 Under TSM, the order and precedence of a status on the other ones follows the Table 6.

Supersedes → ↓ Information	Intervention Status	Warning Status	Over-speed Status	Indication Status	Normal Status
Intervention Status	-	yes	yes	yes	yes
Warning Status	no	-	yes	yes	yes
Over-speed Status	no	no	-	yes	yes
Indication Status	no	no	no	-	yes
Normal Status	no	no	no	no	-

Table 6 – Order and precedence of Status information under TSM

7.5 Release Speed Monitoring (RSM)

7.5.1 Indication Status information (IndS)

7.5.1.1 The Indication Status is active when the current train speed is below or at the Release Speed ($V_{release}$).

7.5.1.2 Figure 25 shows the speed and supervision information of bubble 2g.



Figure 25 – Speed and supervision information in RSM / IndS (bubble 2g)

7.5.2 Intervention Status information (IntS)

7.5.2.1 The Intervention Status information is activated as soon as the current train speed is above the Release Speed ($V_{release}$).

7.5.2.2 The Intervention Status information is deactivated as soon as there is no more service or emergency brake command from the speed and monitoring function.

7.5.2.2.1 Note: The conditions for brake command revocation are defined in document [3].

7.5.3 Order and precedence of Status Indication

7.5.3.1 Under RSM, the order and precedence of a status on the other ones follows the Table 7.

Supersedes → ↓ Information	Intervention Status	Indication Status
Intervention Status	-	yes
Indication Status	no	-

Table 7 – Order and precedence of Status information under RSM

8. ETCS INFORMATION SHOWN ON THE ETCS DEFAULT WINDOW

8.1 Introduction

- 8.1.1.1 The chapter 8 is applicable for ERTMS/ETCS levels 0/1/2/3 and ERTMS/ETCS level NTC excluding the modes SN and NL.
- 8.1.1.2 For the modes SN and NL in ERTMS/ETCS level NTC, the NTC default window of the corresponding National System will be displayed instead. In case a National System is interfaced to the ERTMS/ETCS onboard through an STM, see chapter 9.
- 8.1.1.3 The figures in this chapter show the ETCS objects/functions allocated to the areas of the ETCS layout to form the ETCS default window. The figures showing the areas (e.g. Figure 26) concerned by an ETCS object/function presents the touch screen layout on the left hand side and the soft key layout on the right hand side.
- 8.1.1.4 The layers on the ETCS default window shall be as follows:
- Layer 0: E10, E11, F, H (soft key technology), I (soft key technology), G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, Z (touch screen technology), Y (touch screen technology)
 - Layer -1: A1, A2+A3 (drawn as one area), A4, B (drawn as one area), D (drawn as one area), C1, C2+C3+C4 (drawn as one area), C5, C6, C7, C8, C9, E1, E2, E3, E4 (touch screen technology), E5-E8 (soft key technology, drawn as one area) or E5-E9 (touch screen technology, drawn as one area), G11, G12, G13
 - Layer -2: B3, B4, B5, B6, B7

8.2 Speed and Supervision information

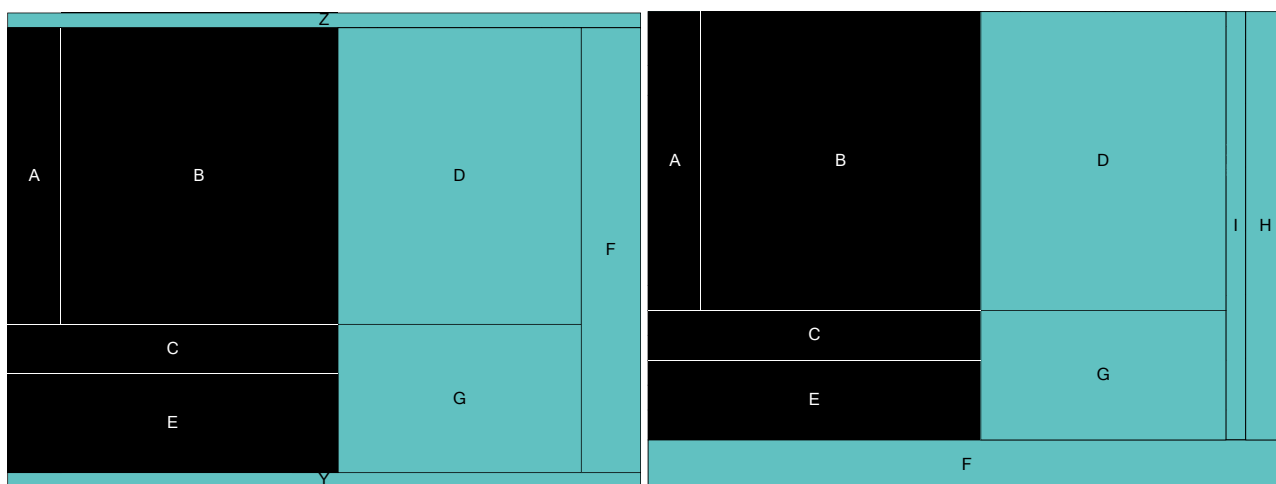


Figure 26 – Areas for speed and supervision information



Figure 27 – Overview of the main objects in the speed and supervision areas

8.2.1 Speed Information

8.2.1.1 Speed dial

8.2.1.1.1 This DMI object displays the speed dial.

8.2.1.1.2 The speed dial shall be displayed in area B0 (see Figure 28).

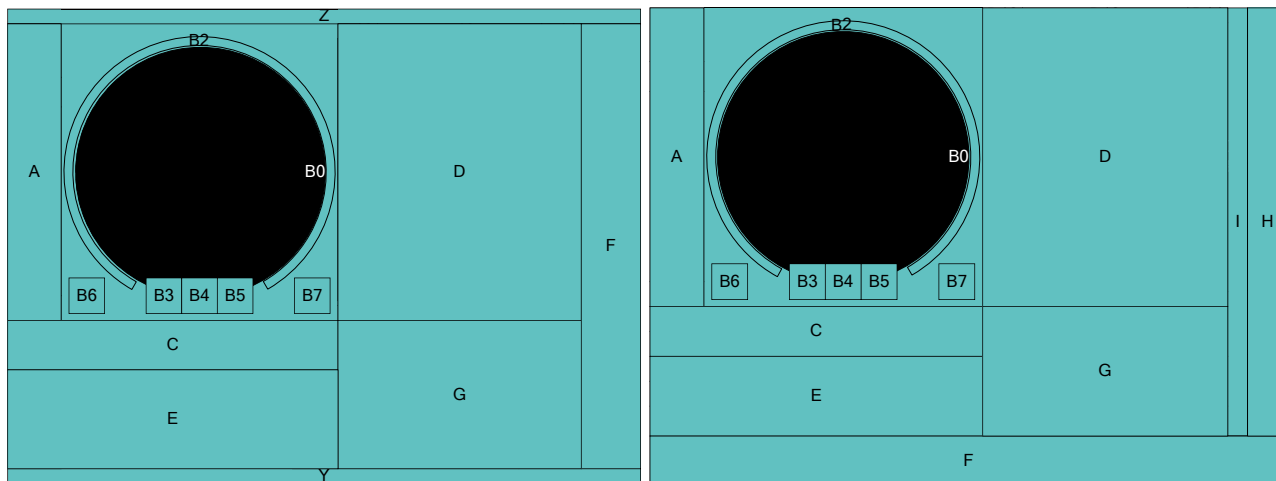


Figure 28 – Area for the speed dial

8.2.1.1.3 The range of the speed dial shall be pre-configured onboard to one of the following possibilities:

- 0 km/h to 400 km/h
- 0 km/h to 250 km/h
- 0 km/h to 180 km/h
- 0 km/h to 140 km/h

- 8.2.1.1.4 The speed dial shall be circular and shall indicate speeds from 0 km/h to the maximum value of the pre-configured onboard range.
- 8.2.1.1.5 The speed dial shall be composed of:
 - a) short or long speed indicator lines drawn radially, from the limit of B0 towards the centre of B0, at every 10 km/h,
 - b) speed numbers attached to some speed indicator lines, positioned at the end of the related indicator line towards the centre of B0 and equally spaced from each other.
- 8.2.1.1.6 The length of the short speed indicator lines shall be 15 cells.
- 8.2.1.1.7 The length of the long speed indicator lines shall be 25 cells.
- 8.2.1.1.8 The width of the speed indicator lines shall be 1 cell.
- 8.2.1.1.9 The numbers and speed indicator lines shall be white.
- 8.2.1.1.10 The functions displayed in B1 and B2 shall use the mapping described here below for the pre-configured onboard range.
- 8.2.1.1.11 For the 400 km/h dial (see Figure 29):

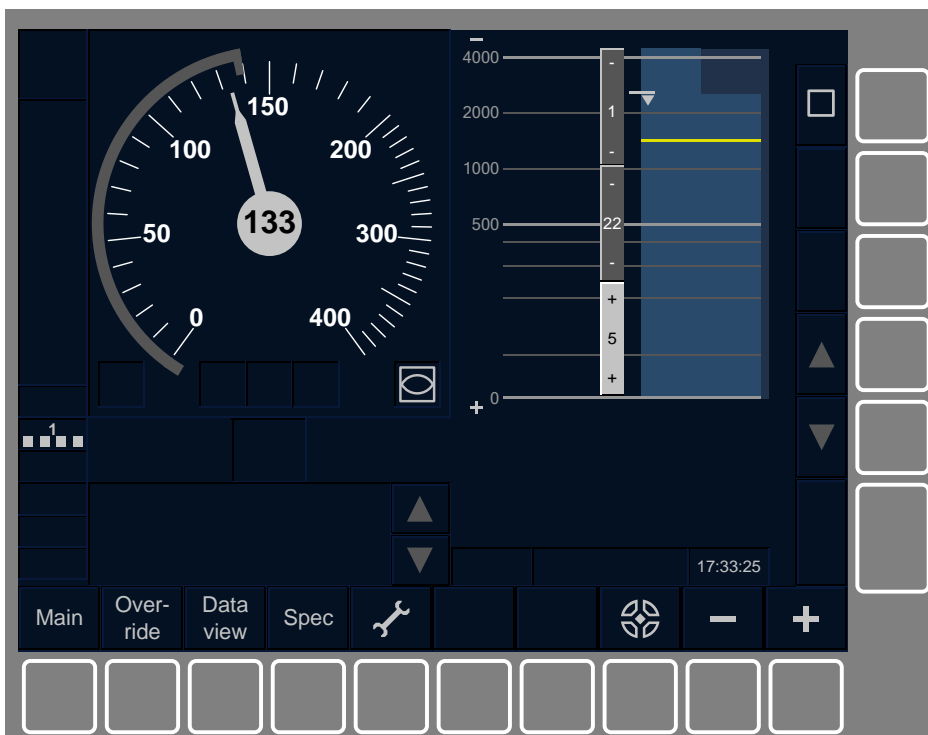
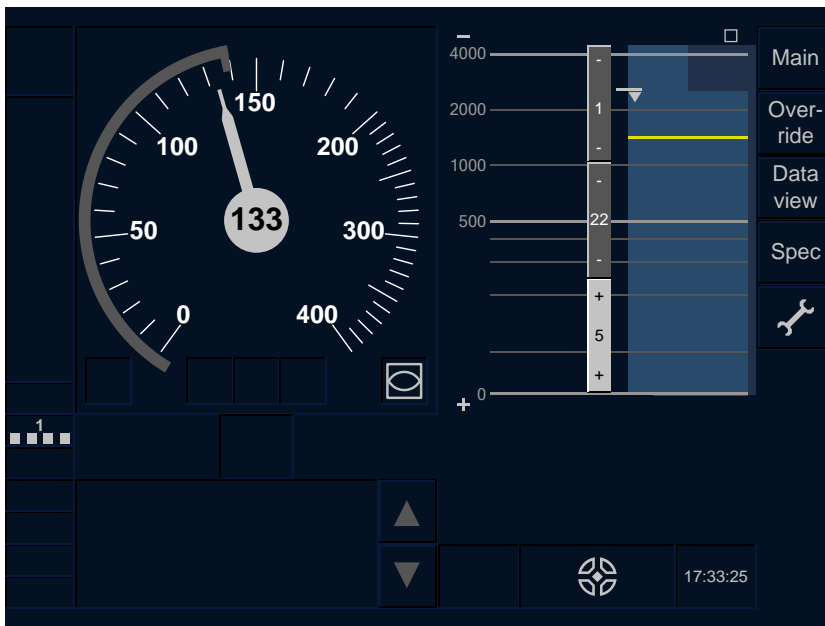


Figure 29 – 400 km/h indication for the speed dial

8.2.1.1.11.1 Assuming that 0 degrees (corresponding to 150 km/h) is vertically upwards from the centre, 0 km/h shall be shown at an angle of -144 degrees and 400 km/h shall be shown at an angle of +144 degrees, while 200 km/h shall be shown at an angle of +48 degrees.

8.2.1.1.11.2 Both segments from 0 km/h to 200 km/h and from 200 km/h to 400 km/h shall have linear mapping between speed and angles.

8.2.1.1.11.3 The speed dial with the 400 km/h shall indicate the following numbers: 0, 50, 100, 150, 200, 300 and 400. At each of the following positions 0, 50, 100, 150, 200,

250, 300, 350, and 400, a long speed indicator line shall be drawn. In between these lines, short speed indicator lines shall be drawn.

8.2.1.1.11.4 Note: This means that in the first segment (from 0 to 200) the distance between the 10 km/h indications is wider (9,6 degrees) than in the second segment (from 200 to 400) (4,8 degrees).

8.2.1.1.12 For the 250 km/h dial (see Figure 30):

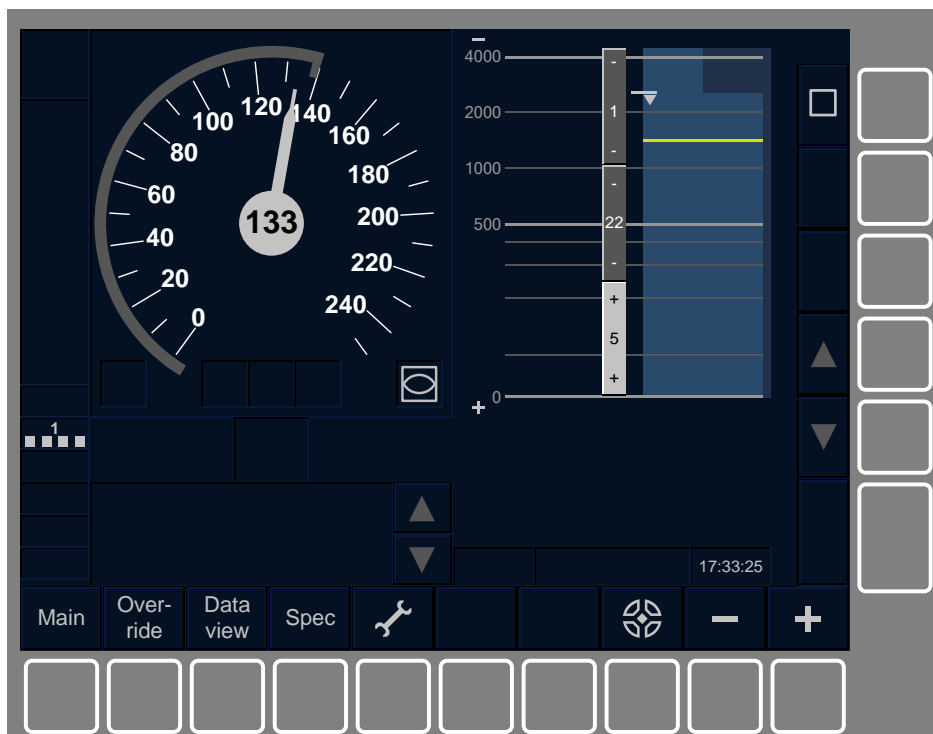
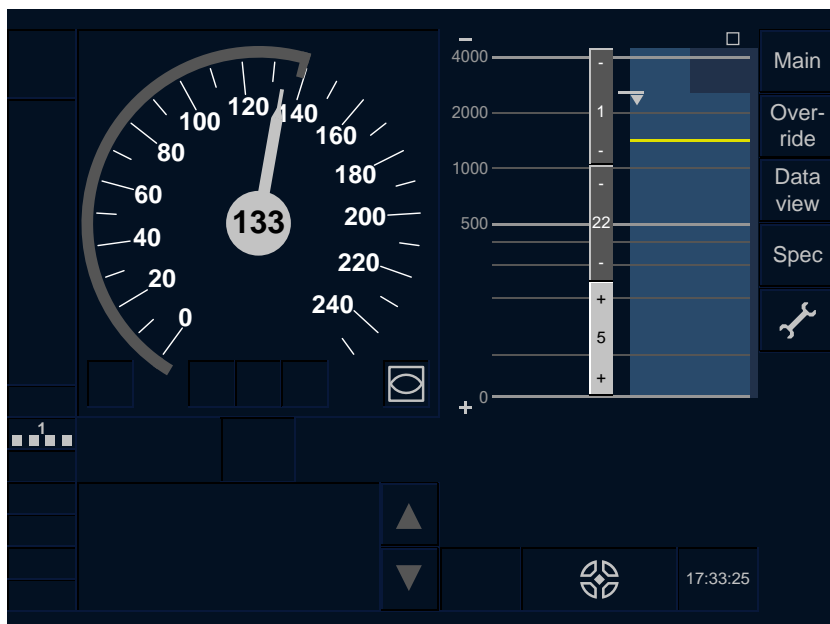


Figure 30 – 250 km/h indication for the speed dial

8.2.1.1.12.1 Assuming that 0 degrees is vertically upwards from the centre, 0 km/h shall be shown at an angle of -144 degrees and 250 km/h is shown at an angle of +144 degrees.

8.2.1.1.12.2 The segment from 0 km/h to 250 km/h shall have linear mapping between speed and angles.

8.2.1.1.12.3 The speed dial with the 250 km/h shall indicate the following numbers: 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220 and 240. At each of these displayed numbers, a long speed indicator line shall be drawn. In between these lines, short speed indicator lines shall be drawn.

8.2.1.1.13 For the 180 km/h dial (see Figure 31):

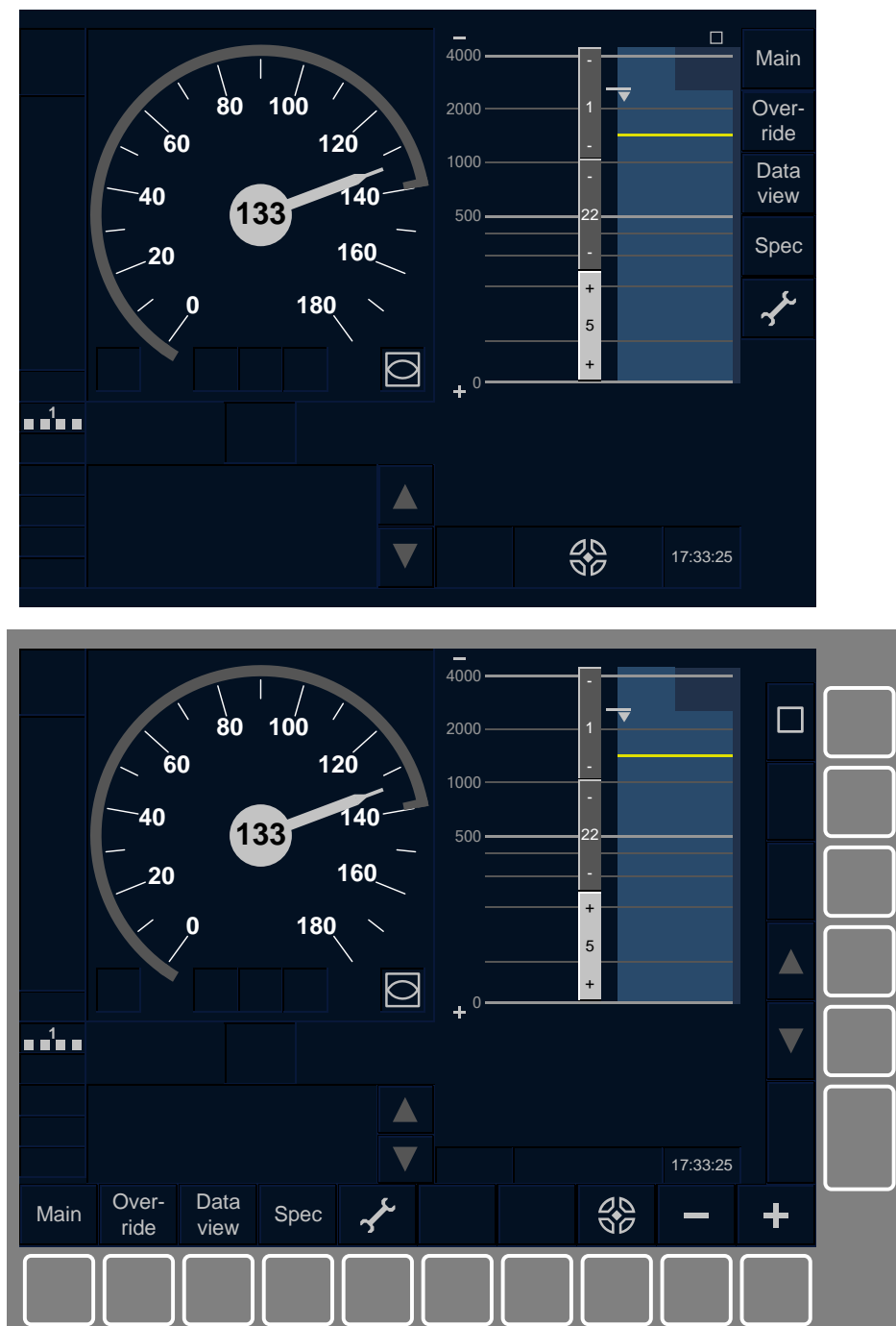


Figure 31 – 180 km/h indication for the speed dial

ERA ERTMS unit

ETCS Driver Machine Interface

8.2.1.1.13.1 Assuming that 0 degrees is vertically upwards from the centre, 0 km/h shall be shown at an angle of -144 degrees and 180 km/h is shown at an angle of +144 degrees.

8.2.1.1.13.2 The segment from 0 km/h to 180 km/h shall have linear mapping between speed and angles.

8.2.1.1.13.3 The speed dial with the 180 km/h shall indicate the following numbers: 0, 20, 40, 60, 80, 100, 120, 140, 160, 180. At each of these displayed numbers, a long speed indicator line shall be drawn. In between these lines, short speed indicator lines shall be drawn.

8.2.1.1.14 For the 140 km/h dial (see Figure 32):

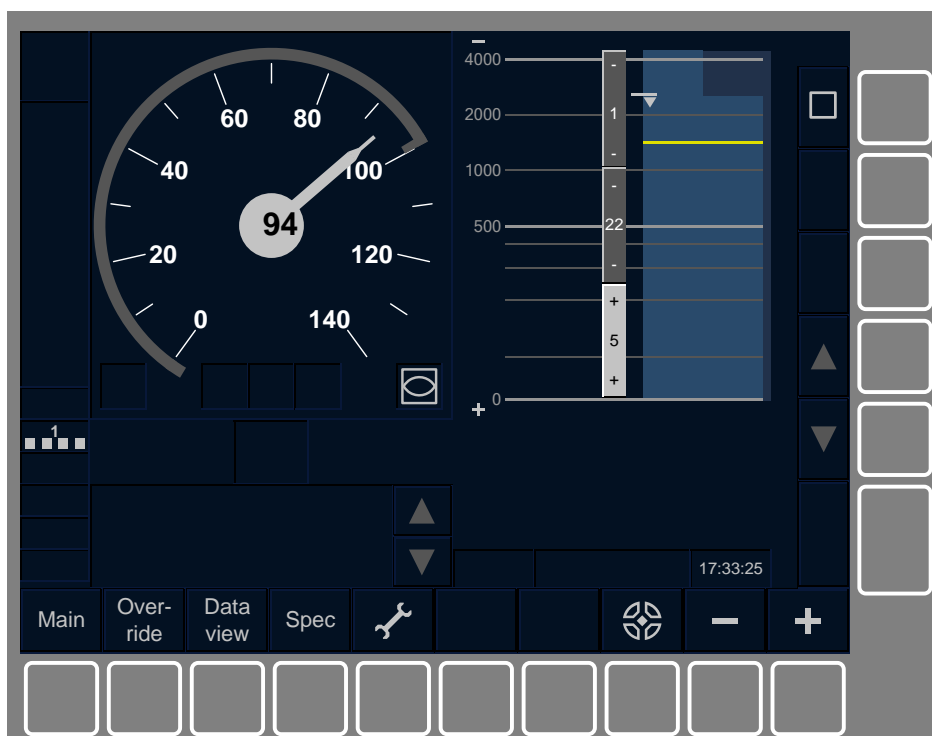
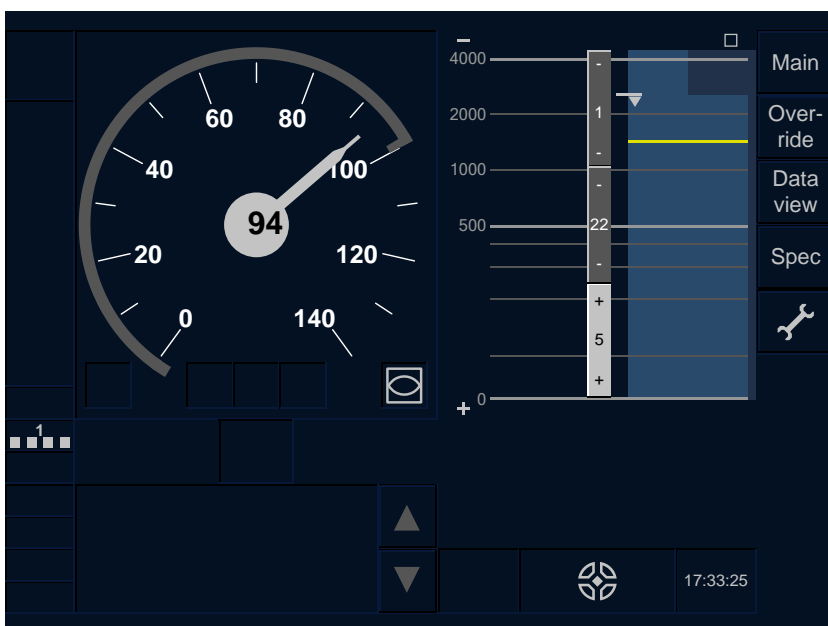


Figure 32 – 140 km/h indication for the speed dial

8.2.1.1.14.1 Assuming that 0 degrees is vertically upwards from the centre, 0 km/h shall be shown at an angle of -144 degrees and 140 km/h is shown at an angle of +144 degrees.

8.2.1.1.14.2 The segment from 0 km/h to 140 km/h shall have linear mapping between speed and angles.

8.2.1.1.14.3 The speed dial with the 140 km/h shall indicate the following numbers: 0, 20, 40, 60, 80, 100, 120, 140. At each of these displayed numbers, a long speed indicator line shall be drawn. In between these lines, short speed indicator lines shall be drawn.

8.2.1.2 Current train speed pointer

8.2.1.2.1 This DMI object displays the current speed of the train.

8.2.1.2.2 The current train speed pointer shall be displayed in area B1 (see Figure 33).

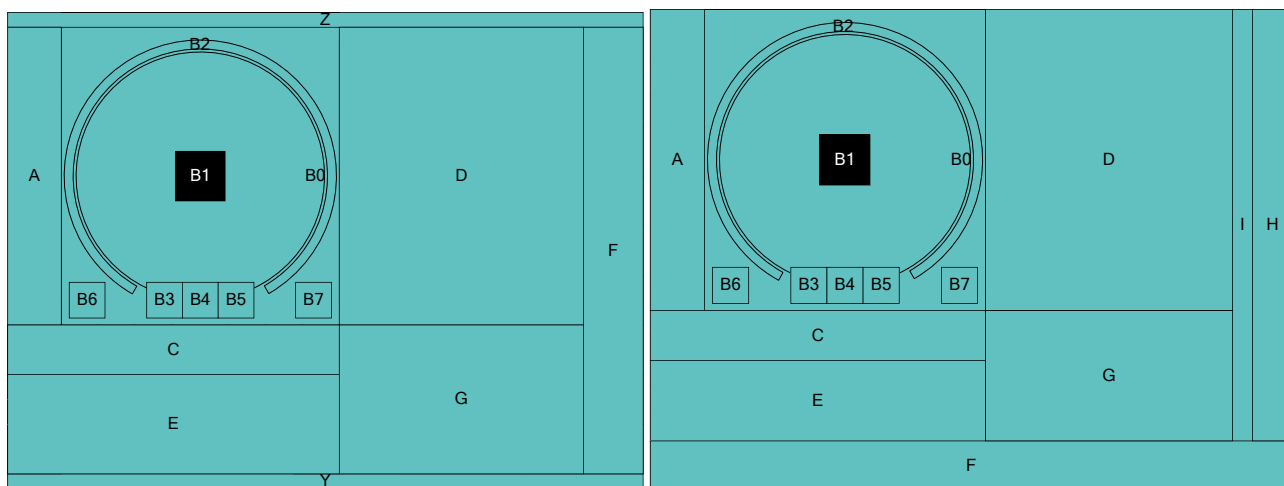


Figure 33 – Area for the current train speed pointer

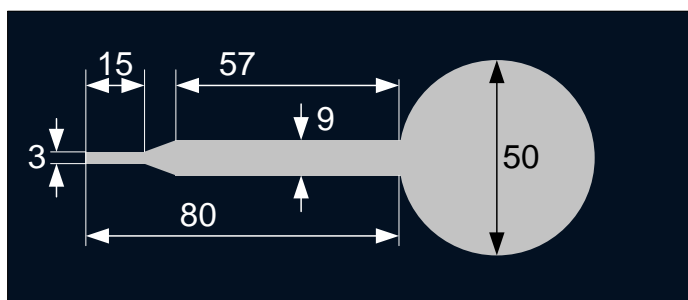


Figure 34 – Size in cells of the current train speed pointer

8.2.1.2.3 The pointer indicates the current train speed. The pointer shall consist of a needle and a circular part centred in B1. Both parts shall always have the same colour.

8.2.1.2.4 The Figure 34 dimensions shall be used.

8.2.1.2.5 Depending on the mode and the supervision status, the pointer shall follow the DMI colour as specified in Table 8.

ERA ERTMS unit
ETCS Driver Machine Interface

Mode	Supervision Status		$0 \text{ km/h} \leq \text{Pointer} \leq V_{\text{Perm}}$	$0 \text{ km/h} \leq \text{Pointer} \leq V_{\text{release}}^*$ (when V_{release} exists)	$0 \text{ km/h} \leq \text{Pointer} < V_{\text{Target}}$	$V_{\text{Target}} \leq \text{Pointer} \leq V_{\text{Perm}}$	Pointer > V_{Perm} (in CSM, PIM or TSM) or > V_{release} (in RSM)
FS/LS/OS	CSM	NoS	grey	-	-	-	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	grey	-	-	-	red
	PIM	NoS	-	-	grey	white	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	-	-	grey	white	red
	TSM	NoS	-	-	grey	white	-
		IndS	-	-	-	yellow	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	-	-	grey	yellow	red
	RSM	IndS	-	yellow	-	-	-
		IntS	-	yellow	-	-	red
SR/UN	CSM	NoS	grey	-	-	-	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	grey	-	-	-	red
	PIM	NoS	-	-	grey	white	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	-	-	grey	white	red
	TSM	NoS	-	-	grey	white	-
		IndS	-	-	-	yellow	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
SH/RV	CSM	NoS	grey	-	-	-	-
		OvS	-	-	-	-	orange
		WaS	-	-	-	-	orange
		IntS	grey	-	-	-	red
NL/SB/PT	-	-	grey	-	-	-	-
TR	-	-	-	-	-	-	red
<p>Hyphen ('-') means: not applicable.</p> <p>* When V_{release} exists, the target is an EOA and V_{target} is therefore equal to zero</p> <p>For NL/SB/PT modes, there is no speed monitoring, the speed pointer is therefore considered as being always below V_{perm}</p> <p>For TR mode, the emergency brake command is applied, the speed pointer is therefore considered as being always above V_{perm}</p>							

Table 8 – Conditions for display and colour of the current train speed pointer

8.2.1.3 Current train speed digital

8.2.1.3.1 The current speed of the train shall be displayed digitally.

8.2.1.3.2 The current train speed digital shall be displayed in area B1 (see Figure 35) i.e. inside the circular part of the pointer.

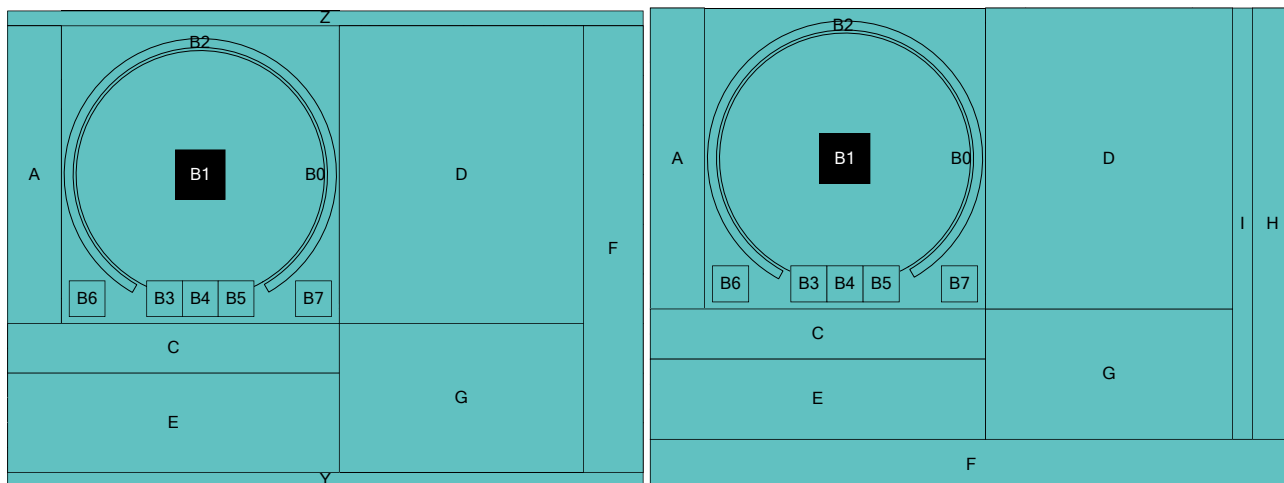


Figure 35 – Area for the current train speed digital

8.2.1.3.3 Area B1 shall be divided along its width into three equally sized sub areas. Every digit of the current train speed shall be placed in such a sub area and aligned to the right of the concerned sub area. In this way, the digits will not change location depending on the different widths of the 10 possible used digits.

8.2.1.3.4 When the speed is composed of less than 3 digits to be displayed, the right most sub area(s) shall be used.

8.2.1.3.5 The digital numbers shall be black, except if the speed pointer has the red colour. In that case, the digital numbers shall be white.

8.2.1.4 Circular Speed Gauge (CSG)

8.2.1.4.1 The Circular Speed Gauge (CSG) shall display, around the speed dial, the V_{perm} , V_{target} , V_{FLOI} and $V_{release}$ information depending on the supervision status.

8.2.1.4.2 The CSG shall be displayed in area B2 (see Figure 36).

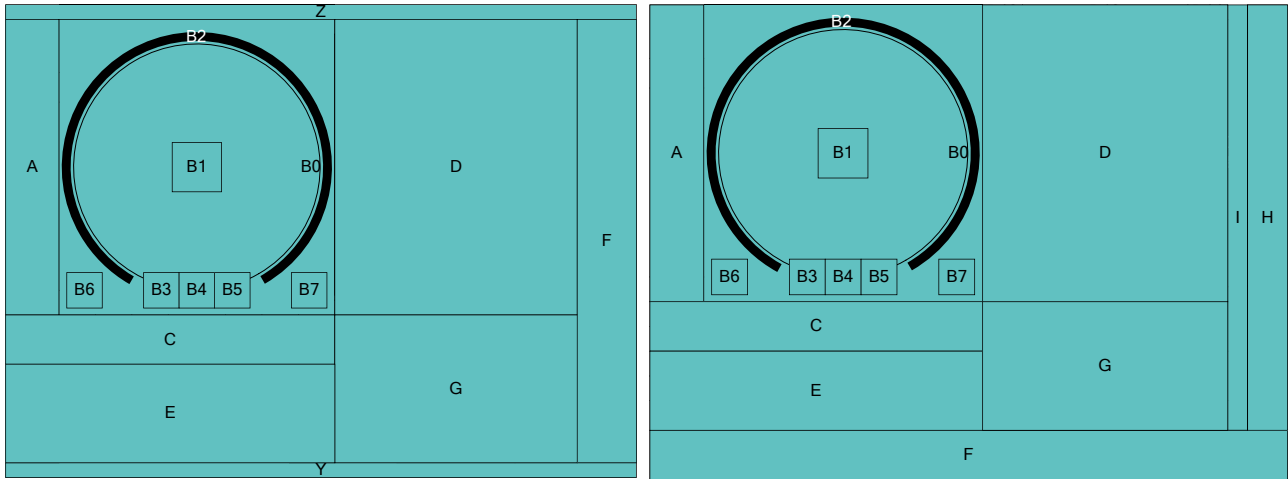


Figure 36 – Area of the Circular Speed Gauge (CSG)

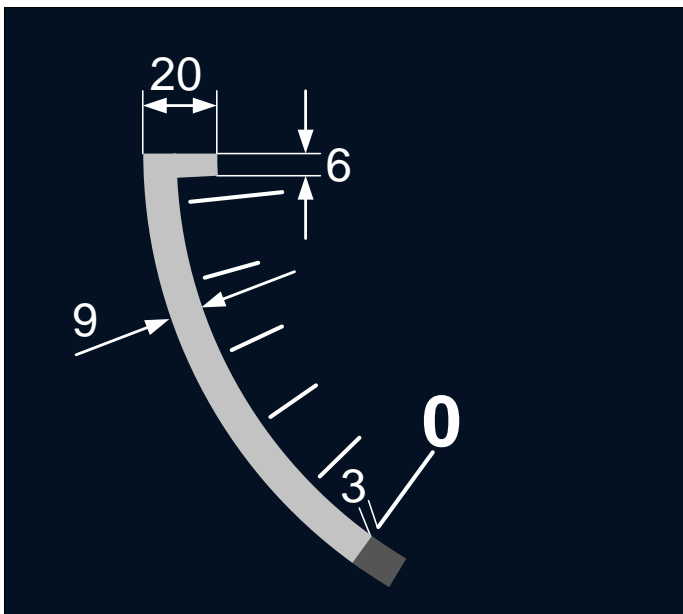


Figure 37 – Size in cells of the Circular Speed Gauge (CSG)

8.2.1.4.3 Figure 38 shows the CSG in PIM with NoS status. Figure 39 shows the CSG in TSM with OvS status.

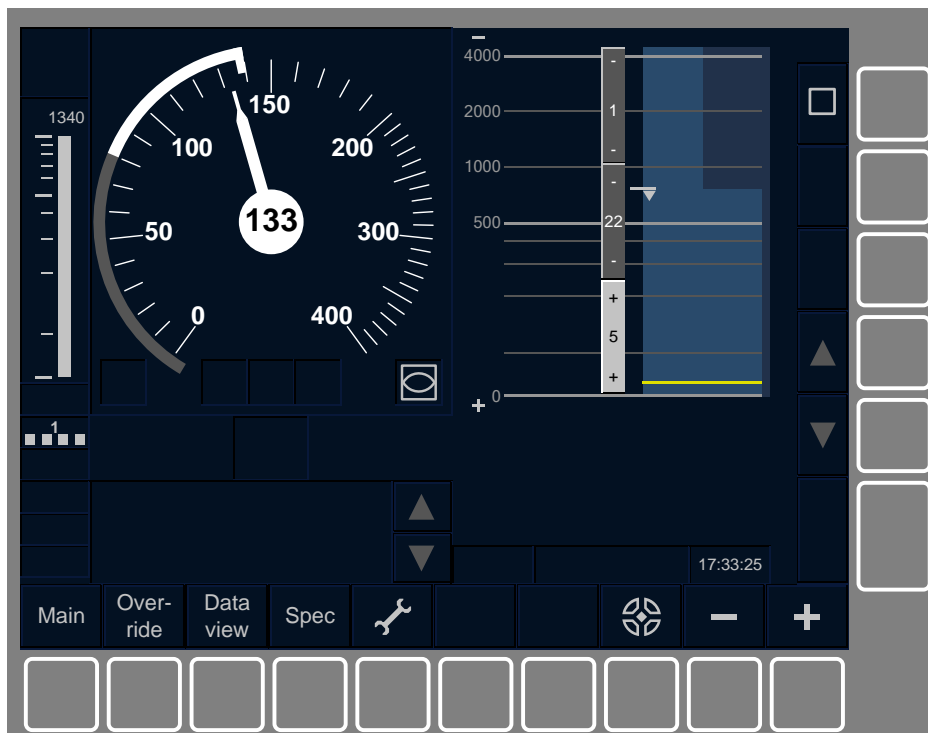
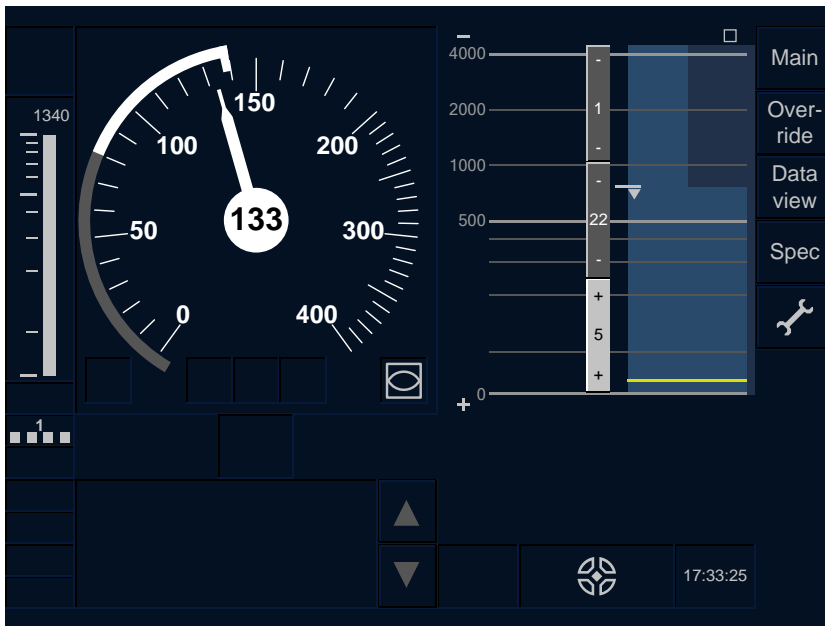


Figure 38 – Circular Speed Gauge (CSG), in PIM with NoS status

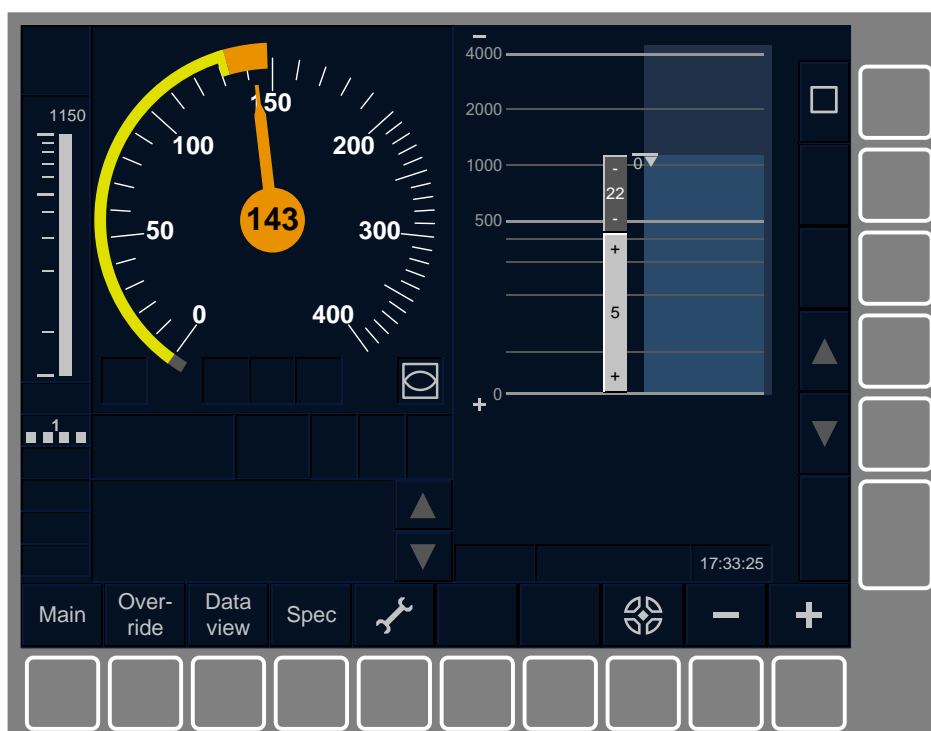
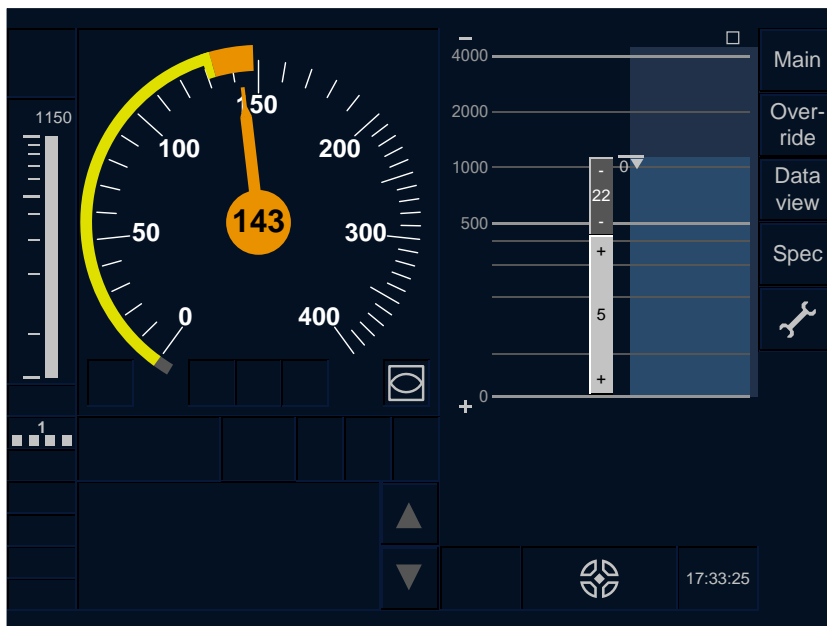


Figure 39 – Circular Speed Gauge (CSG), in TSM with OvS status

- 8.2.1.4.4 Assuming that 0 degrees is vertically upwards from the centre of the speed dial, the CSG shall be placed along the outside border of the speed dial, but from –149 degrees to +144 degrees.
- 8.2.1.4.5 When the CSG is shown, the part of the CSG from –149 degrees to -144 degrees (i.e. 0 km/h) shall always be displayed with dark grey.
- 8.2.1.4.6 The width of the CSG shall be 9 cells from zero up to the hook as shown in Figure 37.

ERA ERTMS unit
ETCS Driver Machine Interface

8.2.1.4.7 At Vperm, the CSG shall display a 'hook' covering the outer border of the speed dial. The size of the hook shall be 6x20 cells (see Figure 37) and the upper limit of the hook shall be at Vperm.

8.2.1.4.8 While the Over-speed, the Warning or the Intervention Status is active, the CSG between the 'hook' (Vperm) and V_{FLOI} shall have the same width as the 'hook' (see Figure 39).

8.2.1.4.9 The CSG shall follow the DMI colour as defined in Table 9.

Mode	Supervision Status		$0 \text{ km/h} \leq \text{CSG} \leq V_{\text{perm}}$	$0 \text{ km/h} \leq \text{CSG} \leq V_{\text{release}}^*$ (when V _{release} exists)	$0 \text{ km/h} \leq \text{CSG} < V_{\text{target}}$	$V_{\text{target}} \leq \text{CSG} \leq V_{\text{perm}}$	$V_{\text{perm}} < \text{CSG} \leq V_{\text{FLOI}}$
FS	CSM	NoS	dark grey	-	-	-	-
		OvS	dark grey	-	-	-	orange
		WaS	dark grey	-	-	-	orange
		IntS	dark grey	-	-	-	red
	PIM	NoS	-	medium grey	dark grey	white	-
		OvS	-	medium grey	dark grey	white	orange
		WaS	-	medium grey	dark grey	white	orange
		IntS	-	medium grey	dark grey	white	red
	TSM	NoS	-	medium grey	dark grey	white	-
		IndS	-	medium grey	dark grey	yellow	-
		OvS	-	medium grey	dark grey	yellow	orange
		WaS	-	medium grey	dark grey	yellow	orange
		IntS	-	medium grey	dark grey	yellow	red
	RSM	IndS	-	medium grey	-	yellow	-
		IntS	-	medium grey	-	yellow	-
SB / LS/ OS/ SR / SH / UN / RV / TR / PT / NL	-	AlIS	-	-	-	-	-
Hyphen ('-') means: not applicable							
* When V _{release} exists, the target is an EOA and V _{target} is therefore equal to zero							

Table 9 – Conditions for display and colour of the circular speed gauge

8.2.1.5 Basic Speed Hook(s)

8.2.1.5.1 The Basic Speed Hook(s) shall display, around the speed dial, the Vperm and Vtarget information depending on the supervision status.

8.2.1.5.2 The Basic Speed Hook(s) shall be displayed in area B2 (see Figure 40).

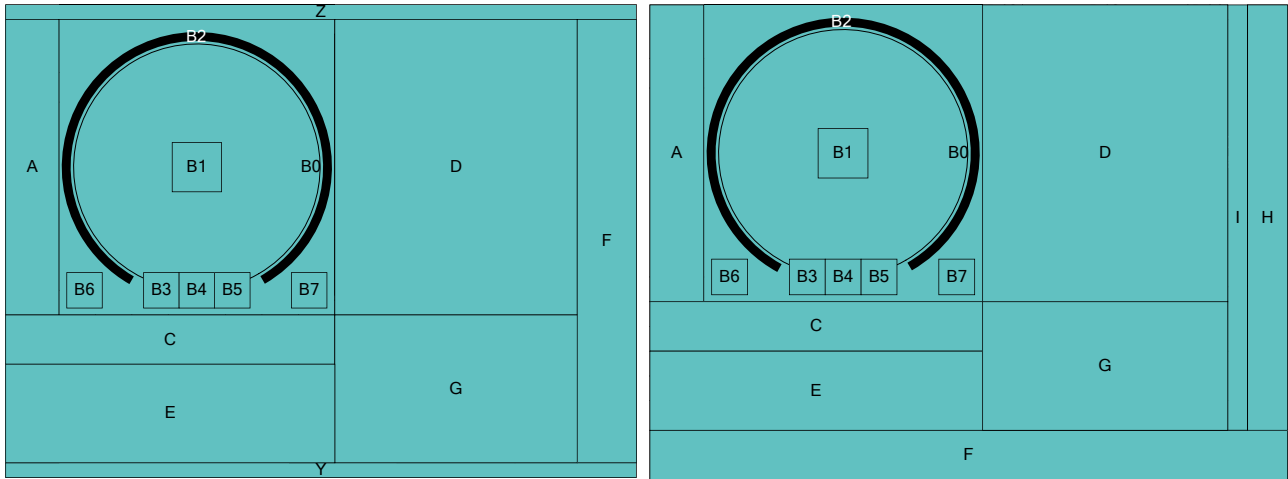
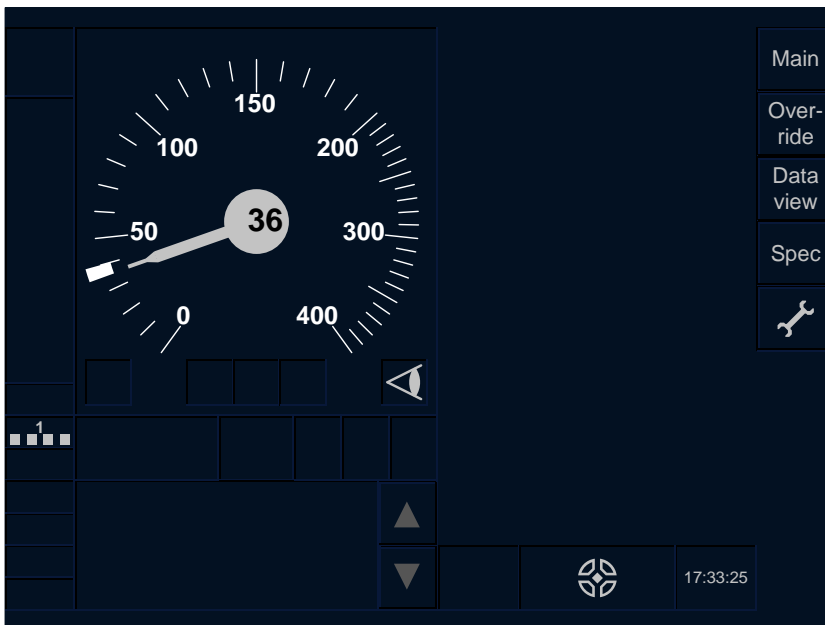


Figure 40 – Area of the Basic Speed Hook(s)

8.2.1.5.3 Examples of Basic Speed Hook(s) are given in Figure 41, Figure 42, Figure 43 and Figure 44.



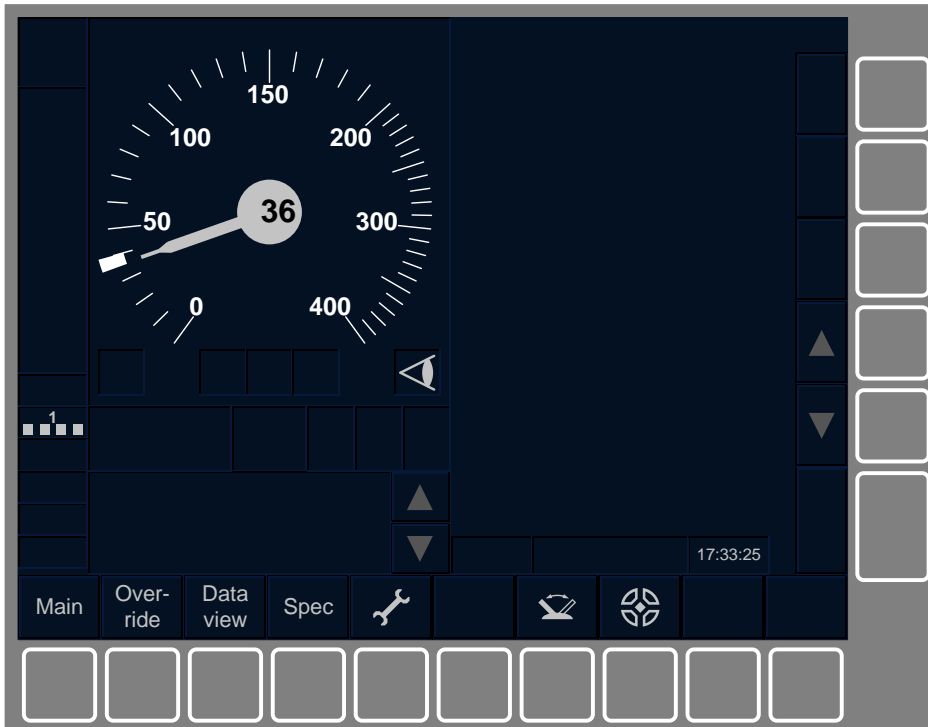
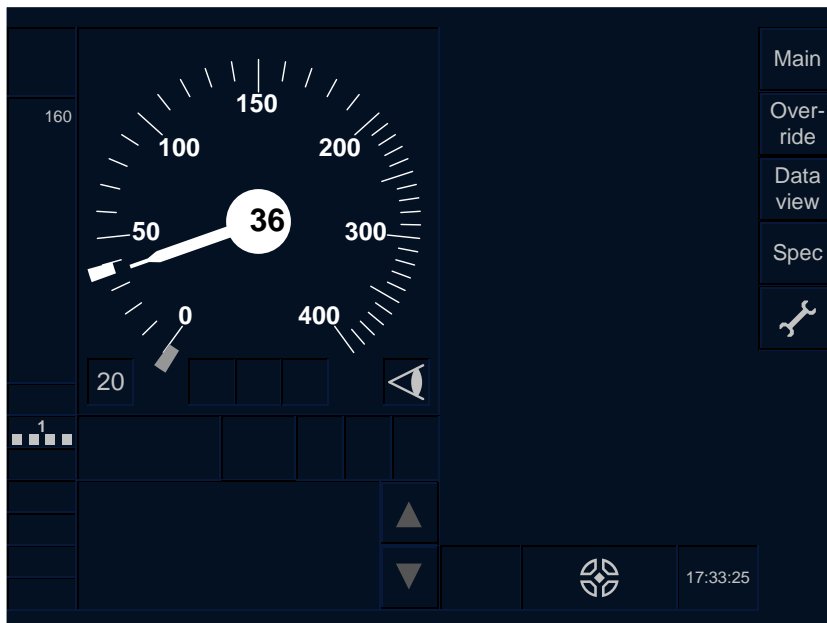


Figure 41 – Basic Speed Hook(s), OS mode in CSM/NoS



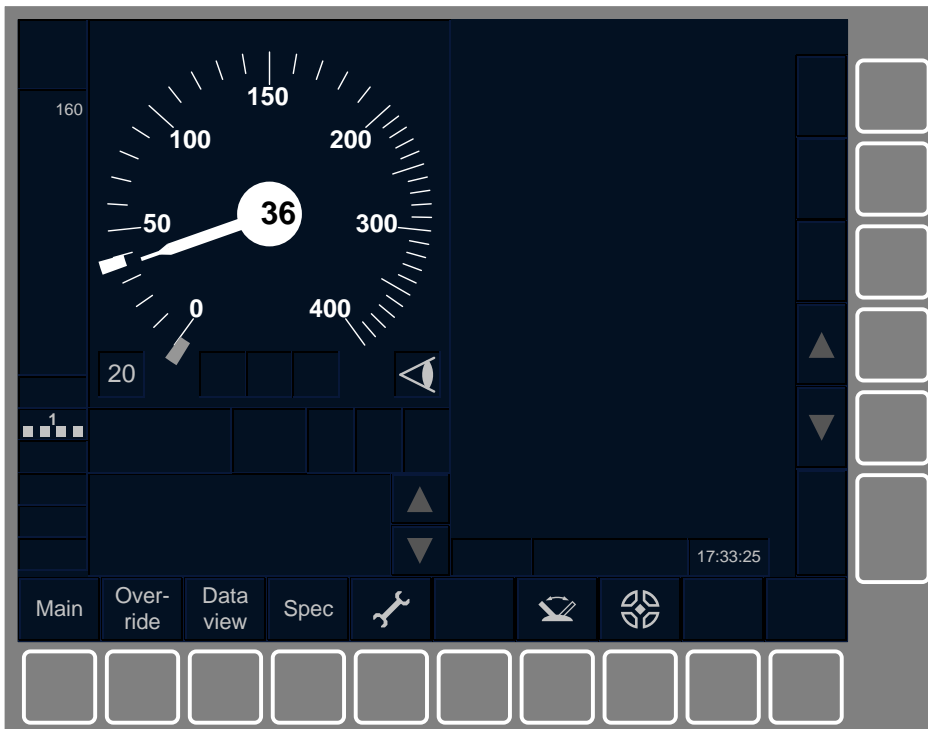
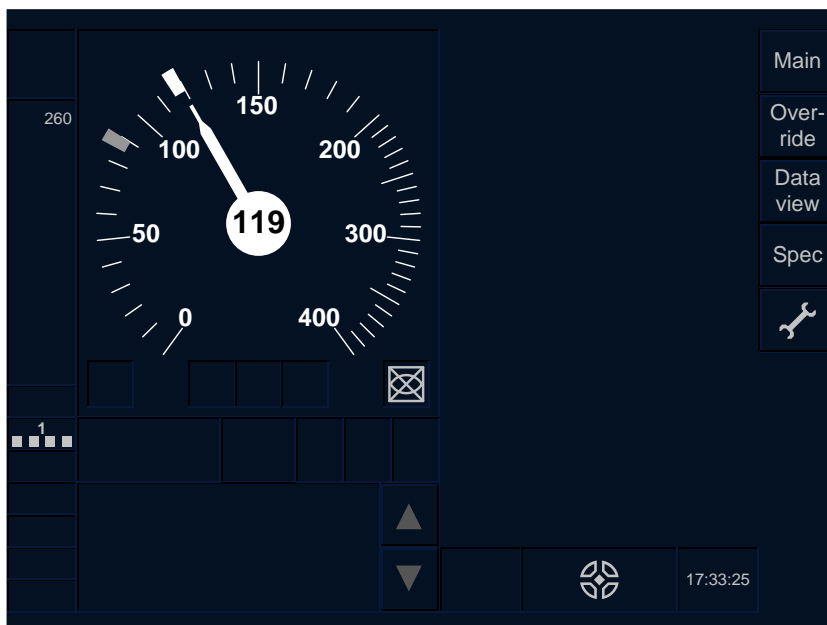


Figure 42 – Basic Speed Hook(s), OS mode in PIM/NoS with a release speed



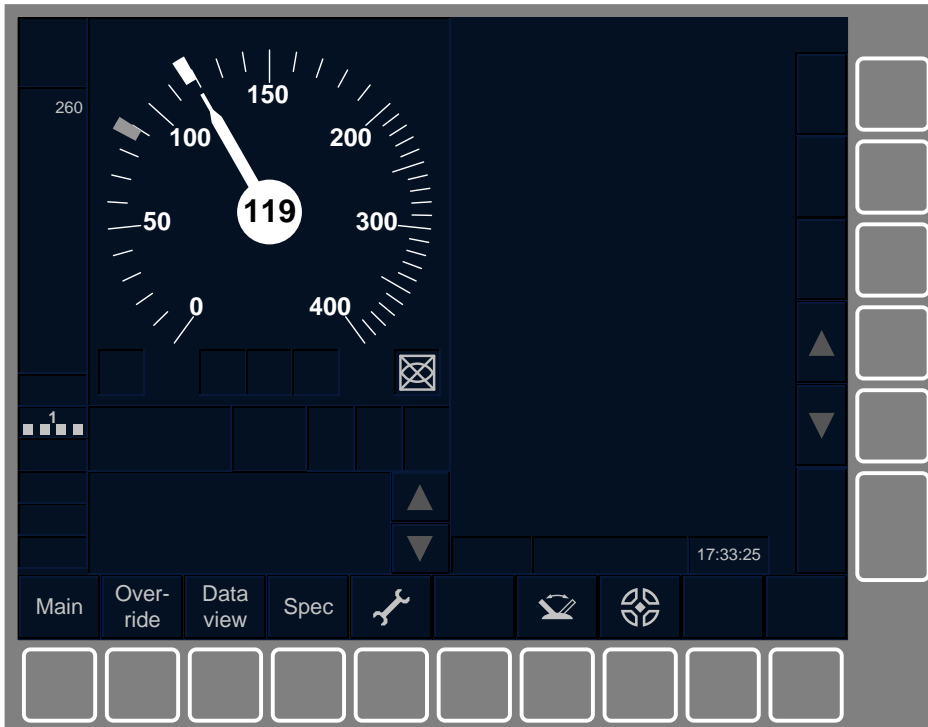
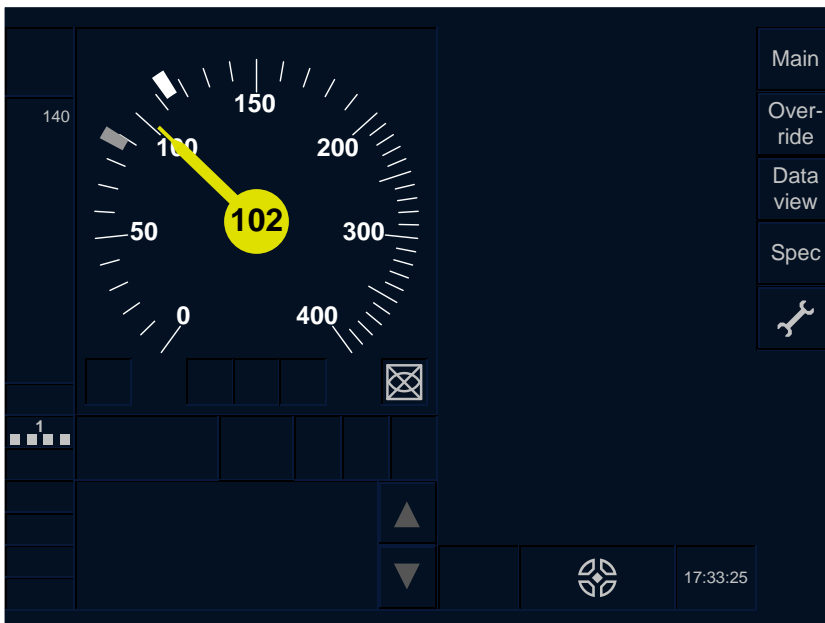


Figure 43 – Basic Speed Hook(s), SR mode in PIM/NoS with a speed restriction at 90km/h



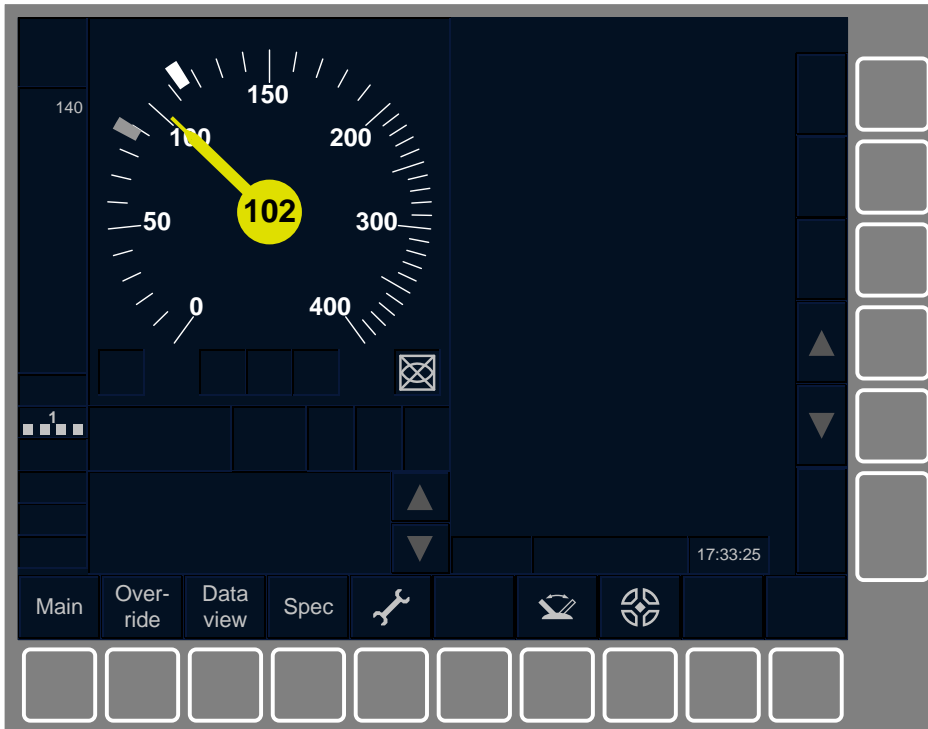
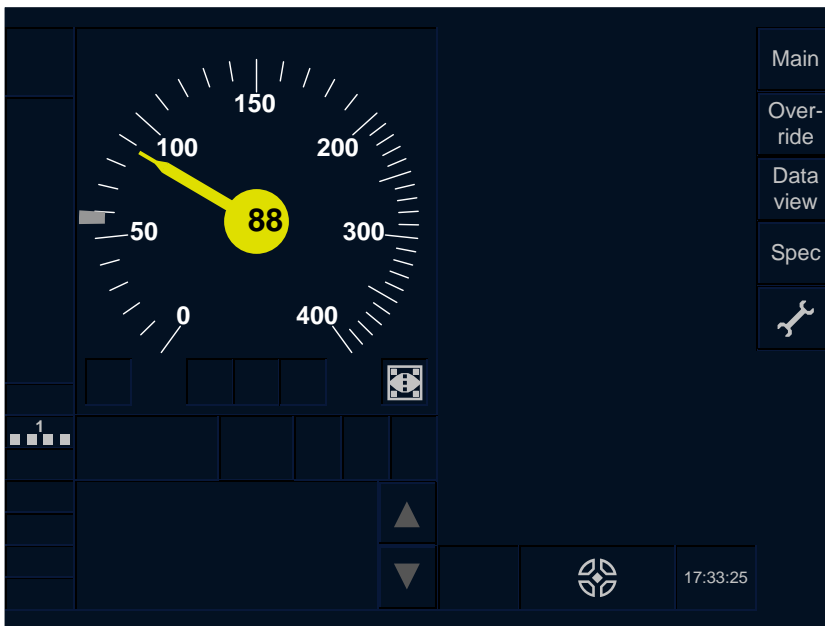


Figure 44 – Basic Speed Hook(s), SR mode in TSM/IndS with a speed restriction at 90km/h



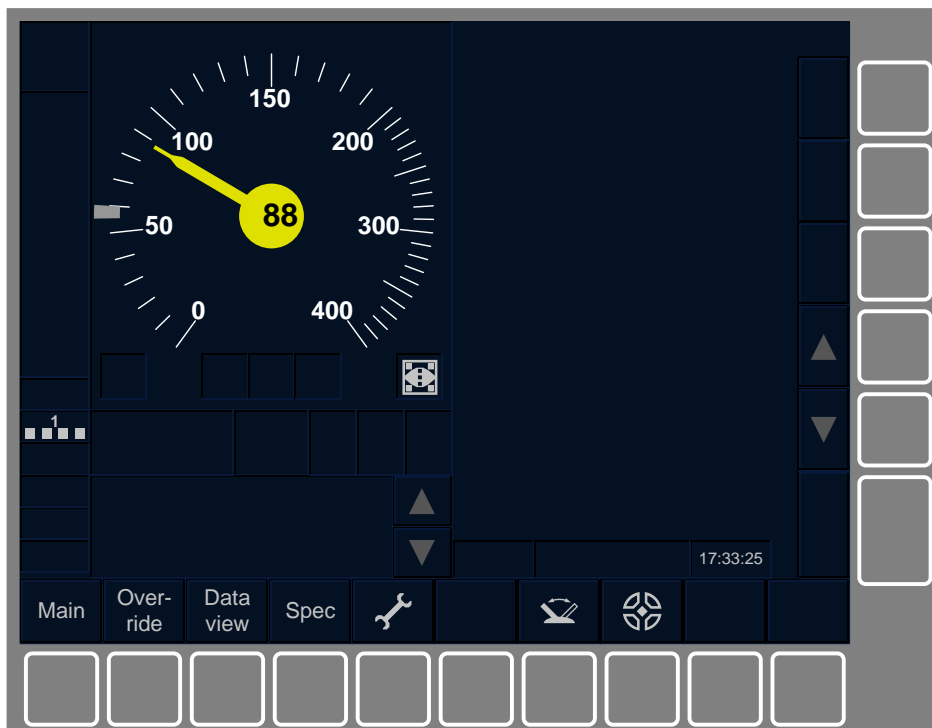


Figure 45 – Basic Speed Hook(s), LS mode in TSM/IndS with the target at 60 km/h

- 8.2.1.5.4 At Vperm, a first 'hook' shall be displayed overlapping the outer border of the speed dial. The size of the hook shall be 10x20 cells and the upper limit of the hook shall be at Vperm.
- 8.2.1.5.5 At Vtarget, a second 'hook' shall be displayed overlapping the outer border of the speed dial. The size of the hook shall be 10x20 cells and the upper limit of the hook shall be at Vtarget.
- 8.2.1.5.6 When the two hooks overlap each other, the overlapping part of the hook at Vperm shall overlay the hook at Vtarget
- 8.2.1.5.7 The Basic Speed Hook(s) shall follow the DMI colour as defined in Table 10.

ERA ERTMS unit

ETCS Driver Machine Interface

			Basic Speed Hook(s)	
Mode	Supervision Status		hook at Vperm	hook at Vtarget
OS / SR*	CSM	AIIS	white	-
	PIM	AIIS	white	medium grey
	TSM	AIIS	white	medium grey
	RSM (not applicable for SR)	AIIS	white	medium grey
LS**	CSM	AIIS	white	-
	PIM	AIIS	-	medium grey
	TSM	AIIS	-	medium grey
	RSM	AIIS	-	medium grey
SH*	CSM	AIIS	white	-
RV	CSM	AIIS	white	-
SB / FS / TR / PT / NL / UN	-	AIIS	-	-

Hyphen ('-') means: not applicable.

* The Basic Speed Hook(s) is/are shown if driver has requested to display it (toggle on) (see chapter 8.2.2.4 for the toggling function)

** The Basic Speed Hook(s) is/are shown if the permitted speed is lower than both the Limited Supervision mode speed limit and the maximum train speed,

Table 10 – Conditions for display and colour of the Basic Speed Hook(s)

8.2.1.6 Release speed

8.2.1.6.1 The graphical presentation of the release speed shall be displayed in area B2 (see Figure 46).

8.2.1.6.2 The digital presentation of the release speed shall be displayed in area B6 (see Figure 46).

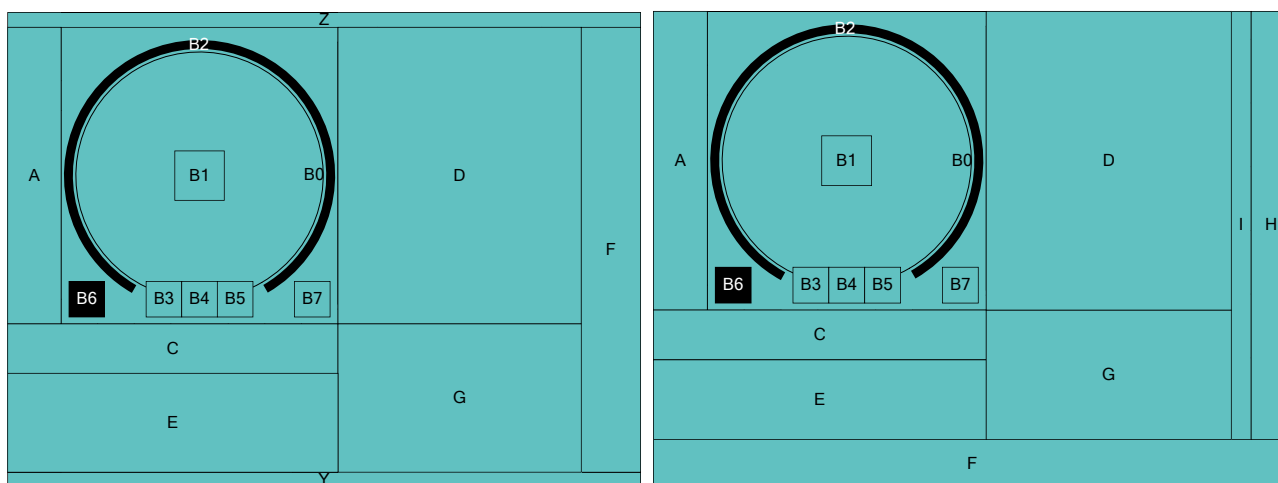


Figure 46 – Areas for the Release speed

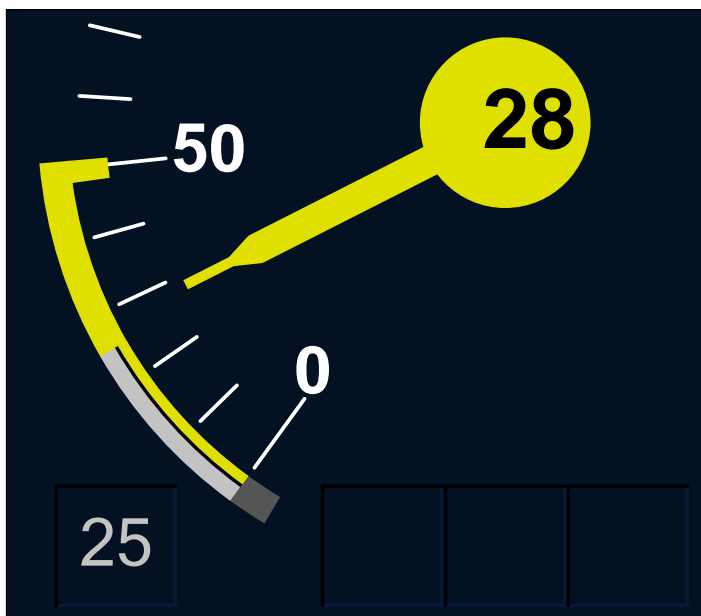


Figure 47 – Release speed, when $V_{perm} > V_{release}$



Figure 48 – Release speed, when $V_{perm} < V_{release}$

- 8.2.1.6.3 When a Release speed exists, its graphical presentation shall be shown on the CSG as specified in Table 9.
- 8.2.1.6.4 When the Release speed is shown on the CSG, it shall be shown at the outer part of the CSG. This Release speed display ($V_{release}$) shall be separated from the permitted speed display (V_{perm}) by a 1 cell line being in the background colour. The permitted speed display below the Release speed value shall have a width of 3 cells. The width of the Release speed display shall ensure that the total width of the CSG is always kept at 9 cells (see Figure 47 and Figure 48).
- 8.2.1.6.5 When a Release speed exists, its digital presentation shall be displayed with a number in medium grey as specified in Table 11.

ERA ERTMS unit

ETCS Driver Machine Interface

Mode	Supervision Status		Release speed digital
FS / OS* / LS**	CSM	AIIS	no
	PIM	AIIS	yes
	TSM	AIIS	yes
	RSM	AIIS	yes
SB / SH / UN / PT / TR / NL / SR / RV	-	AIIS	no

* For OS, the digital presentation of the release speed is shown if driver has requested to display it (toggle on) (see chapter 8.2.2.4 for the toggling function)

** For LS, the digital presentation of the release speed is shown if the permitted speed is lower than both the Limited Supervision mode speed limit and the maximum train speed,

Table 11 – Conditions for display of the release speed digital

8.2.2 Brake Information

8.2.2.1 Distance to target bar

8.2.2.1.1 This DMI object shows the remaining distance to target bar.

8.2.2.1.2 The distance to target bar shall be displayed in area A3 (see Figure 49).

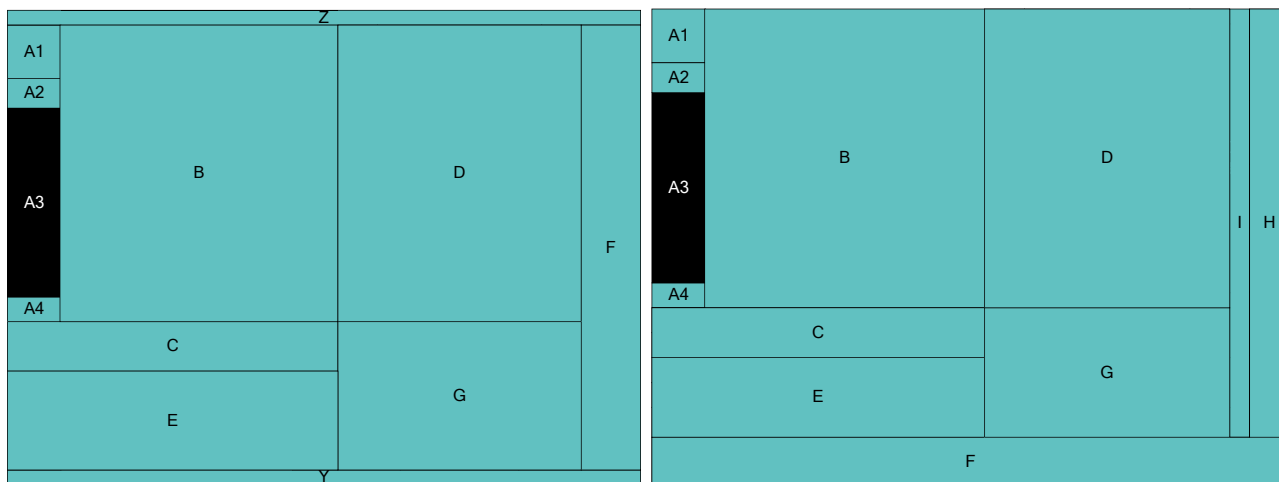


Figure 49 – Area for distance to target bar

8.2.2.1.3 Figure 50 gives an example of the distance to target bar.

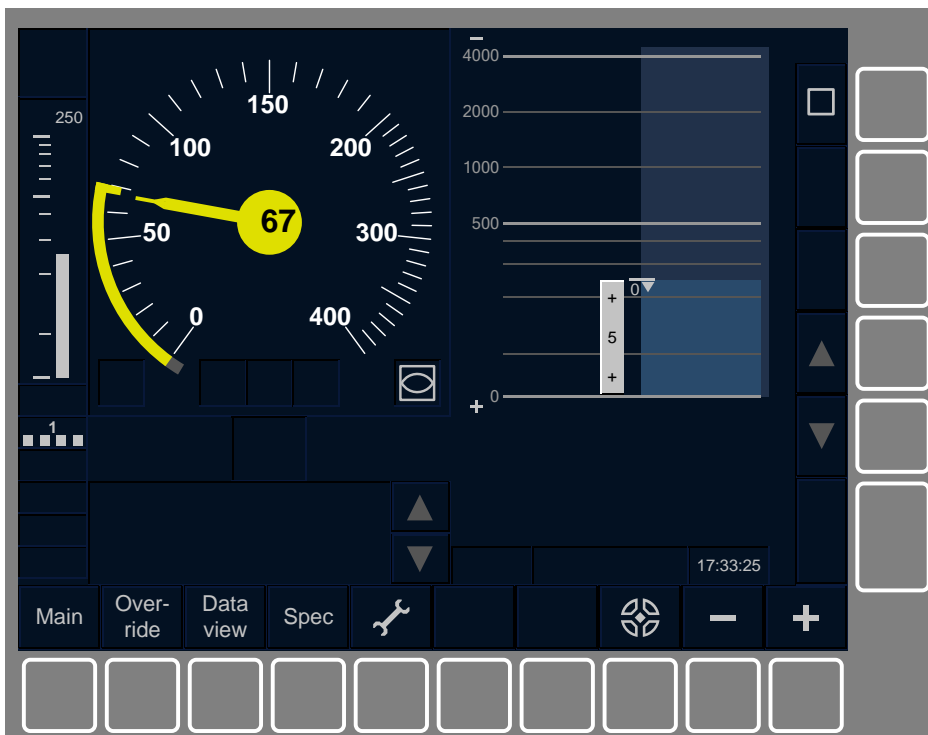
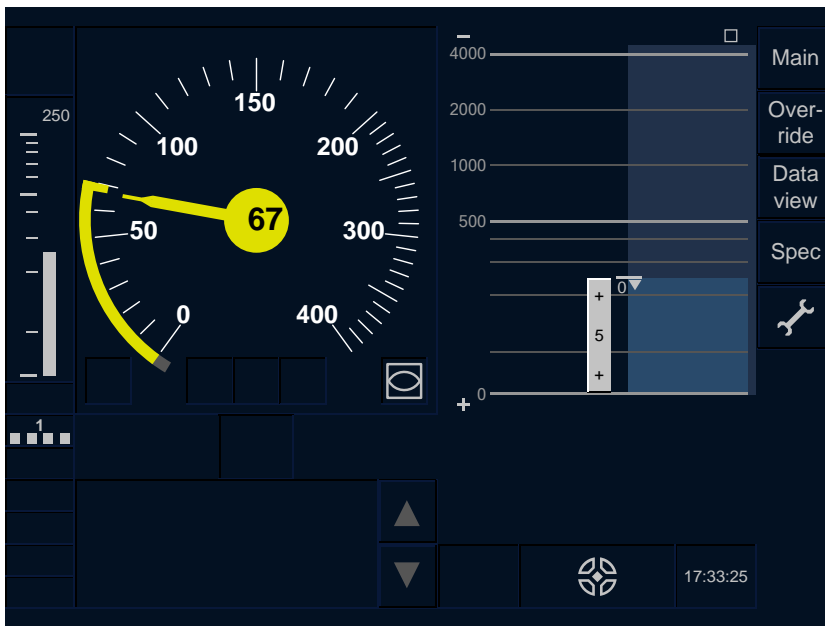


Figure 50 – Distance to target

8.2.2.1.4 A distance scale shall be displayed on the left hand side of the area A3 from 0 to 1000 metres. The distance scale between 0 and 100 m shall be linear, then it shall be logarithmic from 100 m to 1000 m. At each of the positions defined in Table 12, a distance indicator line shall be drawn horizontally. For 0, 500 and 1000 metres, the distance indicator lines shall be with a width of 2 cells and a length of 13 cells. The other lines shall be shorter distance indicator lines with a width of 1 cell and a length of 9 cells.

Distance indicator line	position of distance indicator lines
-------------------------	--------------------------------------

Distance indicator line	position of distance indicator lines
1000	(12,-1)
900	(16,6)
800	(16,13)
700	(16,22)
600	(16,32)
500	(12,45)
400	(16,59)
300	(16,79)
200	(16,105)
100	(16,152)
0	(12,185)

Table 12 –Distance scale for the target distance bar

8.2.2.1.5 The distance indicator lines shall be grey.

8.2.2.1.6 The target distance shall be indicated by a vertical rectangular bar with a width of 10 cells on the right hand side of the area A3. The bottom left corner of the vertical rectangular bar shall be positioned at (29,186).The vertical rectangular bar shall display the remaining distance to the target from 0 to maximum 1000 metres as specified by the distance scale. For distances above 1000 metres, the vertical rectangular bar shall display 1000 metres.

8.2.2.1.7 The vertical rectangular bar shall be grey.

8.2.2.1.8 The distance to target bar and the distance scale shall be shown in A3 as specified in Table 13.

Mode	Supervision Status		Distance to target bar
FS	CSM	AIIS	no
	PIM	AIIS	yes
	TSM	AIIS	yes
	RSM	AIIS	yes
RV	-	AIIS	yes
SB / SH / UN / PT / TR / NL / LS / OS / SR	-	AIIS	no

Table 13 – Conditions for display of the distance to target bar and of the distance scale

8.2.2.2 Distance to target digital

8.2.2.2.1 This DMI object shows the remaining distance to target digital.

8.2.2.2.2 The distance to target digital shall be displayed in area A2 (see Figure 51).

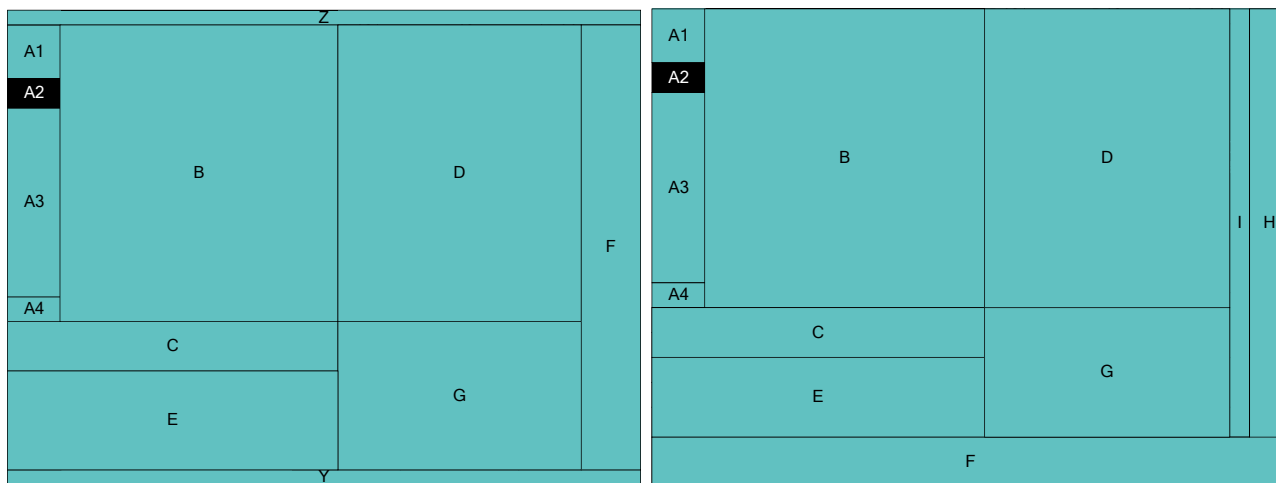


Figure 51 – Area for distance to target digital

8.2.2.2.3 Figure 50 gives an example of the distance to target digital.

8.2.2.2.4 The distance to target digital shall be able to show up to 5 digits. These numbers shall be right aligned with an indent of 10 cells.

8.2.2.2.5 This digital representation shall be vertically centred in A2.

8.2.2.2.6 It shall show a number in grey to the nearest unit of 10 (rounding).

8.2.2.2.7 The distance to target digital shall be shown in A2 as specified in Table 14.

Mode	Supervision Status		Distance to target digital
FS / OS / SR*	CSM	AllS	no
	PIM	AllS	yes
	TSM	AllS	yes
	RSM (not applicable for SR)	AllS	yes
RV	-	AllS	yes
SB / SH / UN / PT / TR / NL / LS	-	AllS	no

* For OS/SR, the distance to target digital is shown if driver has requested to display it (toggle on) (see chapter 8.2.2.4 for the toggling function)

Table 14 – Conditions for display of the distance to target digital

8.2.2.3 Emergency/Service Brake Intervention

8.2.2.3.1 This DMI object shows that ERTMS/ETCS is commanding the brakes.

8.2.2.3.2 The emergency/service brake intervention shall be displayed in area C9 (Figure 52).

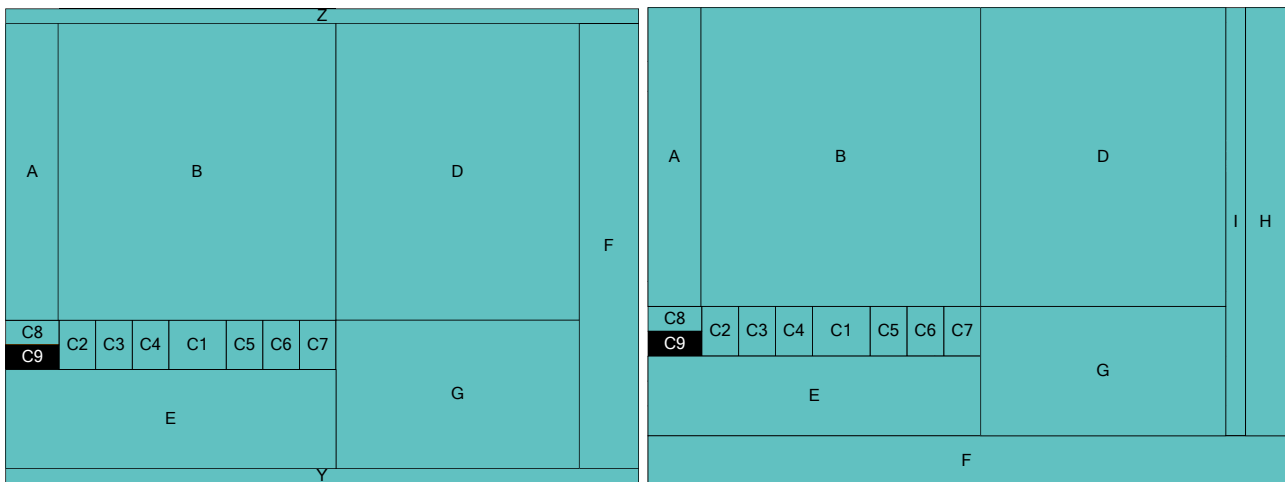
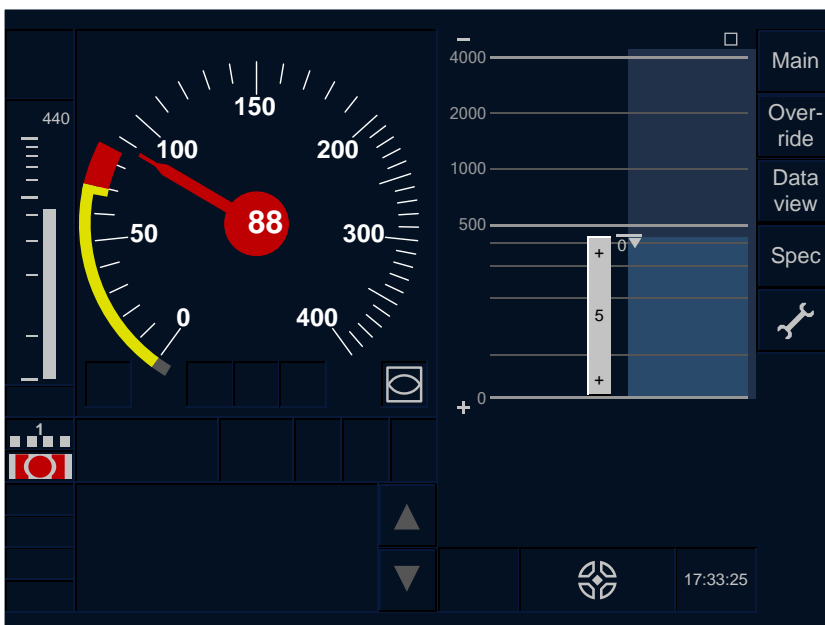


Figure 52 – Area for brake intervention symbol

8.2.2.3.3 The symbol ST01, see chapter 12, shall be used.



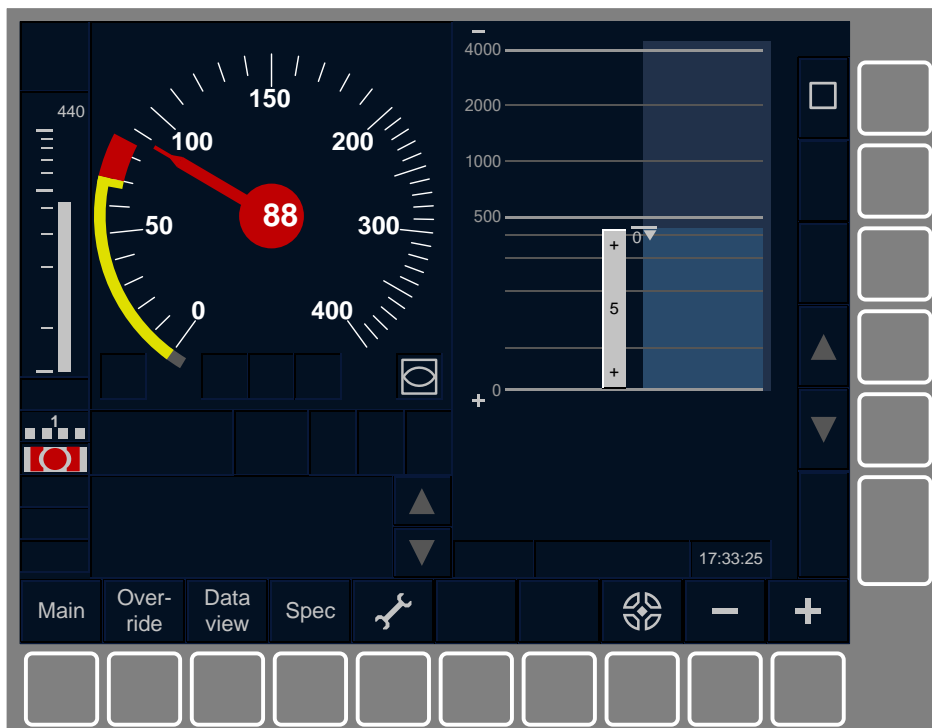


Figure 53 – Brake intervention

8.2.2.3.4 If a driver acknowledgement is required for releasing a brake intervention (see document [3]), the requirements specified in 5.4 shall apply for the symbol ST01 as soon as, if any, the other conditions for the brake release are met (e.g. being at standstill).

8.2.2.3.4.1 Note: If a request for acknowledgement of an ERTMS/ETCS level, of a mode or of a trackside text message leads to the brake intervention, the release will be done respectively when the ERTMS/ETCS level, the mode or the trackside text message is acknowledged.

8.2.2.3.5 When using the touch screen technology, the sensitive area of C9 shall be extended to the C8 and E1 areas. The frame shall only surround the C9 area.

8.2.2.3.6 When the brake intervention is released without any driver's acknowledgement (on ST01 or on any other DMI object), sound Sinfo shall be executed.

8.2.2.3.6.1 Note: when a driver's acknowledgement is required leading to the brake release, Sinfo is already played (see chapter 5.4) to draw the driver's attention to this acknowledgement.

8.2.2.4 Toggling function for speed information

8.2.2.4.1 These DMI objects allow the driver to toggle on and off some speed and distance monitoring information displayed in areas A and B. The toggling function is located respectively in A/B (touch screen technology) and F7 (soft key technology) (see Figure 54).

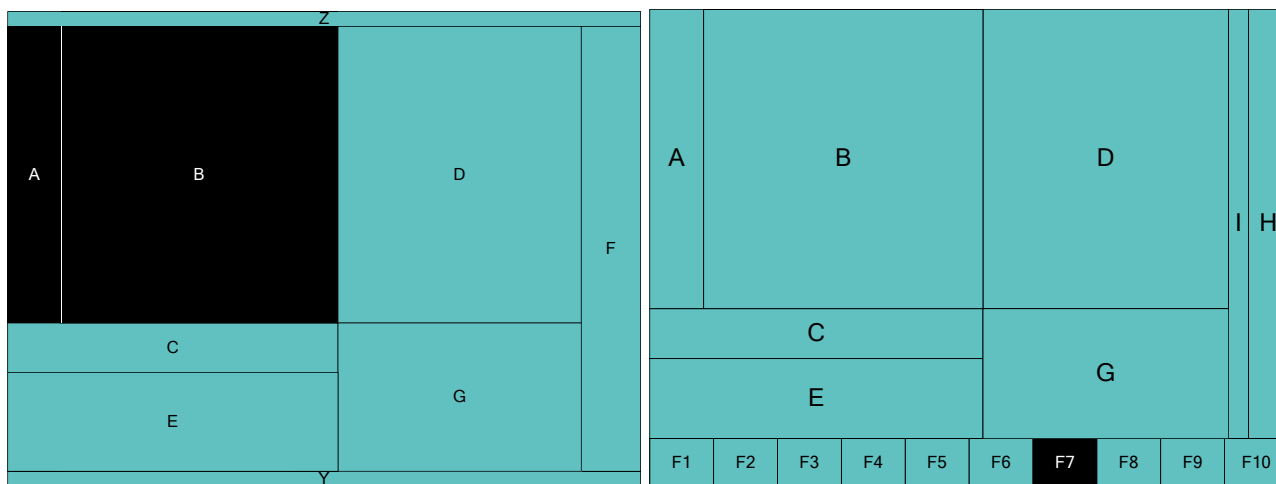


Figure 54 – Areas for toggling function of speed/distance information

- 8.2.2.4.2 When using touch screen technology: If the onboard is in one of the modes identified in the Table 15, the areas A and B shall become sensitive to allow the driver to toggle on and off the display of all concerned objects (see Table 15) for that mode.
- 8.2.2.4.3 When using soft key technology: If the onboard is in one of the modes identified in the Table 15, F7 shall be an enabled up-type button showing the symbol DR01 to allow the driver to toggle on and off the display of all concerned objects (see Table 15) for that mode.
- 8.2.2.4.4 In all other modes (not mentioned in Table 15), the toggling function shall be inactive. For the touch screen technology, the A/B areas shall not be sensitive and for the soft key technology, no button shall exist in F7 for the toggling function.

Mode	Concerned Object
OS	Basic Speed Hook(s)
	Release speed digital
	Distance to target (digital)
SR	Basic Speed Hook(s)
	Distance to target (digital)
SH	Basic Speed Hook(s)

Table 15 – Objects concerned by the toggling function

- 8.2.2.4.5 When the onboard enters one of the modes identified in Table 15, the display of the concerned objects shall be automatically toggled off.

8.2.3 Supplementary Driving Information

8.2.3.1 Mode information

- 8.2.3.1.1 Mode information consists of three elements:

- the ERTMS/ETCS current mode;
- a mode acknowledgement is requested;

c) the override symbol is displayed, to inform the driver that the override function is active.

8.2.3.1.2 The current ERTMS/ETCS mode shall be displayed in B7 (see Figure 55) by using the following symbols defined in chapter 12: symbols MO01, MO04, MO06, MO07, MO09, MO11, MO12, MO13, MO14, MO16, MO18 or MO21.

8.2.3.1.2.1 Exception: If MO18 cannot be displayed on the total image display area, the SF mode shall be indicated by any other means (e.g. blank screen, frozen screen, dedicated lamp, sound,...).

8.2.3.1.2.2 Exception: The mode IS shall be indicated by any means (e.g. by the isolation device).

8.2.3.1.3 The mode acknowledgement shall be displayed in area C1 (see Figure 55) by using the following symbols defined in chapter 12: symbols MO02, MO05, MO08, MO10, MO15, MO17, MO20 or MO22.

8.2.3.1.4 When MO10 is displayed, the Ack-button shall be a delay-type button.

8.2.3.1.5 The override shall be displayed in area C7 (see Figure 55) by using the symbol MO03 defined in chapter 12.

8.2.3.1.6 If an ERTMS/ETCS level announcement without acknowledgement is already displayed in area C1, it shall be substituted by the mode acknowledgement until the driver acknowledges.

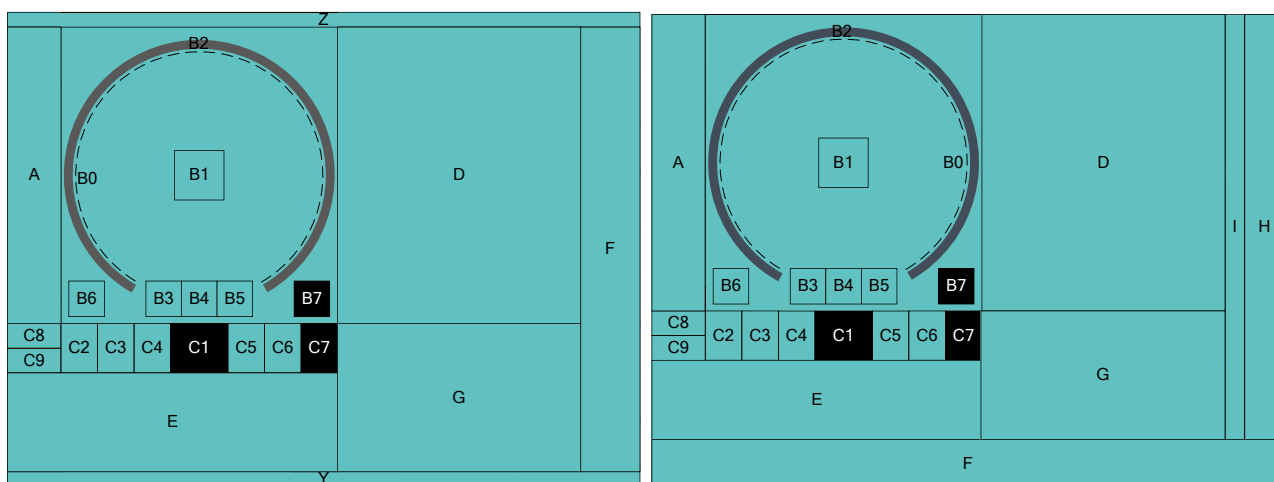


Figure 55 – Areas for mode information (active and acknowledgment)

8.2.3.1.7 Figure 56 shows an example of an active mode symbol in B7 and of the override symbol in C7.

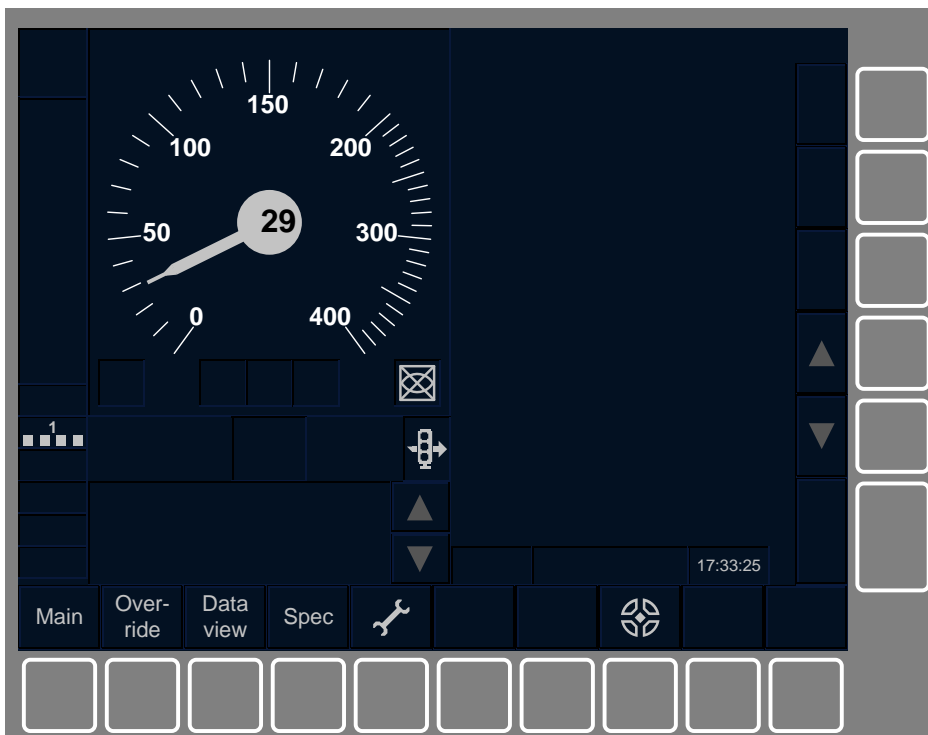
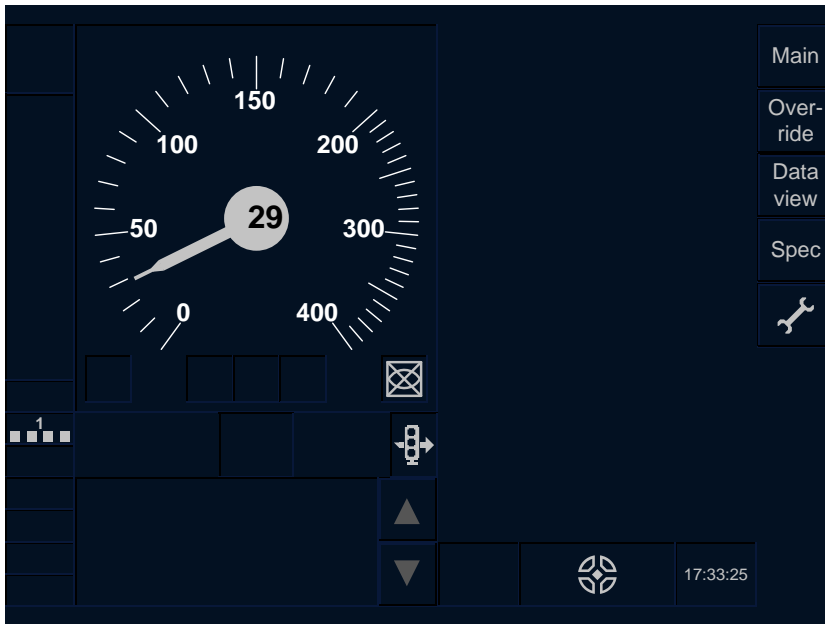


Figure 56 – Mode information

8.2.3.1.8 For the symbols displayed in C1 showing a mode to be acknowledged (i.e. all symbols except MO03), the requirements specified in 5.4 shall apply.

8.2.3.1.9 Symbol MO03 (active override) shall always be shown as long as the override function is activated.

8.2.3.2 Level information

8.2.3.2.1 Level information consists of three elements:

- a) the current ERTMS/ETCS level ;
- b) an ERTMS/ETCS level announcement with acknowledgement;

c) an ERTMS/ETCS level announcement.

8.2.3.2.2 When the current ERTMS/ETCS level is valid and equal to 0, NTC (except in the modes SN and NL), 1, 2 or 3, it shall be displayed in area C8 (see Figure 57).

8.2.3.2.3 If the current ERTMS/ETCS level is unknown or invalid, no DMI object shall be displayed in area C8.

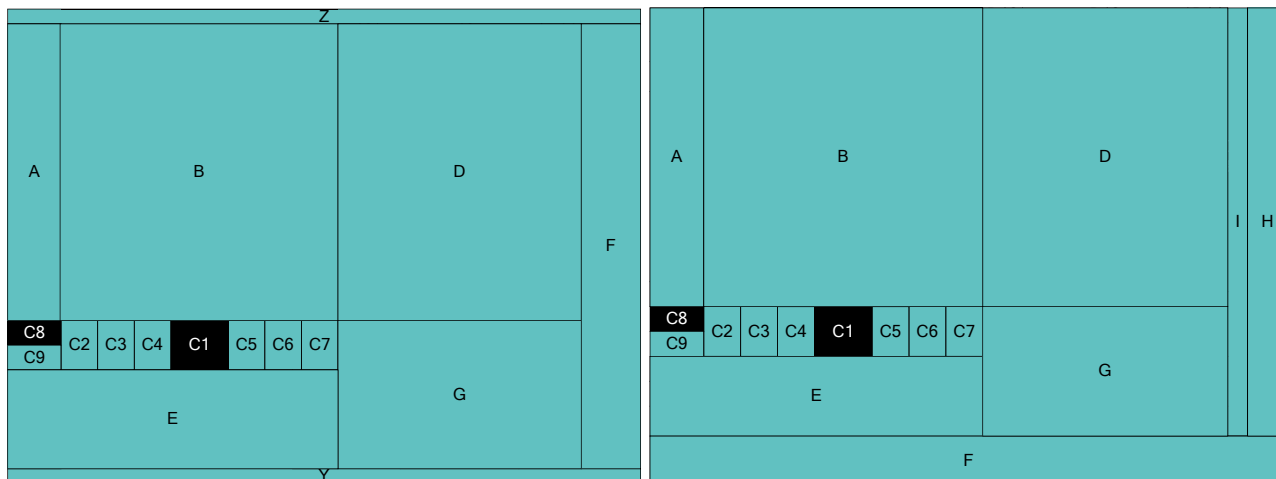


Figure 57 – Areas for level information

8.2.3.2.4 The symbol LE01, LE03, LE04, LE05 shall be used (see chapter 12), depending on the current ERTMS/ETCS level.

8.2.3.2.5 An ERTMS/ETCS level announcement and an ERTMS/ETCS level announcement with acknowledgement shall be displayed in area C1 (see Figure 57).

8.2.3.2.6 No ERTMS/ETCS level announcement shall be displayed as long as a mode acknowledgement is displayed in C1.

8.2.3.2.7 If no acknowledgement is required for the ERTMS/ETCS level announcement, the symbol LE06, LE08, LE10, LE12 or LE14 (see chapter 12) shall be used, depending on the ERTMS/ETCS level announcement.

8.2.3.2.8 If an acknowledgement is required for the ERTMS/ETCS level announcement, the symbol LE07, LE09, LE11, LE13, LE15 (see chapter 12) shall be used, depending on the next ERTMS/ETCS level announcement. For these symbols, the requirements specified in 5.4 shall apply. As long as the train has not yet reached the trackside location from where the acknowledgement is required or as soon as the ERTMS/ETCS level announcement is acknowledged, the symbol LE06, LE08, LE10, LE12 or LE14 (see chapter 12) shall replace respectively LE07, LE09, LE11, LE13, LE15.

8.2.3.2.9 For level NTC, the distinct abbreviation of the corresponding National System (its definition is inherent to the National System and is outside the scope of this specification) shall be displayed instead of the text “NTC” as shown in symbol LE02, LE08, LE09.

8.2.3.2.10 The space used for characters of the National System abbreviation shall not exceed an area of 48 x 19 (w x h) cells in the C8 and shall comply with the minimum size of characters as defined in 5.1.2.

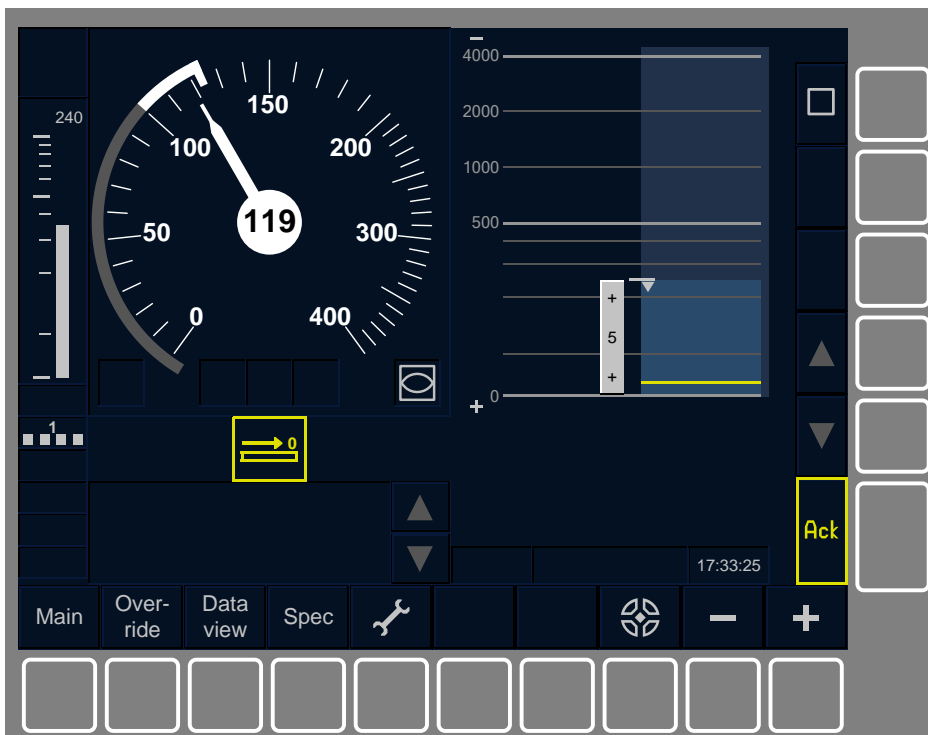
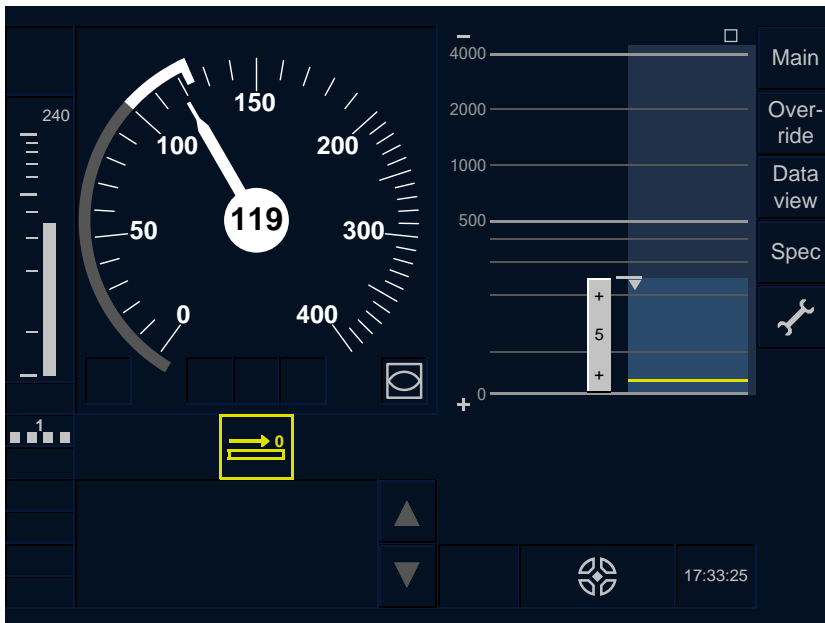


Figure 58 – Level information

8.2.3.3 Track Ahead Free information

8.2.3.3.1 The track ahead free information shall be displayed in area D (see Figure 59).

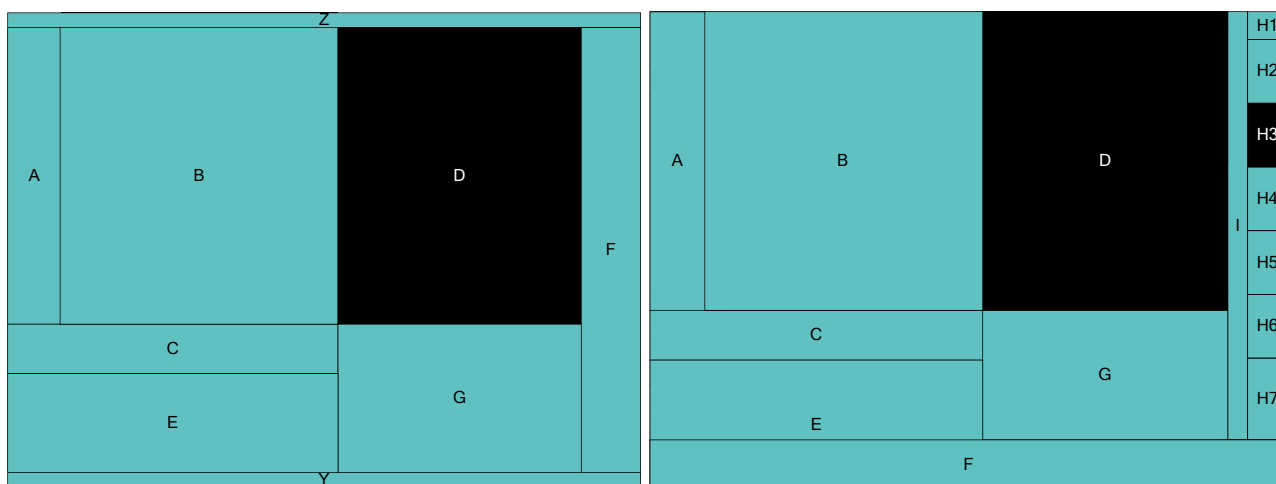


Figure 59 – Area for track ahead free information

- 8.2.3.3.2 The track ahead free information shall be displayed via a question box.
- 8.2.3.3.3 The height of the question box shall be 50 cells.
- 8.2.3.3.4 The width of the question box shall be 244 cells.
- 8.2.3.3.5 When using touch screen technology, the top left corner of the question box shall be positioned at (0,50).
- 8.2.3.3.6 When using soft key technology, the top left corner of the question box shall be positioned at (0,100).
- 8.2.3.3.7 The question box shall be divided into a question part and an answer part.
- 8.2.3.3.8 The width of the question part shall be 162 cells.
- 8.2.3.3.9 The question part shall be placed to the left of the answer part.
- 8.2.3.3.10 The symbol DR02 defined in chapter 12 shall be displayed centred in the question part. The background colour of the question part shall be dark grey.
- 8.2.3.3.11 The answer part shall display the label 'Yes' in black. The background colour of the answer part shall be medium grey.
- 8.2.3.3.12 When using touch screen technology, the answer part shall be an up-type enabled button.
- 8.2.3.3.13 When using soft key technology, H3 displaying the label 'Yes' shall be the soft key associated to the answer part.
- 8.2.3.3.14 The question part and the 'Yes' button (i.e. the answer part) shall both have the same borders as an input field applying 5.1.1.1.4.
- 8.2.3.3.15 Figure 60 shows an example of the track ahead free symbol in D.

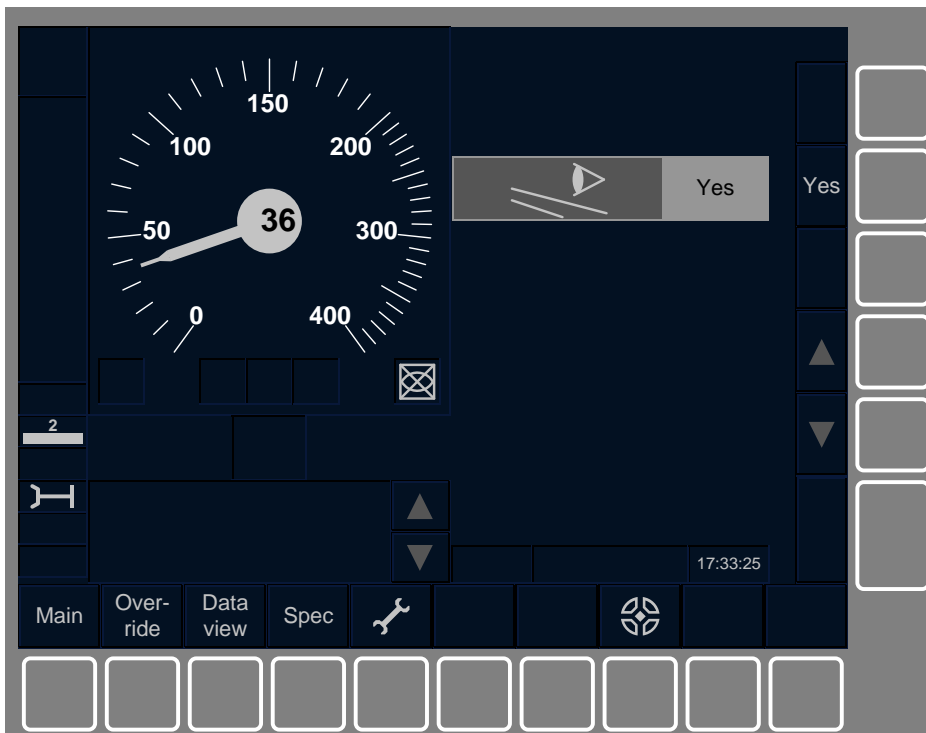
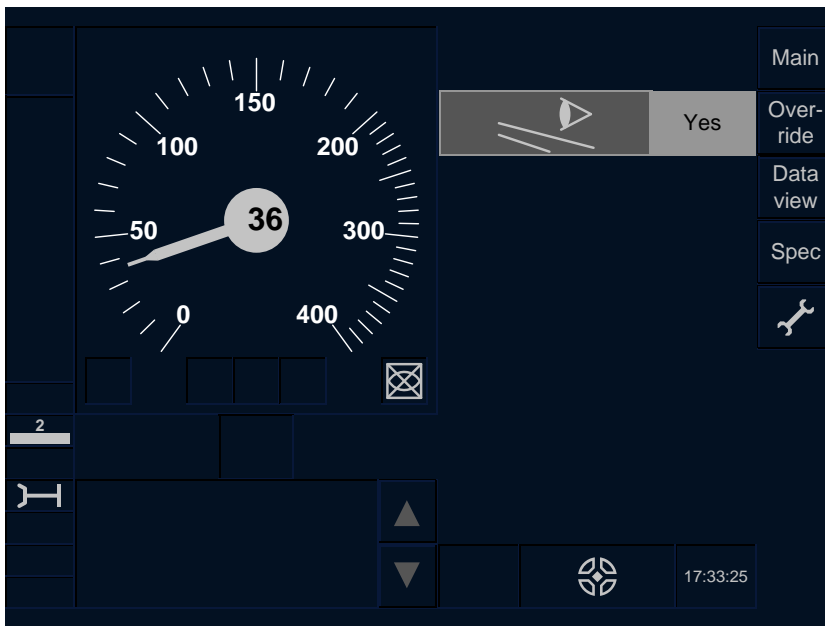


Figure 60 – Track Ahead Free information

8.2.3.4 Text messages

- 8.2.3.4.1 This DMI object displays the plain/fixed text messages received from trackside, the system status messages specified in chapter 15.
- 8.2.3.4.2 When using touch screen technology, the text messages shall use the areas E5 – E11 (see Figure 61).
- 8.2.3.4.3 When using soft key technology, the text messages shall use the areas E5 – E11 and H5-H6 (see Figure 61).

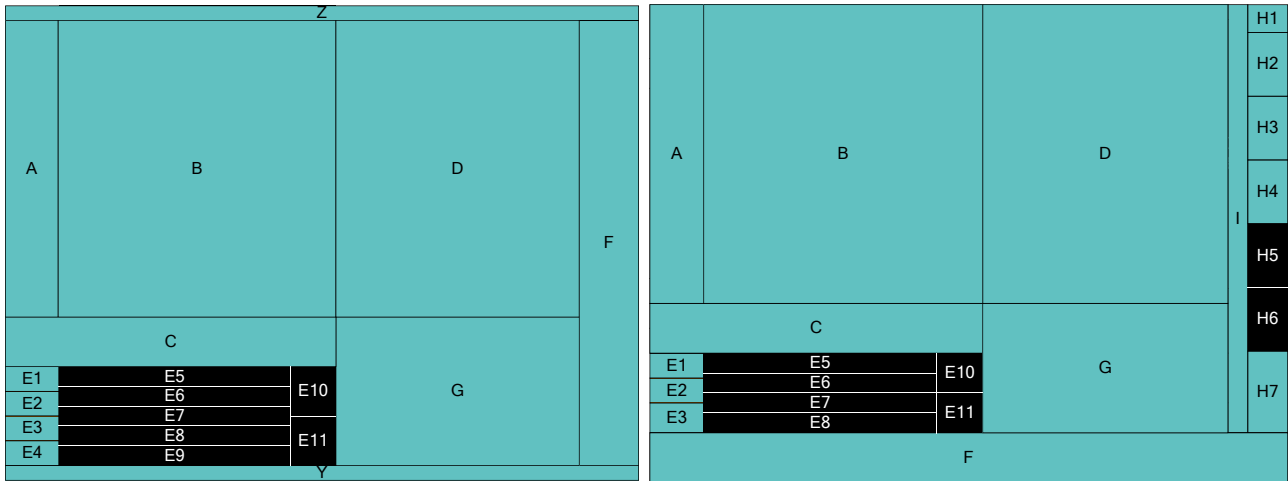
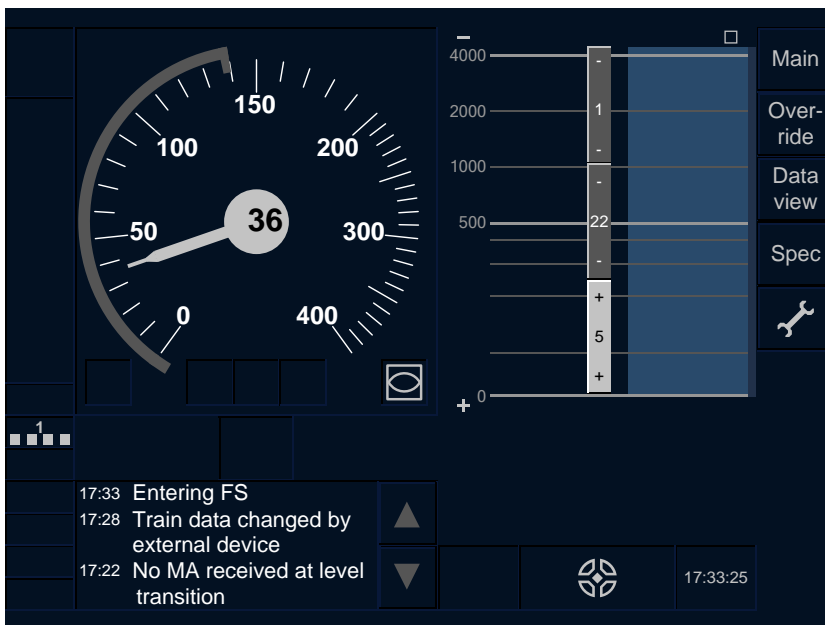


Figure 61 – Areas for text messages

8.2.3.4.4 Figure 62 shows an example of the presentation of text messages.



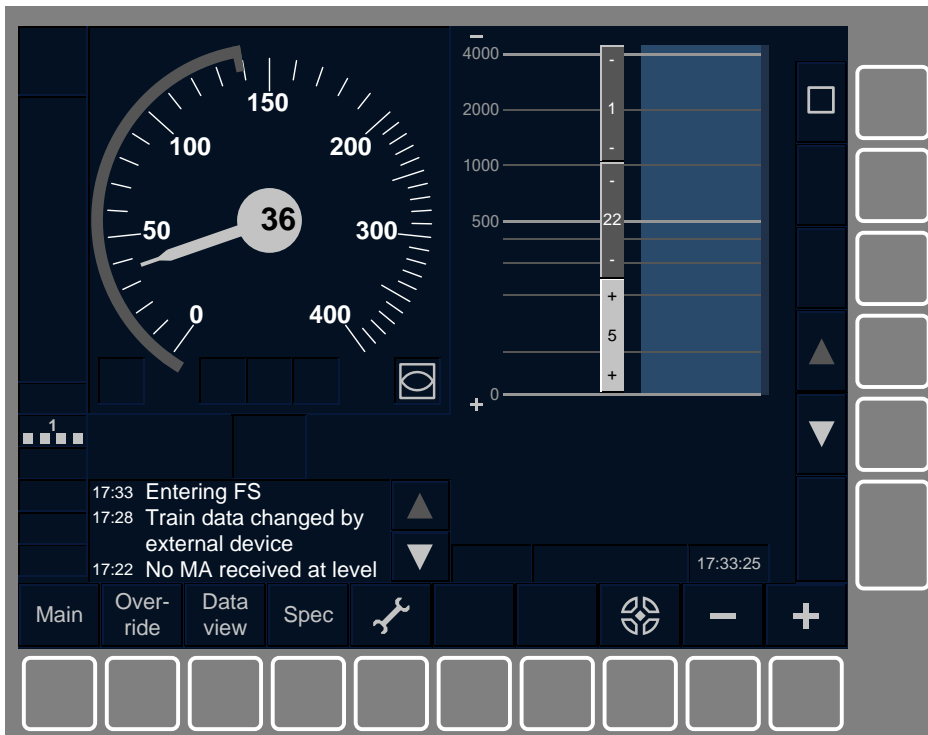


Figure 62 – Text messages

8.2.3.4.5 Figure 63 shows an example of a text message to be acknowledged.



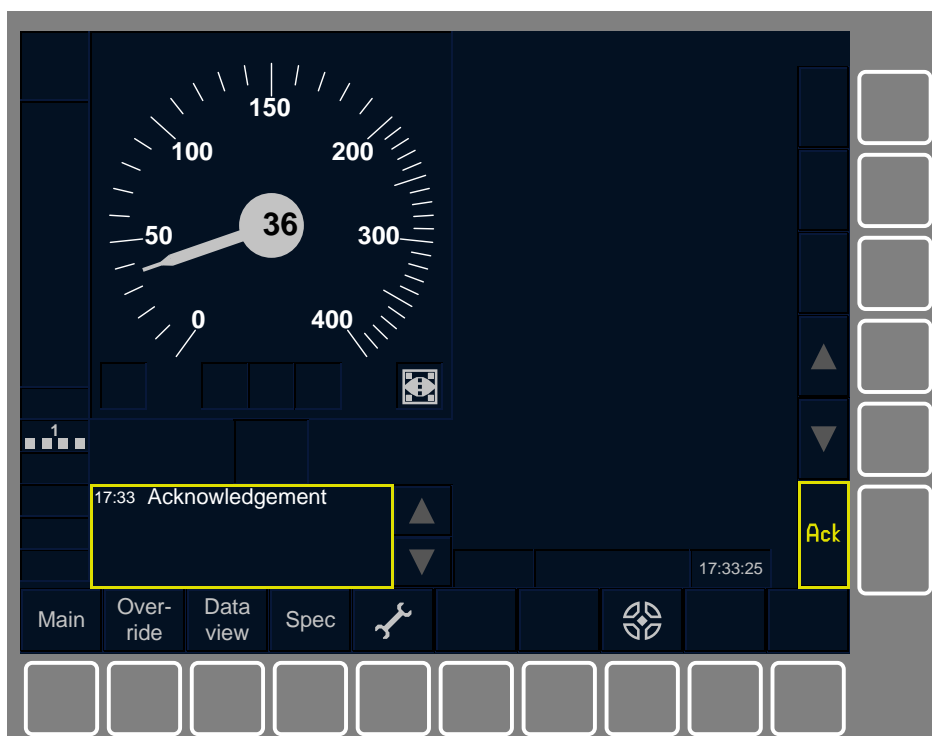


Figure 63 – Text message to be acknowledged

8.2.3.4.6 The following applies to all text messages:

- a) The text messages shall be presented in white colour.
- b) The local time of appearance shall be attached to the first line of a displayed text message. It shall be separated from the first character of the displayed text by an indent of 10 cells. This local time shall be in the format 'hh:mm' with a 24 hours time reference.
- c) If a text message does not fit in one area, it shall continue inside the next area (i.e. the text message will be composed of several lines). The next lines shall be aligned with the first character of the displayed text (see Figure 62).

8.2.3.4.7 The following applies to text messages that do not have to be acknowledged:

- a) The text messages shall be divided into two groups. The first group shall contain the system status messages and the important plain/fixed text messages received from trackside. The second group shall contain the auxiliary plain/fixed text messages received from trackside.
- b) The text messages of the first group shall be displayed above the text messages of the second group.
- c) The text messages of the first group shall be presented with characters in bold style. The text messages of the second group shall be presented with characters in regular style.
- d) The text messages belonging to the same group shall be classified in a chronological way; the newest text message being displayed on top of the group.
- e) It shall be possible to scroll the list of text messages. The scrolling function shall not be circular i.e. the first text message shall not scroll to the last one and vice-versa.

- f) When using touch screen technology, to scroll through the list of text messages the area E10 shall be dedicated to the [Up] button, the area E11 shall be dedicated to [Down] button.
- g) When using soft key technology, to scroll through the list of text messages the H5 shall be dedicated to the [Up] button and H6 shall be dedicated to the [Down] button. The symbols NA13, NA15 and NA14, NA16 shall echo the [Up] and [Down] buttons respectively in E10 and E11.
- h) Sound Sinfo, see chapter 14, shall be used when a new text message of the first group is displayed for the first time. No sound shall be used when a new text message of the second group is displayed for the first time.

8.2.3.4.8 The following applies only to text messages to be acknowledged regardless of the group they belong to:

- a) A text message to be acknowledged shall be presented alone (see Figure 63) (the other messages that do not have to be acknowledged are temporarily not shown) in the E5-E9 (touch screen technology) or E5-E8 (soft key technology) area.
- b) As long as an Ack is required, the requirements specified in 5.4 shall apply on the full area formed by E5-E9 (touch screen technology) or E5-E8 (soft key technology); E10 and E11 shall show respectively the symbols NA15 and NA16.
- c) After acknowledgement and if the acknowledgement does not lead to the end of display, the corresponding text message shall be managed as a text message that do not have to be acknowledged but without playing the sound Sinfo.

8.2.3.5 Orders and announcements of track conditions (excluding tunnel stopping areas)

8.2.3.5.1 This DMI object displays orders and announcement of track conditions (excluding tunnel stopping areas), e.g. lowering the pantograph.

8.2.3.5.2 The orders and announcements of track conditions (excluding tunnel stopping areas) shall be displayed in area B3/4/5 (see Figure 64).

8.2.3.5.3 The placement of the objects is from left to right filling B3/4/5. When an area is already displaying a symbol, the next area shall be used. When all areas are already displaying symbols, any further objects to be displayed shall wait that B3, B4 or B5 is free.

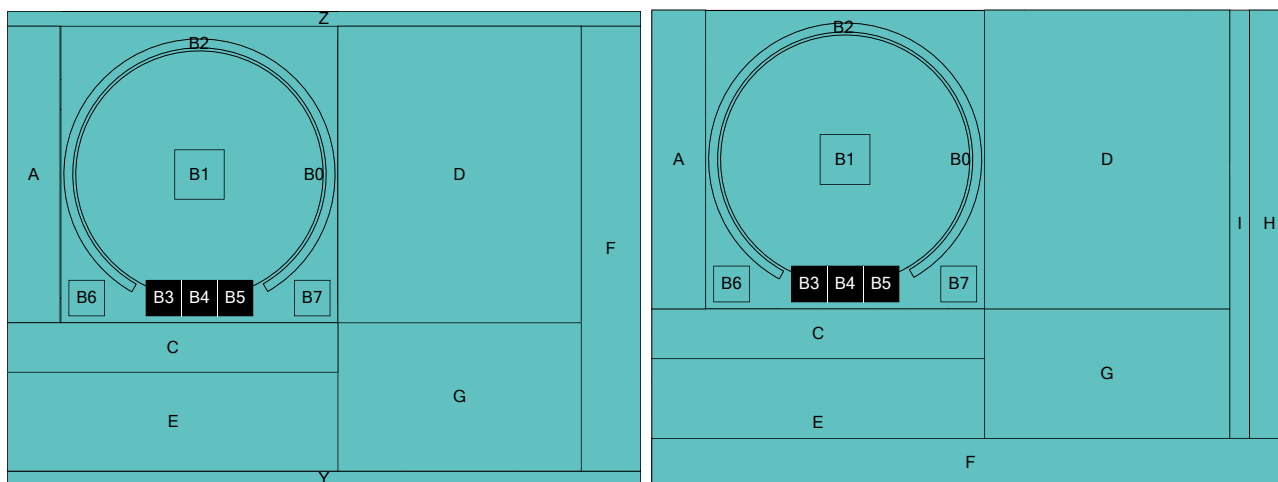


Figure 64 – Areas for orders and announcement of track conditions (excluding tunnel stopping areas)

- 8.2.3.5.4 The symbols TC19, TC21, shall be used to order “Close air conditioning intake announcement”; symbol TC19 to indicate an automatic execution, symbol TC21 when the driver is requested to act.
- 8.2.3.5.5 The symbol TC19 shall be used to indicate “Air conditioning intake closed”.
- 8.2.3.5.6 The symbols TC20, TC22 shall be used to order “Open air conditioning intake”; symbol TC20 to indicate an automatic execution, symbol TC22 when the driver is requested to act.
- 8.2.3.5.7 The symbols TC02, TC03 shall be used to order “Lower pantograph”; symbol TC02 to indicate an automatic execution, symbol TC03 when the driver is requested to act.
- 8.2.3.5.8 The symbol TC01 shall be used to indicate “Pantograph lowered”.
- 8.2.3.5.9 The symbols TC04, TC05 shall be used to order “Raise pantograph”; symbol TC04 to indicate an automatic execution, symbol TC05 when the driver is requested to act.
- 8.2.3.5.10 The symbols TC06, TC07 shall be used to order “Neutral section announcement”; symbol TC06 to indicate an automatic execution, symbol TC07 when the driver is requested to act.
- 8.2.3.5.11 The symbol TC06 shall be used to indicate “Neutral section”.
- 8.2.3.5.12 The symbols TC08, TC09 shall be used to order “End of Neutral section”; symbol TC08 to indicate an automatic execution, symbol TC09 when the driver is requested to act.
- 8.2.3.5.13 The symbols TC10, TC11 shall be used respectively to indicate “Non Stopping area” and “Non Stopping area announcement”.
- 8.2.3.5.14 The symbol TC12 shall be used to indicate “Radio hole”.
- 8.2.3.5.15 The symbols TC13, TC14 shall be used to order “Inhibition of magnetic shoe brake announcement”; symbol TC13 to indicate an automatic execution, symbol TC14 when the driver is requested to act.
- 8.2.3.5.16 The symbol TC13 shall be used to indicate “Inhibition of magnetic shoe brake”.
- 8.2.3.5.17 The symbols TC15, TC16, shall be used to order “Inhibition of eddy current brake announcement”; symbol TC15 to indicate an automatic execution, symbol TC16 when the driver is requested to act.
- 8.2.3.5.18 The symbol TC15 shall be used to indicate “Inhibition of eddy current brake”.
- 8.2.3.5.19 The symbols TC17, TC18 shall be used to order “Inhibition of regenerative brake announcement”; symbol TC17 to indicate an automatic execution, symbol TC18 when the driver is requested to act.
- 8.2.3.5.20 The symbol TC17 shall be used to indicate “Inhibition of regenerative brake”.
- 8.2.3.5.21 The symbols TC23, TC24 shall be used to order a “change of traction system announcement, the line is not fitted with any traction system”; symbol TC23 to indicate an automatic execution, symbol TC24 when the driver is requested to act.

- 8.2.3.5.22 The symbol TC23 shall be used to indicate “New traction system, the line is not fitted with any traction system”.
- 8.2.3.5.23 The symbols TC25, TC26 shall be used to order a “change of traction system announcement, AC 25 kV 50 Hz”; symbol TC25 to indicate an automatic execution, symbol TC26 when the driver is requested to act.
- 8.2.3.5.24 The symbol TC25 shall be used to indicate “New traction system, AC 25 kV 50 Hz”.
- 8.2.3.5.25 The symbols TC27, TC28 shall be used to order a “change of traction system announcement, AC 15 kV 16.7 Hz”; symbol TC27 to indicate an automatic execution, symbol TC28 when the driver is requested to act.
- 8.2.3.5.26 The symbol TC27 shall be used to indicate “New traction system, AC 15 kV 16.7 Hz”.
- 8.2.3.5.27 The symbols TC29, TC30 shall be used to order a “change of traction system announcement, DC 3 kV”; symbol TC29 to indicate an automatic execution, symbol TC30 when the driver is requested to act.
- 8.2.3.5.28 The symbol TC29 shall be used to indicate “New traction system, DC 3 kV”.
- 8.2.3.5.29 The symbols TC31, TC32 shall be used to order a “change of traction system announcement, DC 1.5 kV”; symbol TC31 to indicate an automatic execution, symbol TC32 when the driver is requested to act.
- 8.2.3.5.30 The symbol TC31 shall be used to indicate “New traction system, DC 1.5 kV”.
- 8.2.3.5.31 The symbols TC33, TC34 shall be used to order a “change of traction system announcement, DC 600/750 V”; symbol TC33 to indicate an automatic execution, symbol TC34 when the driver is requested to act.
- 8.2.3.5.32 The symbol TC33 shall be used to indicate “New traction system, DC 600/750 V”.
- 8.2.3.5.33 The symbol TC35 shall be used to order “Sound horn”.
- 8.2.3.5.34 Figure 65 gives an example of the presentation of orders and announcements in area B3/4/5.

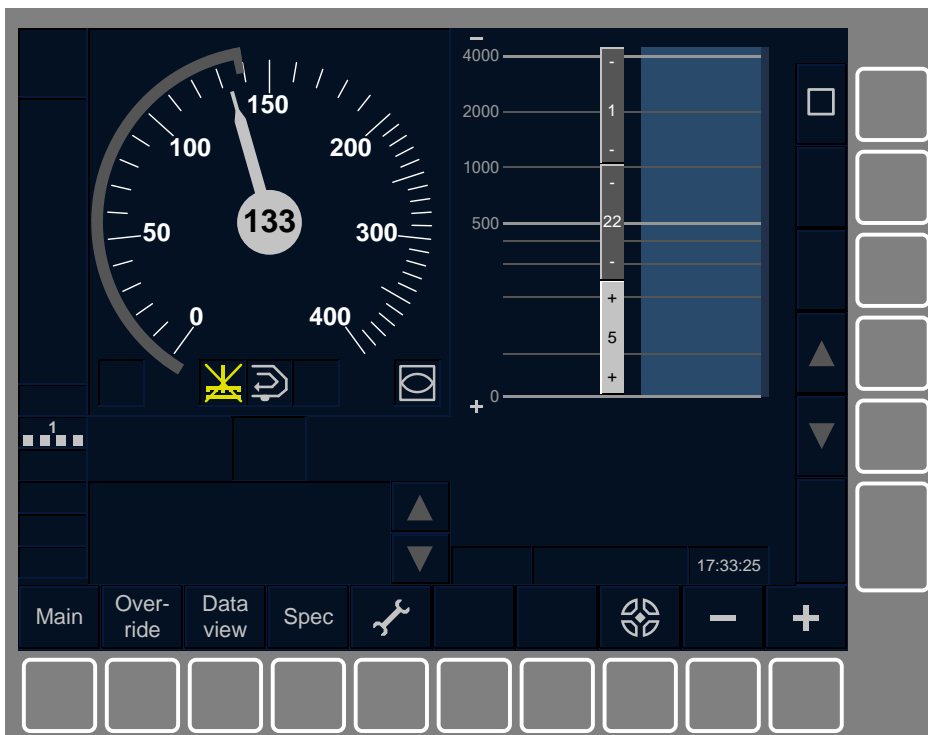
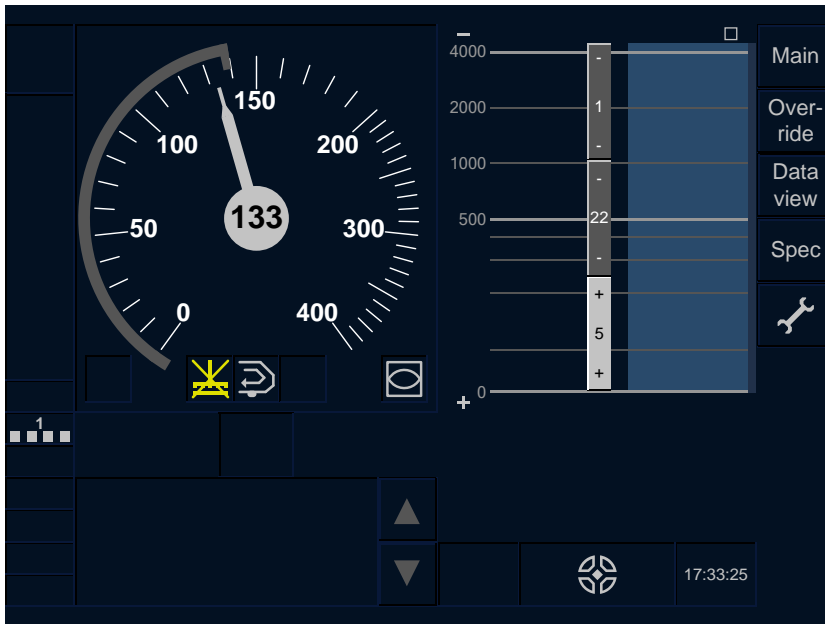


Figure 65 – Orders and announcement of track conditions (excluding tunnel stopping areas)

8.2.3.6 Tunnel stopping area track condition

8.2.3.6.1 This DMI object shows the next “tunnel stopping area” track condition.

8.2.3.6.2 The tunnel stopping area shall be displayed in area C2/C3/C4 (see Figure 66).

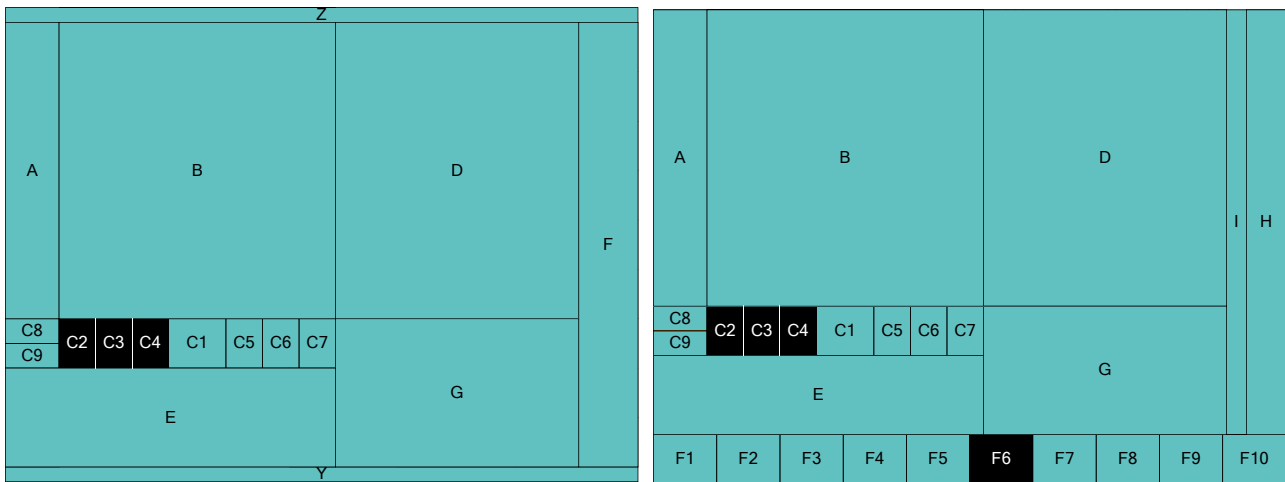
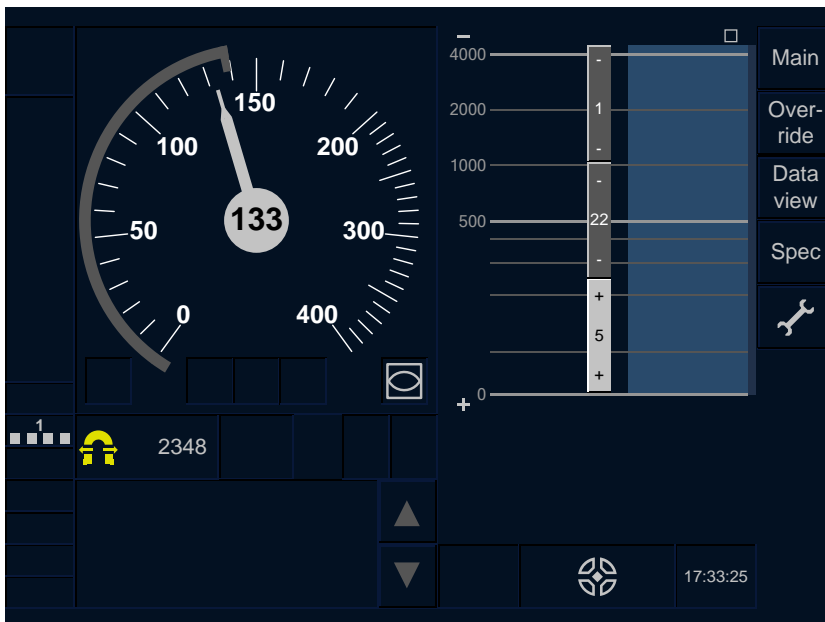


Figure 66 – Area for the tunnel stopping area



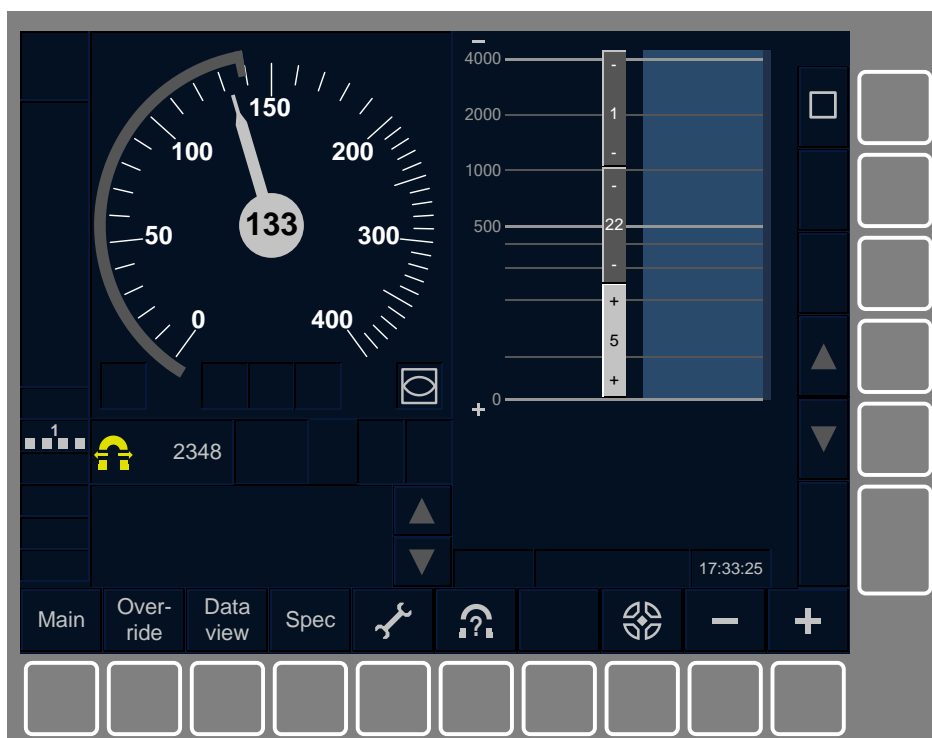


Figure 67 – Tunnel stopping area

- 8.2.3.6.3 The requirements 8.2.3.6.4 to 8.2.3.6.9 shall apply only if tunnel stopping areas are known by the onboard. (for further details, see [3])
- 8.2.3.6.4 It shall be possible to toggle on and off the display of the tunnel stopping area by touching the sensitive area of C2/C3/C4 (touch screen technology) or by using F6 (soft key technology).
- 8.2.3.6.5 When using the touch screen technology, the symbol DR05 shall be shown in C2/C3/C4 if the tunnel stopping area is toggled off.
- 8.2.3.6.6 When using the soft key technology, the symbol DR05 shall be shown in F6.
- 8.2.3.6.7 When the tunnel stopping area is toggled on, the symbols TC36, TC37 shall be shown in C2 to indicate respectively “Tunnel stopping area” and “Tunnel stopping area announcement”.
- 8.2.3.6.8 As long as the symbol TC37 is displayed, the remaining distance to the tunnel stopping area shall also be indicated in the C3/C4 area.
- 8.2.3.6.9 The remaining distance to the tunnel stopping area shall be able to show up to 5 digits with a resolution of 1 m. These numbers shall be in grey, right aligned with an indent of 10 cells and vertically centred.
- 8.2.3.6.10 When using touch screen technology, when the condition specified in 8.2.3.6.3 is not fulfilled, C2/C3/C4 shall not be sensitive and shall not display the symbol DR05.
- 8.2.3.6.11 When using soft key technology, when the condition specified in 8.2.3.6.3 is not fulfilled, no button shall exist in the F6 area.

8.2.3.7 Adhesion Factor Indication

8.2.3.7.1 This DMI object shows that the adhesion factor is set to “slippery rail”.

8.2.3.7.2 The adhesion factor “slippery rail” shall be displayed in area A4 (Figure 68).

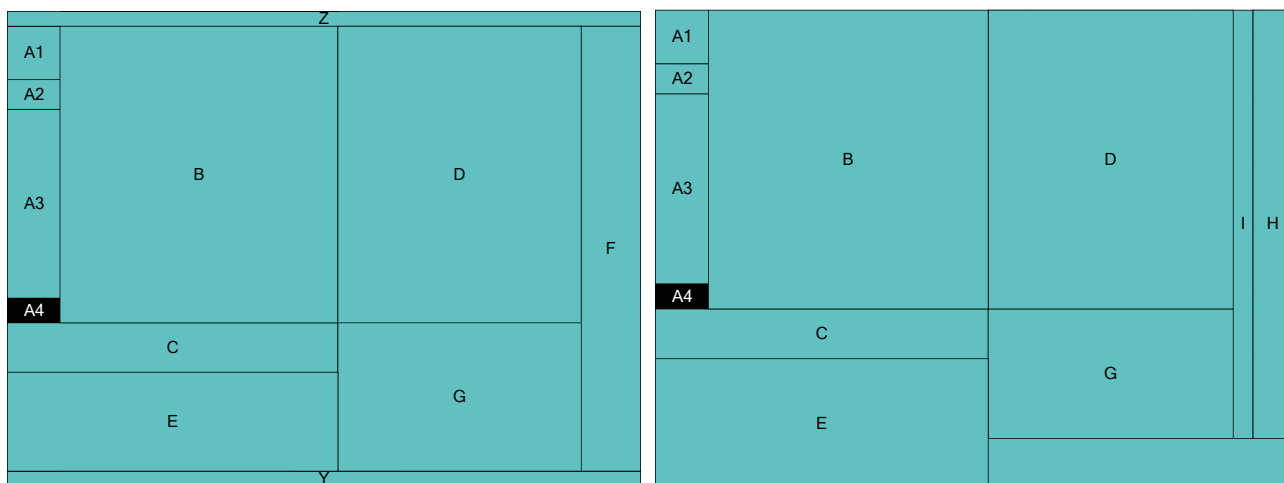


Figure 68 – Area for adhesion factor

8.2.3.7.3 The symbol ST02, see Figure 69, shall be used.

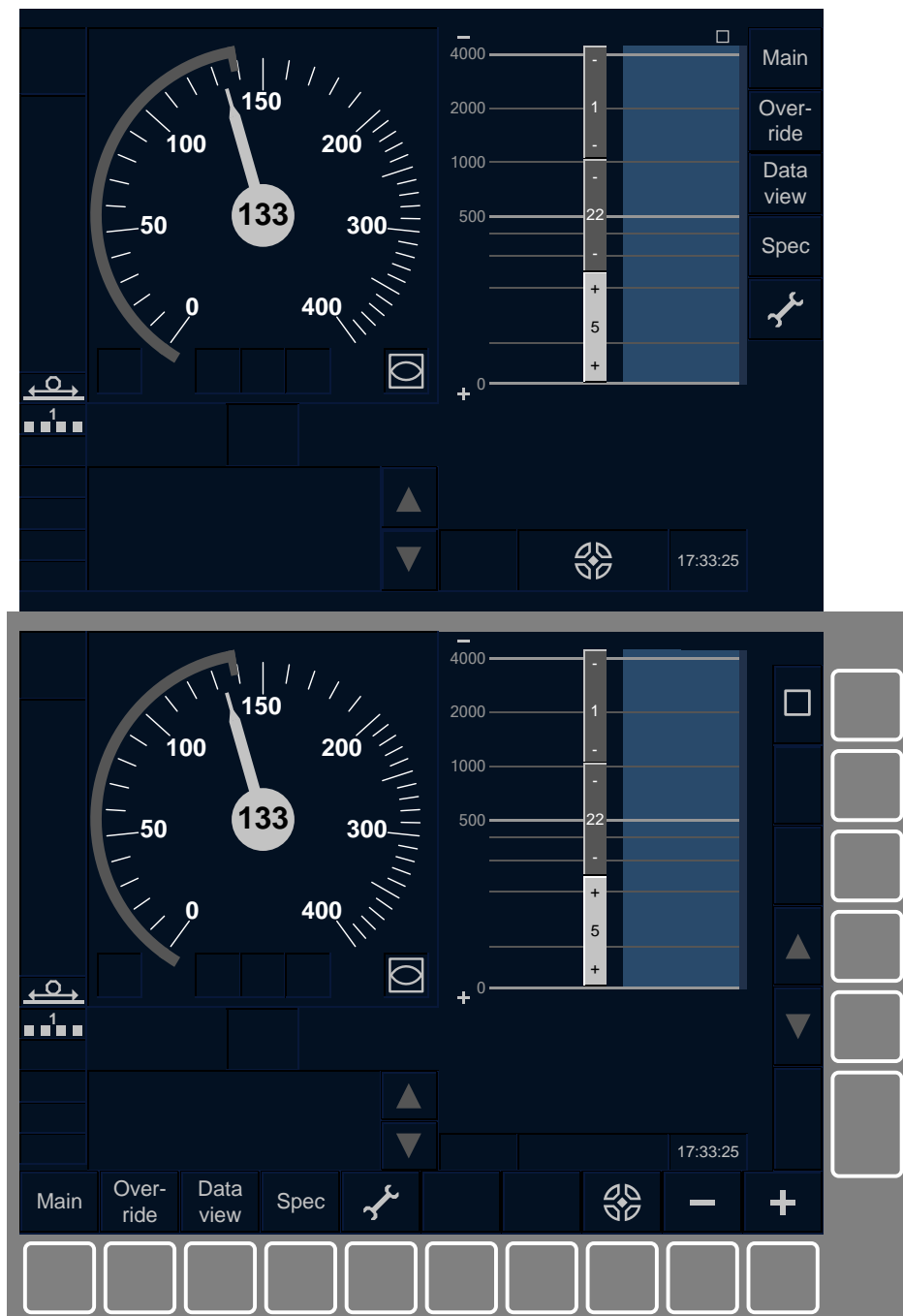


Figure 69 – Adhesion Factor “slippery rail”

8.2.3.8 Level Crossing “not protected” Indication

- 8.2.3.8.1 This DMI object shows that a level crossing is in the status “not protected”.
- 8.2.3.8.2 The level crossing “not protected” shall be displayed in area B3/4/5 (Figure 70).
- 8.2.3.8.3 The placement of the objects is from left to right filling B3/4/5. When an area is already displaying a symbol, the next area shall be used. When all areas are already displaying symbols, any further objects to be displayed shall wait that B3, B4 or B5 is free.

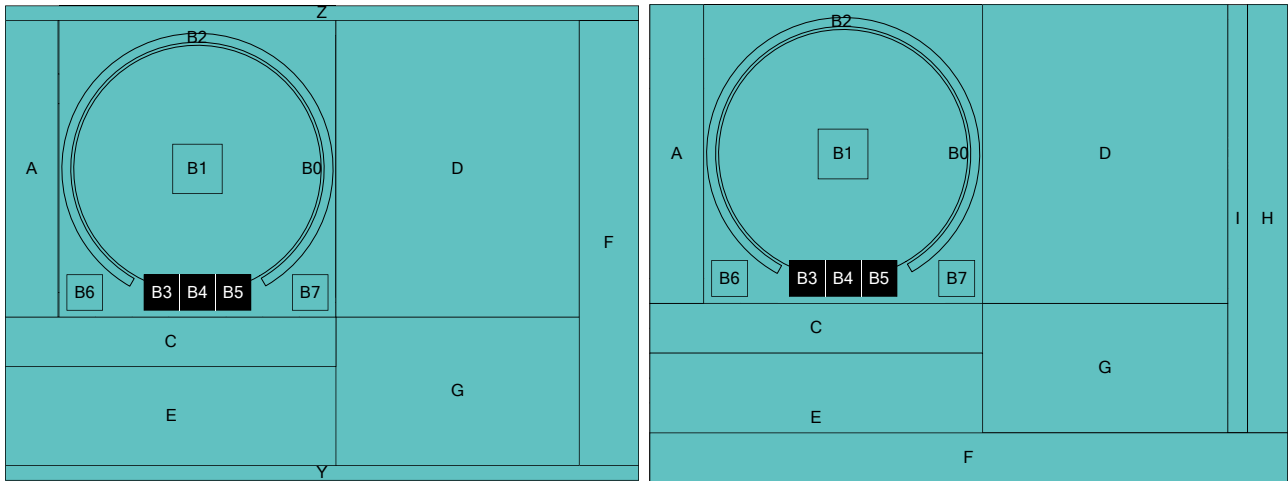


Figure 70 – Area for Level Crossing “not protected”

8.2.3.8.4 The symbol LX01, see Figure 71, shall be used to indicate level crossing “not protected”.

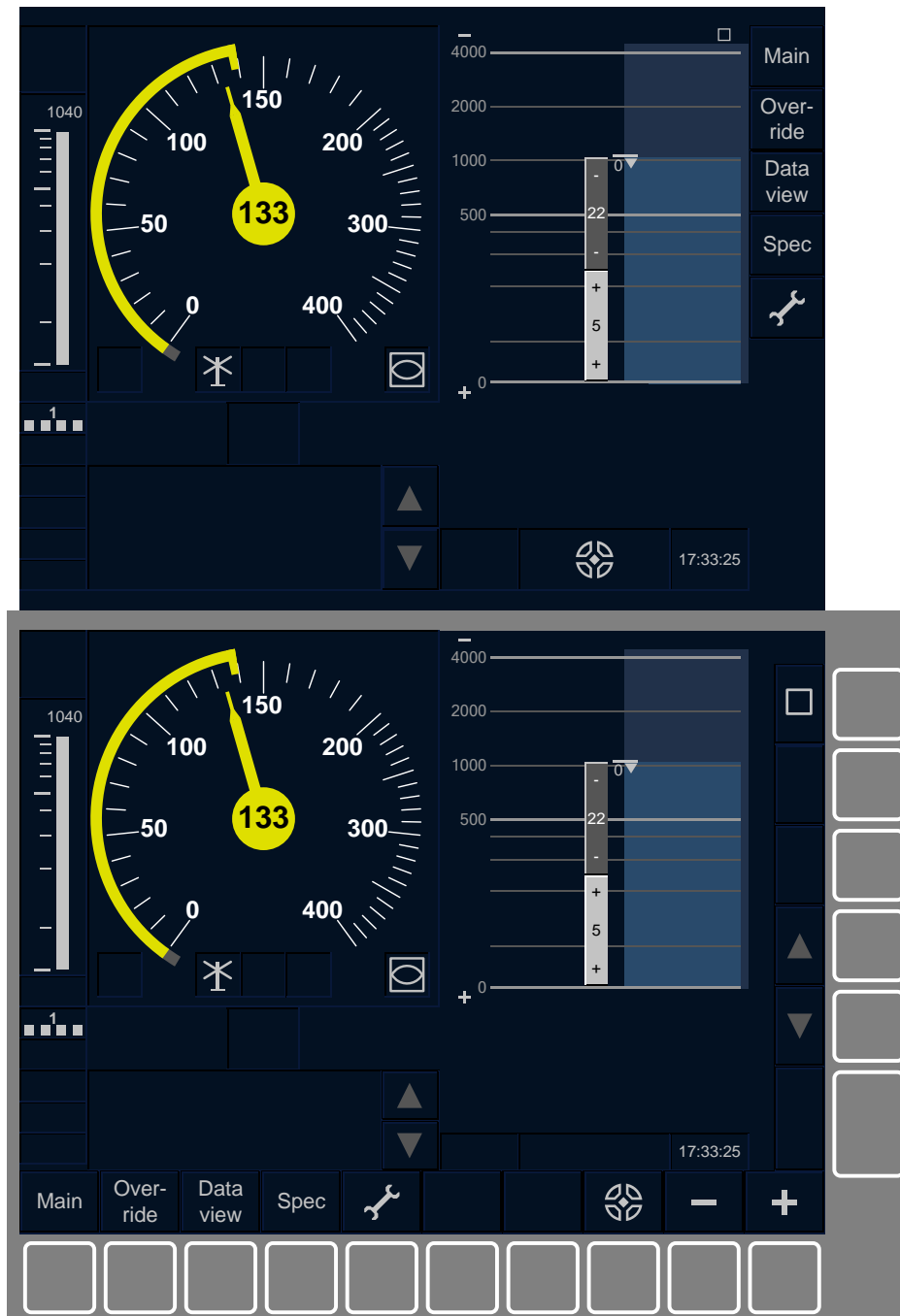


Figure 71 – Level Crossing “not protected”

8.3 Planning Information

8.3.1 General description

8.3.1.1 The planning information shall be shown in area D (see Figure 72) according to the following conditions:

- it is available, and
- the current mode is FS, and
- its status is “show planning information” (see 8.3.9)

8.3.1.1.1 Note: The planning information is considered as not available if the onboard is configured such that the objects of the planning information are permanently disabled. The choice of enabling / disabling the planning information is only train operator dependent, not an ERTMS/ETCS implementation issue.

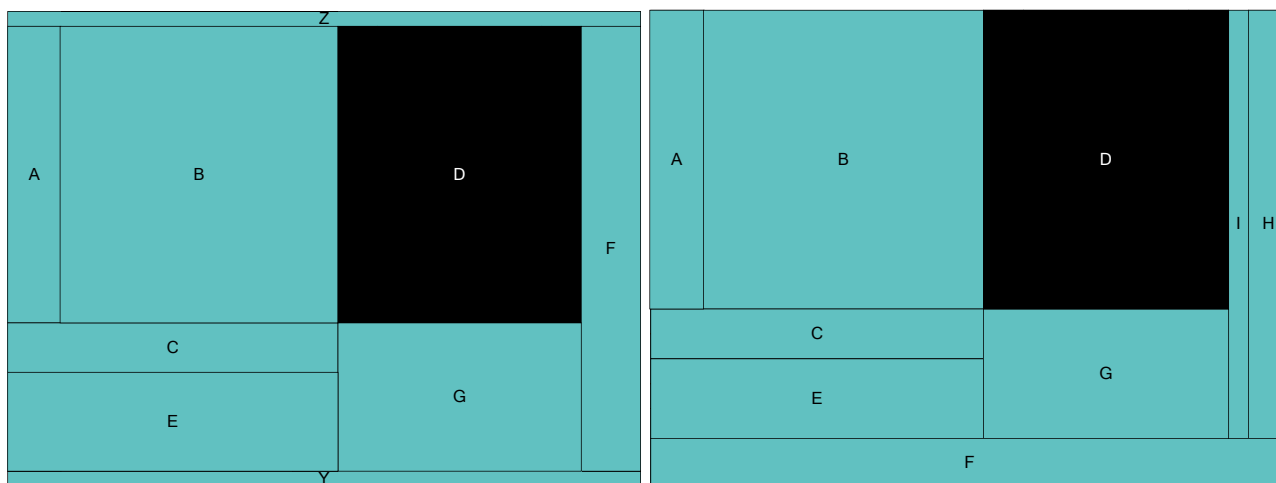


Figure 72 – Area for planning information

8.3.1.2 Figure 73 gives an overview of the objects of the planning information

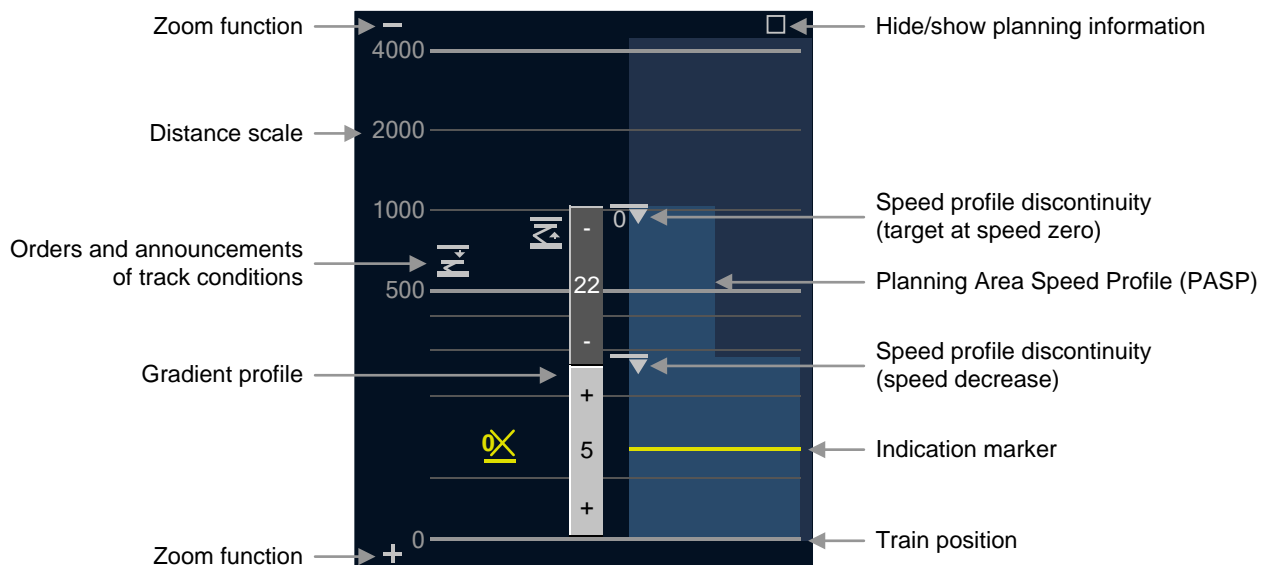


Figure 73 – Main objects of the planning information

8.3.1.3 The planning information shall have the following objects:

- a) distance scale
- b) orders and announcements of track conditions (excluding tunnel stopping areas)
- c) gradient profile
- d) speed profile discontinuities
- e) Planning Area Speed Profile (PASP)
- f) indication marker
- g) hide and show planning information
- h) zoom function

8.3.1.4 When the current mode is not FS, the navigation buttons/sensitive areas related to the zoom function and to the show/hide planning information shall not exist.

8.3.2 Layering principles

8.3.2.1 The order of superimposing objects on top of the background from back to front is:

- 1) The PASP
- 2) The distance scale
- 3) The indication marker
- 4) The orders and announcements, gradient profile, speed profile discontinuities
- 5) Hide/show and zoom.

8.3.3 Distance scale

8.3.3.1 This DMI object displays the distance scale of the planning information in D1-D7.

8.3.3.2 Depending on the distance range selected by the driver, the functions displayed in D2-D8 shall use the corresponding mapping described here below..

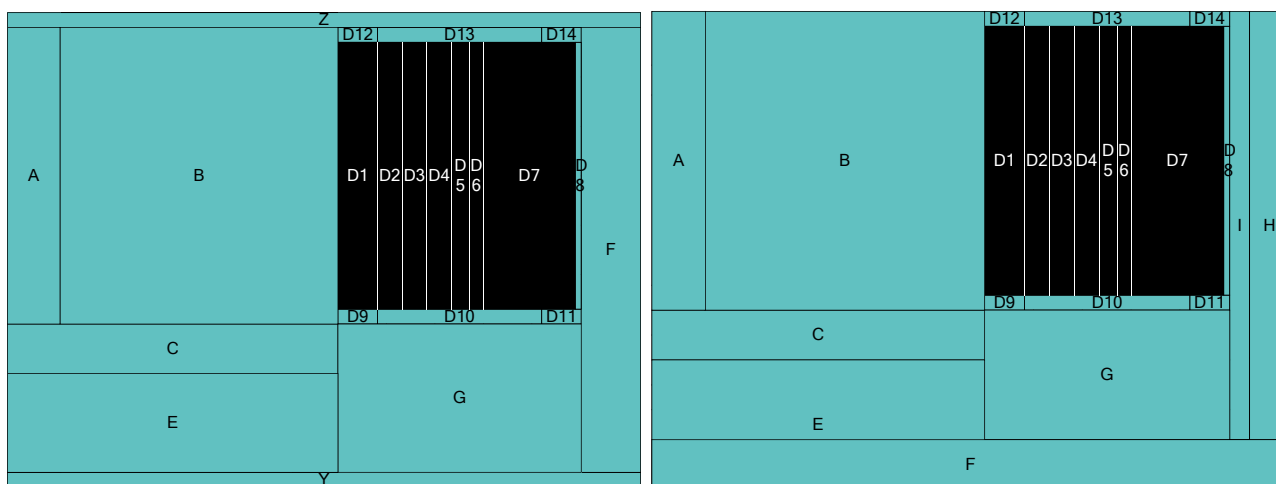


Figure 74 – Area for the distance scale

8.3.3.3 The distance scale between 0 (1st distance scale line) and the 2nd distance scale line shall be linear (see Table 16 and Figure 73), then it shall be logarithmic from the 2nd distance scale line until the end of the scale.

8.3.3.4 There shall be 6 ranges available: from 0 to 1 000 m, from 0 to 2 000 m, from 0 to 4 000 m, from 0 to 8 000 m, from 0 to 16 000 and from 0 to 32 000 m. Depending on the selected range, the distance scale shall display the numbers and distance scale lines as described in Table 16:

Range	Displayed Numbers	Displayed distance scale lines
0 – 1000	0, 125, 250, 500, 1000	0, 25, 50, 75, 100, 125, 250, 500, 1000
0 – 2000	0, 250, 500, 1000, 2000	0, 50, 100, 150, 200, 250, 500, 1000, 2000
0 – 4000	0, 500, 1000, 2000, 4000	0, 100, 200, 300, 400, 500, 1000, 2000,

		4000
0 – 8000	0, 1000, 2000, 4000, 8000	0, 200, 400, 600, 800, 1000, 2000, 4000, 8000
0 – 16000	0, 2000, 4000, 8000, 16000	0, 400, 800, 1200, 1600, 2000, 4000, 8000, 16000
0 – 32000	0, 4000, 8000, 16000, 32000	0, 800, 1600, 2400, 3200, 4000, 8000, 16000, 32000

Table 16 – Ranges of Distance scale

- 8.3.3.5 9 distance scale lines with a length of 200 cells shall be displayed crossing the areas D2 to D7 and shall be positioned within area D as specified in Table 17. From bottom to top: the first, the sixth and the ninth distance scale lines shall have a 2 cells width, the others shall have a 1 cell width.

Distance scale line	position of distance scale lines
1 st	(40,283)
2 nd	(40,250)
3 rd	(40,206)
4 th	(40,182)
5 th	(40,164)
6 th	(40,150)
7 th	(40,107)
8 th	(40,64)
9 th	(40,21)

Table 17 –Distance scale lines for the planning information

- 8.3.3.6 The scale numbers shall be medium grey and vertically centred on the distance scale lines and aligned on the right of area D1. The 2 cell width distance scale lines shall be in medium grey, the 1 cell width distance scale lines in dark grey.

- 8.3.3.6.1 Note: for the number 0, half of this number will be in D9.

8.3.4 Orders and announcements

- 8.3.4.1 This DMI object shows an overview of the orders and announcements.

- 8.3.4.2 The orders and announcements overview shall be displayed in area D2/D3/D4 (see Figure 75) and within the movement authority and up to the first target at zero speed, if any.

- 8.3.4.3 The symbols PL17, PL19 shall be used to show the forthcoming orders “Close air conditioning intake announcement”; symbol PL17 to indicate an automatic execution, symbol PL19 when the driver is requested to act.
- 8.3.4.4 The symbols PL18, PL20 shall be used to show the forthcoming orders “Open air conditioning intake”; symbol PL18 to indicate an automatic execution, symbol PL20 when the driver is requested to act.
- 8.3.4.5 The symbols PL01, PL02 shall be used to show the forthcoming orders “Lower pantograph”; symbol PL01 to indicate an automatic execution, symbol PL02 when the driver is requested to act.
- 8.3.4.6 The symbols PL03, PL04 shall be used to show the forthcoming orders “Raise pantograph”; symbol PL03 to indicate an automatic execution, symbol PL04 when the driver is requested to act.
- 8.3.4.7 The symbols PL05, PL06 shall be used to show the forthcoming orders “Neutral section announcement”; symbol PL05 to indicate an automatic execution, symbol PL06 when the driver is requested to act.
- 8.3.4.8 The symbols PL07, PL08 shall be used to show the forthcoming orders “End of neutral section”; symbol PL07 to indicate an automatic execution, symbol PL08 when the driver is requested to act.
- 8.3.4.9 The symbol PL09 shall be used to show forthcoming “Non stopping area announcement”.
- 8.3.4.10 The symbol PL10 shall be used to indicate forthcoming “Radio hole”.
- 8.3.4.11 The symbols PL11, PL12 shall be used to show the forthcoming orders “Inhibition of magnetic shoe brake announcement”; symbol PL11 to indicate an automatic execution, symbol PL12 when the driver is requested to act.
- 8.3.4.12 The symbols PL13, PL14 shall be used to show the forthcoming orders “Inhibition of eddy current brake announcement”; symbol PL13 to indicate an automatic execution, symbol PL14 when the driver is requested to act.
- 8.3.4.13 The symbols PL15, PL16 shall be used to show the forthcoming orders “Inhibition of regenerative brake announcement”; symbol PL15 to indicate an automatic execution, symbol PL16 when the driver is requested to act.
- 8.3.4.14 The symbol PL24 shall be used to show the forthcoming order “Sound horn”.
- 8.3.4.15 The symbols PL25, PL26 shall be used to show the forthcoming orders “change of traction system announcement, the line is not fitted with any traction system”; symbol PL25 to indicate an automatic execution, symbol PL26 when the driver is requested to act.
- 8.3.4.16 The symbols PL27, PL28 shall be used to show the forthcoming orders “change of traction system announcement, AC 25 kV 50 Hz”; symbol PL27 to indicate an automatic execution, symbol PL28 when the driver is requested to act.

- 8.3.4.17 The symbols PL29, PL30 shall be used to show the forthcoming orders “change of traction system announcement, AC 15 kV 16.7 Hz”; symbol PL29 to indicate an automatic execution, symbol PL30 when the driver is requested to act.
- 8.3.4.18 The symbols PL31, PL32 shall be used to show the forthcoming orders “change of traction system announcement, DC 3 kV”; symbol PL31 to indicate an automatic execution, symbol PL32 when the driver is requested to act.
- 8.3.4.19 The symbols PL33, PL34 shall be used to show the forthcoming orders “change of traction system announcement, DC 1.5 kV”; symbol PL33 to indicate an automatic execution, symbol PL34 when the driver is requested to act.
- 8.3.4.20 The symbols PL35, PL36 shall be used to show the forthcoming orders “change of traction system announcement, DC 600/750 V”; symbol PL35 to indicate an automatic execution, symbol PL36 when the driver is requested to act.

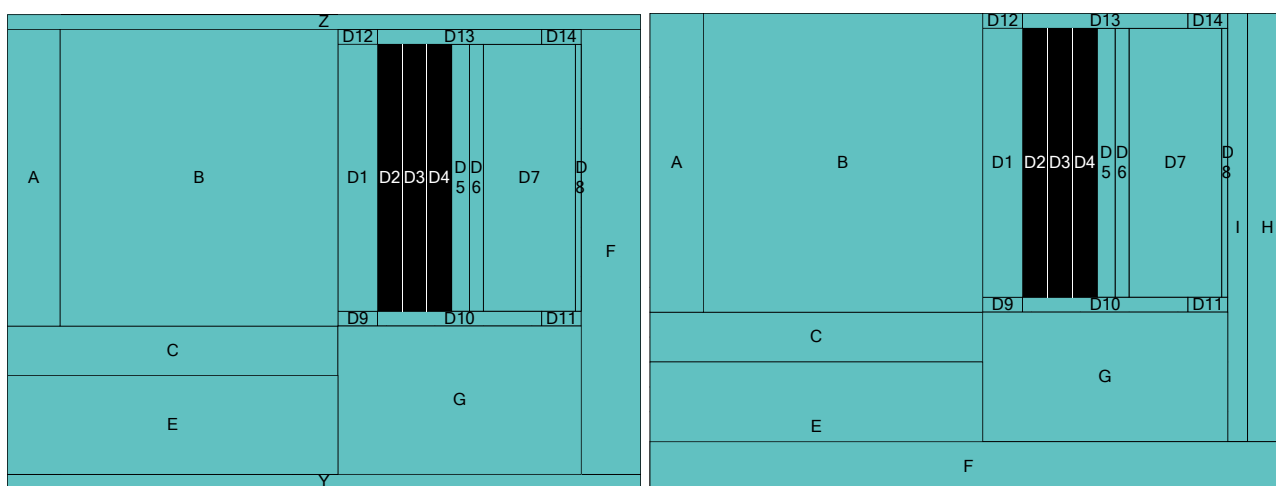


Figure 75 – Area for the orders and announcements

- 8.3.4.21 Figure 73 gives an example of orders and announcements of the planning information.
- 8.3.4.22 Along the distance scale, the bottom of the symbols shall be positioned at the distance from the current train front position to the location where the corresponding symbols for track conditions will start to be displayed in B3/4/5.
- 8.3.4.23 Symbols shall be distributed over the three columns D2/D3/D4 to avoid overlapping as much as possible. Two adjacent symbols shall not be placed into the same column but in different columns.
- 8.3.4.24 Symbols in the same column D2, D3 or D4 shall not be hidden by symbols at a longer distance i.e. in case of overlapping symbols, the closest symbol shall be drawn on top of the more distant symbol(s).

8.3.5 Gradient profile

- 8.3.5.1 This DMI object shows an overview of the gradient profile.
- 8.3.5.2 The gradient profile shall be displayed in area D5 (see Figure 76) and within the movement authority and up to the first target at zero speed, if any.

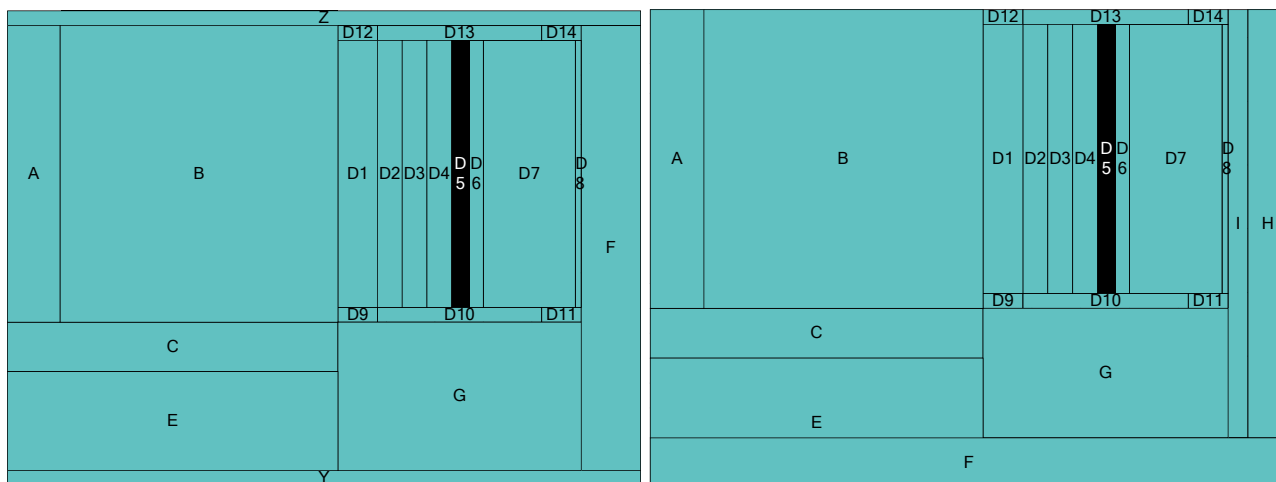


Figure 76 – Area for the gradient profile

- 8.3.5.3 Figure 73 gives an example of the gradient profile of the planning information.
- 8.3.5.4 The gradient profile shall be shown as a set of rectangles with different gradients. The rectangles shall have a width equal to the width of D5.
- 8.3.5.5 Along the distance scale, the bottom of a rectangle shall be positioned at the corresponding distance of the start of the gradient element from the current train front position. The length of the rectangle shall represent the length of the gradient element.
- 8.3.5.6 If the rectangle for the gradient element is long enough to show the gradient direction, a sign shall be shown at the top and bottom of the rectangle: a '+' for a uphill gradient, a '-' for a downhill gradient.
- 8.3.5.7 If the rectangle for the gradient element is long enough to show the number (in ‰) in addition to the '+' or '-' sign, this number shall be shown in the middle of the rectangle.
- 8.3.5.8 Downhill gradients shall be shown in dark grey with characters (sign and/or number) in white. Uphill gradients and zero gradients shall be shown in grey with characters (sign and/or number) in black.
- 8.3.5.9 The uphill gradient and zero gradient rectangles shall have a 1 cell line on top and left side in white.
- 8.3.5.10 The downhill gradient rectangles shall have a 1 cell line on top and left side in grey.
- 8.3.5.11 All gradient rectangles shall have a 1 cell line on the bottom in black.

8.3.6 Speed profile discontinuity information

- 8.3.6.1 This DMI object displays symbols that describe whether there is a speed increase or decrease at the speed profile discontinuities.
- 8.3.6.2 Along the distance scale, speed profile discontinuity symbols shall be displayed in D6-D7 areas and within the movement authority and up to the first target at zero speed, if any. The bottom of the horizontal line of the symbols shall be located at the speed discontinuity location.

- 8.3.6.3 The symbols shall follow all MRSP discontinuities (see Figure 78 and Figure 80), the EOA/LOA location and, if any, the start location of a mode profile. The symbols PL21, PL22, PL23 shall be used respectively for a speed increase, for a speed decrease and for a speed decrease to a target at zero speed (e.g. the EOA).

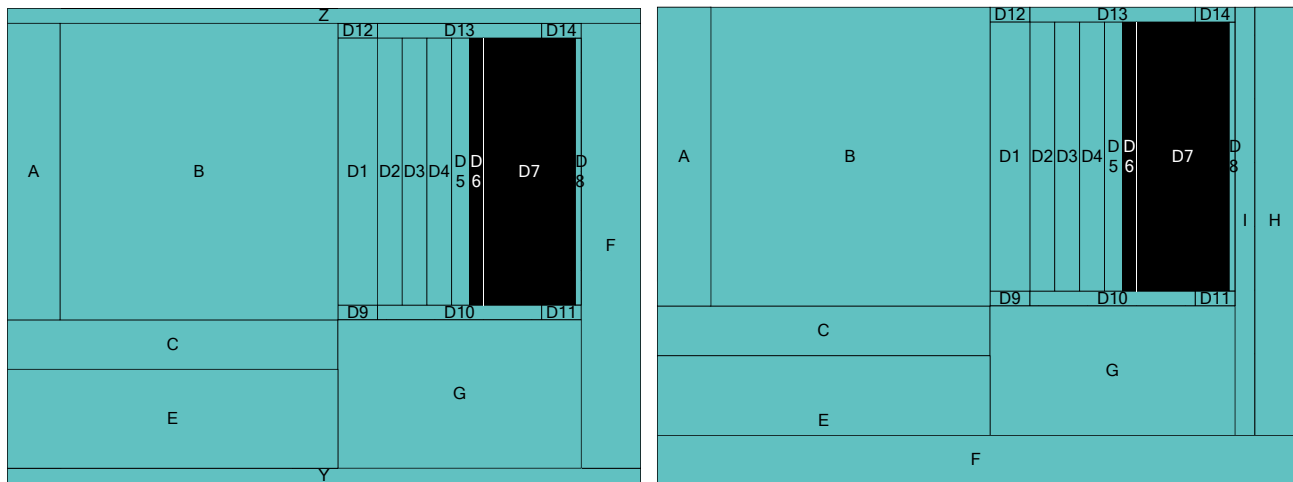


Figure 77 – Area for the speed profile discontinuity information

- 8.3.6.4 Figure 78 gives an example of the speed profile discontinuity information of the planning information.
- 8.3.6.5 The left-half of the speed profile discontinuity symbols shall cover the right side of area D6. The right-half of the symbols shall cover the left side of area D7.
- 8.3.6.6 In case of overlapping symbols, the following rules shall apply:
- a) PL23 shall be drawn on top of PL22 and PL21,
 - b) PL22 shall be drawn on top of PL21.

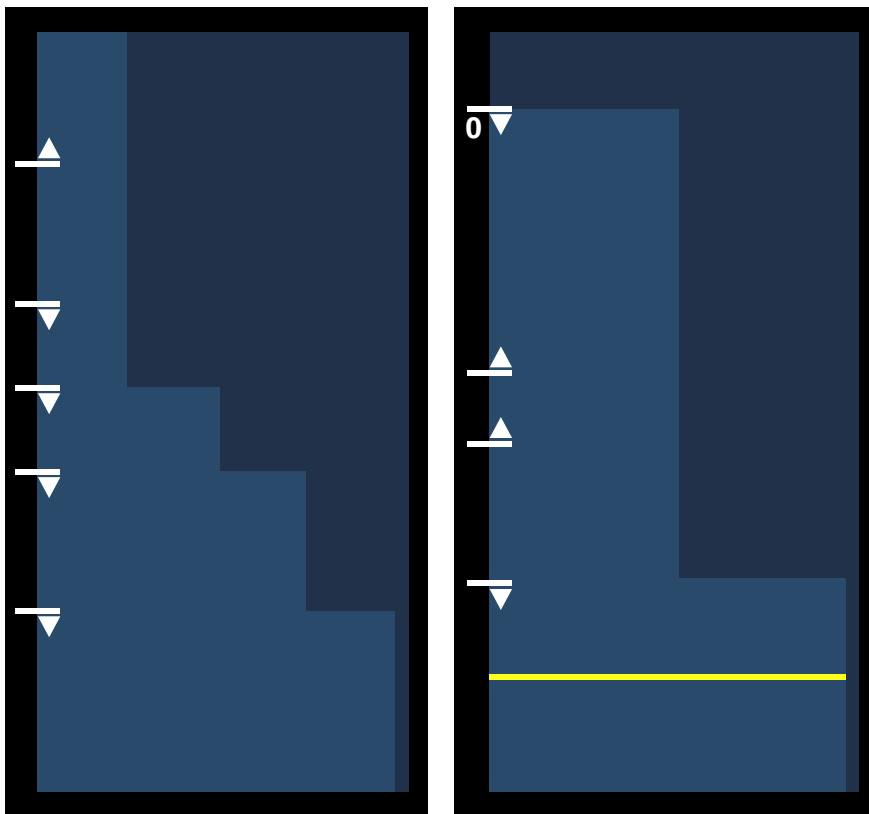


Figure 78 – Speed profile discontinuity information

8.3.7 Planning Area Speed Profile (PASP)

8.3.7.1 This DMI object displays the Planning Area Speed Profile (PASP) as a speed-distance diagram.

8.3.7.1.1 Note: The PASP is based on the MRSP, on the EOA/LOA location and, if any, on the start location of a mode profile computed by the onboard.

8.3.7.2 The PASP shall be displayed in area D7 (see Figure 79) and within the movement authority and up to the first target at zero speed, if any.

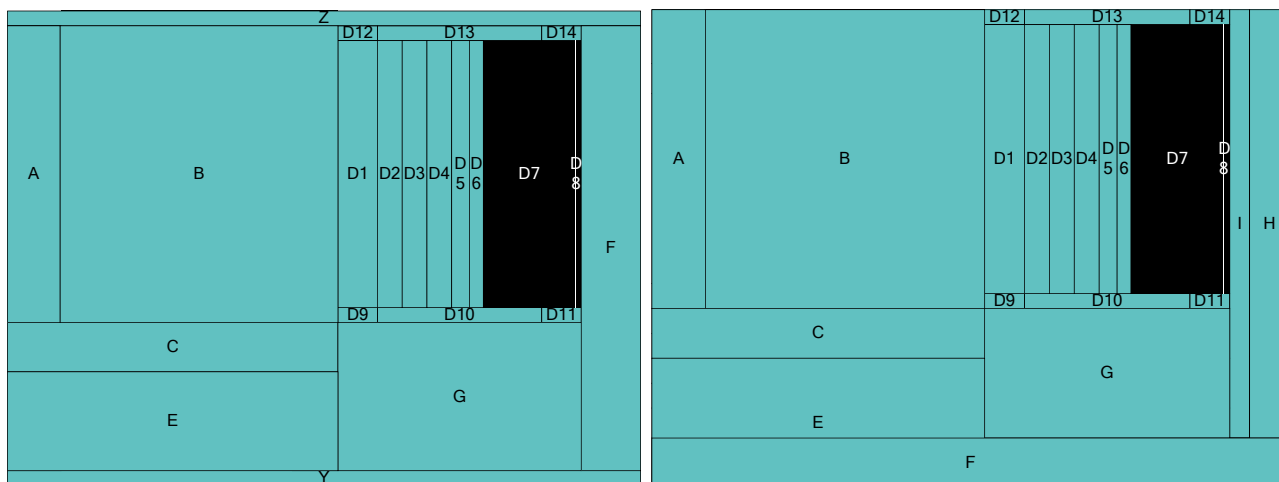


Figure 79 – Area for the planning area speed profile

- 8.3.7.3 The PASP information shall be presented as a diagram. On the vertical axis, the locations of the speed discontinuities shall be displayed according to the distance scale. On the horizontal axis, the speed scale shall be divided in 4 identical quarters.
- 8.3.7.4 The maximum ceiling speed shown in D7 and covering the width of D7 shall represent the ceiling permitted speed at the current train front position.
- 8.3.7.5 The PASP information shall only display up to 3 speed discontinuities more restrictive than the ceiling permitted speed at the current train front position and with a speed value greater than zero.
- 8.3.7.6 The fourth speed restriction shall be reserved for the first target at zero speed, if any.
- 8.3.7.7 The speed shall not be presented to scale, but with fixed ratios relative to the ceiling permitted speed at the current train front position (1/1). Speed decreases shall be shown as 3/4, 1/2 or 1/4 of the ceiling permitted speed at the current train position. Each time a speed decrease is effective, the width of the diagram shall be shortened by quarter(s) of the full width as follows (with regards to a percentage of the ceiling permitted speed at the current train front position):
- a) From 99% to 75%: 1/4
 - b) From 74% to 50%: 1/2
 - c) From 49% to 1%: 3/4
- 8.3.7.8 Example: if the ceiling permitted speed at the current train front position is 140 km/h and the first speed reduction is 70 km/h, then the speed profile in D7 shows a reduction to 1/2 of the current maximum; if the next speed reduction is 40 km/h, then the speed profile in D7 shows 1/4 of the current maximum.
- 8.3.7.9 If a speed increase is drawn using symbol PL21, no further speed decrease except, if any, the speed decrease to the first target at zero speed shall be shown on the PASP in D7.
- 8.3.7.10 The background colour of the PASP in D7-D8 shall be 'PASP dark'.
- 8.3.7.11 The PASP diagram colour shall be 'PASP light'.
- 8.3.7.12 In Figure 80 two examples of the PASP for the driver are given.

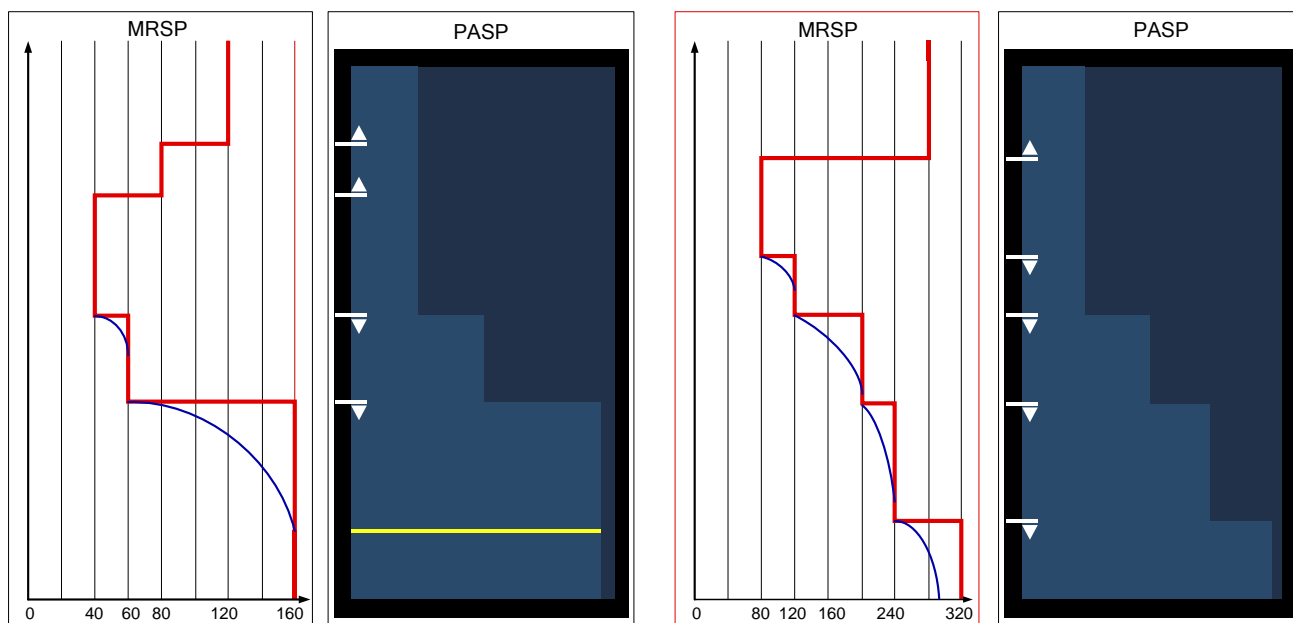


Figure 80 – Relationship between MRSP and the PASP for the driver

8.3.8 Indication Marker

- 8.3.8.1 This DMI object displays in D7 the location where the TSM of the current target starts (see Figure 81).
- 8.3.8.2 The indication marker shall be a horizontal line in yellow with a 2 cells width and a length equal to the width of D7.
- 8.3.8.3 The bottom of the indication marker shall be at the location where the TSM related to the current target starts i.e. at the location where the braking to target indication supervision limit intersects the MRSP (see Figure 11).

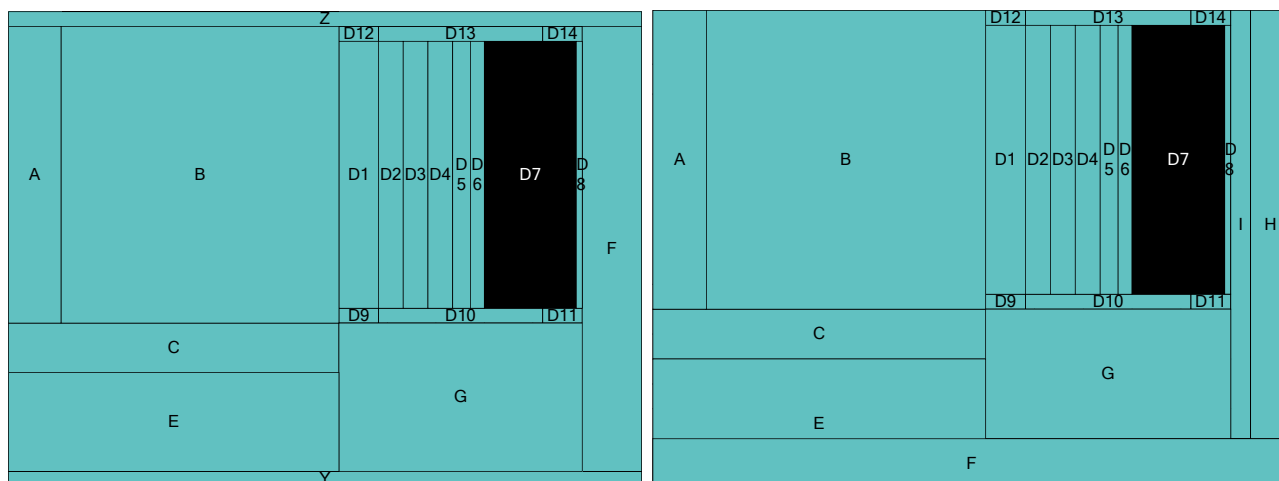


Figure 81 – Area for the indication marker

- 8.3.8.4 Figure 78 and Figure 80 show examples of the presentation of the indication marker in the planning information.

8.3.8.5 Figure 82 show two examples of the relationship of the MRSP/PASP and the indication marker.

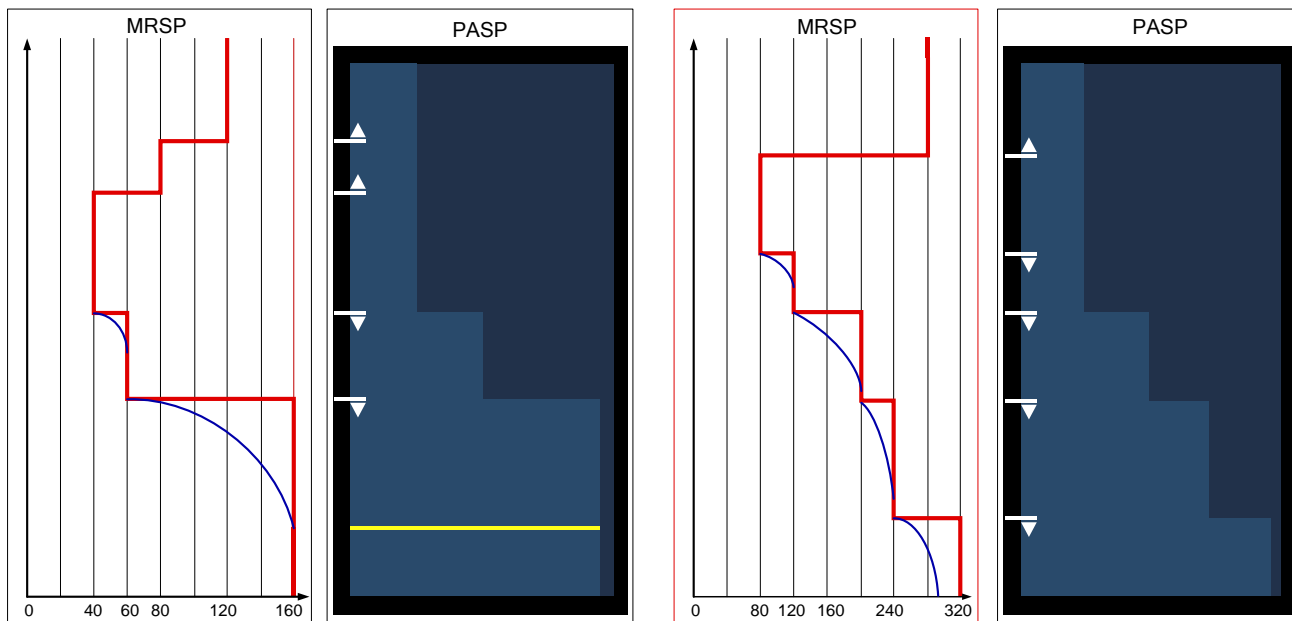


Figure 82 – Relationship between MRSP/PASP and the indication marker

8.3.9 Show and hide planning information

8.3.9.1 These DMI objects allow the driver to show/hide the planning information. The show function is located respectively in D (touch screen technology) and H2 (soft key technology) (see Figure 83). The hide function is located respectively in D14 (touch screen technology) and H2 (soft key technology) (see Figure 84).

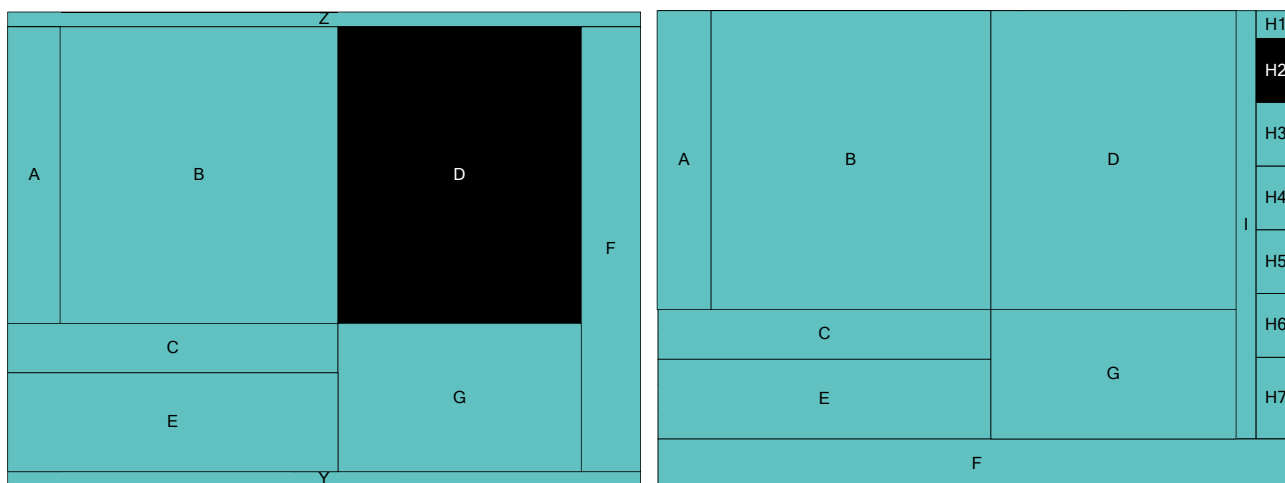


Figure 83 – Area for the show function of the planning information

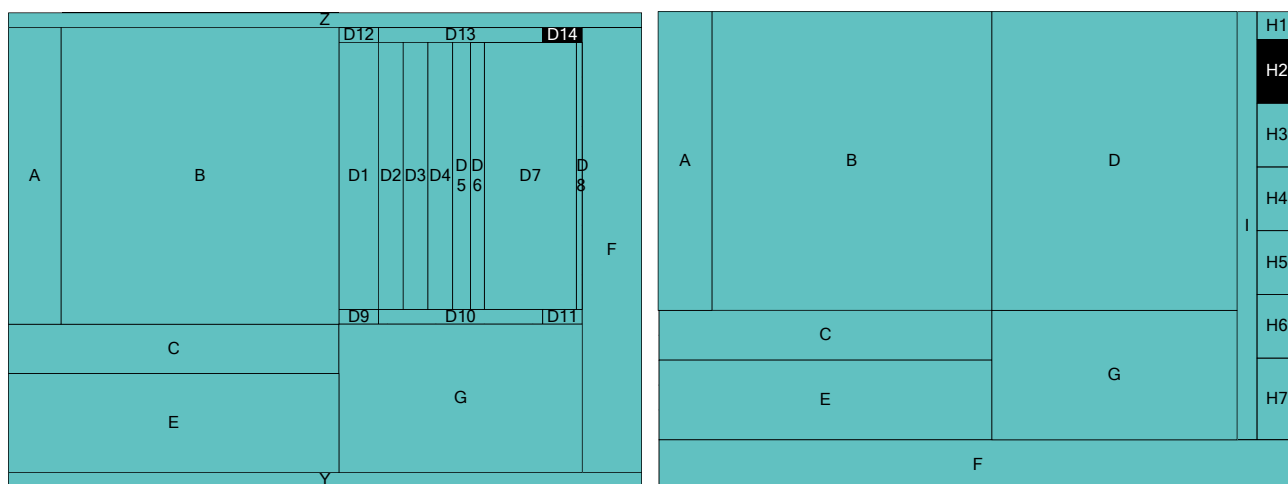


Figure 84 – Area for the hide function of the planning information

- 8.3.9.2 When using a touch screen technology, when the planning information is shown (see 8.3.1.1 for the conditions), the D14 area shall be a [Hide] button used to set the status of the planning information to “hide planning information”.
- 8.3.9.3 When using a touch screen technology, the sensitive area of D14 shall be enlarged by 15 cells height below D14 giving a total size of the sensitive area of 40x30 (wxh).
- 8.3.9.4 When using touch screen technology, when the planning information is hidden in FS mode, the whole area D shall be sensitive and behave as a [Show] button to set the status of the planning information to “show planning information”.
- 8.3.9.5 When using soft key technology, when the planning information is shown (see 8.3.1.1 for the conditions), H2 shall be a [Hide] button used to set the status of the planning information to “hide planning information”.
- 8.3.9.6 When using soft key technology, when the planning information is hidden in FS mode, H2 shall be a [Show] button used to set the status of the planning information to “show planning information”.
- 8.3.9.7 The last status of the planning information shall be stored. In case no status is stored onboard, it shall be considered as “show planning information”.
- 8.3.9.8 When entering FS mode, the status of the planning information stored onboard shall be used.

8.3.10 Zoom function

- 8.3.10.1 These DMI objects allow the driver to change the distance scale of the planning information (zoom function). The zoom function is located respectively in D9/D12 (touch screen technology) and F9/F10/D9/D12 (soft key technology) (see Figure 85).

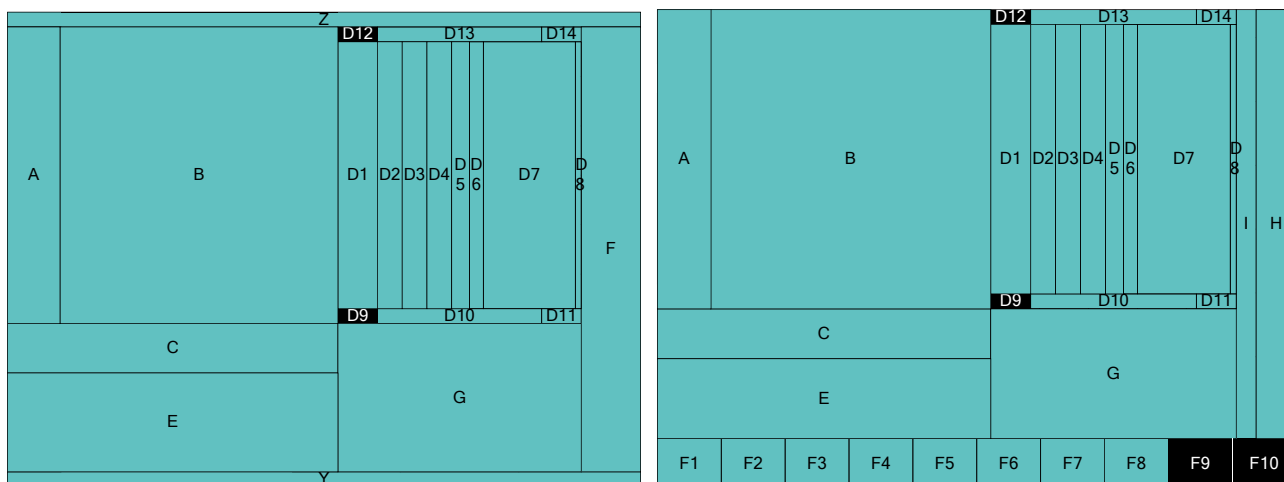


Figure 85 – Area for the zoom function of the planning information

- 8.3.10.2 When using a touch screen technology, when the planning information is shown, a [Scale Up] button shall be used in the D9 area to shorten the distance scale of the whole planning information.
- 8.3.10.3 When using a touch screen technology, when the planning information is shown, a [Scale Down] button shall be used in the D12 area to enlarge the distance scale of the whole planning information.
- 8.3.10.4 When using a touch screen technology, the sensitive area of D9 shall be enlarged by 15 cells height above D9 giving a total size of the sensitive area of 40x30 (wxh).
- 8.3.10.5 When using a touch screen technology, the sensitive area of D12 shall be enlarged by 15 cells height below D12 giving a total size of the sensitive area of 40x30 (wxh).
- 8.3.10.6 When using soft key technology, when the planning information is shown, a [Scale Up] button shall be used in the area F10 to shorten the distance scale of the whole planning information. One of the symbols NA03, NA05 shall be displayed in D9 in order to echo respectively the NA07 or NA09 of the F10 button.
- 8.3.10.7 When using soft key technology, when the planning information is shown, a [Scale Down] button shall be used in the area F9 to enlarge the distance scale of the whole planning information. One of the symbols NA04, NA06 shall be displayed in D12 in order to echo respectively the NA08 or NA10 of the F9 button.
- 8.3.10.8 When a valid activation of the [Scale Up] button is done by the driver, the distance scale shall change to the previous distance range shorter than the current one e.g. change from 0 – 8000 to 0 – 4000.
- 8.3.10.9 When a valid activation of the [Scale Down] button is done by the driver, the distance scale shall change to the next distance range longer than the current one e.g. change from 0 – 8000 to 0 – 16000.

8.4 Monitoring Information

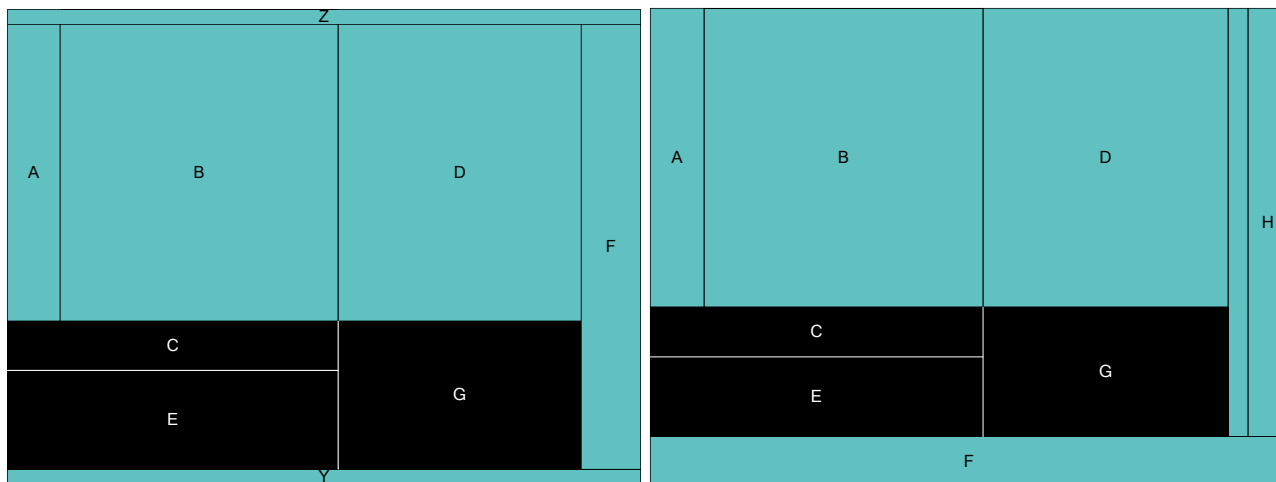


Figure 86 – Areas for the monitoring information

8.4.1 Safe radio connection indication

- 8.4.1.1 This DMI object shows the status of the safe radio connection with regards to its indication status (see document [2], 3.5.7).
- 8.4.1.2 The status of the safe radio connection with the relevant RBC/RIU shall be displayed in area E1 (see Figure 87).

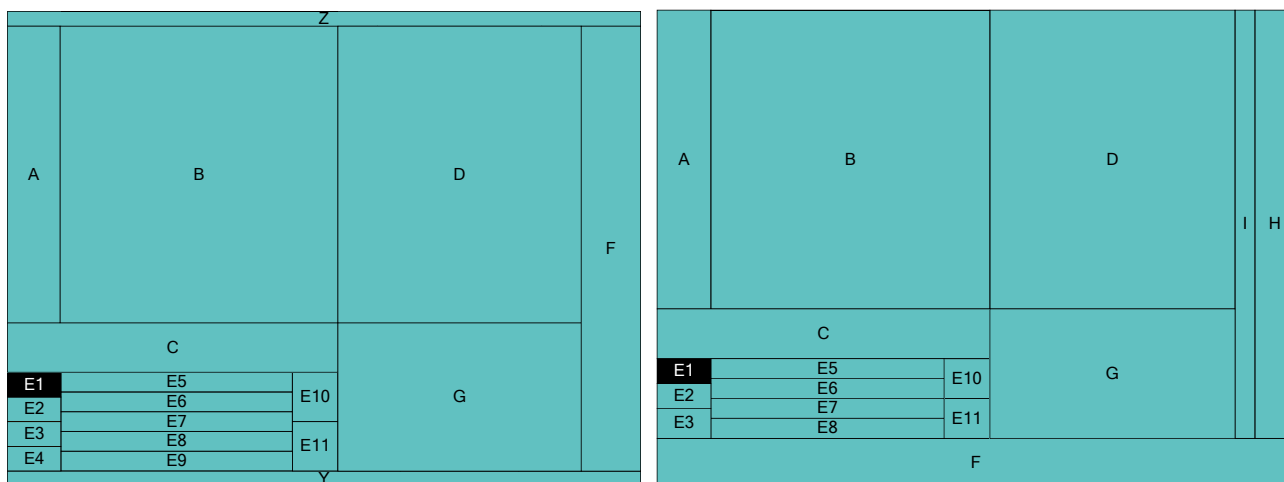


Figure 87 – Area for the safe radio connection indication

- 8.4.1.3 When the indication status for the safe radio connection is “Connection Up”, the symbol ST03 shall be displayed in E1.
- 8.4.1.4 When the indication status for the safe radio connection is “No Connection”, no symbol shall be displayed in E1.
- 8.4.1.5 When the indication status for the safe radio connection is “Connection Lost/Set-Up failed”, the symbol ST04 shall be displayed in E1.
- 8.4.1.6 Figure 88 shows an example of the presentation of the safe radio connection indication in E1.

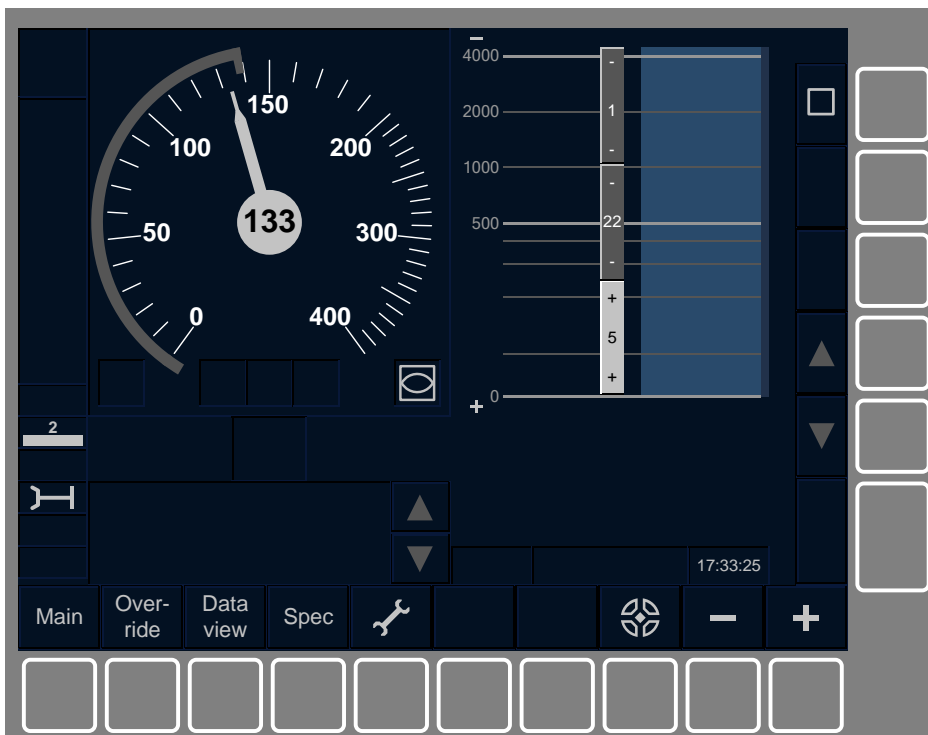
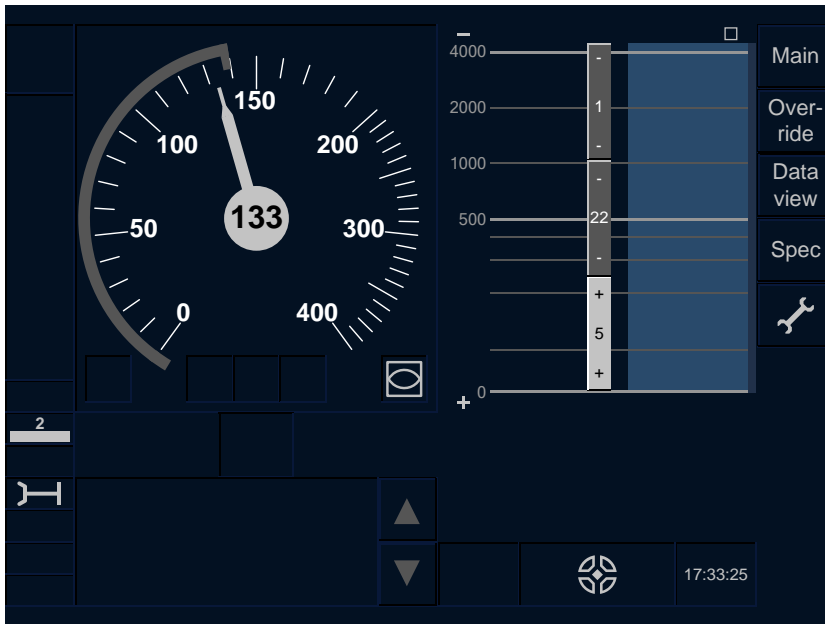


Figure 88 – Safe radio connection and local time

8.4.2 Reversing permitted indication

8.4.2.1 This DMI object shows that reversing is permitted.

8.4.2.2 When the train is at standstill inside a reversing area, the indication that reversing is permitted shall be displayed in area C6 (see Figure 89) using the symbol ST06.

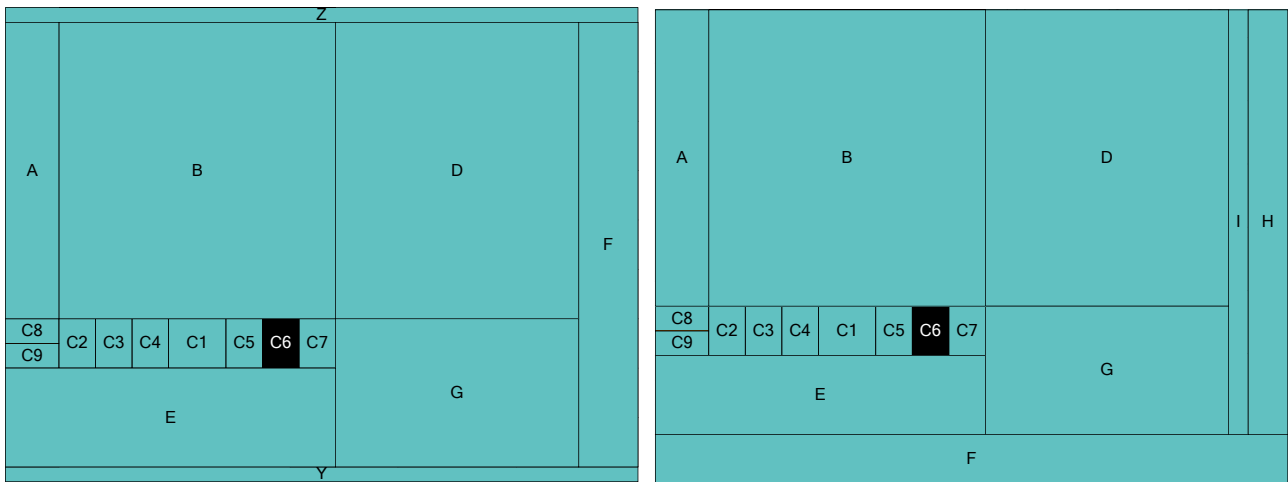
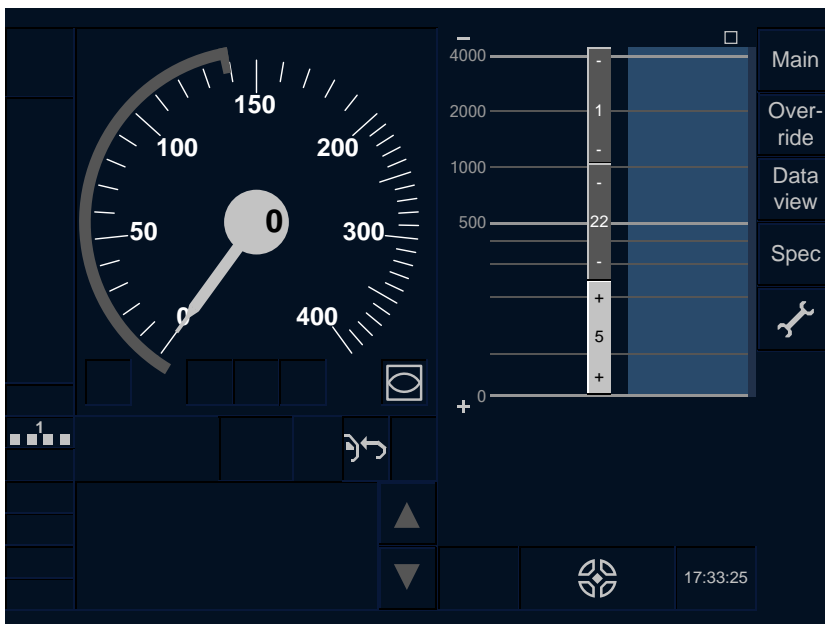


Figure 89 – Area for the reversing permitted indication

8.4.2.3 Figure 90 shows an example of the presentation of the reversing is permitted in C6.



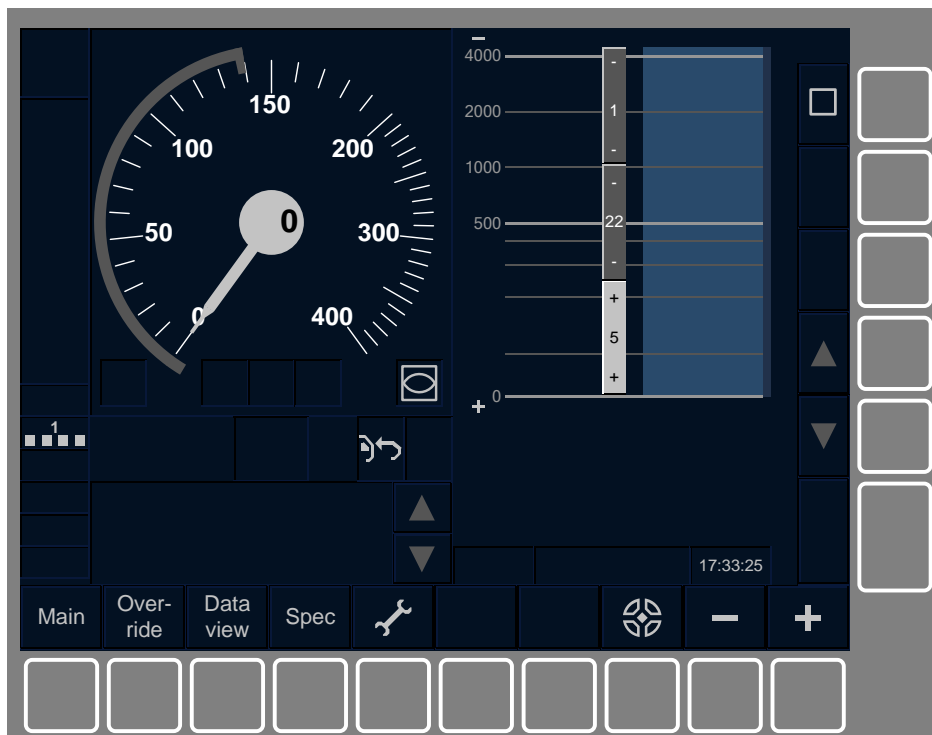


Figure 90 – Reversing permitted

8.4.3 Local time

8.4.3.1 This DMI object shows the local time.

8.4.3.2 The local time shall be displayed in area G13 (see Figure 91).

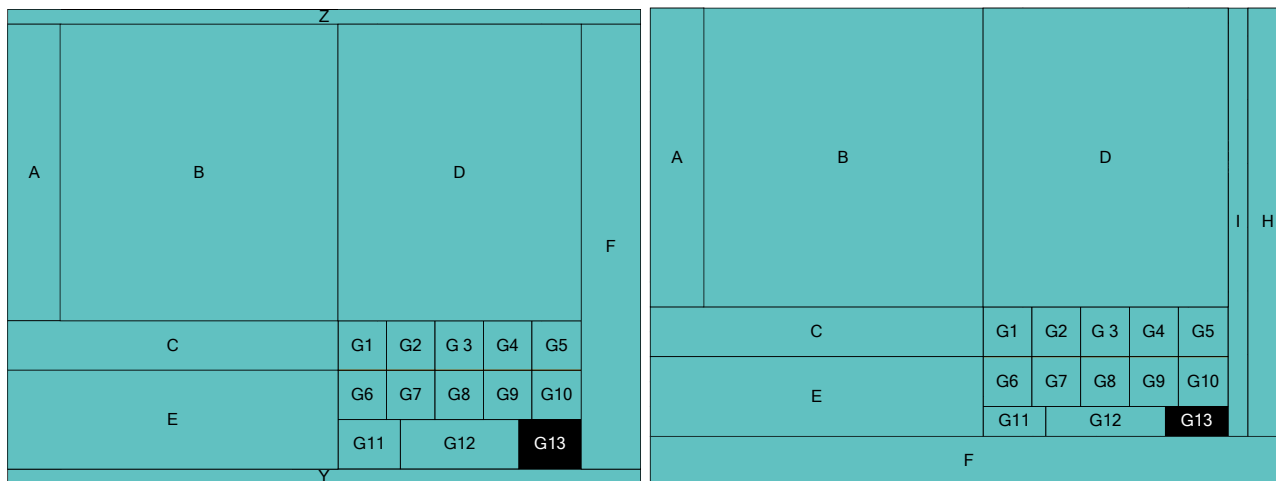


Figure 91 – Area for the local time

8.4.3.3 Figure 88 shows an example of the presentation of the local time in G13.

8.4.3.4 The local time shall be displayed in grey on a single line in the format 'hh:mm:ss' with a 24 hours time reference.

8.4.4 Geographical position

8.4.4.1 This DMI object shows the geographical position of the train.

8.4.4.2 The geographical position shall be displayed in area G12 (see Figure 92).

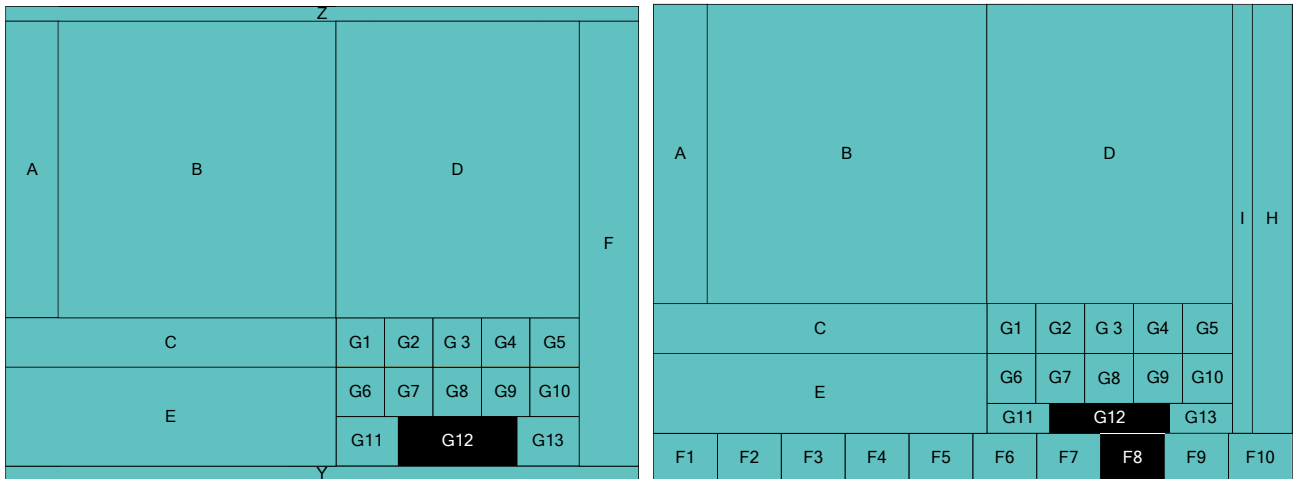
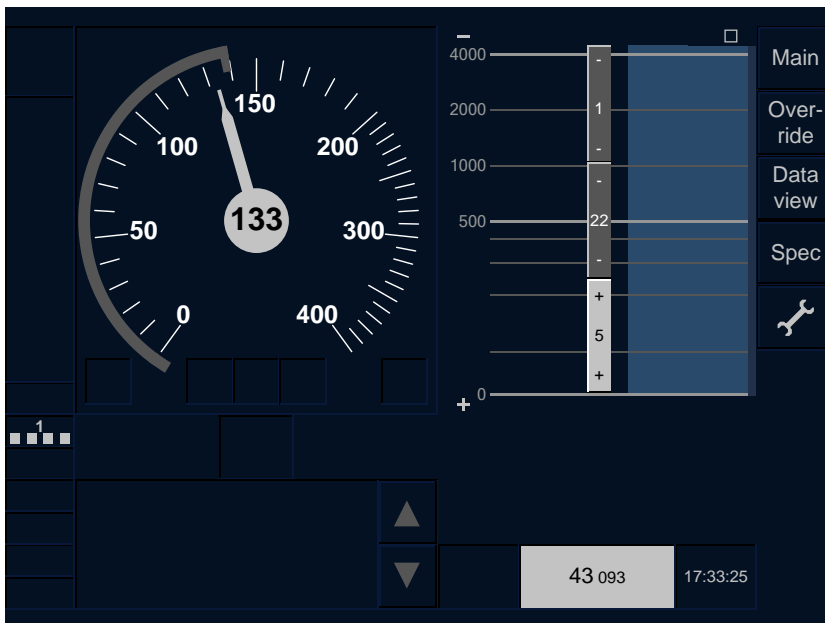


Figure 92 – Area for the geographical position



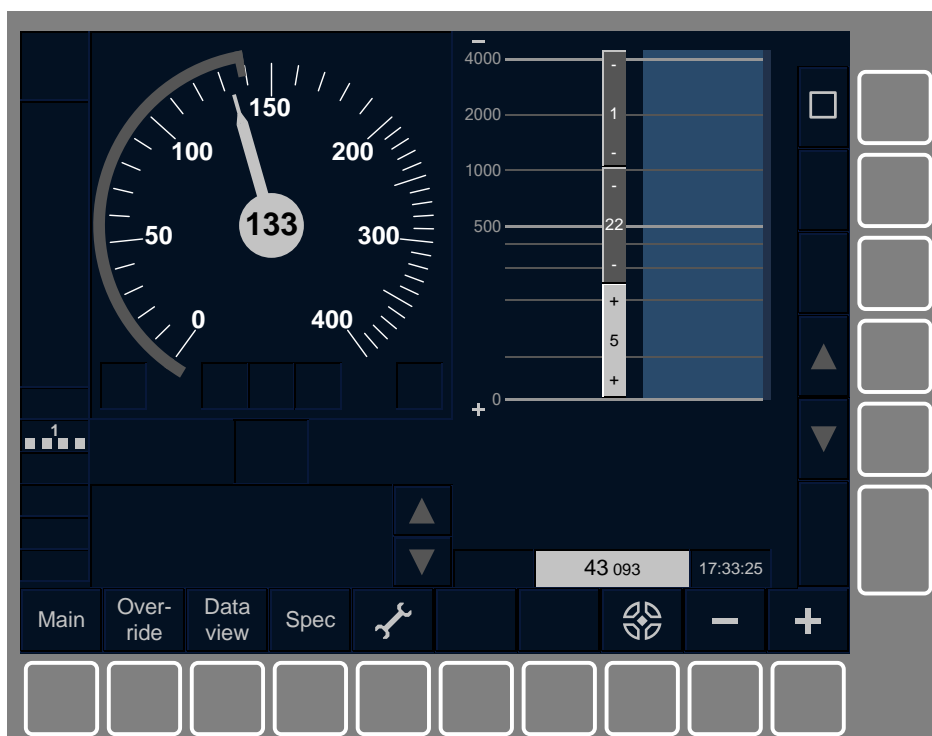


Figure 93 – Geographical position

- 8.4.4.3 The requirements 8.4.4.4 to 8.4.4.9 shall apply only if the geographical position of the train is known by the onboard. (for further details, see [3])
- 8.4.4.4 It shall be possible to toggle on and off the display of the geographical position by touching the sensitive area of G12 (touch screen technology) or by using F8 (soft key technology).
- 8.4.4.5 As soon as the condition specified in 8.4.4.3 is fulfilled, the last status of the toggle on/off shall be used for the display of the geographical position.
- 8.4.4.6 When using the touch screen technology, the symbol DR03 shall be shown in G12 if the geographical position is toggled off.
- 8.4.4.7 When using the soft key technology, the symbol DR03 shall be shown in F8.
- 8.4.4.8 When the geographical position is toggled on, the full G12 area shall have a grey background with the geographical position displayed in black and in the centre of the G12 area.
- 8.4.4.9 A space character shall be inserted between the kilometre and the metre parts of the geographical position.
- 8.4.4.10 When using touch screen technology, when the condition specified in 8.4.4.3 is not fulfilled, the G12 shall not be sensitive and shall not display the symbol DR03.
- 8.4.4.11 When using soft key technology, when the condition specified in 8.4.4.3 is not fulfilled, no button shall exist in the F8 area.

8.5 Sub-level window selection

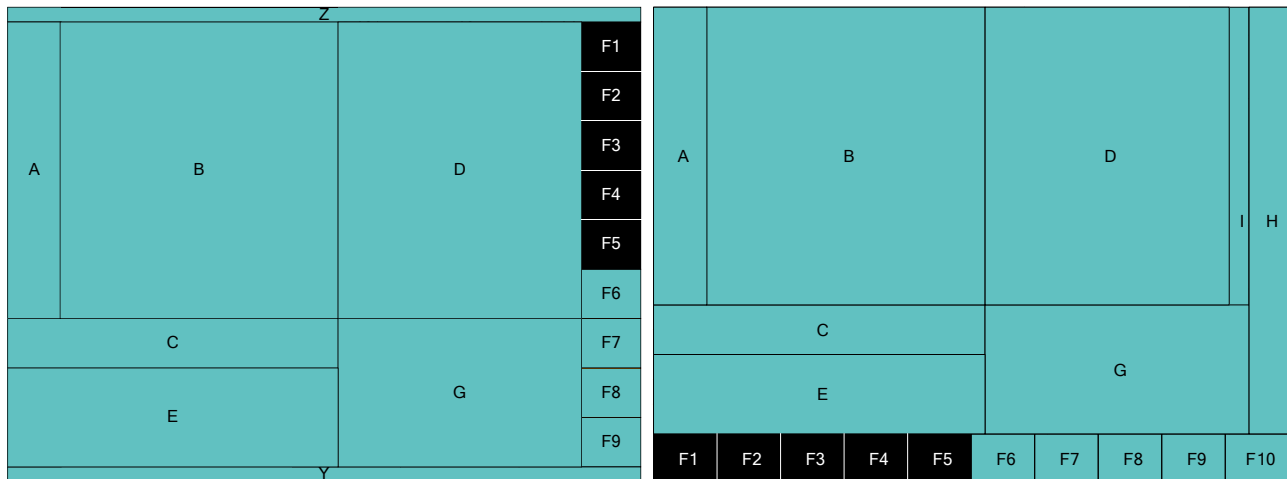


Figure 94 – Sub-level window selection

- 8.5.1.1 The sub-level window selection allows the driver to select the specific sub-level windows.
- 8.5.1.2 The sub-level window selection shall be composed of 5 buttons displayed in area F1 – F5.
- 8.5.1.3 The 5 buttons shall be allocated to the areas F1 – F5 as specified in Table 18.
- 8.5.1.4 The 5 buttons for sub-level window selection shall always be ‘enabled’.
- 8.5.1.5 A button of the main menu shall allow accessing the corresponding sub-level window as specified in Table 18.
- 8.5.1.6 For the ‘Settings’ sub-level window, the ERTMS/ETCS DMI shall additionally offer the possibility to access it via a button positioned on an ergonomic location on the driver’s desk.
- 8.5.1.7 When using touch screen technology, up-type buttons shall be used.

Area	Button label	Sub-level window
F1	Main	Main
F2	Over-ride	Override
F3	Data view	Data view
F4	Spec	Special
F5	symbol SE04	Settings

Table 18 – sub-level window selection

9. ETCS AND NTC INFORMATION SHOWN ON A NTC DEFAULT WINDOW

9.1 Introduction

- 9.1.1.1 The chapter 9 is applicable for the modes SN and NL in ERTMS/ETCS level NTC.
- 9.1.1.2 The chapter 9.2 applies regardless the National System is interfaced to the ERTMS/ETCS onboard through an STM. In case the National System is interfaced to the ERTMS/ETCS onboard through an STM, the chapters 9.3, 9.4 and 9.5 also apply.

9.2 ETCS objects

- 9.2.1.1 The ETCS objects/functions in document [3] chapter 4.7.2, modes SN and NL shall be displayed as far as they concern a default window, i.e. the appearance shall be as specified in chapter 8 but the location of the ETCS objects/functions will be according to the definition of the NTC default window of the corresponding National System.
- 9.2.1.2 The ETCS buttons accessing the sub-level windows shall be available with the labels as specified in 8.5 but with their size and location depending on the ergonomic arrangements of areas of the NTC default window of the corresponding National System.

9.3 NTC Objects

9.3.1 General

- 9.3.1.1 All texts used with NTC objects shall use the same font, indent, character and line spacing as used for ETCS objects.
- 9.3.1.2 The colours requested by the text, indicator or button attribute of a STM request shall be displayed with RGB values as specified for ETCS objects in Table 4. The additional colours not specified for ETCS objects shall be displayed with the RGB values in Table 19.

Colour name	Red	Green	Blue
blue	0	0	234
green	0	234	0
light red	255	96	96
light green	96	255	96

Table 19 - 24-bit RGB colour scheme for additional NTC colours

9.3.2 Flashing mode and style

- 9.3.2.1 When flashing style 'yellow frame' is selected, each NTC indicator or button requested to flash by the STM shall be surrounded by a flashing frame as specified in 5.1.1.3.1.

9.3.2.2 When flashing style 'whole area' is selected, each NTC indicator or button requested to flash by the STM shall toggle between visible and not visible state (i.e. the dark blue background colour).

9.3.2.3 Flashing of different objects shall be synchronised: all objects with normal flashing mode and the same frequency shall be in the same state at the same time ; objects with counterphase flashing shall be in the alternative state at this time.

9.3.3 Text Messages

9.3.3.1 NTC text messages shall be treated and displayed as and together with ETCS text messages, including scrolling and acknowledgment (see 8.2.3.4).

9.3.3.2 Exception: the display shall be according to the display attribute sent by the STM with the text message.

9.3.4 Indicators

9.3.4.1 An NTC indicator can display text and/or an icon. Its state may change by changing the contained text, icon, text colour, text background colour or flashing mode. Additionally its position may change.

9.3.4.2 Visibility of caption text

9.3.4.2.1 The caption text shall always be visible when no icon is requested by the STM.

9.3.4.2.2 If the STM uses the customisable DMI, the caption text shall also be visible, if "display of text upon icon" is requested as corresponding icon attribute in the configuration data.

9.3.4.2.3 Otherwise the caption text shall be ignored by the ERTMS/ETCS on-board.

9.3.4.3 An indicator shall be displayed according to the display attribute sent with the indicator request.

9.3.4.4 If both the caption text and the icon are displayed, the layering shall be text in foreground, icon in middle layer and background colour in background.

9.3.4.5 The part of the caption text from the seventh character shall be displayed on a second line.

9.3.5 Buttons

9.3.5.1 Buttons are a pure functional extension of Indicators. All requirements of chapter 9.3.4 shall apply to buttons, by replacing "indicator" with "button".

9.3.5.2 The ERTMS/ETCS-onboard shall display NTC buttons pressed and not pressed like ETCS buttons.

9.3.6 Sounds

9.3.6.1 A sound shall be played according to the sound definition sent in the sound requests.

9.3.7 Supervision Information

- 9.3.7.1 If the STM uses the customisable DMI service and is configured to display such information or it uses the unified DMI service, the speed and distance supervision information sent by the STM shall be displayed by the ERTMS/ETCS on-board according to the following rules:
- 9.3.7.1.1 The current train speed pointer shall be displayed as specified in 8.2.1.2 but with the colour requested for it by the STM.
 - 9.3.7.1.2 The current train speed digital shall be displayed as specified in 8.2.1.3.
 - 9.3.7.1.3 When requested by the display mode sent by the STM, the distance to target bar shall be displayed as specified in 8.2.2.1.
 - 9.3.7.1.4 When requested by the display mode sent by the STM, the distance to target digital shall be displayed as specified in 8.2.2.2.
 - 9.3.7.1.5 When the supervision speeds are requested to be displayed as bars, the width of those speed bars shall be 9 cells, except for:
 - a) the part of the permitted speed bar below a release speed bar,
 - b) the release speed bar,
 - c) the intervention speed bar if it is requested to display it with the “wide bar width”.
 - 9.3.7.1.6 When a release speed bar is displayed, the permitted speed bar and the release speed bar shall be indicated applying clause 8.2.1.6.4 by analogy to the CSG.
 - 9.3.7.1.7 When the intervention speed bar is requested to be displayed with “wide bar width”, it shall be displayed with 20 cells.
 - 9.3.7.1.8 The speed bars and hooks shall be displayed along the speed dial in the area B2 as for the Circular speed gauge and for the Basic speed hook(s) used on the ETCS default window, except consideration of the display mode.
 - a) A dark grey bar below 0km/h (-149 degrees to -144 degrees, as specified for ETCS default window) if display of any bar is requested.
 - b) The target speed bar between 0km/h and target speed in the colour requested for target speed.
 - c) If the requested display mode is ‘hook only’, the target speed hook shall be displayed at the target speed as specified in 8.2.1.5.5 but with the colour requested for it by the STM.
 - d) If the requested display mode is ‘hook and bar’, the target speed hook shall be displayed at the target speed as specified in 8.2.1.4.7 but with the colour requested for it by the STM.
 - e) The permitted speed bar in the colour requested for permitted speed between target speed and permitted speed or between 0km/h and permitted speed, if no target speed is displayed. The permitted speed bar may overlap with the release speed bar.

- f) If the requested display mode is 'hook only', the permitted speed hook shall be displayed at the permitted speed as specified in 8.2.1.5.4 but with the colour requested for it by the STM.
- g) If the requested display mode is 'hook and bar', the permitted speed hook shall be displayed at the permitted speed as specified in 8.2.1.4.7 but with the colour requested for it by the STM.
- h) The intervention speed bar between permitted speed and intervention speed in the colour requested for intervention speed.
- i) The release speed bar between 0km/h and release speed, possibly overlapping with permitted speed bar in the colour requested for the release speed.

9.3.7.1.9 The release speed digital display shall be displayed in the colour requested for the release speed.

9.4 Customisable DMI service

9.4.1.1 The size and position of NTC DMI objects shall be specified in cells using the same coordinate system with 640x480 cells as specified in 6.2. The position of an object shall be defined as the offset of the upper left corner of the object from the upper left corner of the total grid array. It shall be retrieved from the configuration data using the position identifier sent by the STM. The specification of the customisable DMI service consequently does not reuse the ETCS layout except when explicitly referring to the name of an ETCS area.

9.4.1.2 With the customisable DMI service, the areas for text message (E5-E11) and for its related buttons shall not be used for DMI elements by an STM other than its national text messages. If the ETCS speed and supervision display is used by the STM, it shall not be hidden by other NTC elements displayed in the same area.

9.4.1.3 The customisable DMI service shall display icons centred in the specified area.

9.5 Unified DMI service

9.5.1 Introduction

9.5.1.1 As a principle for the unified DMI service, the ETCS default window is offered to the STMs with the same definition of the areas as specified in chapter 6. No ETCS areas are moved.

9.5.1.2 Only areas of the ETCS 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.

9.5.1.2.1 The available areas for buttons are

- a) For soft key technology: F8, F9, F10, H2, H3, H4
- b) For touch screen technology: F8, F9, C2, C3, C4, C5, C6, G1-G10¹

¹ Some areas can be used for buttons or indicators, depending on the need of the National System

- 9.5.1.2.2 The available areas for indicators are
- a) B3, B4, B5, C2, C3, C4, C5, C6, G1-G103, and H1 for SK
- 9.5.1.3 The available button and indicator areas are mapped to a corresponding position identifier.
- 9.5.1.4 Since the unified DMI has no configuration for the display of national information, the following restrictions apply:
- a) NTC indicators and buttons are displayed with caption texts, text and background colour, but without icons. The font size and text alignment cannot be selected.
 - b) The flashing style used for NTC indicators/buttons and the slow/fast flashing frequencies cannot be selected.
 - c) NTC sounds are specified by a sequence of segments defined by a duration and an associated frequency sent to the ERTMS/ETCS on-board.
 - d) The speed dial range in B0 is the same range as the ETCS one.

9.5.2 Requirements

- 9.5.2.1 The ERTMS/ETCS on-board shall display buttons and indicators in the ETCS area specified by the position identifier.
- 9.5.2.2 The ERTMS/ETCS on-board shall display caption texts of buttons and indicators with 10 cells font size and centred vertically and horizontally.
- 9.5.2.3 The ERTMS/ETCS on-board shall implement the flashing style as 'yellow frame' for the NTC indicators and buttons requested to flash by the STM. For slow flashing the frame shall toggle every 0.5 seconds, for fast flashing every 0.25 seconds.
- 9.5.2.4 The ERTMS/ETCS on-board shall display the NTC supervision information using the same range for the speed dial as for ETCS supervision information.

10. SUB-LEVEL WINDOWS – GENERAL REQUIREMENTS

10.1 Introduction

10.1.1.1 All figures provided in chapter 9 are only used to show the layout of the sub-level windows for explanatory reasons.

10.2 Menu windows

10.2.1 Menu windows for touch screen technology

10.2.1.1 The window shall be in the D/F/G area.

10.2.1.2 Each object shall follow the dimension and position as specified in Table 20.

10.2.1.3 The buttons 1, 2,... shall be up-type buttons.

<i>Menu window</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	306	24	0	0
'close' button	82	50	0	400
Button 1	153	50	0	50
Button 2	153	50	163	50
Button 3	153	50	0	100
Button 4	153	50	163	100
...

Table 20 – Menu window (touch screen technology)

10.2.1.4 Figure 95 gives an example of the layout of a menu window containing 8 buttons with the 7th and 8th in state 'disabled' (i.e. in dark grey).

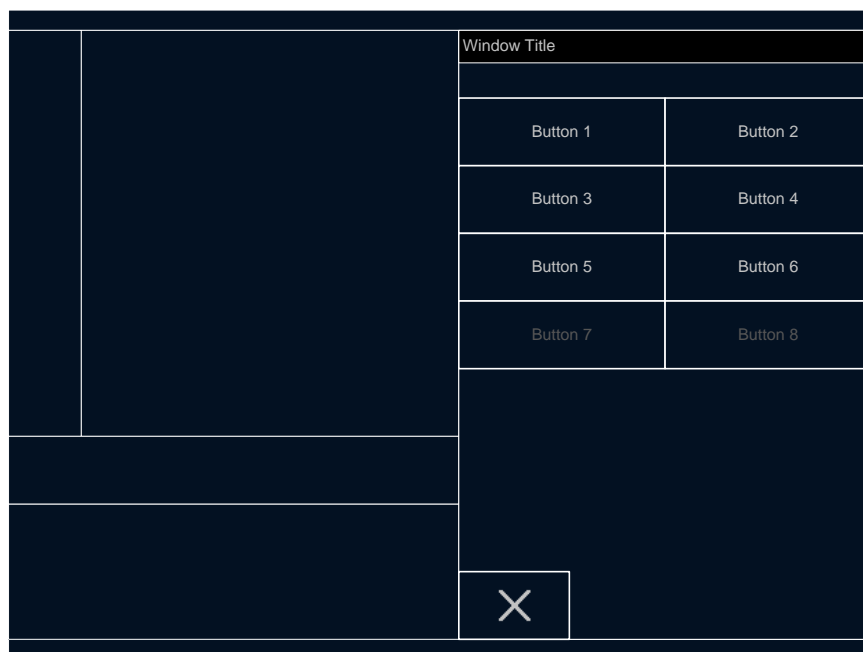


Figure 95 – Menu window (touch screen technology)

10.2.2 Menu windows for soft key technology

- 10.2.2.1 The [Close] button shall be in H3.
- 10.2.2.2 The window shall contain a list of selections (texts) in area D/G/I.
- 10.2.2.3 The list of selections shall be displayed left aligned with an indent of 15 cells from the left of the area D/G/I.
- 10.2.2.4 The first selection of the list shall be 112 cells (i.e. an indent of 100 cells + the 12 cells of the character size) below the top of area D/G/I.
- 10.2.2.5 The text of each selection shall:
 - a) start with a number giving the position of the selection in the list ;
 - b) identify the name of the selection ;
 - c) separate the number and the name of the selection by a '-' and 1 space on each side of the dash.
- 10.2.2.6 The numbers used for the selections shall be positioned in a logical order from 1 to maximum 10.
- 10.2.2.7 Example of a selection: "1 – Train data".
- 10.2.2.8 The labels of the F buttons shall be numbers matching the numbers of the selections.
- 10.2.2.9 The F buttons shall be up-type buttons.
- 10.2.2.10 Figure 96 gives an example of the layout of a menu window containing 5 selections with the 4th and 5th selections in state 'disabled'.

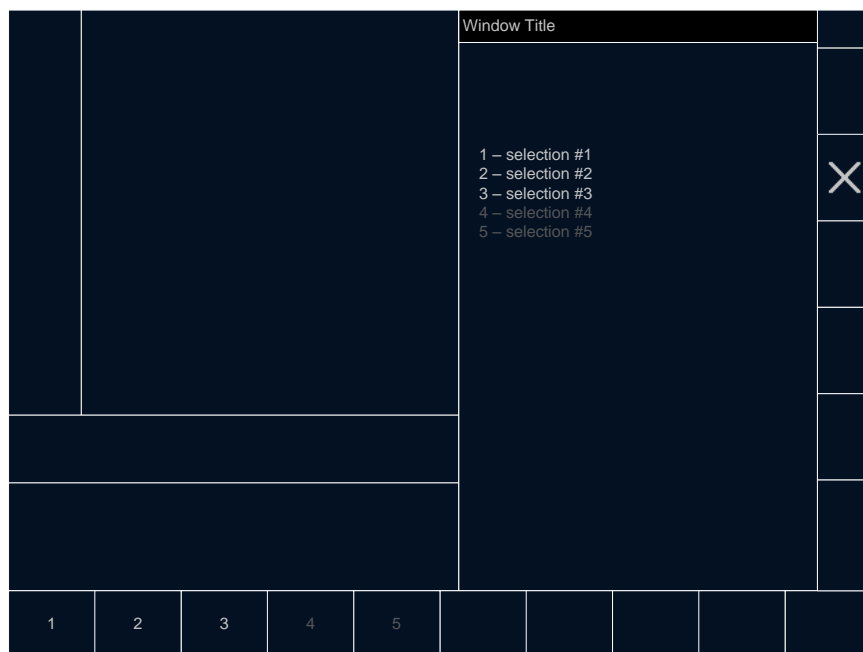


Figure 96 – Menu window (soft key technology)

10.2.3 Layers

10.2.3.1 The layers for menu windows shall be as follows:

- a) Layer 0: D/F/G (touch screen technology) or D/G/I (soft key technology)
- b) All other areas: same as default window (see 8.1.1.4)

10.3 Data entry windows

10.3.1 Input fields

10.3.1.1 An input field shall be used to allow the driver to enter data.

10.3.1.2 The height of the total input field shall be 50 cells.

10.3.1.3 When using the touch screen technology, the width of the total input field shall be 306 cells.

10.3.1.3.1 For touch screen technology, the input fields will be located on the D/F/G area (having a width of 306 cells).

10.3.1.4 When using the soft key technology, the width of the total input field shall be 266 cells.

10.3.1.4.1 For soft key technology, the input fields will be located on the D/G/I area (having a width of 266 cells).

10.3.1.5 Each input field shall be divided into a label area and a data area.

10.3.1.6 The label area shall give the topic of the input field.

10.3.1.7 Exception: If there is only one input field within the window, the input field can only consist of a data area.

- 10.3.1.7.1 Note: With a single input field, the window title can already indicate unambiguously the topic of the input field.
- 10.3.1.8 When the input field contains a label area, the width of the data area shall be 102 cells.
- 10.3.1.9 The label area shall be placed to the left of the data area.
- 10.3.1.10 The text in the label area shall be aligned to the right of the label area with an indent of 10 cells.
- 10.3.1.11 The value of the data in the data area shall be aligned to the left of the data area with an indent of 10 cells.
- 10.3.1.12 The text colour of the label area shall be grey; the background colour of the label area shall be dark grey.
- 10.3.1.13 If the input field is not selected and no data value has been accepted yet by the driver during the data entry / validation process (i.e. 'not selected' state), the background colour of the data area shall be dark grey and, if any, the data value colour shall be grey.
- 10.3.1.13.1 Note: regarding the definition of a data entry / validation process; see chapter 10.6.
- 10.3.1.14 If the input field is selected (i.e. 'selected' state), the background colour of the data area shall be medium grey and the colour of the data value or of the value corresponding to the pressed key(s) (see 10.3.1.19) shall be black.
- 10.3.1.15 If the input field is not selected but a data value has already been accepted by the driver during the data entry / validation process (i.e. 'accepted' state), the background colour of the data area shall be dark grey and the the data value colour shall be white.
- 10.3.1.16 Table 21 gives an overview of the data field states.

	Not selected	Selected	Accepted
Background of the data area	dark grey	medium grey	dark grey
Data value	grey	black	white
Value corresponding to the pressed key(s) (see 10.3.1.19)	-	black	-

Table 21 – Overview of data field states

- 10.3.1.17 Figure 97 gives an overview of the colour philosophy for an input field during a data entry / validation process.

DATA INPUT FIELD COLOUR DEPENDING ON DATA FIELD STATE

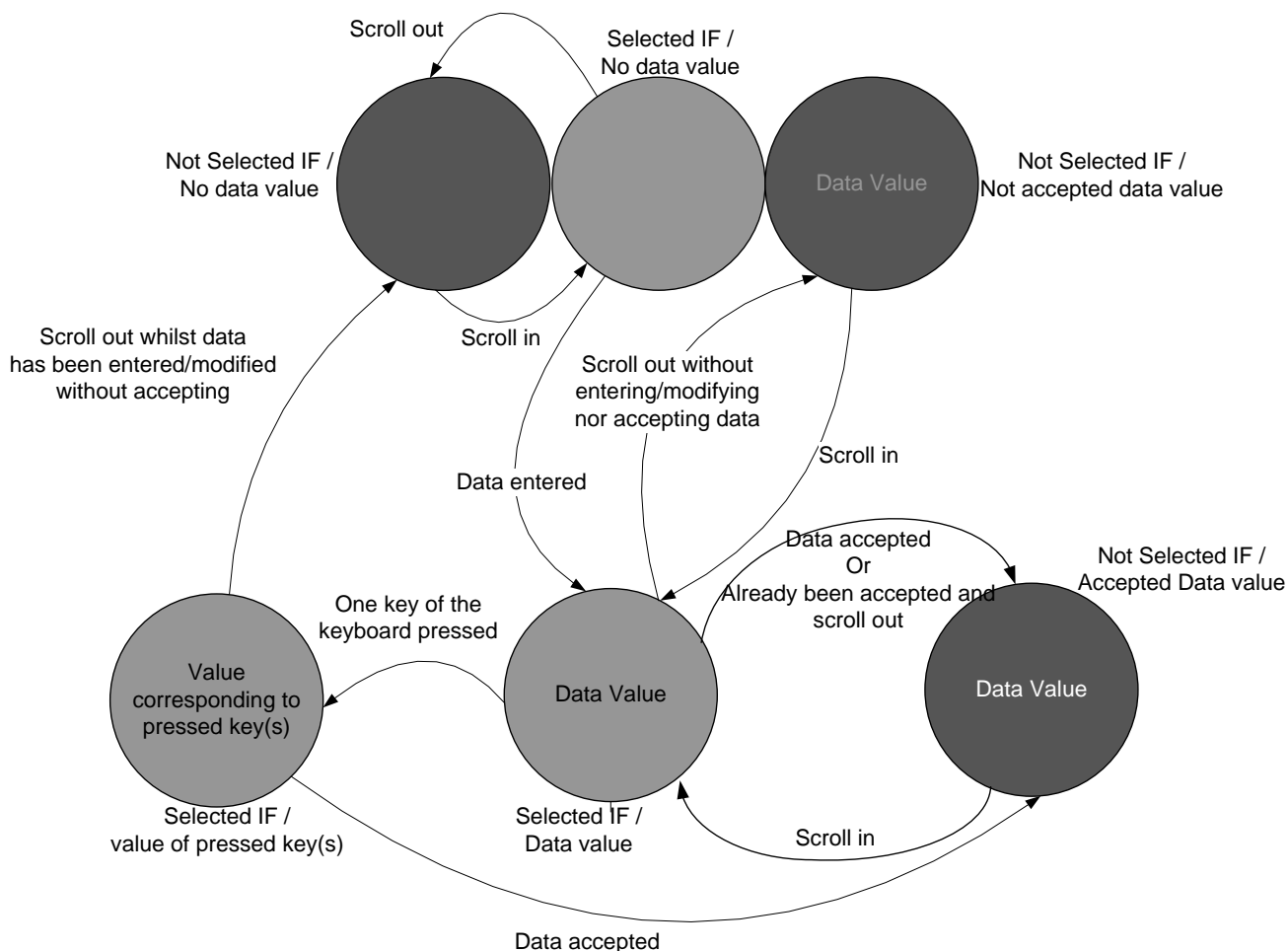


Figure 97 – State transitions for an input field with colour philosophy

- 10.3.1.18 When an input field is selected, the associated keyboard shall be presented in the area below the area of the input field(s).
- 10.3.1.19 After the first press on a data key of the associated keyboard, the value corresponding to the pressed data key shall be displayed in the data area instead of the data value (if any) of the selected input field.
- 10.3.1.20 If the input field is not selected anymore whilst a value has been entered / modified without accepting it, the entered value shall be erased from the data area and the current data value (if any) shall be deleted.
- 10.3.1.21 To accept the entered value in an input field in order that it replaces the current data value (if any), the driver shall activate the associated [Enter] button.
- 10.3.1.22 When using the touch screen technology, the associated [Enter] button shall be the data field itself.
- 10.3.1.23 When a data entry / validation process starts, the first input field shall be in the 'selected' state, all other input fields shall be in the 'not selected' state.

- 10.3.1.24 After activating the [Enter] button associated to the selected input field, this input field shall go to the 'accepted' state and the next input field related to the same topic (i.e. which can be on a next data entry window) shall be selected automatically.
- 10.3.1.25 The list of input fields of the data entry window(s) related to the same topic shall be circular i.e. the first input field follows the last one and the last input field preceeds the first one.
- 10.3.1.26 When using the touch screen technology, it shall be possible for the driver to select a specific input field by activating the input field area (the label or data part). For the activation, the input field shall behave like an up-type button.
- 10.3.1.27 When using soft key technology, it shall be possible for the driver to select a specific input field by using the [Up] and [Down] scroll buttons.

10.3.2 Entering characters

- 10.3.2.1 A cursor shall be used to indicate to the driver where his next selected character will be inserted within the input field.
- 10.3.2.2 The cursor shall be a horizontal line below the position of the next character to be entered i.e. an underscore.
- 10.3.2.3 The cursor shall flash by changing from visible to not visible (e.g. background colour) with a nominal frequency of 2 Hz with a symmetrical mark space ratio.
- 10.3.2.4 When a data key of a keyboard allows entering one single character (e.g. all data keys of a numeric keyboard), the cursor shall jump to the next position in the input field as soon as this data key entry is echoed within the input field.
- 10.3.2.5 When a data key of a keyboard allows entering various characters (e.g. all data keys of an alphanumeric keyboard), the following shall apply:
 - a) the cursor shall jump automatically with a delay-time of 2 s to the next position in the input field after displaying this data key entry within the input field.
 - b) by pressing the same data key again within these 2 s delay-time or by holding the data key for some time, another character under the same data key shall be selected;
 - c) by pressing another data key within these 2 s delay-time the cursor shall be forced to jump to the next position in the input field directly.
- 10.3.2.6 The rules specified in 5.1.5 shall apply as soon as the 6th character of an alphanumeric or numeric data is entered.

10.3.3 Echo texts

- 10.3.3.1 An echo text shall be composed of a label part and a data part.
- 10.3.3.2 The label part shall be identical to the label of the concerned input field.
- 10.3.3.3 The data part of the echo text shall display the data value of the concerned input field.

- 10.3.3.4 Exception: If the data value is not consistent, the data part of the echo text shall indicate the type of inconsistency as specified in 10.3.4 instead of the data value.
- 10.3.3.5 The echo text shall be white if the entered data has been accepted by the driver during the data entry / validation process, otherwise it shall be grey.
- 10.3.3.6 The echo texts shall be presented inside the A/B/C/E area in the same order as their related input fields in D/F/G (touch screen technology) or D/G/I (soft key technology).
- 10.3.3.7 The labels of the echo texts shall be right aligned with an indent of 5 on the left side of the X position 204.
- 10.3.3.8 The label of the first echo text shall be 112 cells (i.e. an indent of 100 cells + the 12 cells of the character size) below the top of area A/B/C/E.
- 10.3.3.9 The data of the echo texts shall be left aligned with an indent of 5 cells on the right side of the X position 204.
- 10.3.3.10 The data of the first echo text shall be 112 cells (i.e. an indent of 100 cells + the 12 cells of the character size) below the top of area A/B/C/E.

10.3.4 Data checks

10.3.4.1 Introduction

- 10.3.4.1.1 This chapter defines the mechanisms used to inform the driver about data entry mistakes. For that purpose, five types of checks are defined:
 - a) Technical range check used when the value of an input field is out of its technical range (e.g. outside the range of the corresponding variable defined in document [3]),
 - b) Technical resolution check used when the value of an input field is not matching its resolution (e.g. different from the resolution of the corresponding variable defined in document [3])
 - c) Technical cross-check used when the values of several input fields do not technically fit together,
 - d) Operational range check used when the value of an input field is out of its operational range (e.g. outside the range used for the nominal operational situations),
 - e) Operational cross-check used when the values of several input fields do not operationally fit together.
- 10.3.4.1.1.1 Note: The main difference between the technical and operational rules is that an operational one can be overruled by the driver while a technical one forces him to modify the data value(s).
- 10.3.4.1.2 It shall be possible to configure in the on-board the permitted range(s), resolution for a specific input field as well as the cross-check rules between several input fields. However, the definitions of those rules are outside the scope of this specification.
- 10.3.4.1.3 Since these mechanisms rely on the echo texts, it is only possible to inform the driver about data entry mistakes in data entry windows with echo texts.

10.3.4.2 Technical range checks

- 10.3.4.2.1 The check versus the technical permitted range shall take place when an entered data value is accepted by the driver.
- 10.3.4.2.2 When the entered data value of an input field is outside its pre-configured technical permitted range, the data part of its echo text shall indicate '++++' in red.
- 10.3.4.2.3 The input field that contains the out of range shall remain in the "Selected IF/data value" state (see Figure 97) and shall still show the entered data value.
- 10.3.4.2.4 The [Enter] button and, if any, the [Up], [Down], [Next] and [Previous] navigation buttons shall be disabled until the state of the input field switches to "Selected IF/value of pressed key(s)".

10.3.4.3 Technical resolution checks

- 10.3.4.3.1 The check versus the technical resolution shall take place when an entered data value is accepted by the driver.
- 10.3.4.3.2 When an entered data value of an input field is outside its pre-configured technical resolution, the data part of its echo text shall indicate '++++' in red.
- 10.3.4.3.3 The input field that contains the wrong resolution shall remain in the "Selected IF/data value" state (see Figure 97) and shall still show the entered data value.
- 10.3.4.3.4 The [Enter] button and, if any, the [Up], [Down], [Next] and [Previous] navigation buttons shall be disabled until the state of the input field switches to "Selected IF/value of pressed key(s)".

10.3.4.4 Technical cross-checks

- 10.3.4.4.1 When a valid button activation is performed on the 'Yes' button attached to the question '[Window Title] entry complete?' (see 10.3.4.5 and 10.3.6), the technical cross-check rules shall be executed in sequence.
- 10.3.4.4.2 For the input fields whose entered data values do not comply with the currently executed cross-check rule, the data part of their corresponding echo texts shall indicate '????' in red.
- 10.3.4.4.3 The input fields not complying with the cross-check rule shall still show their entered data value.
- 10.3.4.4.4 The 'Yes' button button attached to the question '[Window Title] entry complete?' shall be disabled until one of the entered data values is modified i.e. until one of the input field switches to "Not Selected IF/Accepted Data value" (see Figure 97).

10.3.4.5 Operational range checks

- 10.3.4.5.1 The check versus the operational permitted range shall take place when an entered data value is accepted by the driver and only if the technical range check, if any, is satisfied.

- 10.3.4.5.2 When the entered data value of the input field is outside its pre-configured operational range, the data part of its echo text shall indicate '++++' in yellow.
- 10.3.4.5.3 The input field that contains the operational out of range shall remain in the "Selected IF/data value" state (see Figure 97) and shall still show the entered data value.
- 10.3.4.5.4 If any, the [Up], [Down], [Next] and [Previous] navigation buttons shall be disabled until the state of the input field switches to "Selected IF/value of pressed key(s)".
- 10.3.4.5.5 The [Enter] button shall become a delay-type button to allow the driver to overrule the operational range check rule.
- 10.3.4.5.6 If the driver performs a valid button activation on the delay-type [Enter] button, the entered data value of the input field shall be considered as permitted meaning that the input field shall go in the "Not Selected IF/Accepted Data value" state and the data part of the echo text shall display the entered data value instead of '++++'.

10.3.4.6 Operational cross-checks

- 10.3.4.6.1 When a valid button activation is performed on the 'Yes' button attached to the question '[Window Title] entry complete?' (see 10.3.4.5 and 10.3.6), the operational cross-check rules shall be executed in sequence and only if all technical cross-check(s) is/are satisfied.
- 10.3.4.6.2 For the input fields whose entered data values do not comply with the currently executed cross-check rule, the data part of their corresponding echo texts shall indicate '????' in yellow.
- 10.3.4.6.3 The input fields not complying with the cross-check rule shall still show their entered data value.
- 10.3.4.6.4 The 'Yes' button attached to the question '[Window Title] entry complete?' shall become a delay-type button to allow the driver to overrule the operational cross-check rule.
- 10.3.4.6.5 If the driver performs a valid button activation on the delay-type 'Yes' button, the entered data values of the input fields concerned by the cross-check rule shall be considered as permitted and the data part of the corresponding echo texts shall display the entered data values instead of '????'.

10.3.4.7 Sequence of data checks

- 10.3.4.7.1 The sequence of data checks shall follow the process in Figure 98.

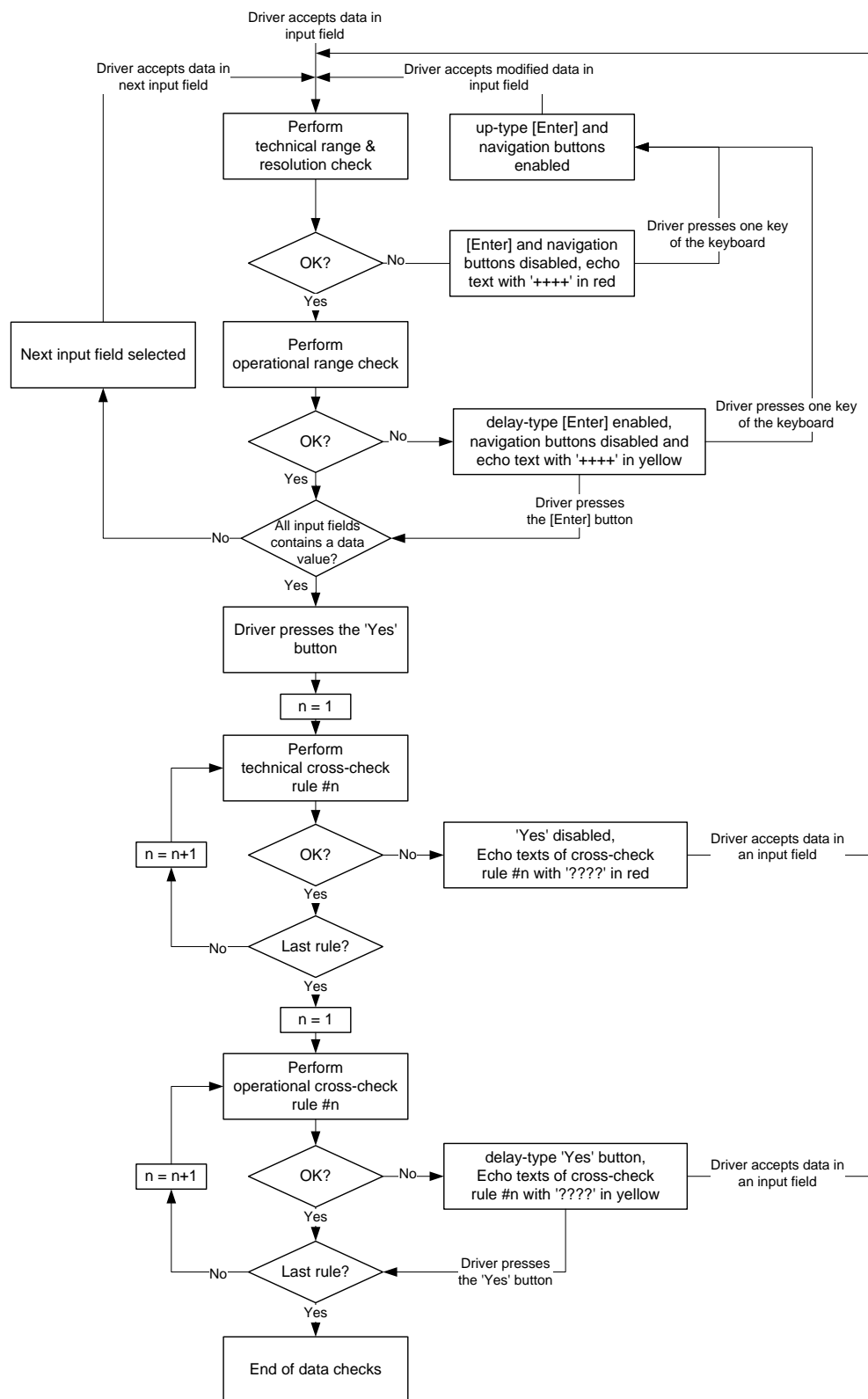


Figure 98 – Sequence of data checks

10.3.5 Data entry window for touch screen technology

- 10.3.5.1 A data entry window shall contain a maximum of 4 input fields if it covers the total grid array (i.e. A/B/C/D/E/F/G) or only one input field if it covers the half grid array (i.e. D/F/G).

10.3.5.1.1 Note: the number of input fields is limited to be able to present a keyboard with 12 keys below the last input field.

10.3.5.2 When the window covers the half grid array (D/F/G areas), each object (excluding the keyboard keys) shall follow the dimension and position as specified in Table 22.

<i>Data entry window on half grid array</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
'Close' button	82	50	0	400
'Previous' button (when several windows containing input fields related to the same topic exists)	82	50	82	400
'Next' button (when several windows containing input fields related to the same topic exists)	82	50	164	400
Window Title	306	24	0	0
Input field 1 (label part)	204	50	0	50
Input field 1 (data part)	102	50	204	50

Table 22 – Data entry window on half grid array (touch screen technology)

10.3.5.3 When the window covers the A/B/C/D/E/F/G areas, each object (excluding the keyboard keys, the echo texts and the objects for 'data entry complete') shall follow the dimension and position as specified in Table 23.

<i>Data entry window on total grid array</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
'Close' button	82	50	334	400
'Previous' button (when several windows containing input fields related to the same topic exists)	82	50	416	400
'Next' button (when several windows containing input fields related to the same topic exists)	82	50	498	400
Window Title	334	24	0	0
Input field 1 (label part)	204	50	334	50
Input field 1 (data part)	102	50	538	50
Input field 2 (label part)	204	50	334	100
Input field 2 (data part)	102	50	538	100
Input field 3 (label part)	204	50	334	150
Input field 3 (data part)	102	50	538	150
Input field 4 (label part)	204	50	334	200
Input field 4 (data part)	102	50	538	200

Table 23 – Data entry window on total grid array (touch screen technology)

- 10.3.5.4 When the window covers the total grid array (A/B/C/D/E/F/G areas), the text label of the window title shall be right aligned.
- 10.3.5.5 If the window contains only one input field and only the data part is presented (see 10.3.1.7), the dimension of the data part shall be the dimension of the merged area between input field 1 (label area) and input field 1 (data area) as expressed in Table 22 and Table 23.
- 10.3.5.6 When the window covers the total grid array (A/B/C/D/E/F/G areas), it shall be possible to echo the values of the input fields on the A/B/C/E area applying the requirements in 10.3.3.
- 10.3.5.7 When the window covers the total grid array (A/B/C/D/E/F/G areas), the objects specified in Table 24 shall additionally be presented on the window for confirmation by the driver of the data entry completion.

Data entry complete				
Item	Width	Height	X Location	Y Location
area for '[Window Title] entry complete?'	334	50	0	350
'Yes' button	334	50	0	400

Table 24 – Data entry complete objects (touch screen technology)

- 10.3.5.8 The sensitive area of the 'Yes' button shall be extended on the area for the '[Window Title] entry complete?' (see Table 24).
- 10.3.5.9 The 'Yes' button shall be enabled when all input fields related to the topic of the window(s) display a data value (displaying a value corresponding to pressed key(s) is not displaying a data value, for further details see Figure 97). Otherwise the 'Yes' button shall be disabled.
- 10.3.5.10 The text label of the 'Yes' button shall be in black. The background colour shall be in dark grey if the 'Yes' button is disabled or in medium grey if it is enabled. The 'Yes' button shall have the same border as an input field applying 5.1.1.1.4.
- 10.3.5.11 The 'Yes' button shall be an up-type button.
- 10.3.5.12 Depending on the selected input field, the window shall present the corresponding keyboard which can be numeric, enhanced numeric, alphanumeric or a dedicated keyboard with predefined choices.
- 10.3.5.13 The buttons of the keyboard shall be down-type buttons.
- 10.3.5.14 Each button of the keyboard shall follow the dimension and position in the D/F/G area as specified in Table 25 in order to be above the navigation buttons.

Keyboard				
Item	Width	Height	X Location	Y Location
Keyboard key '1'	102	50	0	200

Keyboard key '2'	102	50	102	200
Keyboard key '3'	102	50	204	200
Keyboard key '4'	102	50	0	250
Keyboard key '5'	102	50	102	250
Keyboard key '6'	102	50	204	250
Keyboard key '7'	102	50	0	300
Keyboard key '8'	102	50	102	300
Keyboard key '9'	102	50	204	300
Keyboard key '10'	102	50	0	350
Keyboard key '11'	102	50	102	350
Keyboard key '12'	102	50	204	350
...

Table 25 – Keyboard (touch screen technology)

- 10.3.5.15 When a numeric keyboard is presented, the keys 1 to 11 shall respectively contain enabled buttons for the numbers '1' to '9', the [delete] and the number '0'. The key 12 shall show the '.' button as disabled.
- 10.3.5.16 When an enhanced numeric keyboard is presented, the keys 1 to 12 shall respectively contain enabled buttons for the numbers '1' to '9', the [delete], the number '0' and the '.' button.
- 10.3.5.17 When an alphanumeric keyboard is presented, the keys 1 to 11 shall respectively contain enabled buttons for the alphanumeric characters 1, 2/a/b/c,..., 9/w/x/y/z, the [delete], the number '0'. The key 12 shall show the '.' button as disabled. The labels of the keys shall separate the number from the letters with a space character e.g. '2 abc'.
- 10.3.5.18 When a dedicated keyboard is limited to a 'No'/'Yes' choice, the key '7' shall be the 'No' key and the key '8' shall be the 'Yes' key.
- 10.3.5.19 When more than 12 predefined choices exist for a dedicated keyboard, the key 12 shall be dedicated to the [More] button. When pressing the [More] button, the keys 1 to 11 shall respectively contain enabled buttons for the next (maximum) 11 predefined choices. The list of predefined choices shall be circular i.e. the 1st group of predefined choices (from 1 to 11) follows the last group of predefined choices.
- 10.3.5.20 Figure 99 gives the layout of a data entry window with a single input field without label part on the half grid array.

		Window Title		
		Data		
		Key '1'	Key '2'	Key '3'
		Key '4'	Key '5'	Key '6'
		Key '7'	Key '8'	Key '9'
		Key '10'	Key '11'	Key '12'
		✕		

Figure 99 – Data entry window on half grid array (touch screen technology)

10.3.5.21 Figure 100 gives the layout of a data entry window with 4 input fields covering the total grid array including echo texts, a request for '[Window Title] entry complete?', a 'Previous' and a 'Next' button to scroll between the windows related to the same topic.

Window Title (x/y)				
<div style="display: flex; justify-content: space-between;"> <div>Label 1</div> <div>Data 1</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Label 2</div> <div>Data 2</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Label 3</div> <div>Data 3</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Label 4</div> <div>Data 4</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Label 5</div> <div>Data 5</div> </div> <div style="display: flex; justify-content: space-between;"> <div>...</div> <div>...</div> </div> <div style="text-align: center; margin-top: 20px;"> [Window Title] entry complete? </div>	Label 1		Data 1	
	Label 2		Data 2	
	Label 3		Data 3	
	Label 4		Data 4	
	Key '1'	Key '2'	Key '3'	
	Key '4'	Key '5'	Key '6'	
	Key '7'	Key '8'	Key '9'	
	Key '10'	Key '11'	Key '12'	
	YES			✕
				◀ ▶

Figure 100 – Data entry window with 4 input fields on total grid array (touch screen technology)

10.3.6 Data entry window for soft key technology

10.3.6.1 A Data entry window shall contain a maximum of 4 input fields if it covers the total grid array (i.e. A/B/C/D/E/G/I) or only one input field if it covers the half grid array (i.e. D/G/I).

10.3.6.1.1 Note: the number of input fields is limited to be able to present a dedicated keyboard below the last input field.

10.3.6.2 When the window covers the half grid array (D/G/I areas), each object (excluding the keyboard keys) shall follow the dimension and position as specified in Table 26.

<i>Data entry window on half grid array</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	266	24	0	0
Input field 1 (label part)	164	50	0	50
Input field 1 (data part)	102	50	164	50

Table 26 – Data entry window on half grid array (soft key technology)

10.3.6.3 When the window covers the total grid array (A/B/C/D/E/G/I areas), each object (excluding the keyboard keys, the echo texts and the objects for ‘data entry complete’) shall follow the dimension and position as specified in Table 27.

<i>Data entry window on total grid array</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	334	24	0	0
Input field 1 (label part)	164	50	334	50
Input field 1 (data part)	102	50	498	50
Input field 2 (label part)	164	50	334	100
Input field 2 (data part)	102	50	498	100
Input field 3 (label part)	164	50	334	150
Input field 3 (data part)	102	50	498	150
Input field 4 (label part)	164	50	334	200
Input field 4 (data part)	102	50	498	200

Table 27 – Data entry window on total grid array (soft key technology)

10.3.6.4 If the window contains only one input field and only the data part is presented (see 10.3.1.7), the dimension of the data part shall be the dimension of the merged area between input field 1 (label area) and input field 1 (data area) as expressed in Table 26 and Table 27.

10.3.6.5 When the window covers the total grid array (A/B/C/D/E/G/I areas), the text label of the window title shall be right aligned.

10.3.6.6 When no previous window containing input fields related to the same topic exists, the [Close] button shall be in H3.

10.3.6.7 When a previous window containing input fields related to the same topic exists, the [Previous] button shall be in H3.

- 10.3.6.8 When a next window containing input fields related to the same topic exists, the [Next] button shall be in H4.
- 10.3.6.9 When a window contains more than one input field or the 'Yes' button is enabled (see 10.3.6.13) or the 'switch' button is enabled (see 11.3.9.7), The [Up] and [Down] buttons shall be respectively in H5 and H6.
- 10.3.6.10 The [Enter] button shall be in H7.
- 10.3.6.11 When the window covers the total grid array (A/B/C/D/E/G/I areas), it shall be possible to echo the values of the input fields on the A/B/C/E area applying the requirements in 10.3.3.
- 10.3.6.12 When the window covers the total grid array (A/B/C/D/E/G/I areas), the objects specified in Table 28 shall additionally be presented on the window for confirmation by the driver of the data entry completion.

<i>Data entry complete</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
area for '[Window Title] entry complete?'	334	50	0	330
'Yes' button	334	50	0	380

Table 28 – Data entry complete objects (soft key technology)

- 10.3.6.13 The 'Yes' button shall be enabled when all input fields related to the topic of the window(s) display a data value (displaying a value corresponding to pressed key(s) is not displaying a data value, for further details see Figure 97). Otherwise the 'Yes' button shall be disabled.
- 10.3.6.14 The text label of the 'Yes' button shall be in black. The background colour shall be in dark grey if the 'Yes' button is disabled or in medium grey if it is enabled. The 'Yes' button shall have the same border as an input field applying 5.1.1.1.4.
- 10.3.6.15 When the 'Yes' button is enabled, an associated soft key with the label 'Yes' shall be presented in F3 if the [Down] button has been pressed being on the last input field or if the [Up] button has been pressed being on the first input field.
- 10.3.6.15.1 Note: the 'Yes' button is consequently inserted between the last and the first input fields within the circular list of input fields (see 10.3.1.25).
- 10.3.6.16 Depending on the selected input field, the window shall present in area F/H the corresponding keyboard which can be numeric, enhanced numeric, alphanumeric or a dedicated keyboard with predefined choices.
- 10.3.6.17 The buttons of the keyboard shall be down-type buttons.
- 10.3.6.18 When a numeric keyboard is presented, the buttons F1 to F10 shall be used respectively for the numbers 1, 2, ..., 9 and 0.
- 10.3.6.19 When an enhanced numeric keyboard is presented (i.e. when a '.' is used), the buttons F1 to F10 shall be used respectively for the numbers 1/., 2, ..., 9 and 0. The label of F1 shall separate the number 1 from the dot '.' With a space character.

- 10.3.6.20 When an alphanumeric keyboard is presented, the buttons F1 to F10 shall be used respectively for the alphanumeric characters 1, 2/a/b/c, ..., 9/w/x/y/z and 0. The labels of the keys shall separate the number from the letters with a space character e.g. '2 abc'.
- 10.3.6.21 When a numeric, an enhanced numeric or an alphanumeric keyboard is presented, H2 shall be used for the [Delete] button.
- 10.3.6.22 When a dedicated keyboard with predefined choices is presented, the following shall apply:
- a) The window shall contain a list of selections (texts) in area D/G/I.
 - b) The list shall be displayed left aligned with an indent of 15 cells from the left of the area D/G/I.
 - c) The first selection of the list shall be 27 cells (i.e. an indent of 15 cells + the 12 cells of the character size) below the position of the input field 3 (half grid array) or input field 4 (total grid array).
 - d) The text of each selection shall:
 - start with a number or a letter giving the position of the selection in the list ;
 - identify the name/value of the selection ;
 - separate the number/letter and the name/value of the selection by a '-'.
 - e) The numbers or letters used for the selections shall be positioned in a logical order respectively from 1 to maximum 10 or from A to J ;
 - f) The labels of the F buttons shall be numbers/letters matching the numbers/letters of the selection/value.
- 10.3.6.22.1 Exception: When a dedicated keyboard is limited to a 'No'/'Yes' choice, no list of selections shall be presented in D/G/I area. F7 shall be the 'No' key and F8 shall be the 'Yes' key.
- 10.3.6.22.2 When more than 10 predefined choices exist for a dedicated keyboard, 10.3.6.22 shall apply for each group of maximum 9 choices and F10 shall be dedicated to the [More] button. When pressing the [More] button, the next (maximum) 9 predefined choices shall be presented but with the numbers/letters adapted accordingly (e.g. going respectively from 10 to maximum 18 or from J to maximum R for the next 9 choices). The list of predefined choices shall be circular i.e. the 1st group of predefined choices (from 1 to 9) follows the last group of predefined choices.
- 10.3.6.23 Figure 101 gives an example of the layout of a data entry window on half grid array with a numeric keyboard.

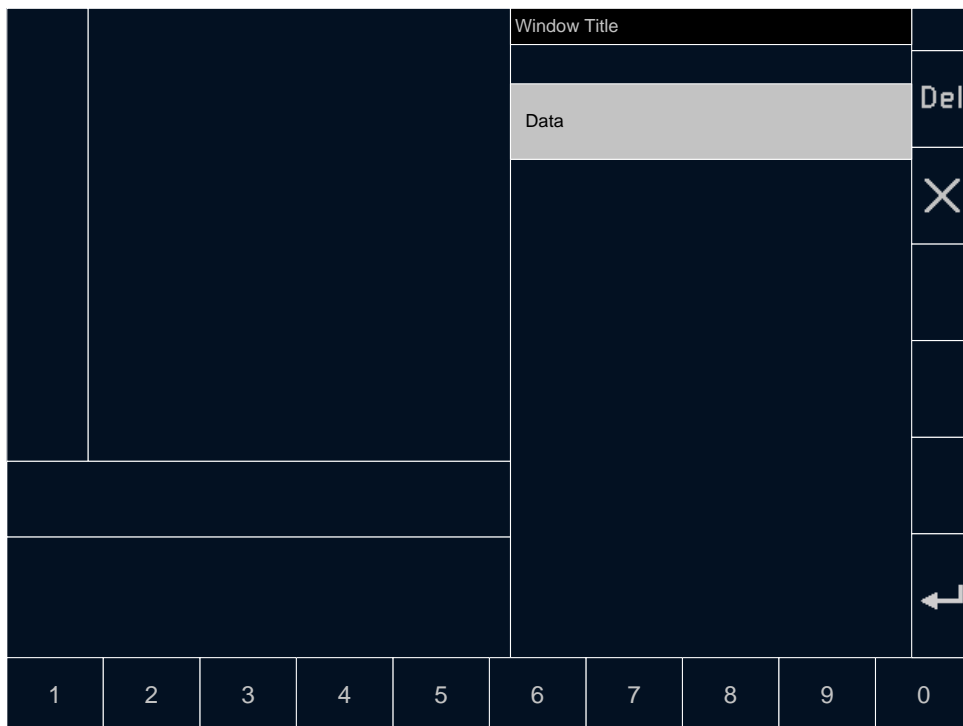


Figure 101 – Data entry window on half grid array and a numeric keyboard (soft key technology)

10.3.6.24 Figure 102 gives an example of the layout of a data entry window on half grid array with a dedicated keyboard.

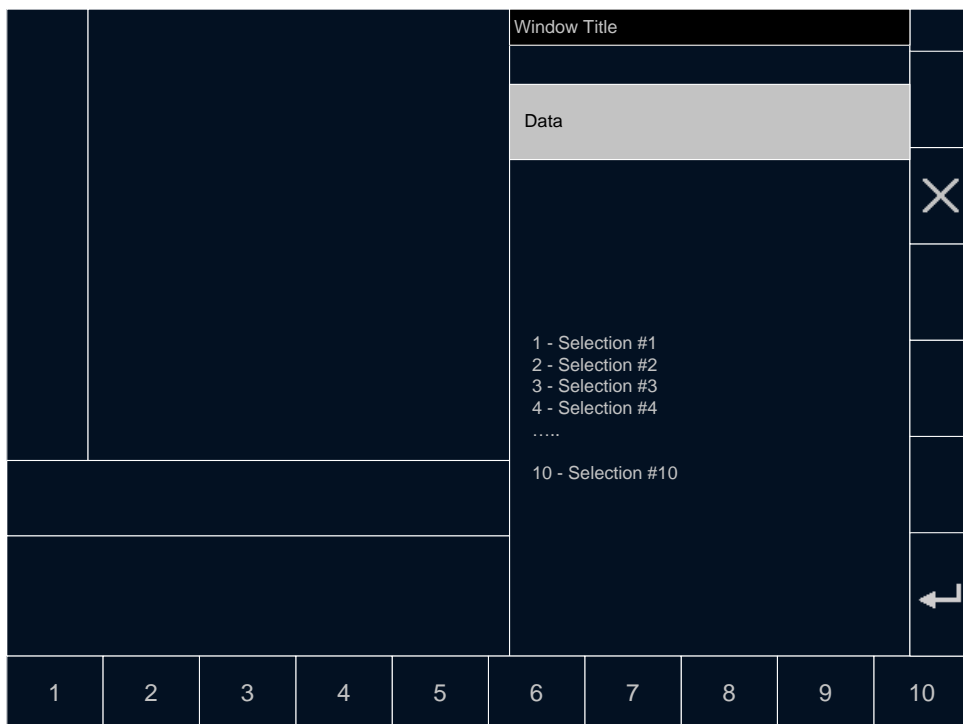


Figure 102 – Data entry window on half grid array and a dedicated keyboard (soft key technology)

10.3.6.25 Figure 103 and Figure 104 give examples of the layout of a data entry window with 4 input fields covering the total grid array including echo texts and the request for '[Window Title] entry complete?'; Figure 103 when a numeric keyboard is associated to

the selected input field, Figure 104 when dedicated keyboard is associated to the selected input field.

Window Title									
Label 1 Data 1 Label 2 Data 2 Label 3 Data 3 Label 4 Data 4					Label 1		Data 1		Del
					Label 2		Data 2		
					Label 3		Data 3		
					Label 4		Data 4		
[Window Title] entry complete?									
YES									
1	2	3	4	5	6	7	8	9	0

Figure 103 – Data entry window with 4 input fields on total grid array and numeric keyboard (soft key technology)

Window Title									
Label 1 Data 1 Label 2 Data 2 Label 3 Data 3 Label 4 Data 4					Label 1		Data 1		X
					Label 2		Data 2		
					Label 3		Data 3		
					Label 4		Data 4		
[Window Title] entry complete?					1 - Selection #1 2 - Selection #2 3 - Selection #3				
YES									
1	2	3							

Figure 104 – Data entry window with 4 input fields on total grid array and dedicated keyboard (soft key technology)

10.3.7 Layers

10.3.7.1 The layers for data entry windows on half grid array shall be as follows:

- a) Layer 0: D/F/G (touch screen technology) or D/G/I (soft key technology)
- b) All other areas: same as default window (see 8.1.1.4)

10.3.7.2 The layers for data entry windows on total grid array shall be as follows:

- a) Layer 0: all areas
- b) Layer -1: none
- c) Layer -2: none

10.4 Data validation windows

10.4.1 Data validation for touch screen technology

10.4.1.1 The window shall be in the A/B/C/D/E/F/G area.

10.4.1.2 The data validation window shall contain a single input field (only data part) with a dedicated keyboard being a 'No'/'Yes' choice (see 10.3.5.18).

10.4.1.3 Each object shall follow the dimension and position as specified in Table 29.

10.4.1.4 The text label of the window title shall be right aligned.

<i>Data validation window</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	334	24	0	0
'Close' button	82	50	334	400
Input field (data part)	306	50	334	0
'No' key	102	50	334	300
'Yes' key	102	50	436	300

Table 29 – Data validation window (touch screen technology)

10.4.1.5 The window shall give echo texts corresponding to the input fields of the topic (e.g. train data) to be validated applying the requirements in 10.3.3.

10.4.1.6 Figure 105 gives an example of the layout of a data validation window containing 5 data to be validated.

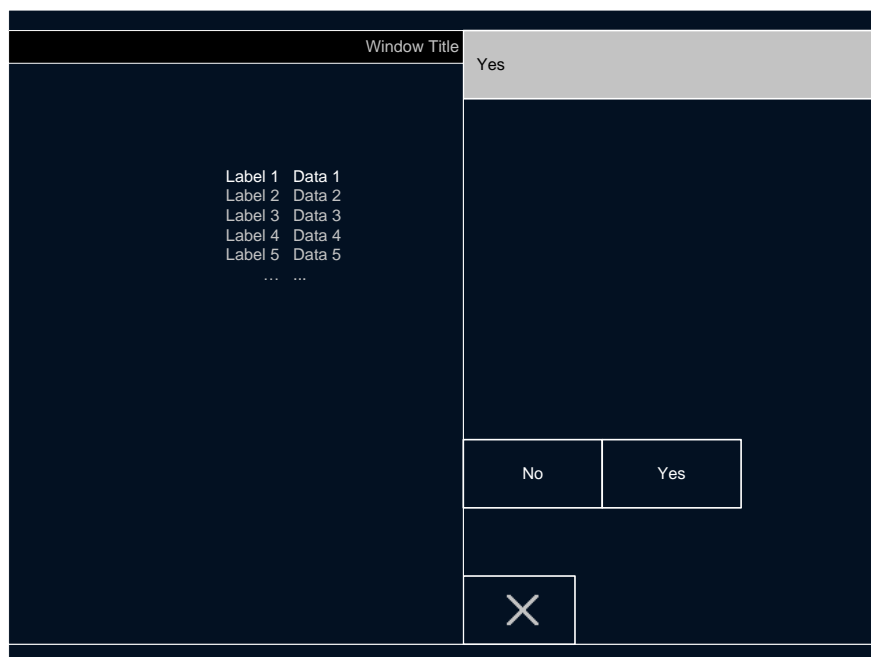


Figure 105 – Data validation window (touch screen technology)

10.4.2 Data validation for soft key technology

10.4.2.1 The window shall be in the A/B/C/D/E/G/I area.

10.4.2.2 The data validation window shall contain a single input field (only data part) with a dedicated keyboard being a 'No'/'Yes' choice (see 10.3.6.22.1).

10.4.2.3 Each object shall follow the dimension and position as specified in Table 30.

10.4.2.4 The text label of the window title shall be right aligned.

<i>Data validation window</i>				
<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	334	24	0	0
Input field (data part)	268	50	334	0

Table 30 – Data validation window (soft key technology)

10.4.2.5 The [Close] button shall be in H3.

10.4.2.6 The window shall give echo texts corresponding to the input fields of the topic (e.g. train data) to be validated applying the requirements in 10.3.3.

10.4.2.7 Figure 106 gives an example of the layout of a data validation window containing 5 data to be validated.

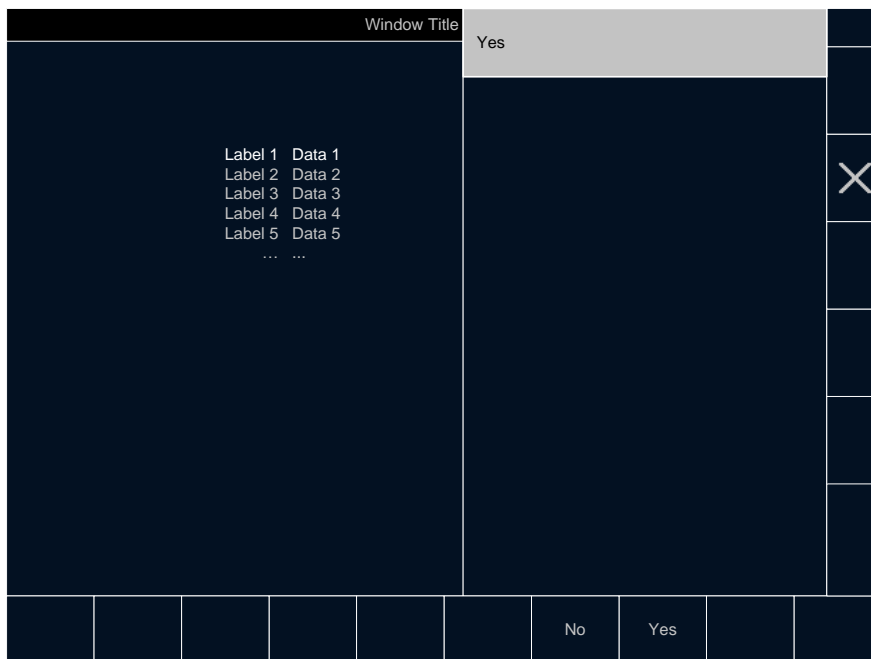


Figure 106 – Data validation window (soft key technology)

10.4.3 Layers

10.4.3.1 The layers for data validation window shall be as follows:

- a) Layer 0: all areas
- b) Layer -1: none
- c) Layer -2: none

10.5 Data view windows

10.5.1 Data view for touch screen technology

10.5.1.1 The window shall be in the D/F/G area.

10.5.1.2 Each object shall follow the dimension and position as specified in Table 31.

Data View window				
Item	Width	Height	X Location	Y Location
'Close' button	82	50	0	400
'Previous' button (when several windows containing data view items related to the same data view topic exists)	82	50	82	400
'Next' button (when several windows containing data view items related to the same data view topic exists)	82	50	164	400
Window Title	306	24	0	0

Table 31 – Data view window (touch screen technology)

- 10.5.1.3 A data view item shall be composed of a label part identifying the concerned data and of a data part displaying its data value.
- 10.5.1.4 The data part shall display the value only when it is valid (see reference [3] for the status unknown/invalid/valid).
- 10.5.1.5 The data view item shall be grey.
- 10.5.1.6 Data view items related to different topic shall be separated by one empty text line.
- 10.5.1.7 The labels of the data view items shall be right aligned with an indent of 5 on the left side of the X position 204.
- 10.5.1.8 The label of the first data view item shall be 62 cells (i.e. an indent of 50 cells + the 12 cells of the character size) below the top of area D/F/G.
- 10.5.1.9 The data of the data view items shall be left aligned with an indent of 5 cells on the right side of the X position 204.
- 10.5.1.10 The data of the first data view item shall be 62 cells (i.e. an indent of 50 cells + the 12 cells of the character size) below the top of area D/F/G.
- 10.5.1.11 Figure 107 gives an example of the layout of a data view window containing 5 data view items; the 2 first data view items belonging to one topic, the next 3 data view items belonging to another topic.

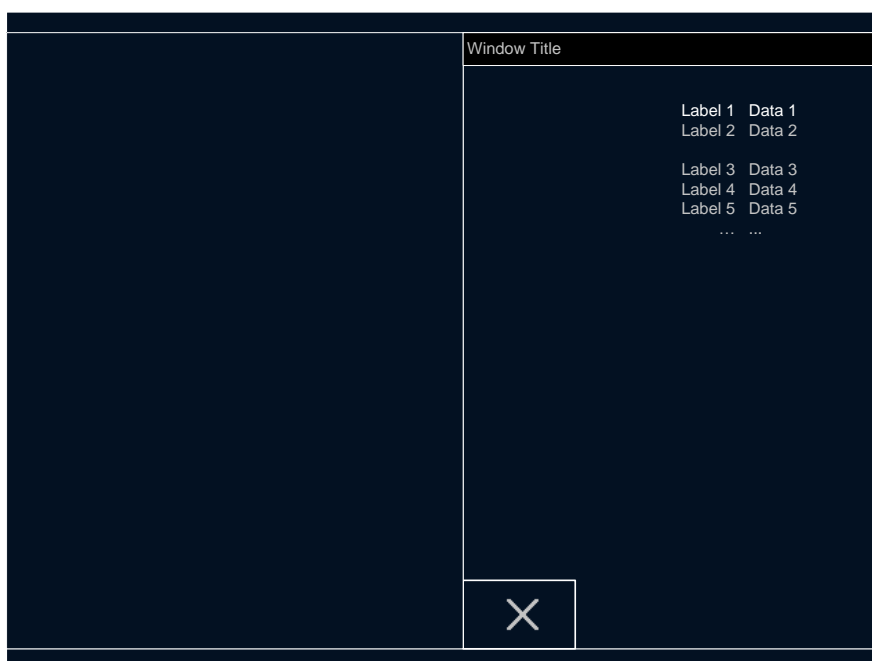


Figure 107 – Data view window (touch screen technology)

10.5.2 Data view for soft key technology

- 10.5.2.1 The window shall be in the D/G/I area.
- 10.5.2.2 Each object shall follow the dimension and position as specified in Table 32.

Data View window

ERA ERTMS unit
ETCS Driver Machine Interface

<i>Item</i>	<i>Width</i>	<i>Height</i>	<i>X Location</i>	<i>Y Location</i>
Window Title	266	24	0	0

Table 32 – Data view window (soft key technology)

- 10.5.2.3 When no previous window containing data view items related to the same topic exists, the [Close] button shall be in H3.
- 10.5.2.4 When a previous window containing data view items related to the same topic exists, the [Previous] button shall be in H3.
- 10.5.2.5 When a next window containing data view items related to the same topic exists, the [Next] button shall be in H4.
- 10.5.2.6 A data view item shall be composed of a label part identifying the concerned data and of a data part displaying its data value.
- 10.5.2.7 The data part shall display the value only when it is valid (see reference [3] for the status unknown/invalid/valid).
- 10.5.2.8 The data view item shall be grey.
- 10.5.2.9 Data view items related to different topic shall be separated by one empty text line.
- 10.5.2.10 The labels of the data view items shall be right aligned with an indent of 5 on the left side of the X position 176.
- 10.5.2.11 The label of the first data view item shall be 62 cells (i.e. an indent of 50 cells + the 12 cells of the character size) below the top of area D/G/I.
- 10.5.2.12 The data of the data view items shall be left aligned with an indent of 5 cells on the right side of the X position 176.
- 10.5.2.13 The data of the first data view item shall be 62 cells (i.e. an indent of 50 cells + the 12 cells of the character size) below the top of area D/G/I.
- 10.5.2.14 Figure 108 gives an example of the layout of a data view window containing 5 data view items; the 2 first data view items belonging to one topic, the next 3 data view items belonging to another topic.

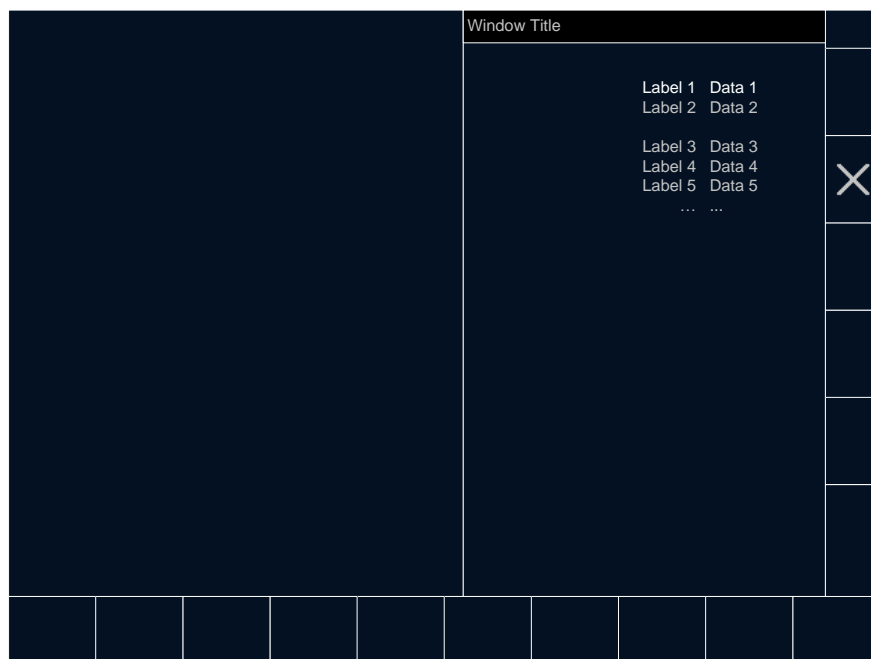


Figure 108 – Data view window (soft key technology)

10.5.3 Layers

10.5.3.1 The layers for data view windows shall be as follows:

- a) Layer 0: D/F/G (touch screen technology) or D/G/I (soft key technology)
- b) All other areas: same as default window (see 8.1.1.4)

10.6 Data entry / validation process

10.6.1.1 If not started yet, a data entry / validation process regarding a topic shall start when the first data entry window of this topic is displayed.

10.6.1.2 If no validation window regarding the same topic as the data entry window exists, the data entry / validation process shall stop:

- a) when one of the data entry window(s) is left by accepting the data values via the 'Yes' button, or
- b) when any of the data entry window(s) is left via the [Close] button, or
- c) when any of the data entry window(s) is left due to another reason.

10.6.1.3 If a validation window regarding the same topic as the data entry window exists, the data entry / validation process shall stop:

- a) when the validation window is left by accepting a data value set to 'Yes' in its input field, or
- b) when any of the data entry window(s) is left via the [Close] button, or
- c) when the validation window is left via the [Close] button, or
- d) when any of the data entry window(s) is left due to a reason other than accepting the data values via the 'Yes' button, or
- e) when the validation window is left due to another reason.

- 10.6.1.4 Note: The other reasons stopping a data entry / validation process are explained in the relevant sections of chapter 10.

11. ERTMS/ETCS SUB-LEVEL WINDOWS

11.1 Introduction

11.1.1.1 The chapter 11 defines the ERTMS/ETCS sub-level windows based on the general requirements of chapter 10. It is applicable for all ERTMS/ETCS levels.

11.1.1.2 Note: The default window partly visible in some figures of chapter 11 uses the ETCS default window as specified in chapter 8. However, for the modes SN and NL in ERTMS/ETCS level NTC, the NTC default window of the corresponding National System will be displayed instead.

11.2 Menu Windows

11.2.1 Main window

11.2.1.1 The Main window shall comply with the requirements in chapter 10.2.

11.2.1.2 The window title shall indicate “Main”.

11.2.1.3 The buttons (for touch screen technology) / selections (for soft key technology) shall indicate the label as specified in Table 33.

11.2.1.4 The buttons of the Main window shall be enabled when the conditions specified in Table 33 are fulfilled and no driver's acknowledgement is required.

11.2.1.4.1 Note: The button / selection #4 is intentionally not used.

11.2.1.5 The ‘Shunting’, ‘Exit Shunting’, ‘Non-Leading’ and ‘Maintain Shunting’ buttons shall be delay type buttons.

11.2.1.6 When the hour glass symbol ST05 is presented (due to an exchange of messages with the RBC, see chapter 11.7), it shall be shown vertically centered in the ‘Main’ window title area. The first X position of the symbol shall be 42. It shall then move 26 cells to the right every second. When it is no more possible to display the symbol ST05 inside the window title area, the symbol shall come back to its first position and shall start again moving to the right with the same pace.

ERA ERTMS unit
ETCS Driver Machine Interface

Button / selection #	label	Enabling conditions	SRS reference
1	Start	(train is at standstill) AND (mode is SB) AND (Driver ID is valid) AND (Train data are valid) AND (ERTMS/ETCS level is valid) AND (Train running number is valid) OR (train is at standstill) AND (mode is PT) AND (Train data are valid) AND (((ERTMS/ETCS level is 1) OR ((ERTMS/ETCS level is 2/3) AND (no pending emergency stop is stored onboard)))) OR (mode is SR) AND (ERTMS/ETCS level is 2/3)	3.8.2.7
			4.4.11.1.6
			4.4.14.1.6
			4.7.2
			5.4.3.2 S20
			5.4.5.3
			5.11.3 S140
2	Driver ID	(train is at standstill) AND (mode is SB) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) OR ((Modification of Driver ID while running is allowed by national value) OR ((Modification of Driver ID while running is not allowed by national value) AND (train is at standstill))) AND (mode is SH/FS/LS/SR/OS/NL/UN/SN)	3.18.4.1
			4.7.2
			5.4.5.3
3	Train data	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN)	3.18.3.2.1
			3.18.3.5
			4.7.2
			5.4.3.2 S10
			5.4.5.3
5	Level	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/NL/UN/SN)	3.18.4.2
			4.7.2
			5.4.5.3
6	Train running number	(train is at standstill) AND (mode is SB) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) OR (mode is FS/LS/SR/OS/NL/UN/SN)	3.18.4.5.1
			3.18.4.5.2
			3.18.4.5.3
			4.7.2
			5.4.5.3
7	Shunting	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN) AND (ERTMS/ETCS level is valid) AND ((ERTMS/ETCS level is 0/1/NTC) OR ((ERTMS/ETCS level is 2/3) AND (communication session exists))) OR (train is at standstill) AND (mode is PT) AND ((ERTMS/ETCS level is 1) OR ((ERTMS/ETCS level is 2/3) AND (communication session exists) AND (no pending emergency stop is stored onboard)))	4.4.8.1.6
			4.4.14.1.7
			4.7.2
			5.4.3.2 S10
			5.4.5.3
			5.6.3 E015
			5.11.3 S140

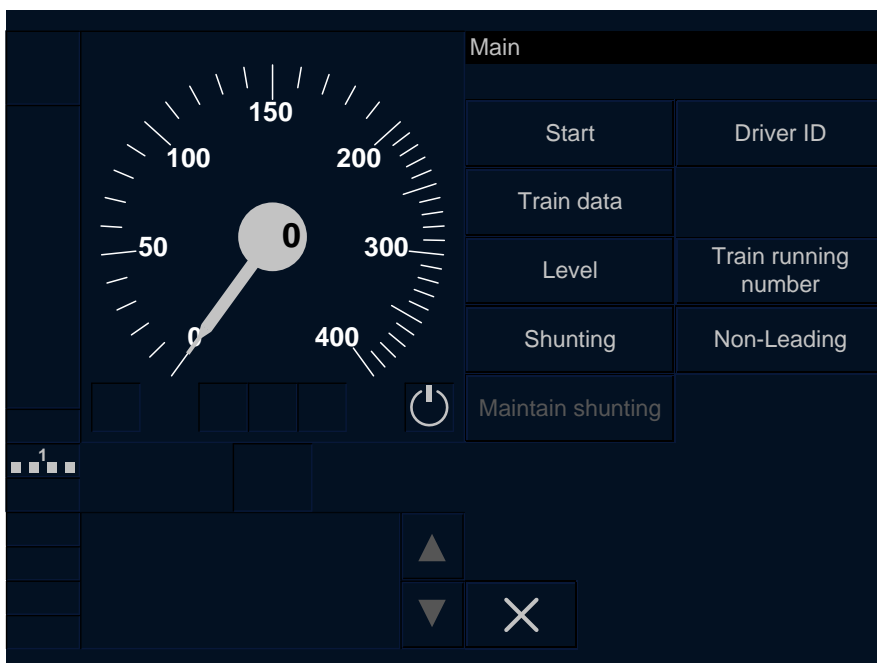
ERA ERTMS unit

ETCS Driver Machine Interface

Button / selection #	label	Enabling conditions	SRS reference
	Exit Shunting	(train is at standstill) AND (mode is SH)	4.6.3 [19] 4.7.2
8	Non-Leading	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/SH/FS/LS/SR/OS) AND (The “non leading” input signal is received)	4.6.3 [46] 4.7.2 5.4.3.2 S10 5.4.5.3
9	Maintain Shunting	(mode is SH) AND (The “passive shunting” input signal is received)	4.4.20.1.5 4.4.20.1.6 4.6.3 [26] 4.7.2

Table 33 – Button / selection label

11.2.1.7 Figure 109 shows the presentation of the main window (if not in SH or NL mode).



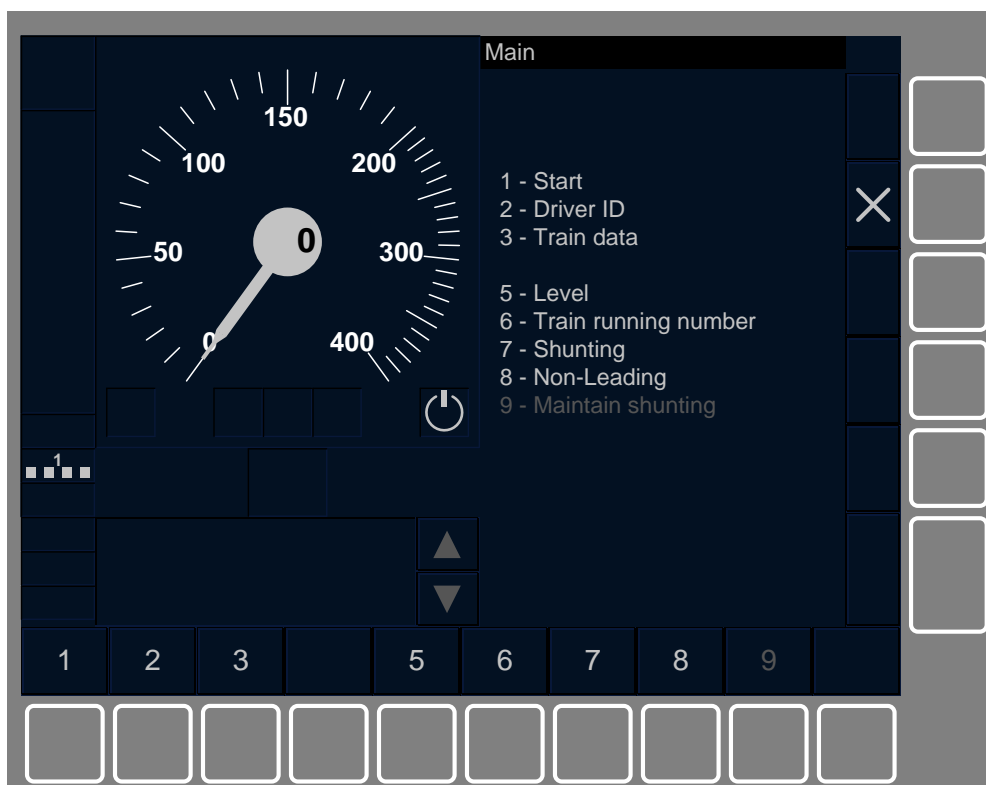


Figure 109 – Main window

11.2.2 Override window

11.2.2.1 The Override window shall comply with the requirements in chapter 10.2.

11.2.2.2 The window title shall indicate “Override”.

11.2.2.3 The button (for touch screen technology) / selection (for soft key technology) shall indicate the label as specified in Table 34.

11.2.2.4 The button of the Override window shall be enabled when the conditions specified in Table 34 are fulfilled and no driver’s acknowledgement is required.

Button /selection #	label	Enabling conditions	SRS reference					
1	EOA	(train speed is under or equal to the speed limit for triggering the “override”function) AND (mode is /FS/LS/SR/OS/UN/PT/SN/SH) OR (train speed is under or equal to the speed limit for triggering the “override”function) AND (mode is SB) AND (Driver ID is valid) AND (Train data are valid) AND (ERTMS/ETCS level is valid) AND (ERTMS/ETCS level is 2/3)	<table><tr><td>4.6.3 [37]</td></tr><tr><td>4.7.2</td></tr><tr><td>5.4.5.3</td></tr><tr><td>5.8.2.1</td></tr><tr><td>5.11.4.2</td></tr></table>	4.6.3 [37]	4.7.2	5.4.5.3	5.8.2.1	5.11.4.2
4.6.3 [37]								
4.7.2								
5.4.5.3								
5.8.2.1								
5.11.4.2								

Table 34 – Button / selection label

11.2.2.5 Figure 110 shows the presentation of the override window.

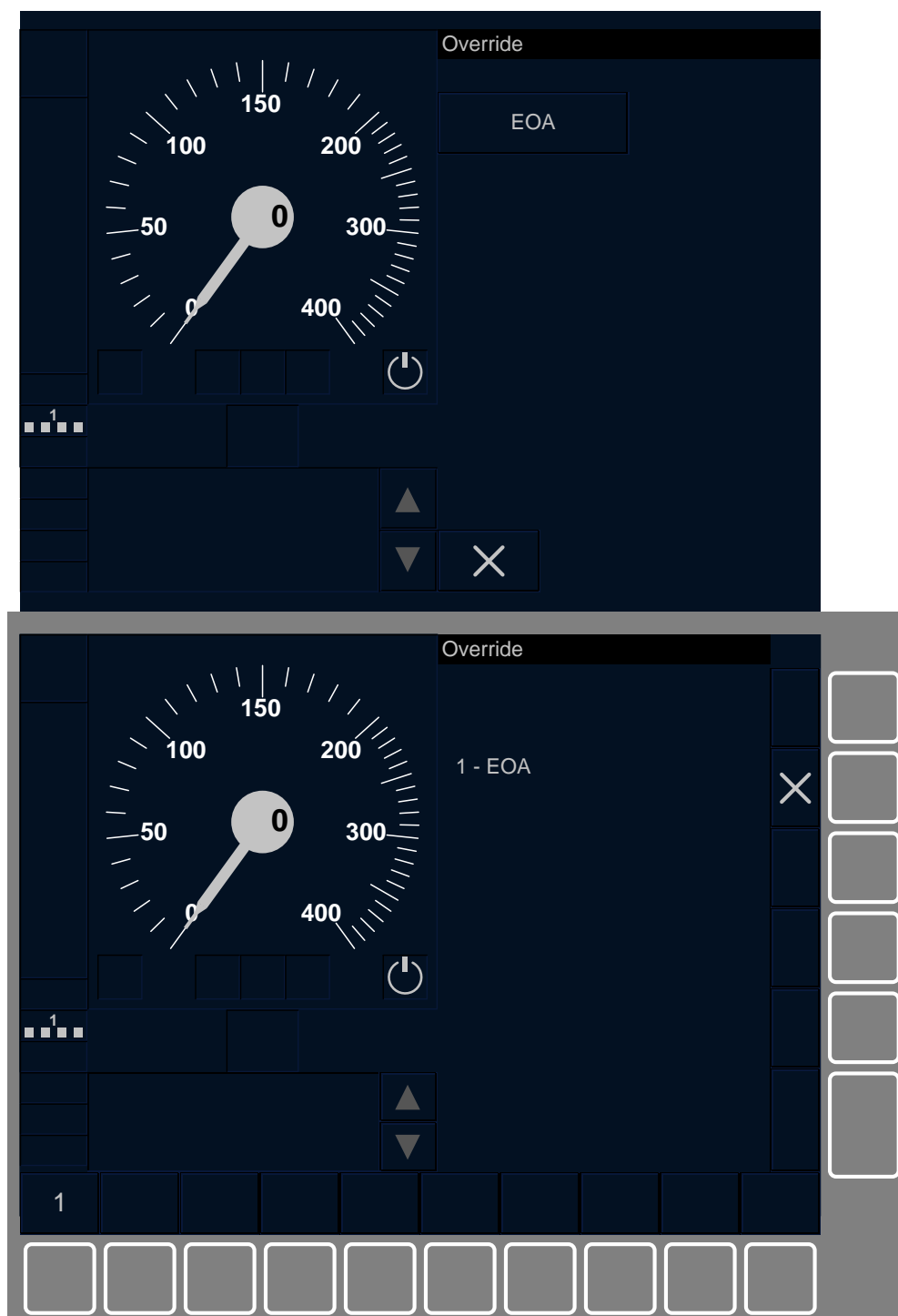


Figure 110 – Override window

11.2.3 Special window

- 11.2.3.1 The Special window shall comply with the requirements in chapter 10.2.
- 11.2.3.2 The window title shall indicate “Special”.
- 11.2.3.3 The buttons (for touch screen technology) / selections (for soft key technology) shall indicate the label as specified in Table 35.

ERA ERTMS unit
ETCS Driver Machine Interface

11.2.3.4 The buttons of the Special window shall be enabled when the conditions specified in Table 35 are fulfilled and no driver's acknowledgement is required.

11.2.3.5 The 'Train integrity' button shall be a delay type button.

Button /selection #	label	Enabling conditions	SRS reference
1	Adhesion	(train is at standstill) AND (mode is SB) AND (Modification of adhesion factor by driver is allowed by national value) AND (Driver ID is valid) AND (Train data are valid) AND (ERTMS/ETCS level is valid) OR (Modification of adhesion factor by driver is allowed by national value) AND (mode is FS/LS/SR/OS/UN/SN)	3.18.4.6.2.1 4.7.2
2	SR speed / distance	(train is at standstill) AND (mode is SR)	4.4.11.1.5 4.7.2
3	Train integrity	(train is at standstill) AND (mode is SB/FS/LS/SR/OS/PT) AND (Driver ID is valid) AND (Train data are valid) AND (ERTMS/ETCS level is valid)	3.6.5.2.1 3.6.5.2.2 4.7.2

Table 35 – Button / selection label

11.2.3.6 Figure 111 shows the presentation of the "Special" window (with the SR speed/distance button 'disabled').

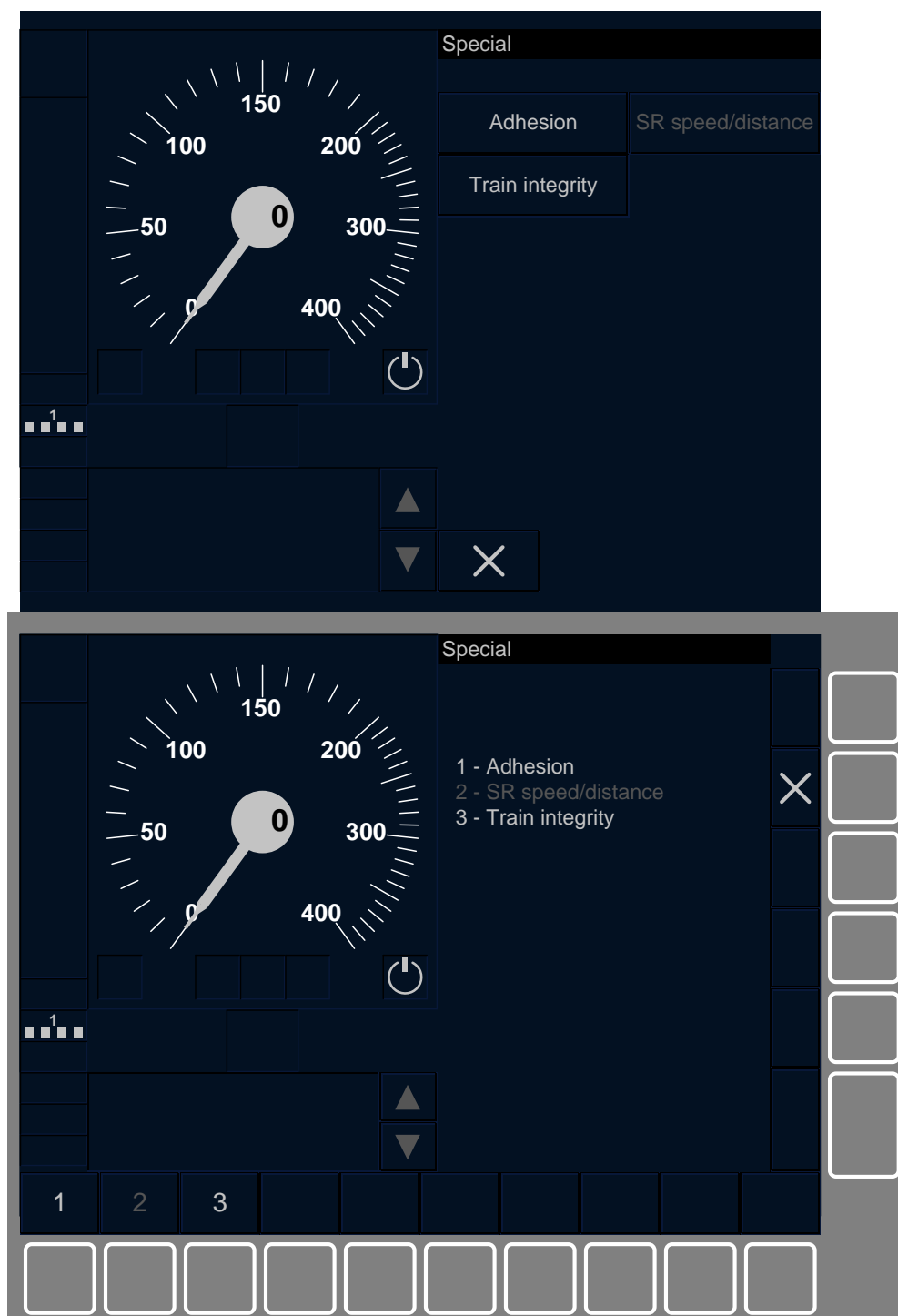


Figure 111 – Special window

11.2.4 Settings window

- 11.2.4.1 The Settings window shall comply with the requirements in chapter 10.2.
- 11.2.4.2 The window title shall indicate “Settings”.
- 11.2.4.3 The buttons (for touch screen technology) / selections (for soft key technology) shall indicate the label as specified in Table 36.

- 11.2.4.4 The buttons of the Settings window shall be enabled when the conditions specified in Table 36 are fulfilled and no driver's acknowledgement is required.
- 11.2.4.5 It shall be possible in the Settings window to add buttons for additional DMI technical functions (e.g. a function locking the touch screen for cleaning purpose).
- 11.2.4.5.1 Note: These additional DMI technical functions are outside of the scope of this specification. Nevertheless, it is recommended that they follow the ergonomic principles specified in this document (e.g. if a sub-level window is accessed via such button, it is recommended that the sub-level window follows the general requirements of chapter 9)

Button /selection #	label	Enabling conditions	SRS reference
1	Symbol SE03 (for touch) Language (for soft)	(train is at standstill) AND (mode is SB) OR (mode is SH/FS/LS/SR/OS/NL/UN/TR/PT/SN/RV)	4.7.2
2	Symbol SE02 (for touch) Volume (for soft)	(train is at standstill) AND (mode is SB) OR (mode is SH/FS/LS/SR/OS/NL/UN/TR/PT/SN/RV)	-
3	Symbol SE01 (for touch) Brightness (for soft)	(train is at standstill) AND (mode is SB) OR (mode is SH/FS/LS/SR/OS/NL/UN/TR/PT/SN/RV)	-
4	System version	(train is at standstill) AND (mode is SB) OR (mode is SH/FS/LS/SR/OS/NL/UN/TR/PT/SN/RV)	4.7.2
5	Set VBC	(train is at standstill) AND (mode is SB) AND (maximum on-board storage capacity of VBC set by driver is not reached, see [4] 4.5.1.2)	4.7.2
6	Remove VBC	(train is at standstill) AND (mode is SB) AND (at least one VBC is stored on-board)	4.7.2
7 and following	Used for "Additional DMI technical functions" (outside of the scope of this specification)		

Table 36 – Button / selection label

- 11.2.4.6 Figure 112 shows the presentation of the "Settings" window.

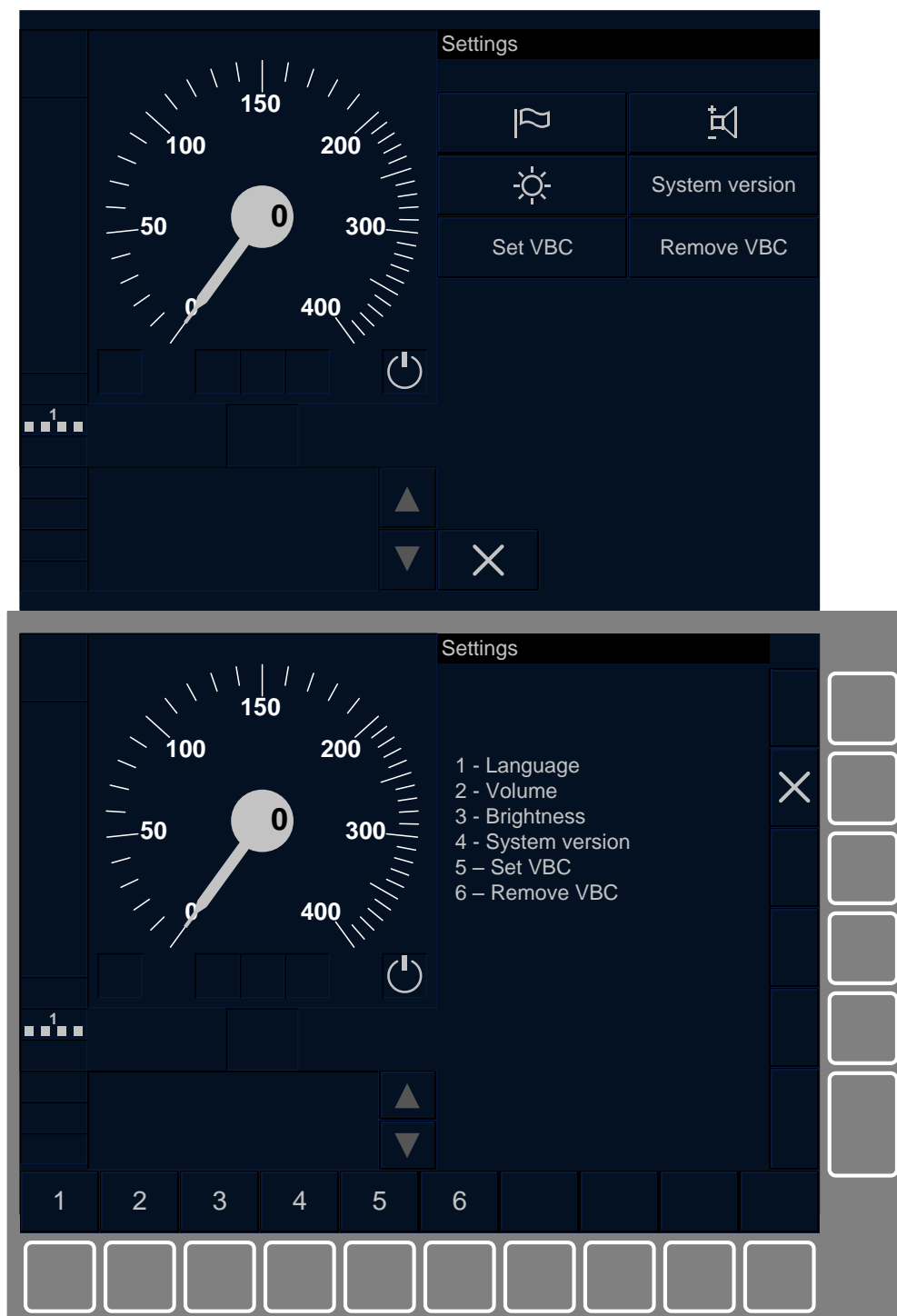


Figure 112 – Settings window

11.2.5 RBC contact window

- 11.2.5.1 The RBC contact window shall comply with the requirements in chapter 10.2.
- 11.2.5.2 The window title shall indicate “RBC contact”.
- 11.2.5.3 The buttons (for touch screen technology) / selections (for soft key technology) shall indicate the label as specified in Table 37.

ERA ERTMS unit

ETCS Driver Machine Interface

- 11.2.5.4 The buttons of the RBC contact window shall be enabled when the conditions specified in Table 37 are fulfilled and no driver's acknowledgement is required.
- 11.2.5.5 The 'Radio Network ID' button shall be a delay type button.
- 11.2.5.6 When the hour glass symbol ST05 is presented (see chapter 11.7), it shall be shown vertically centered in the 'RBC contact' window title area. The first X position of the symbol shall be 42. It shall then move 26 cells to the right every second. When it is no more possible to display the symbol ST05 inside the window title area, the symbol shall come back to its first position and shall start again moving to the right with the same pace.

Button /selection #	label	Enabling conditions	SRS reference
1	Contact last RBC	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/NL/PT) AND (ERTMS/ETCS level is valid) AND (ERTMS/ETCS level is 2/3) AND (RBC id/RBC Phone Number is invalid) AND (at least one Mobile Terminal registered to a Radio Network)	3.18.4.3.2
			3.18.4.3.3
			5.4.3.2 S3
2	Use short number	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/NL/PT) AND (ERTMS/ETCS level is valid) AND (ERTMS/ETCS level is 2/3) AND (RBC id/RBC Phone Number is invalid OR unknown) AND (at least one Mobile Terminal registered to a Radio Network)	3.18.4.3.2
			3.18.4.3.3
			3.18.4.3.4
			5.4.3.2 S3
3	Enter RBC data	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/NL/PT) AND (ERTMS/ETCS level is valid) AND (ERTMS/ETCS level is 2/3) AND (RBC id/RBC Phone Number is invalid OR unknown) AND (at least one Mobile Terminal registered to a Radio Network)	3.18.4.3.2
			3.18.4.3.3
			5.4.3.2 S3
4	Radio Network ID	(train is at standstill) AND (Driver ID is valid) AND (mode is SB/FS/LS/SR/OS/NL/PT) AND (ERTMS/ETCS level is valid) AND (ERTMS/ETCS level is 2/3) AND (RBC id/RBC Phone Number is invalid OR unknown)	3.18.4.3.2
			3.18.4.3.3
			5.4.3.2 S3

Table 37 – Button / selection label

- 11.2.5.7 Figure 113 shows the presentation of the "RBC contact" window.

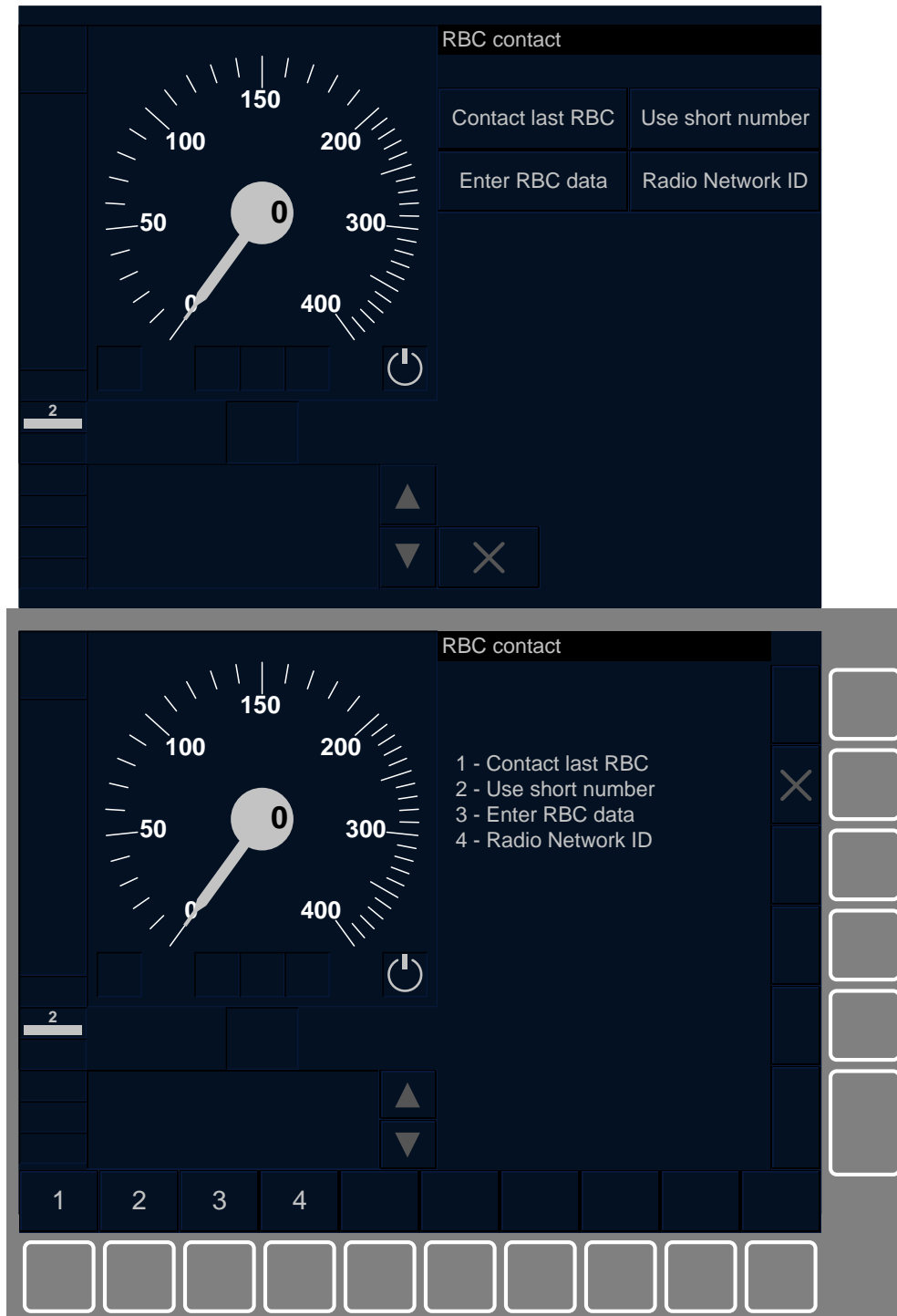


Figure 113 – RBC contact window

11.3 Data entry Windows

11.3.1 Train running number window

- 11.3.1.1 The Train running number window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.1.2 The window title shall indicate “Train running number”.

- 11.3.1.3 The single input field shall be used for the entry / revalidation of the train running number.
- 11.3.1.4 The keyboard associated to the train running number shall be a numeric keyboard.
- 11.3.1.5 Figure 114 shows the presentation of the Train running number window.

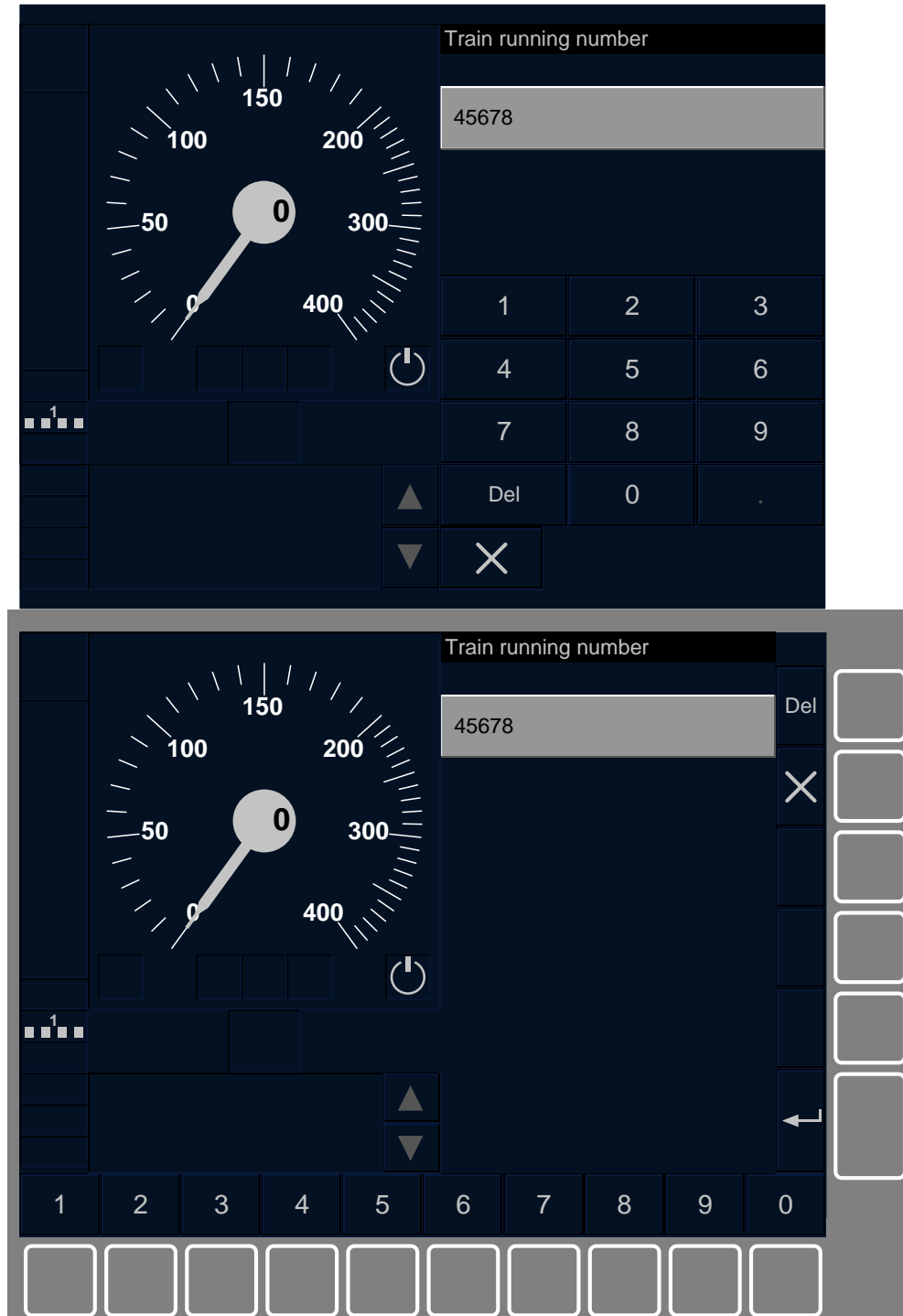


Figure 114 – Train running number window

11.3.2 ERTMS/ETCS level window

- 11.3.2.1 The ERTMS/ETCS level window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.2.2 The window title shall indicate “Level”.
- 11.3.2.3 The single input field shall be used for the entry / revalidation of the ERTMS/ETCS level.
- 11.3.2.4 The keyboard associated to the ERTMS/ETCS level shall be a dedicated keyboard as specified in Table 38 displaying the ERTMS/ETCS level(s).

Button /selection #	Label
1	Level 1
2	Level 2
3	Level 3
4	Level 0
5	NTC A
6	NTC B
7	NTC C
8	NTC D
9	NTC E
...	...

Table 38 – Keyboard for ERTMS/ETCS level

- 11.3.2.5 The buttons / selections #1, 2, 3, 4 shall be reserved respectively for the ERTMS/ETCS levels 1, 2, 3, 0.
- 11.3.2.6 For NTC levels, the labels ‘NTC A’, ‘NTC B’, ... shall be replaced by the distinct abbreviations of the concerned National Systems (its definition is inherent to the National System and is outside the scope of this specification).
- 11.3.2.7 When a table of priority of trackside supported levels (see document [3] for further details) is available onboard, only the buttons corresponding to ERTMS/ETCS levels contained in the table of priority of trackside supported levels shall be enabled; the other buttons shall be disabled.
- 11.3.2.8 When a table of priority of trackside supported levels is not available onboard, only the buttons corresponding to ERTMS/ETCS levels contained in the default list of levels configured on-board shall be enabled; the other buttons shall be disabled.
- 11.3.2.9 Figure 115 shows the presentation of the ERTMS/ETCS level window (with 6 National Systems).

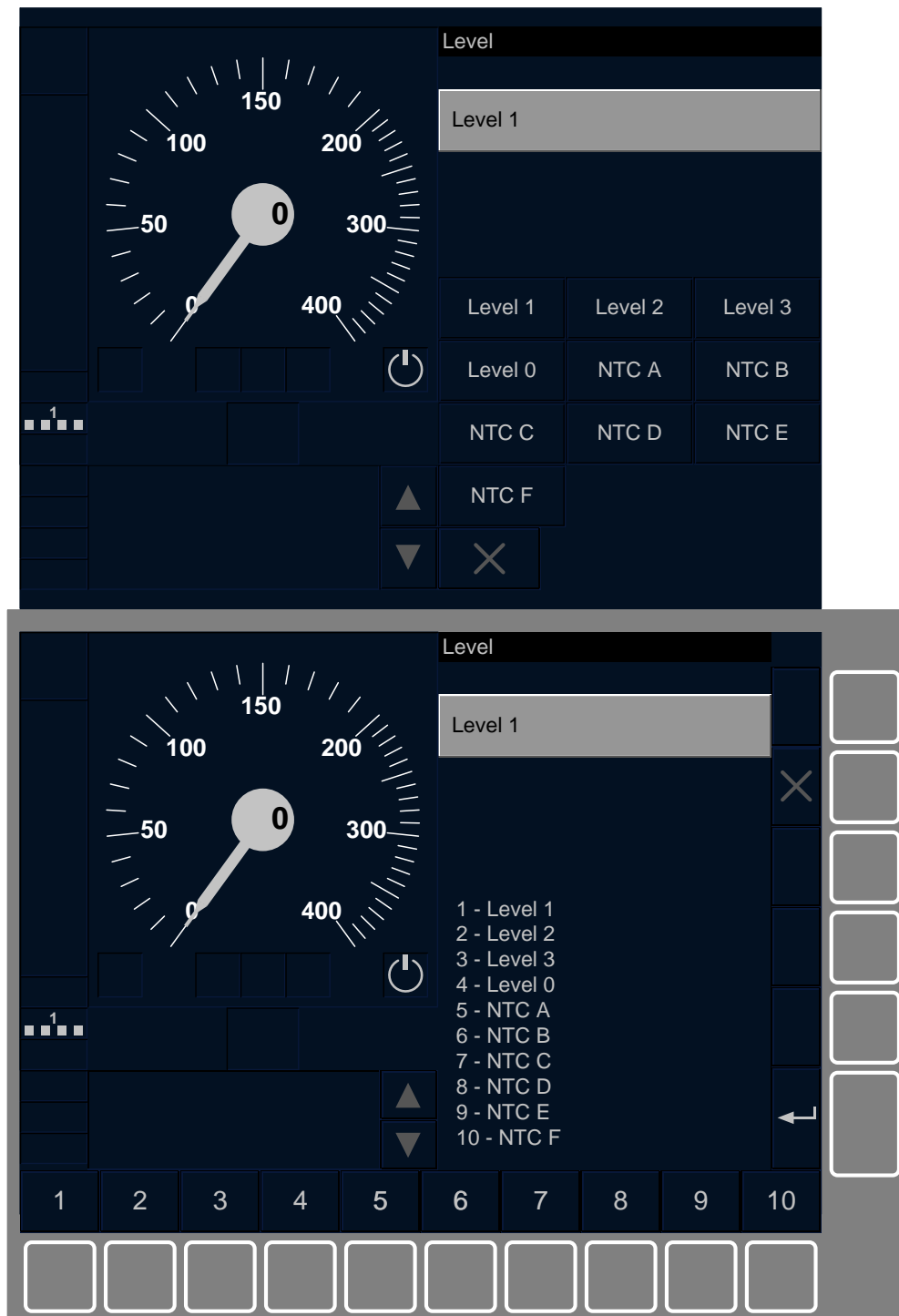


Figure 115 – ERTMS/ETCS level window

11.3.3 Driver ID window

- 11.3.3.1 The Driver ID window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.3.2 The window title shall indicate “Driver ID”.
- 11.3.3.3 The single input field shall be used for the entry / revalidation of the Driver ID.
- 11.3.3.4 The keyboard associated to the Driver ID shall be an alphanumeric keyboard.

- 11.3.3.5 When the onboard is in the step S1 of the start up dialogue sequence (see 11.7.2), the Driver ID window shall also present a 'settings' button with the symbol SE04 and a 'train running number' button with the label 'TRN'.
- 11.3.3.6 The 'settings' button shall be positioned:
- a) For touch screen technology: in the bottom right corner of D/F/G area with a size of 82 x 50 cells (w x h) i.e. at the position (224,400),
 - a) For soft key technology: in H6.
- 11.3.3.7 The 'train running number' button shall be positioned:
- a) For touch screen technology: left aligned of the 'setting' button with a size of 82 x 50 cells (w x h) i.e. at the position (142,400),
 - b) For soft key technology: in H5.
- 11.3.3.8 Figure 116 shows the presentation of the Driver ID window.

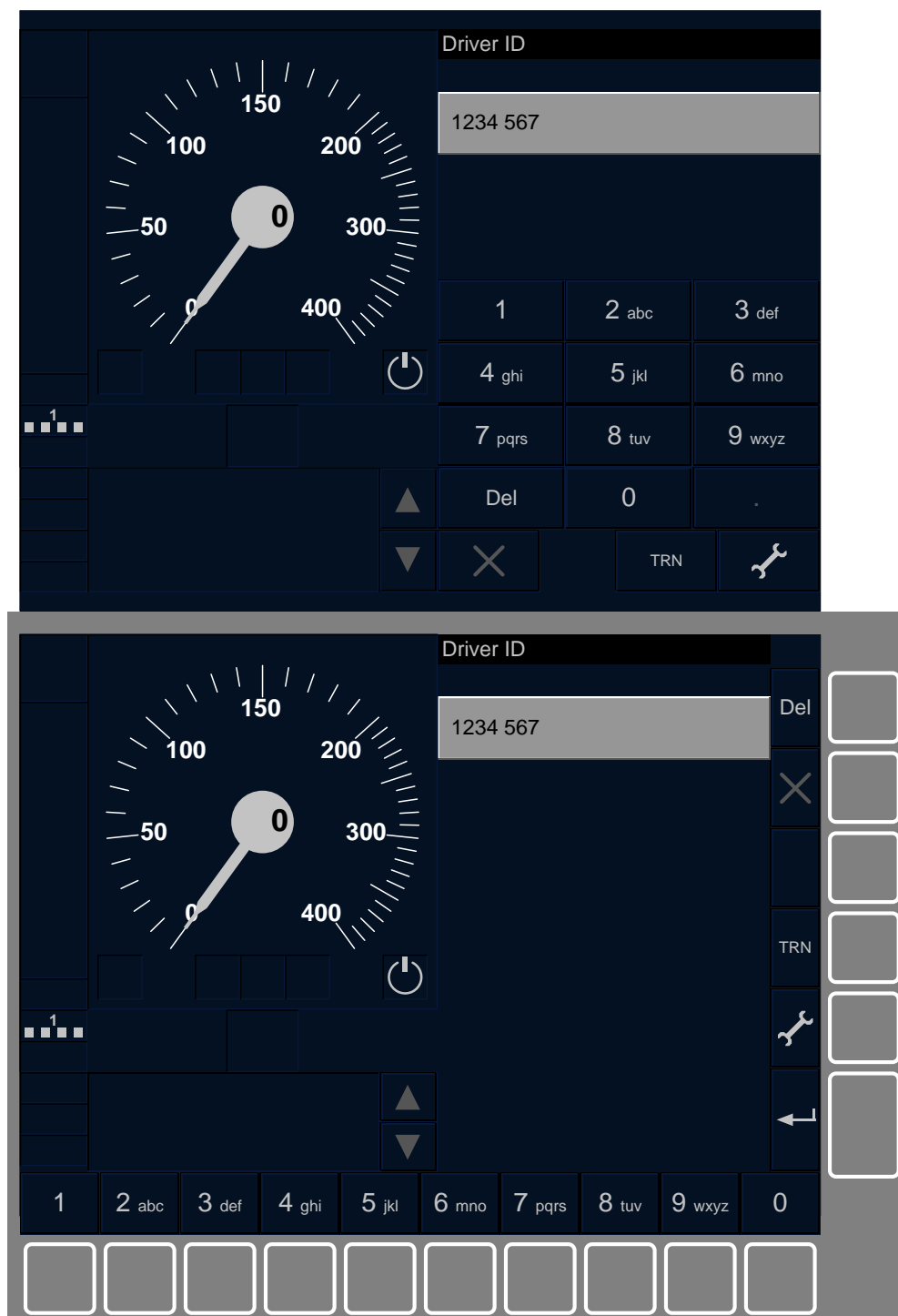


Figure 116 – Driver ID window

11.3.4 Radio network ID window

- 11.3.4.1 The Radio network ID window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part
- 11.3.4.2 The window title shall indicate “Radio network ID”.
- 11.3.4.3 The single input field shall be used for the entry / revalidation of the Radio network ID.

11.3.4.4 The keyboard associated to the Radio network ID shall be a dedicated keyboard corresponding to the alphanumeric list of available and allowed Radio Networks acquired following the driver's action on the 'Radio Network ID' button.

11.3.4.5 Figure 117 shows the presentation of the Radio network ID window.

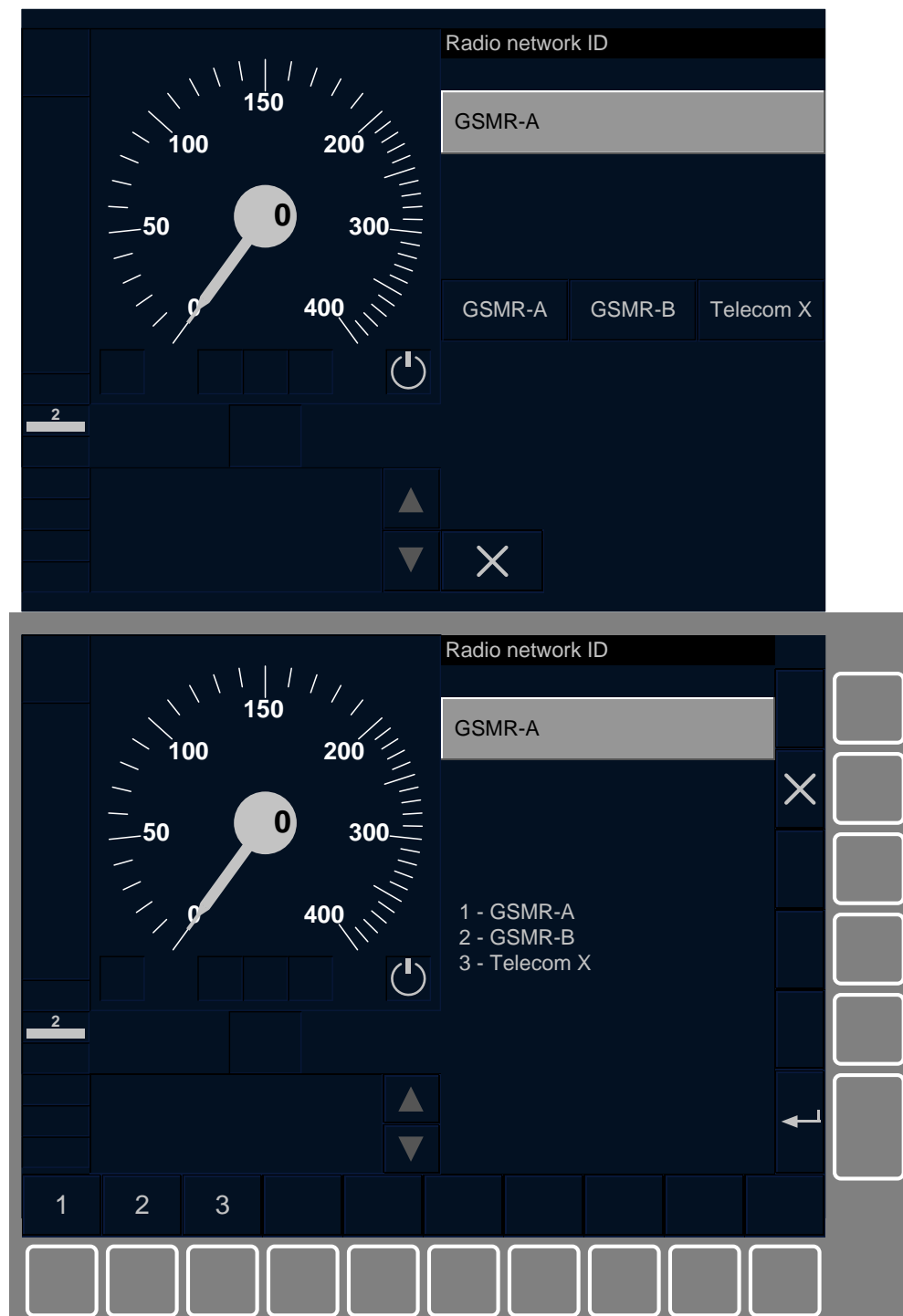


Figure 117 – Radio network ID window

11.3.5 RBC data window

11.3.5.1 The RBC data window shall comply with the requirements in chapter 10.3 for a window on total grid array with the question 'RBC data entry complete?' but no echo texts.

- 11.3.5.2 The window title shall indicate “RBC data”.
- 11.3.5.3 The 1st input field with the label ‘RBC ID’ shall be used for the entry / revalidation of the RBC ID.
- 11.3.5.3.1 When converting the entered RBC ID into binary format, the 14 less significant bits shall form the variable NID_RBC and the remaining bits (max 10 bits) shall form the variable NID_C (see [3] chapter 7 for the definitions of NID_C and NID_RBC).
- 11.3.5.4 The 2nd input field with the label ‘RBC phone number’ shall be used for the entry / revalidation of the RBC telephone number.
- 11.3.5.5 The keyboards associated to the 2 input field(s) shall be numeric keyboards.
- 11.3.5.6 Figure 118 shows the presentation of the RBC data window.

The figure displays two versions of the RBC data window. The top version is a compact interface with a dark blue background. It features a header 'RBC data' and two input fields: 'RBC ID' with the value '1234 5678' and 'RBC phone number' with the value '1234 5678' over '9012 3456'. Below these is a 3x3 numeric keypad with buttons for digits 1-9, 'Del', and '0'. At the bottom, there is a 'Yes' button and a large 'X' button. The bottom version is an expanded interface. It has the same header and input fields. The numeric keypad is larger, with buttons for digits 1-0 and additional navigation buttons: 'Del', a large 'X', and four buttons with symbols (up arrow, down arrow, left arrow, and a square). The 'Yes' button is also present.

Figure 118 – RBC data window

11.3.6 Language window

- 11.3.6.1 The Language window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.6.2 The window title shall indicate “Language”.
- 11.3.6.3 The single input field shall be used for the entry / revalidation of the language.

11.3.6.4 The keyboard associated to the language shall be a dedicated keyboard displaying the possible language(s) in its (their) own language.

11.3.6.4.1 Note: the possible language(s) depends on the onboard configuration.

11.3.6.5 Figure 119 shows the presentation of the language window.

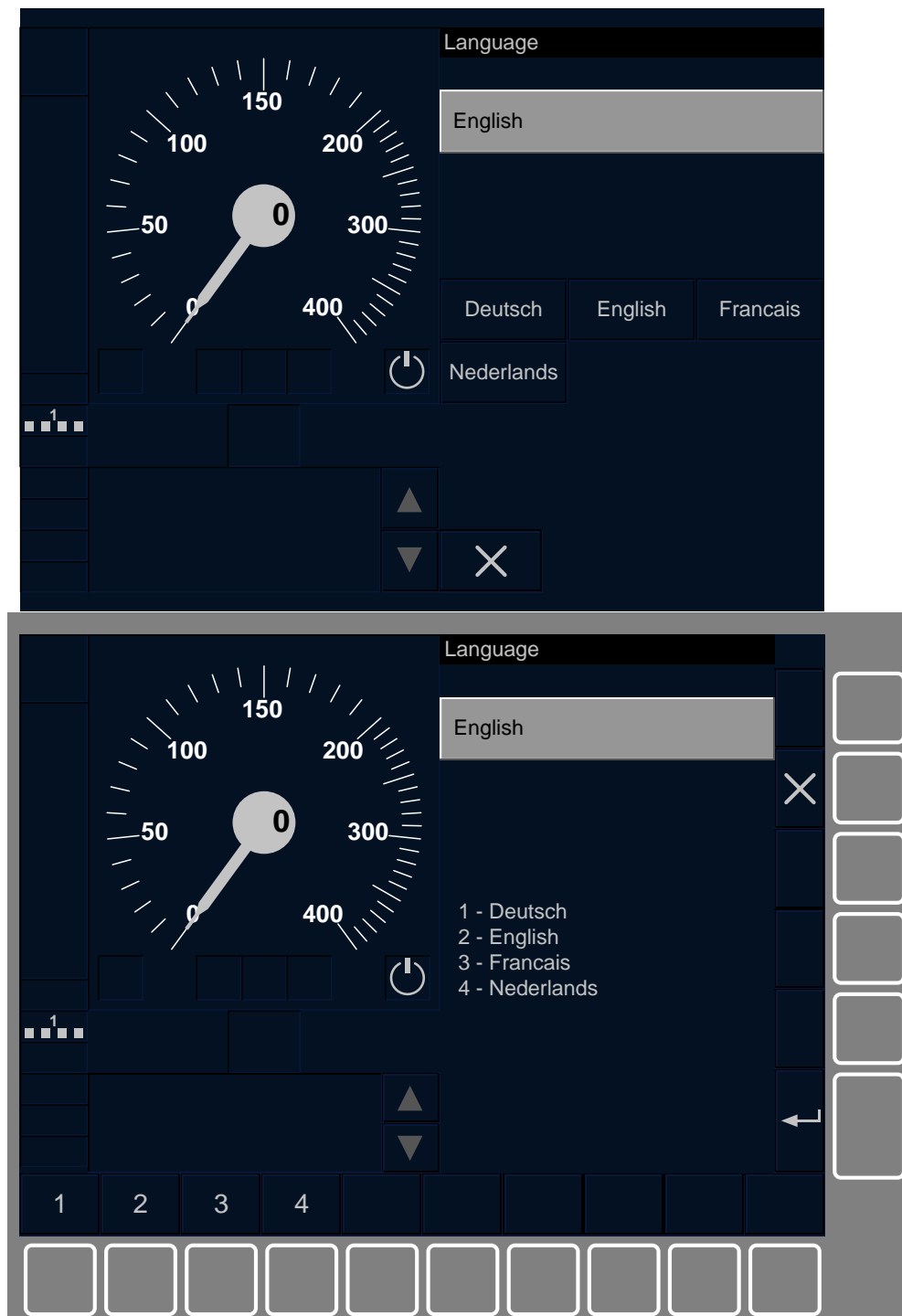


Figure 119 – Language window

11.3.7 Volume window

11.3.7.1 The Volume window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.

- 11.3.7.2 The window title shall indicate "Volume".
- 11.3.7.3 The single input field shall be used for the entry / revalidation of the volume.
- 11.3.7.4 The keyboard associated to the volume shall be a dedicated keyboard.
- 11.3.7.4.1 Note: the definition of the keyboard is an implementation issue; e.g. several buttons for different levels of volume, 2 buttons to respectively decrease/increase the volume level,...

11.3.8 Brightness window

- 11.3.8.1 The Brightness window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.8.2 The window title shall indicate "Brightness".
- 11.3.8.3 The single input field shall be used for the entry / revalidation of the luminance.
- 11.3.8.4 The keyboard associated to the luminance shall be a dedicated keyboard.
- 11.3.8.4.1 Note: the definition of the keyboard is an implementation issue; e.g. several buttons for different levels of luminance, 2 buttons to respectively decrease/increase the luminance level,...

11.3.9 Train data window(s)

- 11.3.9.1 The Train data window(s) shall comply with the requirements in chapter 10.3 for a window on total grid array with echo texts and with the question 'Train data entry complete?'.
- 11.3.9.2 The window title shall indicate "Train data".
- 11.3.9.3 If there are more than one Train data window, the window titles shall also comply with 5.3.1.2.1g) for the indication of the sequence number of the windows and the total number of windows related to the train data.
- 11.3.9.4 If data check rules have been defined for train data, the requirements in chapter 10.3.4 shall apply for the echo texts.
- 11.3.9.5 The number of input fields is not mentioned since it can vary depending on:
 - a) the chosen procedure for the train data entry (see 11.3.9.6),
 - b) whether some train data are pre-configured onboard,
 - c) whether some train data are received from other ERTMS/ETCS external sources (e.g. from the train interface),
 - d) whether train data pre-configured onboard or received from other ERTMS/ETCS external sources are modifiable by the driver,
- 11.3.9.5.1 Note: The choice to allow or not the driver to modify a train data pre-configured onboard or received from other ERTMS/ETCS external sources is outside of the scope of this specification.

- 11.3.9.6 It shall be possible to select by means of an input signal from the train interface the kind of train data entry configuration to be applied amongst the following possibilities:
- a) *Fixed train data entry*: the Train data window shall contain only one input field allowing the driver to enter a train type amongst a number of pre-configured ones. Each train type shall represent a combination of all train data. Once a train type is selected, the onboard shall not offer any possibility for the driver to change any value of a specific train data composing the selected train type.
 - b) *Flexible train data entry*: the Train data entry window(s) shall contain one or more input fields for the specific train data the driver has to enter/modify.
 - c) *Switchable train data entry*: the Train data entry window(s) shall offer the possibility to switch from a “*Fixed train data entry*” layout to a “*Flexible train data entry*” layout or vice versa.

11.3.9.7 Requirements applicable to “Switchable train data entry”:

- 11.3.9.7.1 The Train data window(s) shall by default be presented with the layout lastly used, i.e. the layout “*Fixed train data entry*” or “*Flexible train data entry*” shall always be retained.
- 11.3.9.7.2 The Train data window(s) shall present an enabled ‘switch’ button.
- 11.3.9.7.3 When the driver presses the ‘switch’ button, the Train data window(s) shall switch to the other layout, i.e. to “*Fixed train data entry*” if the current layout is “*Flexible train data entry*” or vice versa.
- 11.3.9.7.4 The label of the ‘switch’ button shall be ‘Select type’ if the Train data window(s) show a “*Flexible train data entry*” layout or with the label ‘Enter data’ if the Train data window(s) show a “*Fixed train data entry*” layout.
- 11.3.9.7.5 The ‘switch’ button shall be positioned:
- a) For touch screen technology: in the bottom right corner of D/F/G area with a size of 60 x 50 cells (w x h) i.e. at the position (246,400),
 - b) For soft key technology: in the D/G/I area and above F9 with a size of 64 x 50 cells (w x h) (i.e. at the position (178,400)). The text label of the ‘switch’ button shall be in black. The background colour shall be in medium grey. The ‘switch’ button shall have the same border as an input field applying 5.1.1.1.4.
- 11.3.9.7.6 For soft key technology, when the ‘switch’ button is enabled, an associated soft key with the same label as the ‘switch’ button shall be presented in F9 if the [Down] button has been pressed being on the last input field or the [Up] button has been pressed being on the first input field.

- 11.3.9.7.6.1 Note: the ‘switch’ button is consequently inserted between the last and the first input fields within the circular list of input fields (see 10.3.1.25).

11.3.9.8 Keyboard associated to the fixed train data entry

- 11.3.9.8.1 The keyboard associated to the train type of the fixed train data entry shall be as specified in Table 39.

Input Field	Keyboard
-------------	----------

Train type	Dedicated keyboard with each key label giving the name of the train type
------------	--

Table 39 – Keyboard for fixed train data entry

11.3.9.8.2 Note: the naming of the train types is outside of the scope of this specification.

11.3.9.9 Keyboards associated to the flexible train data entry

11.3.9.9.1 The keyboards associated to the possible input field(s) of the flexible train data entry shall be as specified in Table 40.

Input Field	Keyboard
Train category	Dedicated keyboard
Length (m)	Numeric
Brake percentage	Numeric
Maximum speed (km/h)	Numeric
Axle load category	Dedicated keyboard
Airtight	Dedicated keyboard Touch screen technology: Key '7' = No Key '8' = Yes Soft key technology: F7= No F8 = Yes
Loading gauge	Dedicated keyboard

Table 40 – Keyboards for flexible train data entry

11.3.9.9.2 The keyboard associated to the 'Train category', the 'Axle load category' and the 'Loading gauge' input field shall display keys for each ERTMS/ETCS operational train category, axle load category and loading gauge relevant for the train formation(s) (including the operational degraded situations).

11.3.9.9.3 The labels for the 'Train category' input field as well as their correspondence with NC_CDTRAIN and the brake position shall be as specified in Table 41 (see document [3] for NC_CDTRAIN and the brake position)

ERTMS/ETCS operational train category		NC_CDTRAIN (Cant Deficiency)	NC_TRAIN
Type of train	Label		
Passenger trains (PASS)	PASS 1	0 (80 mm)	Passenger train in P
	PASS 2	2 (130 mm)	Passenger train in P
	PASS 3	3 (150 mm)	Passenger train in P
Tilting trains (TILT)	TILT 1	4 (165 mm)	Passenger train in P
	TILT 2	5 (180 mm)	Passenger train in P

ERA ERTMS unit
ETCS Driver Machine Interface

	TILT 3	6 (210 mm)	Passenger train in P
	TILT 4	7 (225 mm)	Passenger train in P
	TILT 5	8 (245 mm)	Passenger train in P
	TILT 6	9 (275 mm)	Passenger train in P
	TILT 7	10 (300 mm)	Passenger train in P
Freight trains with brake position in P (FP)	FP 1	0 (80 mm)	Freight train in P
	FP 2	1 (100 mm)	Freight train in P
	FP 3	2 (130 mm)	Freight train in P
	FP 4	3 (150 mm)	Freight train in P
Freight trains with brake position in G (FG)	FG 1	0 (80 mm)	Freight train in G
	FG 2	1 (100 mm)	Freight train in G
	FG 3	2 (130 mm)	Freight train in G
	FG 4	3 (150 mm)	Freight train in G

Table 41 – Keyboard for Train category

11.3.9.9.4 The labels for the ‘Loading gauge’ input field as well as their correspondence with M_LOADINGGAUGE shall be as specified in Table 42 (see document [3] for M_LOADINGGAUGE)

Loading gauge label	M_LOADINGGAUGE
G1	1 (G1)
GA	2 (GA)
GB	3 (GB)
GC	4 (GC)
Out of GC	0 (The train does not fit to any of the interoperable loading gauge profiles)

Table 42 – Keyboard for Loading gauge

11.3.9.9.5 The labels for the ‘Axle load category’ input field shall correspond to the values of M_AXLELOADCAT (see document [3] for M_AXLELOADCAT).

11.3.9.10 Example of Train data for a variable train formation

11.3.9.10.1 This kind of train data windows are typically used for freight trains or passenger trains with a variable number of coaches.

11.3.9.10.2 Figure 120 and Figure 121 show the presentation of the Train data windows for a variable train formation using the flexible train data entry with all train data modifiable by the driver (i.e. all input fields are existing).

ERA ERTMS unit
ETCS Driver Machine Interface

Train data (1/2)																						
<div>Train category PASS 1 Length (m) 200 Brake percentage 135 Max speed (km/h) 160 Axle load category A Airtight no Loading gauge Out of GC</div> <div>Train data entry complete?</div>	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td colspan="2" style="text-align: center;">Train category</td><td style="text-align: center;">PASS 1</td></tr><tr><td colspan="3" style="text-align: center;">Length (m) 200</td></tr><tr><td colspan="3" style="text-align: center;">Brake percentage 135</td></tr><tr><td colspan="3" style="text-align: center;">Max speed (km/h) 160</td></tr><tr><td style="text-align: center;">PASS 1</td><td style="text-align: center;">PASS 2</td><td style="text-align: center;">PASS 3</td></tr><tr><td style="text-align: center;">FP 2</td><td style="text-align: center;">FP 3</td><td style="text-align: center;">FP 4</td></tr><tr><td style="text-align: center;">FG 2</td><td style="text-align: center;">FG 3</td><td style="text-align: center;">FG 4</td></tr></table> <div style="display: flex; justify-content: space-between; align-items: center; padding-top: 10px;">Yes✕◀▶</div>	Train category		PASS 1	Length (m) 200			Brake percentage 135			Max speed (km/h) 160			PASS 1	PASS 2	PASS 3	FP 2	FP 3	FP 4	FG 2	FG 3	FG 4
Train category		PASS 1																				
Length (m) 200																						
Brake percentage 135																						
Max speed (km/h) 160																						
PASS 1	PASS 2	PASS 3																				
FP 2	FP 3	FP 4																				
FG 2	FG 3	FG 4																				

Train data (1/2)																
<div>Train category PASS 1 Length (m) 200 Brake percentage 135 Max speed (km/h) 160 Axle load category A Airtight no Loading gauge Out of GC</div> <div>Train data entry complete?</div>	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td colspan="2" style="text-align: center;">Train category</td><td style="text-align: center;">PASS 1</td></tr><tr><td colspan="3" style="text-align: center;">Length (m) 200</td></tr><tr><td colspan="3" style="text-align: center;">Brake percentage 135</td></tr><tr><td colspan="3" style="text-align: center;">Max speed (km/h) 160</td></tr><tr><td colspan="3" style="vertical-align: top; padding: 5px;">1 - PASS 1 2 - PASS 2 3 - PASS 3 4 - FP 2 5 - FP 3 6 - FP 4 7 - FG 2 8 - FG 3 9 - FG 4</td></tr></table> <div style="display: flex; justify-content: space-between; align-items: center; padding-top: 10px;">Yes✕▶▲▼↶</div>	Train category		PASS 1	Length (m) 200			Brake percentage 135			Max speed (km/h) 160			1 - PASS 1 2 - PASS 2 3 - PASS 3 4 - FP 2 5 - FP 3 6 - FP 4 7 - FG 2 8 - FG 3 9 - FG 4		
Train category		PASS 1														
Length (m) 200																
Brake percentage 135																
Max speed (km/h) 160																
1 - PASS 1 2 - PASS 2 3 - PASS 3 4 - FP 2 5 - FP 3 6 - FP 4 7 - FG 2 8 - FG 3 9 - FG 4																

1

2

3

4

5

6

7

8

9

Figure 120 – Train data window for a variable train formation with all train data modifiable by the driver (1st window)

Train data (2/2)

Axle load category A

Airtight no

Loading gauge Out of GC

Train category PASS 1
Length (m) 200
Brake percentage 135
Max speed (km/h) 160
Axle load category A
Airtight no
Loading gauge Out of GC

Train data entry complete?

Yes

X ◀ ▶

Train data (2/2)

Axle load category A

Airtight no

Loading gauge Out of GC

Train category PASS 1
Length (m) 200
Brake percentage 135
Max speed (km/h) 160
Axle load category A
Airtight no
Loading gauge Out of GC

Train data entry complete?

Yes

1 - A
2 - B1
3 - B2
4 - C2
5 - C3
6 - C4
7 - D2
8 - D3
9 - D4

Del ◀ ▶ ▲ ▼ ↵

1 2 3 4 5 6 7 8 9 ...

Figure 121 – Train data window for a variable train formation with all train data modifiable by the driver (2nd window)

11.3.9.10.3 Figure 122 shows the presentation of the Train data windows for a variable train formation using the flexible train data entry with the train category, the airtight and the loading gauge pre-configured onboard or received from other ERTMS/ETCS external sources and not modifiable by the driver i.e. without the 'Train category', 'Airtight' and 'Loading gauge' input fields.

Train data		
Length (m)	200	
Brake percentage	135	
Max speed (km/h)	160	
Axle load category	A	
1	2	3
4	5	6
7	8	9
Del	0	.
Train data entry complete?		
Yes		
X		

Train data									
Length (m)	200								
Brake percentage	135								
Max speed (km/h)	160								
Axle load category	A								
Train data entry complete?									
Yes									
X									
Del									
X									
▲									
▼									
←									
1	2	3	4	5	6	7	8	9	0

Figure 122 – Train data window for a variable train formation with the train category, the airtight and the loading gauge pre-configured onboard or received from other ERTMS/ETCS external sources and not modifiable by the driver

11.3.9.11 Example of Train data for a fixed train formation

11.3.9.11.1 This kind of train data windows are typically used for train sets (coupled or not) or push-pull trains.

11.3.9.11.2 Figure 123 shows the presentation of the Train data window for a fixed train formation using the fixed train data entry.

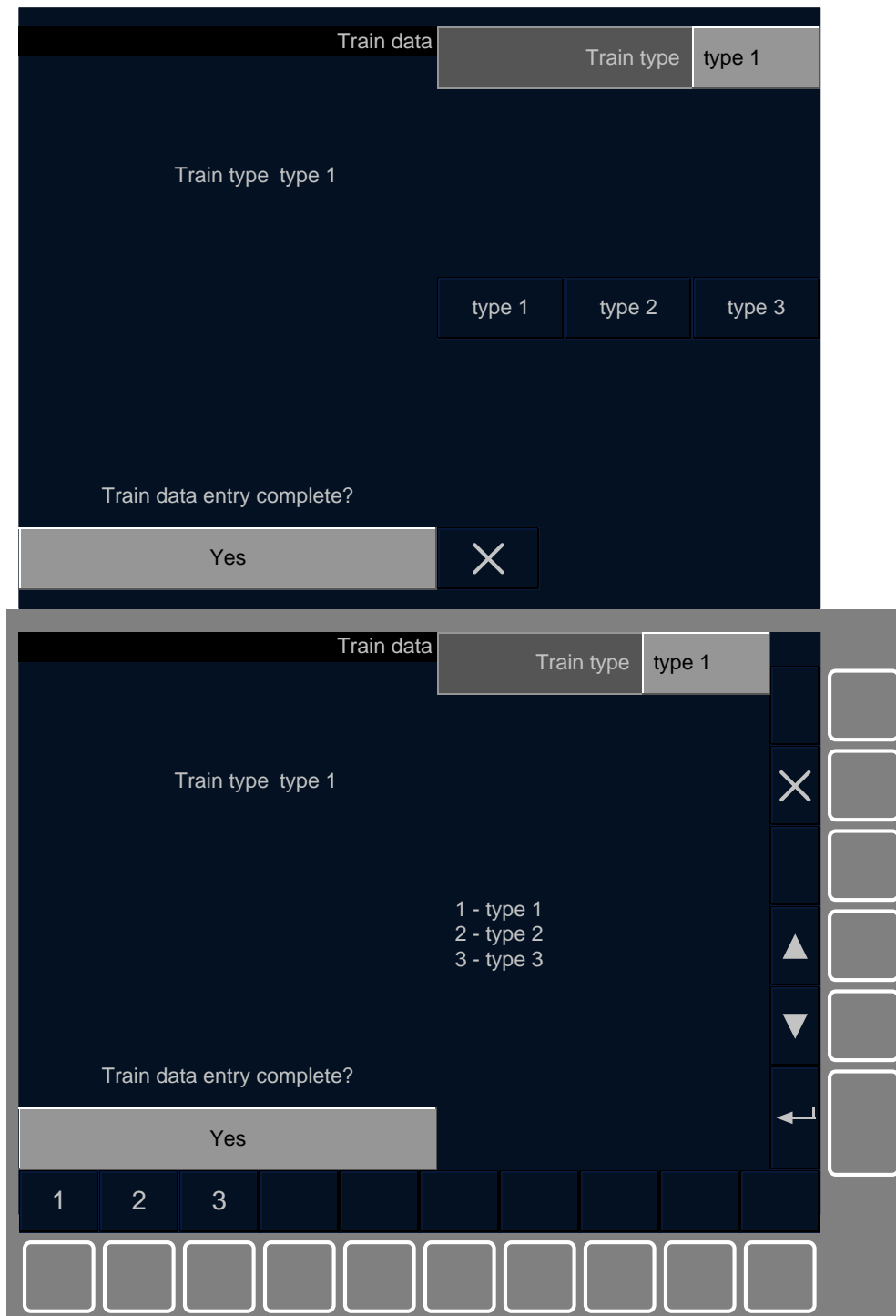


Figure 123 – Train data window for a fixed train formation

11.3.9.12 Example of Train data window allowing to switch from fixed to flexible train data entry or vice versa

11.3.9.12.1 This kind of train data window allows via the 'switch' button to manually adapt the train data entry from fixed to variable train formations or vice versa.

11.3.9.12.2 Figure 124 shows the presentation of the Train data window using the switchable train data entry with a fixed train data entry layout.

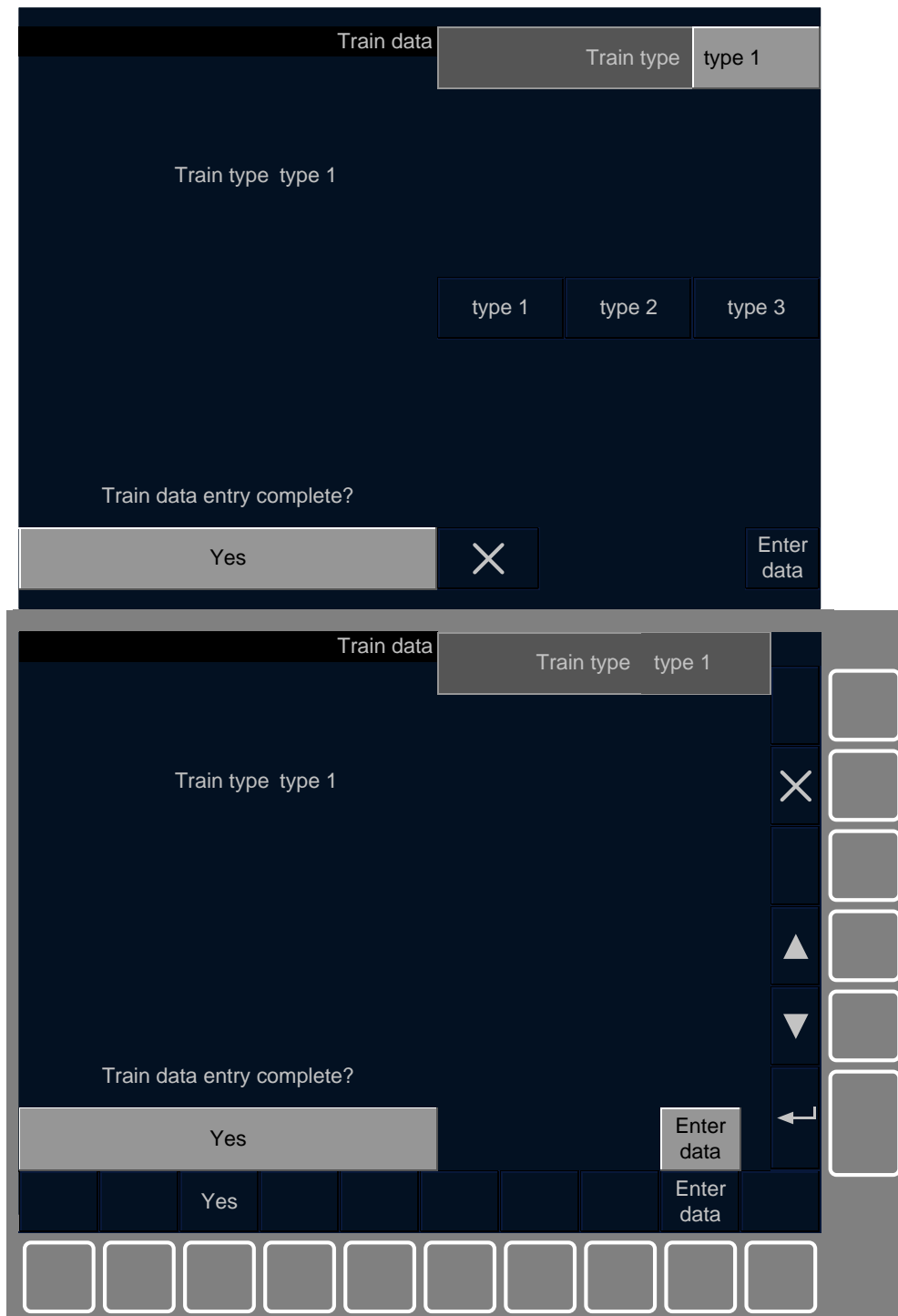


Figure 124 – Train data window allowing to switch from fixed to variable train formations

11.3.9.12.3 Figure 125 shows the presentation of the 1st Train data window using the switchable train data entry with a flexible train data entry layout and with all train data modifiable by the driver (i.e. all input fields are existing).

Train data (1/2)	
Train category PASS 1 Length (m) 200 Brake percentage 135 Max speed (km/h) 160 Axle load category A Airtight no Loading gauge Out of GC	Train category
	Length (m)
	Brake percentage
	Max speed (km/h)
	PASS 1
	FP 2
Train data entry complete?	
<div style="display: flex; justify-content: space-between; align-items: center;"> Yes ✕ ◀ ▶ Select type </div>	

Train data (1/2)	
Train category PASS 1 Length (m) 200 Brake percentage 135 Max speed (km/h) 160 Axle load category A Airtight no Loading gauge Out of GC	Train category
	Length (m)
	Brake percentage
	Max speed (km/h)
	PASS 1
	FP 2
Train data entry complete?	
<div style="display: flex; justify-content: space-between; align-items: center;"> Yes Select type </div>	

Yes

Select type

Yes

Select type

Figure 125 – Train data window allowing to switch from variable to fixed train formations

11.3.10 SR speed / distance window

- 11.3.10.1 The SR speed/distance window shall comply with the requirements in chapter 10.3 for a window on total grid array with echo texts and with the question 'SR speed / distance entry complete?'.
- 11.3.10.2 The window title shall indicate "SR speed / distance".
- 11.3.10.3 If data check rules have been defined for SR speed / distance, the requirements in chapter 10.3.4 shall apply for the echo texts.

- 11.3.10.4 The 1st input field shall be used for the entry / revalidation of the SR speed.
- 11.3.10.5 The 2nd input field shall be used for the entry / revalidation of the SR distance.
- 11.3.10.6 The keyboards associated to the 2 input field(s) “SR speed” and “SR distance” shall be numeric keyboards.
- 11.3.10.7 Figure 126 shows the presentation of the SR speed / distance window.

The figure displays two versions of the SR speed / distance window. The top version is a simplified layout with a title bar 'SR speed/distance', two input fields for 'SR speed (km/h)' (40) and 'SR distance (m)' (450), a numeric keypad, and a 'Yes' button. The bottom version is a more complex layout with the same title bar and input fields, but includes a 'Del' button, a close button (X), and a set of navigation buttons (up, down, left, right) on the right side. The bottom version also has a numeric keypad at the bottom.

Figure 126 – SR speed / distance window

11.3.11 Adhesion window

- 11.3.11.1 The adhesion window shall comply with the requirements in chapter 10.3 for a window on half grid array containing a single input field with only the data part.
- 11.3.11.2 The window title shall indicate “Adhesion”.
- 11.3.11.3 The single input field shall be used for the entry / revalidation of the adhesion.
- 11.3.11.4 The keyboard associated to the adhesion shall be a dedicated keyboard as specified in Table 43 displaying the possible adhesion status.

Button /selection #	Label
1	Non slippery rail
2	Slippery rail

Table 43 – Keyboard for adhesion

- 11.3.11.5 Figure 127 shows the presentation of the adhesion window.

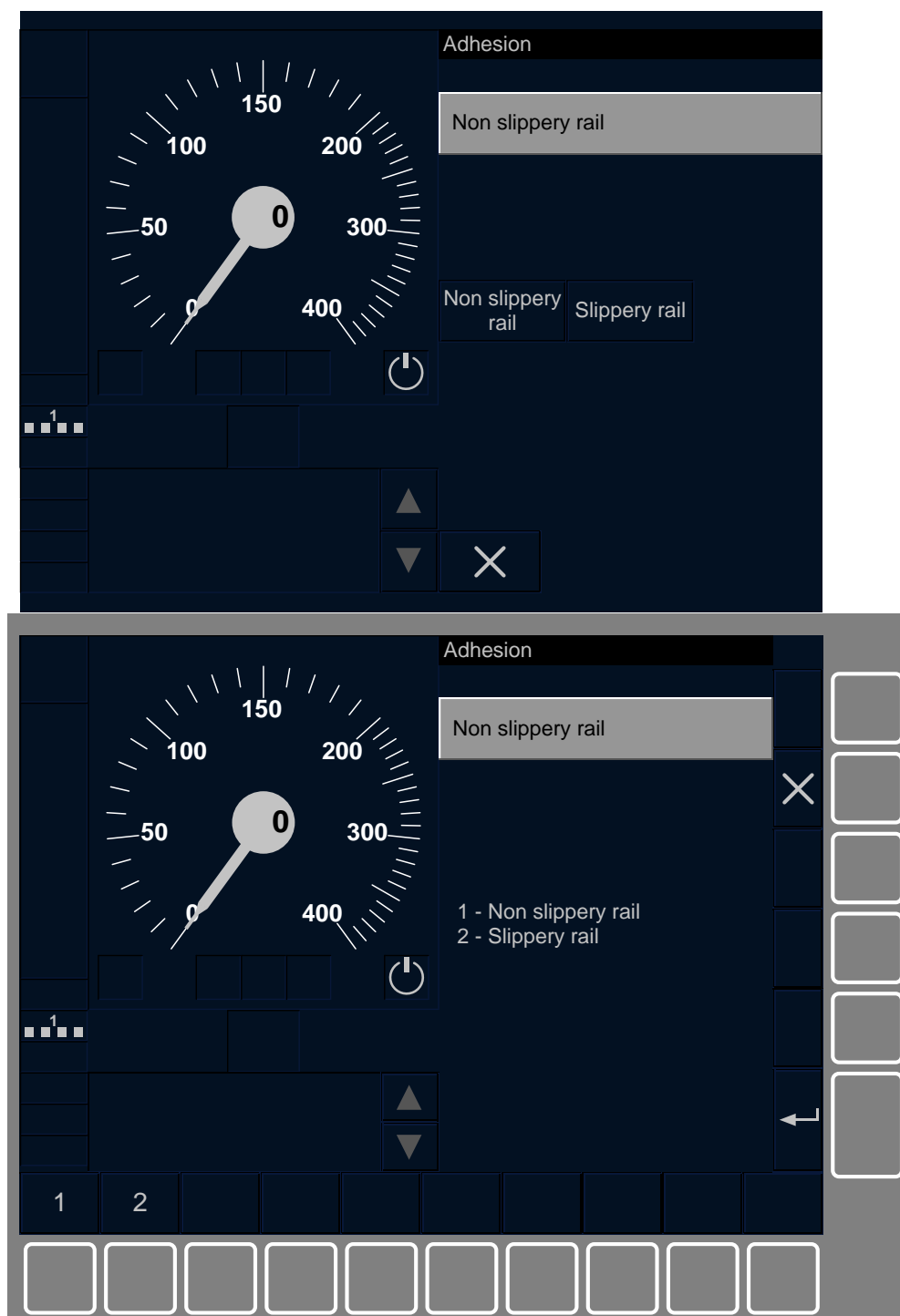


Figure 127 – Adhesion window

11.3.12 Set VBC window

- 11.3.12.1 The Set VBC window shall comply with the requirements in chapter 10.3 for a window on total grid array with echo texts and with the question 'Set VBC entry complete?'.
- 11.3.12.2 The window title shall indicate "Set VBC".
- 11.3.12.3 If data check rules have been defined for set VBC, the requirements in chapter 10.3.4 shall apply for the echo texts.

- 11.3.12.4 The single input field 'VBC set code' with the label 'VBC code' shall be used for the entry of a new VBC in the list of Virtual Balise Covers stored on-board.
- 11.3.12.5 When converting the entered 'VBC set code' into binary format, the 6 less significant bits shall form the variable NID_VBCMK, the next 10 bits shall form the variable NID_C and the remaining bits shall form the variable T_VBC (see [3] chapter 7 for the definitions of NID_C, NID_VBCMK and T_VBC).
- 11.3.12.6 The keyboard associated to the 'VBC set code' shall be a numeric keyboard.
- 11.3.12.7 Figure 128 shows the presentation of the Set VBC window.

The figure displays two versions of the 'Set VBC' window. The top version is a simplified schematic showing a title bar 'Set VBC', a label 'VBC code' with the value '321456', a large text area displaying 'VBC code 321456', a numeric keypad (1-9, 0, Del), a 'Set VBC entry complete?' prompt, a 'Yes' button, and a close button (X). The bottom version is a more detailed representation of the same window, showing a full numeric keypad at the bottom, a vertical column of navigation buttons (Del, X, and four arrow keys) on the right, and the same internal layout as the top view.

Figure 128 – Set VBC window

11.3.13 Remove VBC window

- 11.3.13.1 The Remove VBC window shall comply with the requirements in chapter 10.3 for a window on total grid array with echo texts and with the question 'Remove VBC entry complete?'.
- 11.3.13.2 The window title shall indicate "Remove VBC".
- 11.3.13.3 If data check rules have been defined for Remove VBC, the requirements in chapter 10.3.4 shall apply for the echo text.
- 11.3.13.4 The single input field 'VBC remove code' with the label 'VBC code' shall be used for the entry of a VBC to be removed from the list of Virtual Balise Covers stored on-board.
- 11.3.13.5 When converting the entered 'VBC remove code' into binary format, the 10 less significant bits shall form the variable NID_C, the next 6 bits shall form the variable NID_VBCMK and the remaining bits (max 8 bits) shall not be used by the on-board (see [3] chapter 7 for the definitions of NID_C, NID_VBCMK).
- 11.3.13.6 The keyboard associated to the 'VBC remove code' shall be a numeric keyboard.
- 11.3.13.7 Figure 129 shows the presentation of the Remove VBC window.



Figure 129 – Remove VBC window

11.4 Data validation windows

11.4.1 Train data validation window

- 11.4.1.1 The Train data validation window shall comply with the requirements in chapter 10.4.
- 11.4.1.2 The window title shall indicate “Validate train data”.
- 11.4.1.3 The echo texts shall echo data of the Train data window(s) (see 11.3.9).

- 11.4.1.4 Figure 130 shows the presentation of the Train data validation window with the data of the 2 input fields 'length' and 'max speed' modified by the driver and consequently shown in white applying 10.3.3.5.

Validate train data Yes

Train category PASS 1
Length (m) 200
Brake percentage 135
Max speed (km/h) 160
Axle load category A
Airtight no
Loading gauge Out of GC

No Yes

X

Validate train data Yes

Train category PASS 1
Length (m) 200
Brake percentage 135
Max speed (km/h) 160
Axle load category A
Airtight no
Loading gauge Out of GC

X

No Yes

←

Figure 130 – Train data validation window

11.4.2 Set VBC validation window

- 11.4.2.1 The Set VBC validation window shall comply with the requirements in chapter 10.4.
- 11.4.2.2 The window title shall indicate “Validate set VBC”.

11.4.2.3 The echo text shall echo data of the Set VBC window (see 11.3.12).

11.4.2.4 Figure 131 shows the presentation of the Set VBC validation window

11.4.2.4.1 Note: the echo text is always shown in white applying 10.3.3.5 since the input field of the Set VBC window is always entered by the driver.

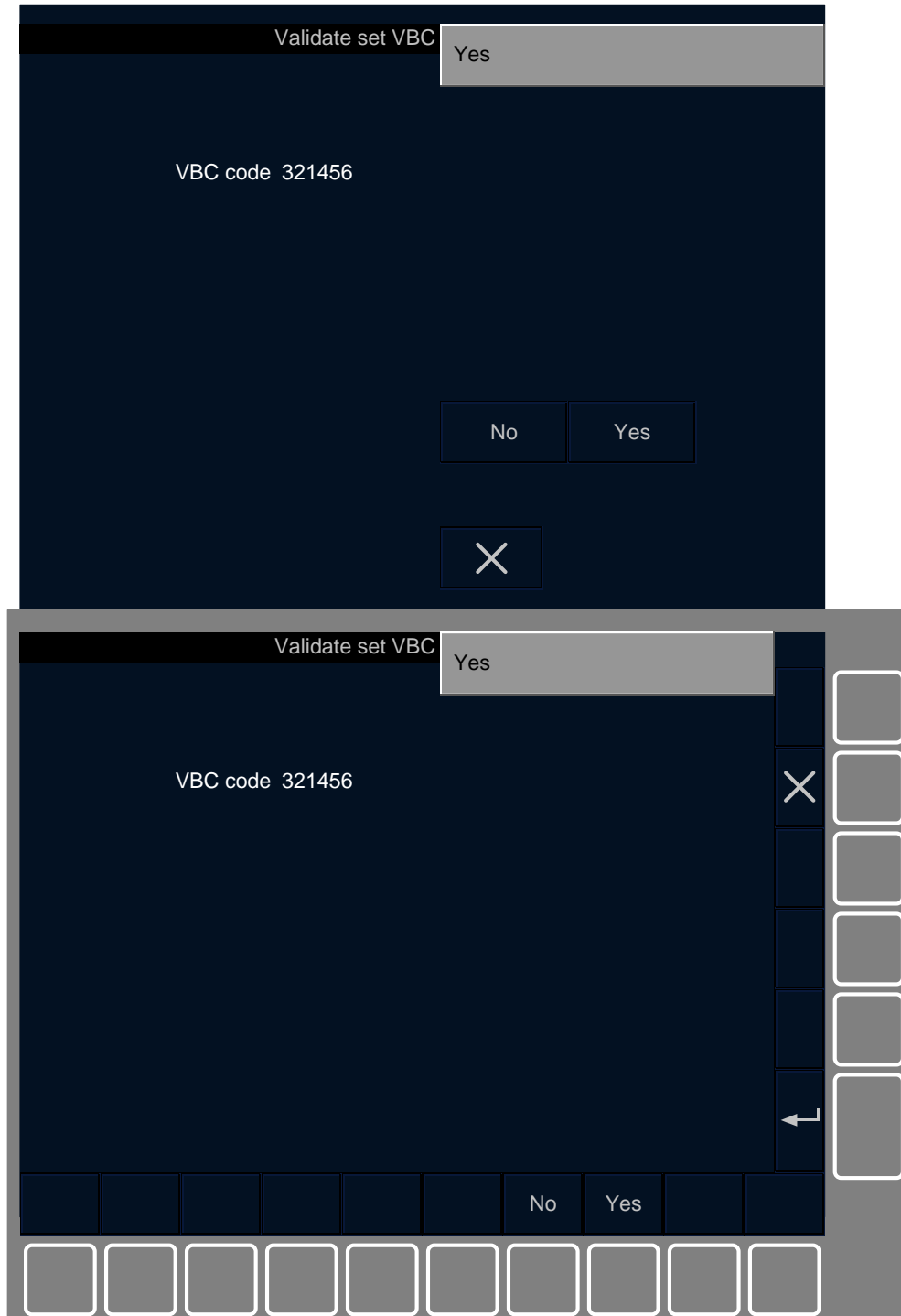


Figure 131 – Set VBC validation window

11.4.3 Remove VBC validation window

11.4.3.1 The Remove VBC validation window shall comply with the requirements in chapter 10.4.

- 11.4.3.2 The window title shall indicate “Validate remove VBC”.
- 11.4.3.3 The echo text shall echo data of the Remove VBC window (see 11.3.13).
- 11.4.3.4 Figure 132 shows the presentation of the Remove VBC validation window
- 11.4.3.4.1 Note: the echo text is always shown in white applying 10.3.3.5 since the input field of the Remove VBC window is always entered by the driver.

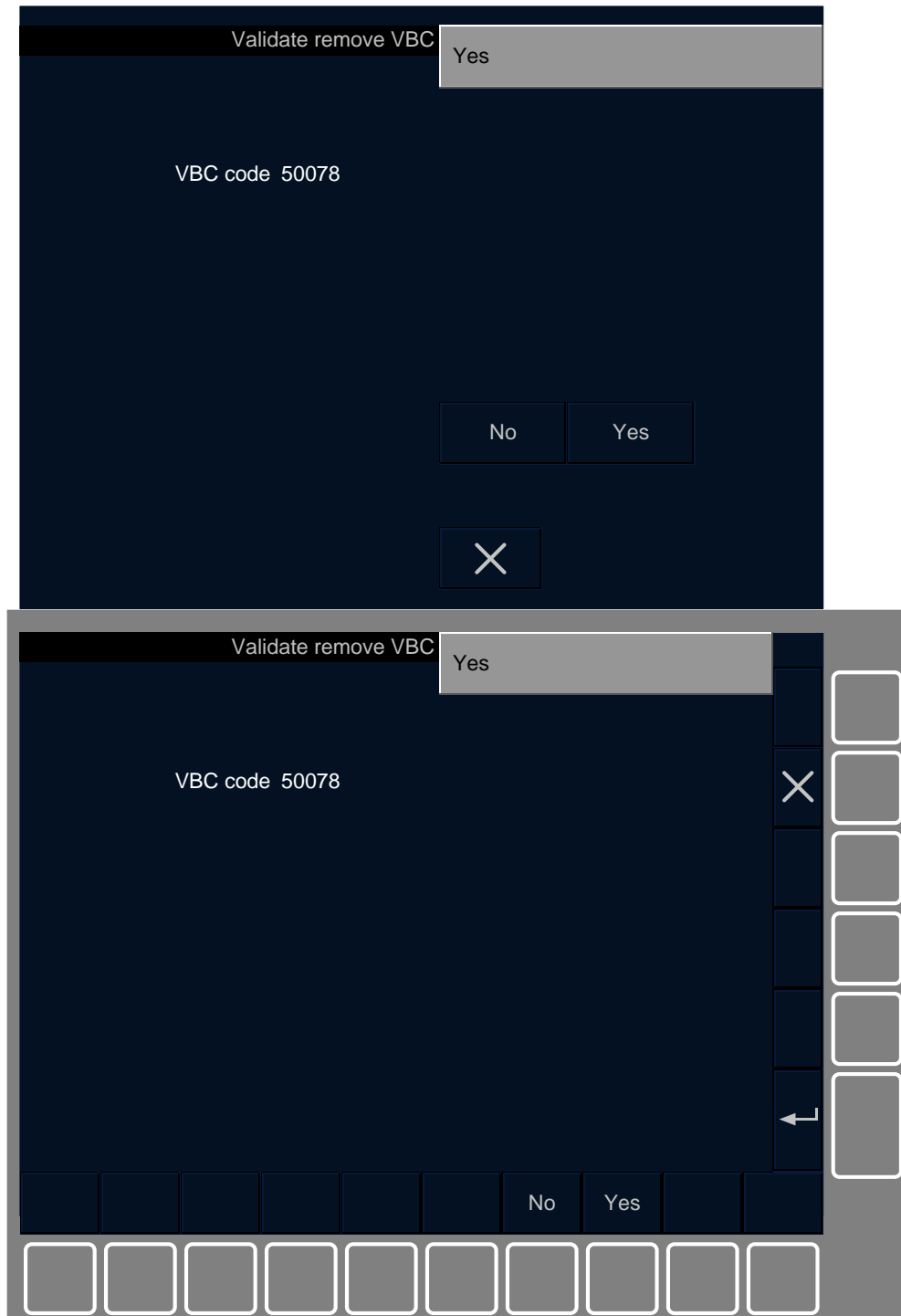


Figure 132 – Remove VBC validation window

11.5 Data view windows

11.5.1 Data view window

- 11.5.1.1 The Data view windows shall comply with the requirements in chapter 10.5.
- 11.5.1.2 The window titles shall indicate “Data view”.
- 11.5.1.3 The window titles shall also comply with 5.3.1.2.1g) for the indication of the sequence number of the windows and the total number of windows related to the Data view.
- 11.5.1.4 The data view items shall be as specified in Table 44 for fixed train data entry and as specified in Table 45 for flexible train data entry.
- 11.5.1.5 For the topic “Train data”, only data view items corresponding to the Train Data either modifiable by the driver or modifiable by other ERTMS/ETCS external sources shall be displayed.
- 11.5.1.5.1 Note: a Train Data is considered as modifiable if it can be impacted by a change of value of the train type (fixed train data entry) or of its individual input field (flexible train data entry)
- 11.5.1.6 For the topic “VBCs stored on-board”, the number of data view items is not mentioned since it can vary depending on the number of VBCs stored on-board.

Topic	Window #	Data view item #	Label
Driver ID	1	1	Driver ID
Train running number	1	2	Train running number
Train data	1	3	Train type
Train data	1	4	Train category
		5	Length (m)
		6	Brake percentage
		7	Maximum speed (km/h)
		8	Axle load category
		9	Airtight
		10	Loading gauge
RBC contact info	2	11	Radio network ID
		12	RBC ID
		13	RBC phone number
VBCs stored on-board	2..n	14	VBC #1 set code
		15	VBC #2 set code
	

Table 44 – Data view items for fixed train data entry

Topic	Window #	Data view item #	Label
Driver ID	1	1	Driver ID

ERA ERTMS unit
ETCS Driver Machine Interface

Topic	Window #	Data view item #	Label
Train running number	1	2	Train running number
Train data	1	4	Train category
		5	Length (m)
		6	Brake percentage
		7	Maximum speed (km/h)
		8	Axle load category
		9	Airtight
		10	Loading gauge
RBC contact info	2	11	Radio network ID
		12	RBC ID
		13	RBC phone number
VBCs stored on-board	2..n	14	VBC #1 set code
		15	VBC #2 set code
	

Table 45 – Data view items for flexible train data entry

11.5.1.7 Figure 133 and Figure 134 show the presentation of 2 Data view windows.

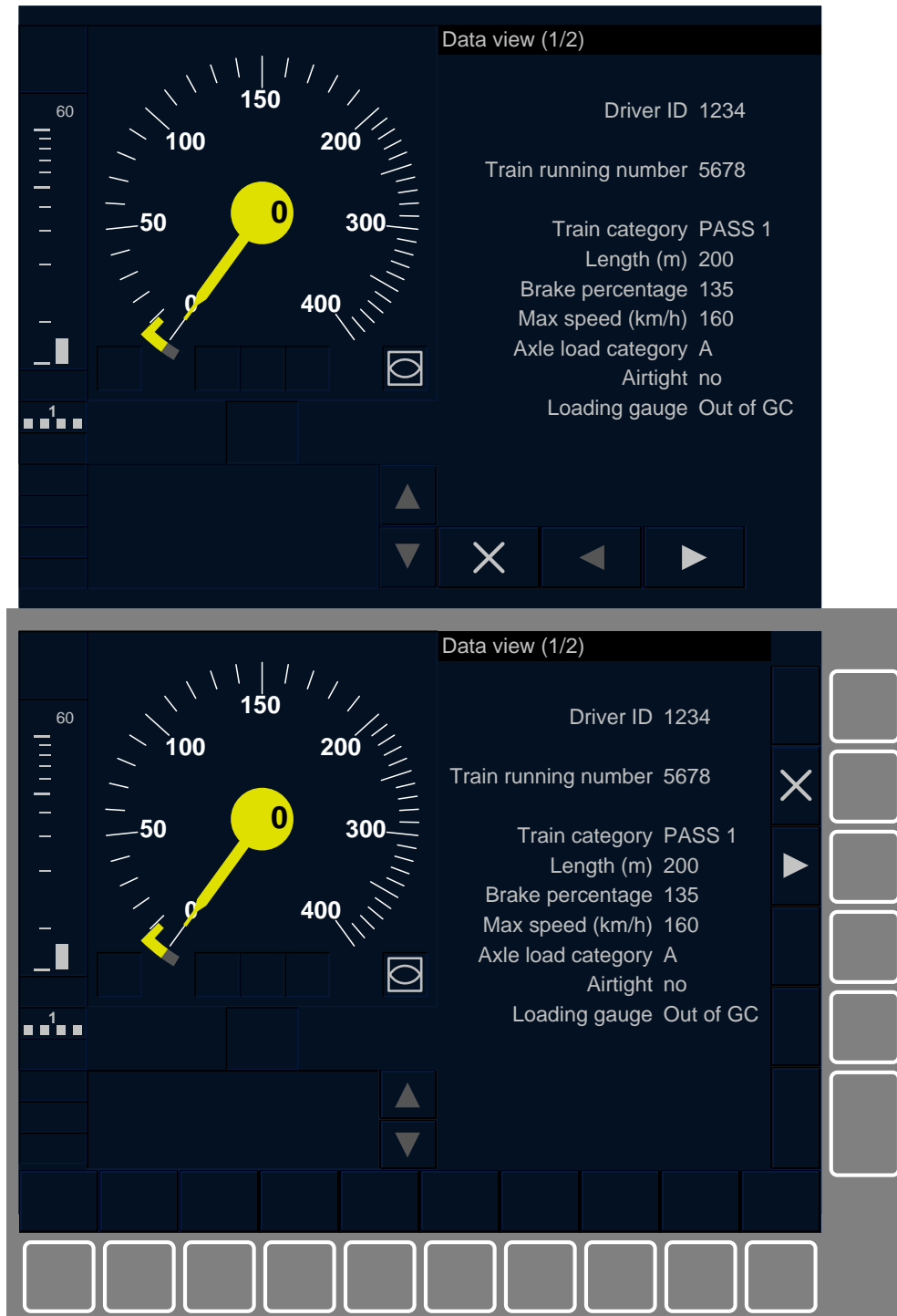


Figure 133 – Data view window (1st window)

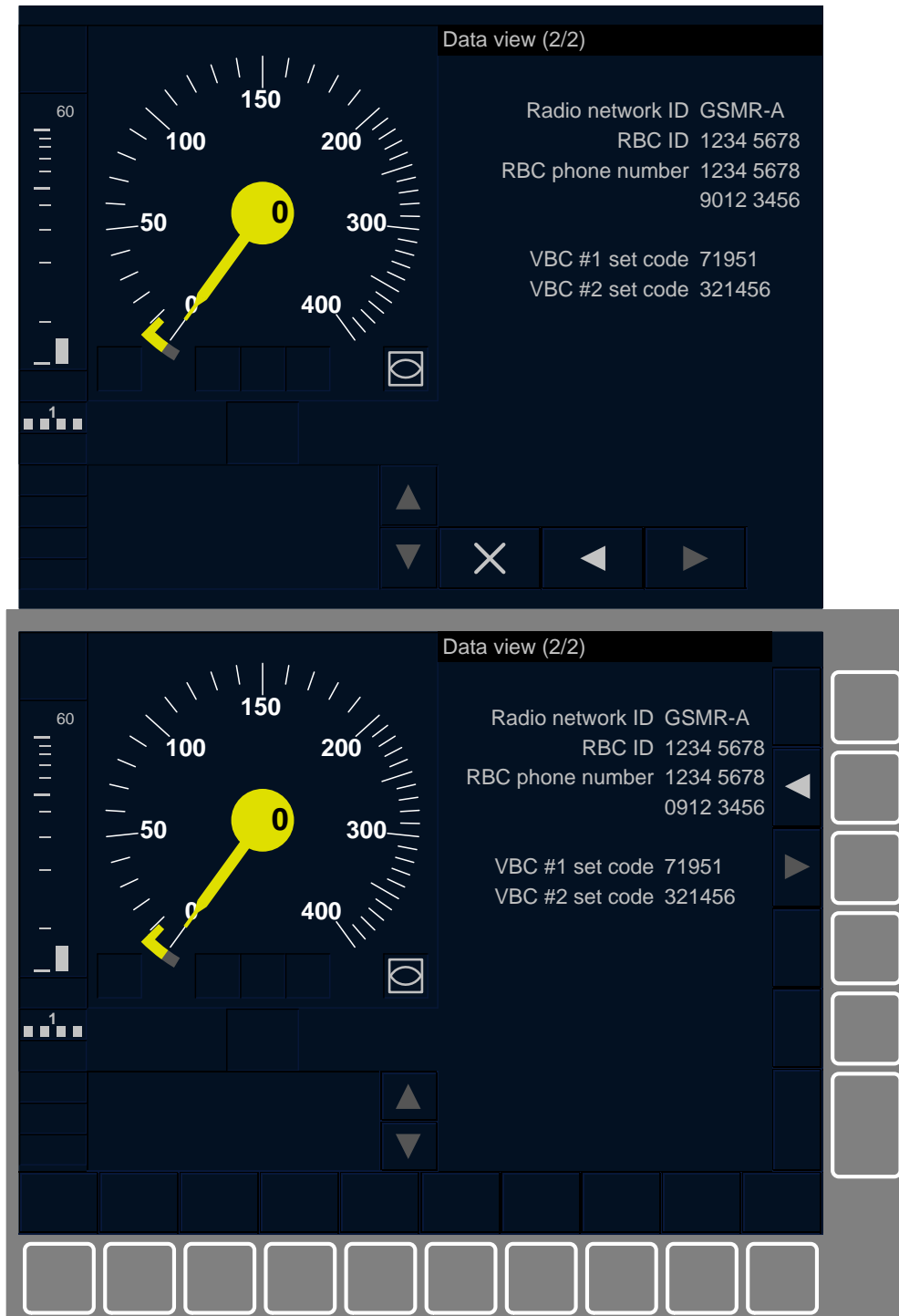


Figure 134 – Data view window (2nd window)

11.5.2 System version window

11.5.2.1 The System version window shall comply with the requirements in chapter 10.5.

11.5.2.2 The window title shall indicate “System version”.

11.5.2.3 The data view item shall be as specified in Table 46.

Topic	data view text #	data
System version	1	Operated system version

Table 46 – Data view items

11.5.2.4 Figure 135 shows the presentation of the System version window.

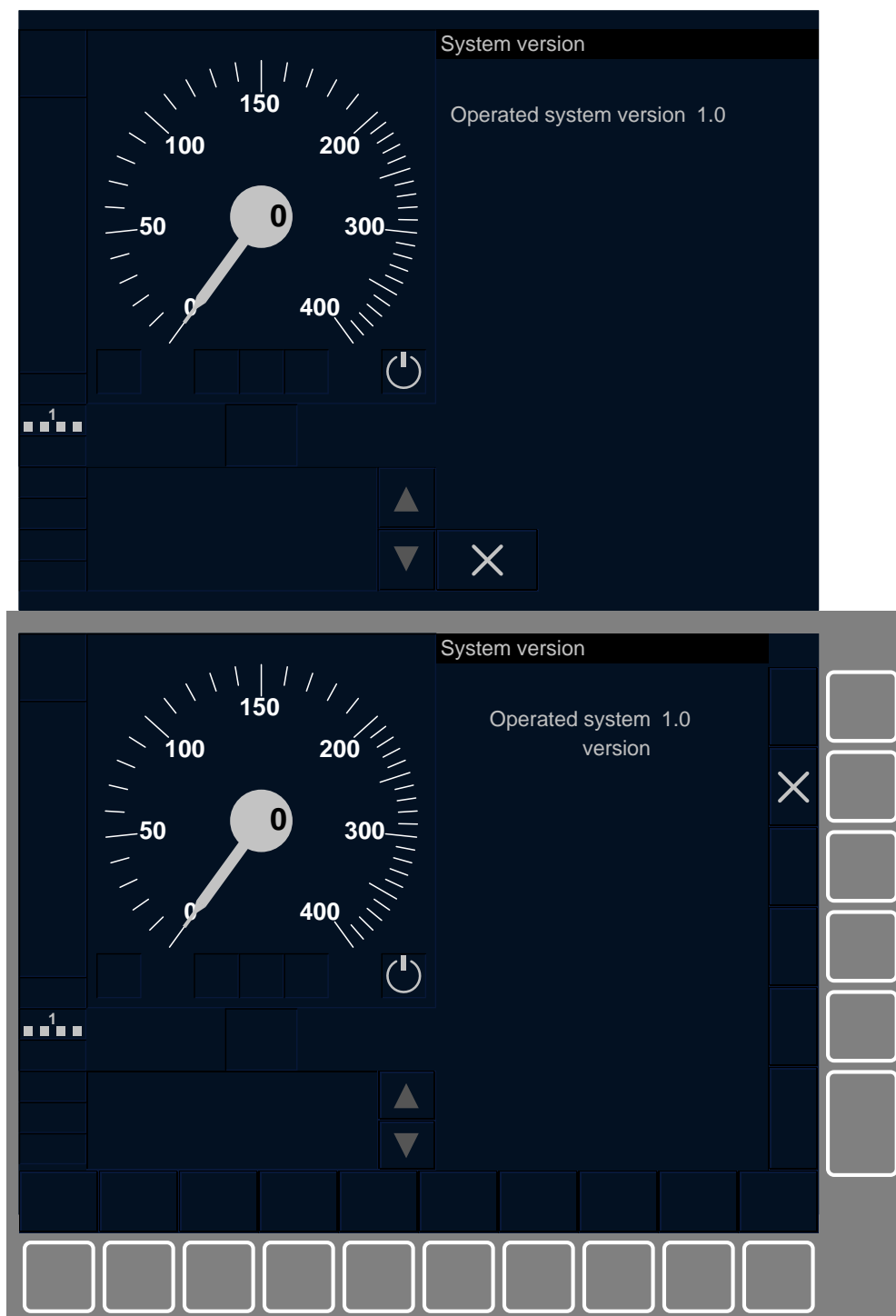


Figure 135 – System version window

11.6 Parent/child relationship

- 11.6.1.1 With regards to the use of the close button, the relationship between parent and child windows shall be as specified in Table 47.
 - 11.6.1.1.1 Note: The cell for “Additional DMI technical functions” is marked in grey since these functions are outside of the scope of this specification.
- 11.6.1.2 During the start up dialogue sequence (see 11.7.2 steps S1 and S1-1), the Driver ID window shall be the parent of the Settings and the Train running number windows.

ERA ERTMS unit
ETCS Driver Machine Interface

Parent/child relationship <i>(from left to right = from parent to child)</i>			
Default	Main	Driver ID	-
		Train data <i>(one or more windows)</i>	-
		Train data validation <i>(accessible via Train data windows)</i>	-
		Level	-
		RBC contact <i>(accessible via the Level window and only if the level is 2/3)</i>	Radio network ID <i>(accessible via the RBC contact window and only if driver selects "Radio network ID")</i>
			RBC data <i>(accessible via the RBC contact window and only if driver selects "Enter RBC data")</i>
		Train running number	-
	Override	-	-
	Data View	-	-
	Special	Adhesion	-
		SR speed / distance	-
	Settings	Language	-
		Volume	-
		Brightness	-
		System version	-
		Set VBC	-
		Set VBC validation	-
		Remove VBC	-
		Remove VBC validation	-
		Additional DMI technical functions	-

Table 47 – Parent/child relationship

11.7 Dialogue sequences

11.7.1 Introduction

- 11.7.1.1 In a dialogue sequence, the latest active window including the mentioned configuration of objects/symbols (e.g. the main window with all buttons disabled and the hour glass symbol ST05 displayed) shall remain displayed until another window or another configuration of the same window is mentioned further on in the flowchart.
- 11.7.1.2 When an event involves a driver's action on a button, it assumes that the corresponding button is enabled (see 11.1 for the conditions enabling a button).
- 11.7.1.3 The status of data mentioned in the dialogue sequences refers to the status of data stored onboard as defined in document [3].
- 11.7.1.4 If the status is "invalid" or "valid", the value stored onboard shall be presented to the driver when entering the corresponding data entry window.
 - 11.7.1.4.1 Exception: for the train data windows; see S3-1 of the main dialogue sequence. For the train data validation window; see S3-2 of the main dialogue sequence.
- 11.7.1.5 For a window covering the half grid array, the value stored onboard shall be replaced by the data value of the input field when the driver accepts this data value.
- 11.7.1.6 For a window covering the total grid array, the values stored onboard shall be replaced by the data values of the input fields when the driver presses the 'Yes' button.
 - 11.7.1.6.1 Exception: for the train data windows, the values stored onboard shall be replaced by the values of the input fields for train data only when the train data validation window is left with the value of its input field set to 'Yes'. It means that no action is done on the train data stored onboard when the driver presses the 'Yes' button of the train data windows (see S3-2 of the main window dialogue sequence).
 - 11.7.1.6.2 Exception: for the Set VBC or Remove VBC window, the action on the VBCs stored onboard shall be performed respectively with the value of the input field 'VBC set code' or of the input field 'VBC remove code' only when the corresponding validation window is left with the value of its input field set to 'Yes'. It means that no action is done on the VBCs stored onboard when the driver presses the 'Yes' button of the Set VBC or Remove VBC window (see S6-2 and S7-2 of the settings dialogue sequence).
- 11.7.1.7 After the Start Up dialogue sequence (see 11.7.2), if one of the windows mentioned in Table 48 is currently displayed and any of the enabling conditions (see 11.2) of the corresponding button is not fulfilled anymore, the data entry / validation process shall be stopped and the parent window shall be displayed instead.

Window	Corresponding button for checking the enabling conditions
Train running number	Train running number
Driver ID	Driver ID
ERTMS/ETCS level	Level
Radio network ID	Radio Network ID
RBC data	Enter RBC data
Language	Language
Volume	Volume
Brightness	Brightness
Train data	Train data
Train data validation	Train data
SR speed / distance	SR speed / distance
Adhesion	Adhesion

Table 48 – Relationship between windows and enabling conditions of buttons

11.7.1.8 During the Start Up dialogue sequence, if a driver's acknowledgement is required, it shall be displayed 1 second after the end of the Start Up dialogue sequence.

11.7.1.9 After the Start Up dialogue sequence, if a data entry or validation window is currently displayed when a driver's acknowledgement is required, the data entry / validation process shall be stopped, the parent window shall be displayed instead and the driver's acknowledgement shall appear 1 second afterwards.

11.7.2 Start Up

11.7.2.1 The "Start Up" dialogue sequence shall guide the driver when a start of mission is initiated as specified in [3] chapter 5.4.

11.7.2.1.1 Note: When possible, the steps refer to the numbering in the SRS (see document [3]) to facilitate the traceability.

11.7.2.2 The [close] button shall be disabled in all windows presented before reaching S10 except in the steps S1-1, S1-2, S3-2-2 and S3-3.

11.7.2.2.1 Note: In S10, the driver can therefore close the start up dialogue sequence to go to another sub-level window e.g. to go to the Override window and press the EOA button (if enabled).

11.7.2.3 Note: Some of steps of the start of mission procedure (see SRS 5.4) are kept for the sake of understanding. These steps are marked in the figure with a specific background (see D32 to A39) and in the following table by italic texts in the grey rows.

ERA ERTMS unit

ETCS Driver Machine Interface

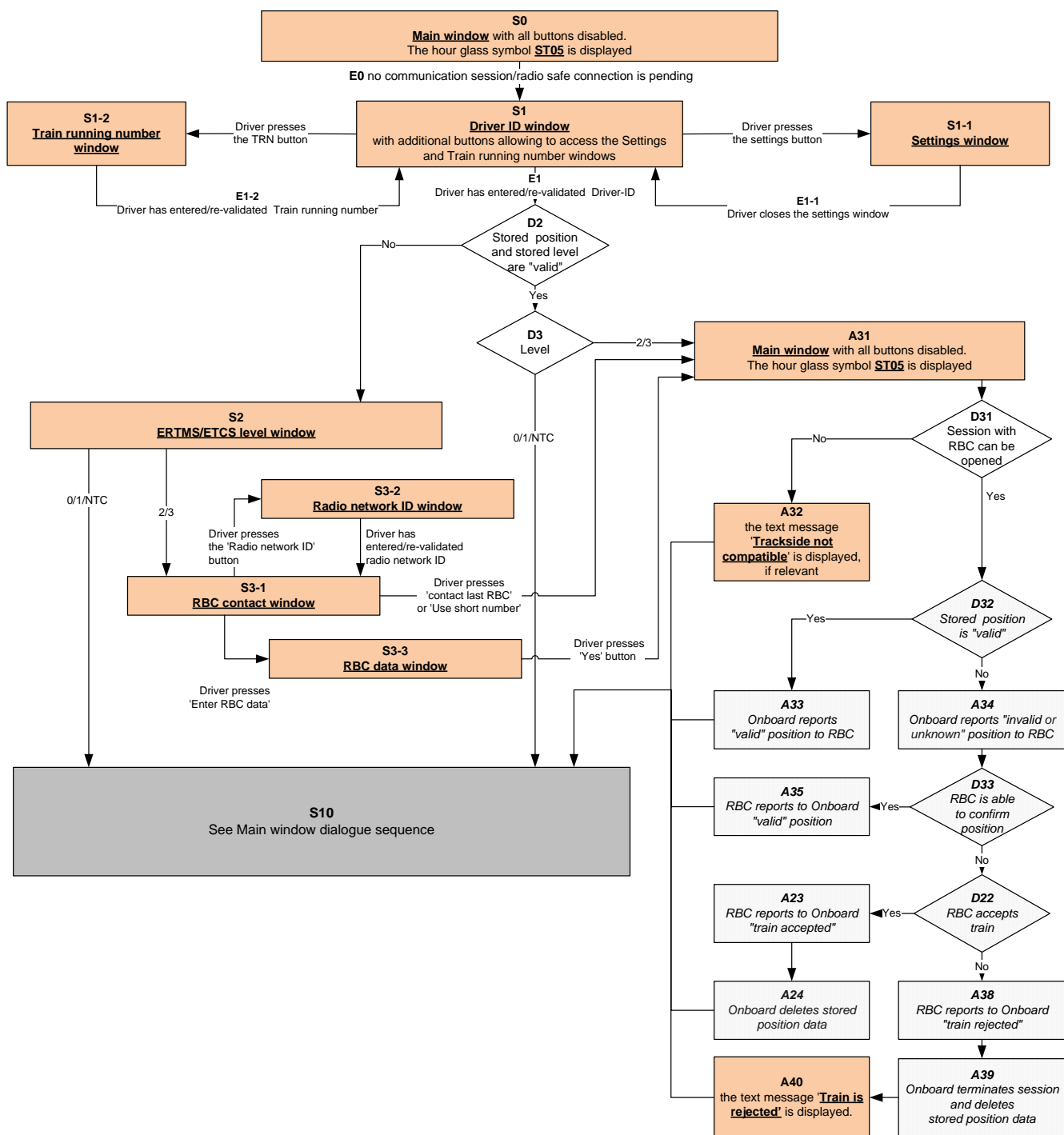


Figure 136 – Start Up dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.2.4 The steps of the “Start Up” dialogue sequence shall follow Table 49.

ID in Flow Chart	Requirements	Window
S0	<p>If the cab is active and the mode is SB but a communication session is still established or is being established:</p> <ul style="list-style-type: none">• The Main window shall be presented to the driver with all buttons ‘disabled’.• The symbol ST05 shall be displayed to show that the onboard awaits that no communication session is established. <p>When all conditions to initiate a start of mission are fulfilled, the procedure shall go to S1 and the Start Up dialogue sequence shall be engaged.</p>	Figure 109 – Main window
S1	<p>The Driver ID window shall request the driver to enter the Driver ID (if the status of the Driver ID is “unknown”) or shall request the driver to revalidate or re-enter the Driver ID (if the status of Driver ID is “invalid”).</p> <p>Once the Driver ID is entered or revalidated (E1), the procedure shall go to D2</p> <ul style="list-style-type: none">• If the driver presses the settings button, the procedure shall go to S1-1• If the driver presses the train running number button, the procedure shall go to S1-2	Figure 116 – Driver ID window
S1-1	<p>The Settings window shall be presented to the driver. (See 11.7.7 for the settings dialogue sequence)</p> <p>Once the driver closes the settings window (E1-1), the procedure shall go back to S1</p>	Figure 112 – Settings window

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S1-2	<p>The <u>Train running number window</u> shall request the driver to enter the Train running number (if the status of the Train running number is “unknown”) or shall request the driver to revalidate or re-enter the Train running number (if the status of Train running number is “invalid” or “valid”).</p> <p>Once the train running number is entered or revalidated (E1-2), the procedure shall go back to S1</p>	Figure 114 – Train running number window
D2	<p>If both the stored position and the stored level are valid, the procedure shall go to D3</p> <p>If the stored position or the stored level is invalid or unknown, the procedure shall go to S2</p>	
D3	<p>If the stored level is 2 or 3, the procedure shall go to D7</p> <p>If the stored level is 0, 1 or NTC, the procedure shall go to S10</p>	
D7	<p>If at least one Mobile Terminal is registered to a Radio Network, the process shall go to A31</p> <p>If no Mobile Terminal is registered to a Radio Network, the process shall go to A29</p>	
S2	<p>The <u>ERTMS/ETCS level window</u> shall request the driver to enter the Level data (if the status of the Level data is “unknown”) or shall request the driver to revalidate or re-enter the Level data (if the status of Level data is “invalid”).</p> <p>If the entered / re-validated level is 2 or 3, the procedure shall go to S3-1</p> <p>If the entered / re-validated level is 0 or 1 or one of proposed NTC level(s), the procedure shall go to S10</p>	Figure 115 – ERTMS/ETCS level window

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S3-1	<p>The <u>RBC contact window</u> shall offer the possibility to the driver to select 'Contact last RBC', 'Use short number', 'Enter RBC data' and 'Radio network ID'</p> <ul style="list-style-type: none"> • If the driver presses 'Contact last RBC' or 'Use short number', the procedure shall go to A31. • If the driver presses 'Enter RBC data', the procedure shall go to S3-3. • If the driver presses 'Radio network ID', the procedure shall go to S3-2-1. 	Figure 113 – RBC contact window
S3-2-1	<p>The <u>RBC contact window</u> shall be presented to the driver with all buttons 'disabled'.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits the alphanumeric list of available and allowed Radio Networks.</p> <p>If this list is not empty, the procedure shall go to S3-2-2.</p> <p>If this list is empty, the procedure shall go to A29.</p>	Figure 117 – Radio network ID window
S3-2-2	<p>The <u>Radio network ID window</u> shall request the driver to revalidate or re-enter the Radio network ID</p> <p>Once the Radio network ID is entered or revalidated, the procedure shall go to S3-2-3</p>	Figure 117 – Radio network ID window
S3-2-3	<p>The <u>RBC contact window</u> shall be presented to the driver with all buttons 'disabled'.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits the registration to the Radio Network.</p> <p>Once the ERTMS/ETCS on-board equipment is registered to the Radio Network, the procedure shall go to S3-1</p>	Figure 117 – Radio network ID window

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
A29	The text message “ <u>Radio network registration failed</u> ” (see chapter 15) shall be displayed. This procedure shall go to S10 .	
S3-3	The <u>RBC data window</u> shall request the driver to enter the RBC ID / phone number (if the status of the RBC ID/phone number is “unknown”) or to revalidate or re-enter the RBC ID/phone number (if the status of RBC ID/phone number is “invalid”). When the ‘Yes’ button related to the ‘RBC data entry complete?’ question is enabled (i.e. all input fields contains a value), if the driver presses this ‘Yes’ button, the procedure shall go to A31	Figure 118 – RBC data window
S10	The procedure shall go to the S1 of the main window dialogue sequence	
A31	The <u>Main window</u> shall be presented to the driver with all buttons ‘disabled’. The symbol <u>ST05</u> shall be displayed to show that the onboard awaits an answer from the RBC.	Figure 109 – Main window
D31	If the opening of the session is successful, the procedure shall go to D32 If the opening of the session has failed, the procedure shall go to A32	
A32	If the communication session is terminated due to no compatible version, the text message “ <u>Trackside not compatible</u> ” (see chapter 15) shall be displayed. This procedure shall go to S10 .	
D32	<i>If the stored position is valid, the procedure shall go to A33</i> <i>If the stored position is invalid, the procedure shall go to A34</i>	

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
A33	<p><i>If the train position data stored in the on-board equipment is of status “valid”, the train position, marked as “valid” shall be transmitted to the RBC via the “SoM position report” message.</i></p> <p><i>This condition leads to S10.</i></p>	
A34	<p><i>If the train position data stored in the on-board equipment is of status “invalid” or “unknown”, the train position, marked as “invalid” or “unknown” shall be transmitted to the RBC via the “SoM position report” message.</i></p> <p><i>The procedure shall then go to D33</i></p>	
D33	<p><i>When the position report marked as “invalid” is received by the RBC, this latter shall check whether it can validate this position report.</i></p> <p><i>If the position report can be validated by the RBC, the procedure shall go to A35</i></p> <p><i>Otherwise, if the position report was marked “unknown”, or the “invalid” position report cannot be validated by the RBC, the procedure shall go to D22</i></p> <p><i>Note: How the RBC is able to validate the position report is a national issue, out of the scope for this specification</i></p>	
A35	<p><i>The RBC shall inform the ERTMS/ETCS onboard equipment that the reported position is valid.</i></p> <p><i>When this message is received by the ERTMS/ETCS on-board equipment, the status of the position shall be set to “valid”</i></p> <p><i>The procedure shall go to S10.</i></p>	

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
D22	<p><i>If the reported train position is “unknown”, or the RBC is not able to confirm a reported “invalid” position, the RBC shall nevertheless decide whether it accepts the train or not.</i></p> <p><i>If yes, the procedure shall go to A23</i></p> <p><i>If no, the procedure shall go to A38</i></p> <p><i>Note: How the RBC assumes responsibility for the train is a national issue, out of the scope for this specification</i></p>	
A23	<i>The RBC shall inform the ERTMS/ETCS on-board equipment that it accepts the train although the on-board has no “valid” position information.</i>	
A24	<p><i>When the ERTMS/ETCS on-board equipment is informed that the train is accepted without valid position data, it shall delete the train position data (new status: “unknown”)</i></p> <p><i>This condition leads to S10.</i></p>	
A38	<i>The RBC shall inform the ERTMS/ETCS on-board equipment that it rejects the train</i>	
A39	<p><i>When the ERTMS/ETCS on-board equipment is informed that the train is rejected, it shall delete the train position data (new status: “unknown”) and shall terminate the session with the RBC.</i></p> <p><i>The procedure shall then go to A40</i></p>	
A40	<p>The text message “<u>Train is rejected</u>” (see chapter 15) shall be displayed.</p> <p>This procedure shall go to S10.</p>	

Table 49 – Steps of the Start Up dialogue sequence

11.7.3 Main window

11.7.3.1 The “Main window” dialogue sequence shows the interaction with the driver when the main window is presented either because he has pressed the main button on the default window or because the start up dialogue sequence is in S10 (i.e. a start of mission is ongoing).

11.7.3.2 The [close] button shall be enabled in all windows except in the steps S5-2-1, S5-2-3, S7, S8 or S9 where they shall be disabled.

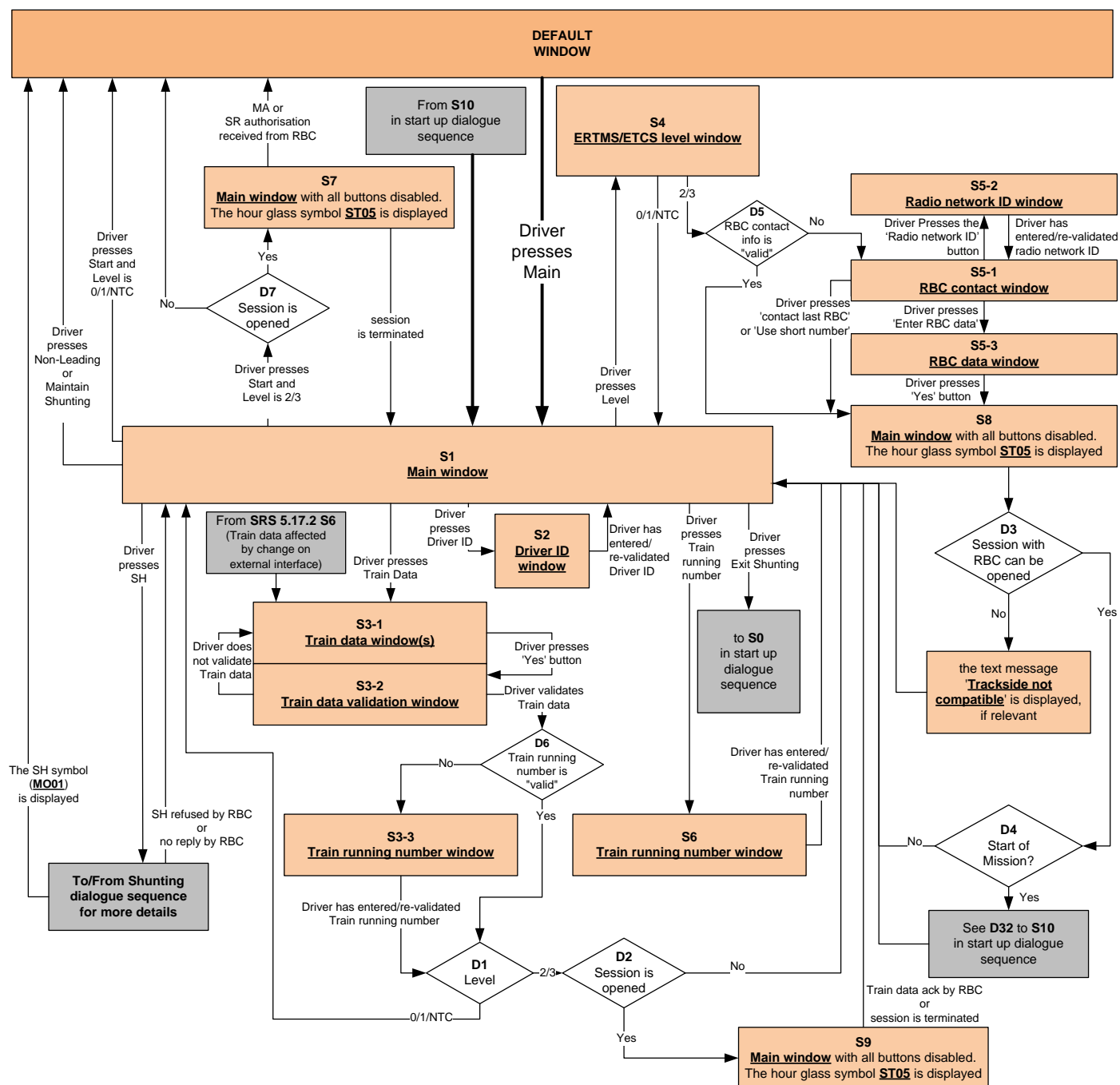


Figure 137 – Main window dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.3.3 The steps of the “Main window” dialogue sequence shall follow Table 50.

ID in Flow Chart	Requirements	Window
S1	<p>The Main window shall offer the possibility to the driver to select ‘Driver ID’, ‘Shunting’ / ‘Exit Shunting’, ‘Maintain Shunting’, ‘Non leading’, ‘Train data’, ‘Level’, ‘Train running number’ and ‘Start’.</p> <ul style="list-style-type: none">• If the driver presses ‘Driver ID’, the procedure shall go to S2.• If the driver presses ‘Shunting’, the procedure shall go to the Shunting dialogue sequence.• If the driver presses ‘Non-Leading’ or ‘Maintain Shunting’, the procedure shall go back to the default window.• If the driver presses ‘Exit Shunting’, the procedure shall go to S0 of the start up dialogue sequence.• If the driver presses ‘Train data’, the procedure shall go to S3-1• If the driver presses ‘Level’, the procedure shall go to S4• If the driver presses ‘Train running number’, the procedure shall go to S6• If the driver presses ‘Start’ and the level is 0/1/NTC, the procedure shall go back to the default window.• If the driver presses ‘Start’ and the level is 2/3, the procedure shall go to D7	Figure 109 – Main window
S2	<p>The Driver ID window shall request the driver to revalidate or re-enter the Driver ID.</p> <p>Once the Driver ID is re-entered or revalidated, the procedure shall go back to S1 (the Main window)</p>	Figure 116 – Driver ID window

<p>S3-1</p>	<p>When entering S3-1, the 1st <u>Train data window</u> shall be presented to the driver to initiate to entry of train data.</p> <p>Depending on the input signal from the train interface when S3-1 is entered from S1 (i.e. the train data entry / validation process starts) and, in case of “<i>Switchable train data entry</i>”, on the layout lastly used (see 11.3.9), the <u>Train data window(s)</u> shall request the driver:</p> <ul style="list-style-type: none"> a) <u>Fixed train data entry</u>: to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) the input field for the train type. b) <u>Flexible train data entry</u>: to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) each input field for train data. c) <u>Switchable train data entry</u>: <ul style="list-style-type: none"> • Layout “<i>Fixed train data entry</i>”: to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) the input field for the train type. • Layout “<i>Flexible train data entry</i>”: to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) each input field for train data. <p>If S3-1 is entered from S1 (i.e. the train data entry / validation process starts following a driver action on the ‘Train data’ button):</p> <ul style="list-style-type: none"> • When the status of train data is “valid”, the proposed value for each input field shall be the corresponding train data value stored onboard. • When the status of train data is “invalid”, if a value is proposed, it can be either the value of the corresponding train data stored onboard, a value pre-configured onboard or a value received from another ERTMS/ETCS external source (e.g. from the train interface). 	<p>Figure 120 – Train data window for a variable train formation with all train data modifiable by the driver (1st window)</p> <p>Figure 121 – Train data window for a variable train formation with all train data modifiable by the driver (2nd window)</p> <p>Figure 122 – Train data window for a variable train formation with the train category, the airtight and the loading gauge pre-configured onboard or received from other ERTMS/ETCS external sources and not modifiable by the driver</p> <p>Figure 123 – Train data window for a fixed train formation</p> <p>Figure 124 – Train data window allowing to switch from fixed to variable train formations</p> <p>Figure 125 – Train data window allowing to switch from variable to fixed train formations</p>
--------------------	--	---

ERA ERTMS unit
ETCS Driver Machine Interface

- When the status of train data is “unknown”, if a value is proposed, it can be either a value pre-configured onboard or a value received from another ERTMS/ETCS external source (e.g. from the train interface).

Note: For each input field, the source used for proposing a value is only rolling stock dependent, not an ERTMS/ETCS implementation issue.

If **S3-1** is entered from step **SRS 5.17.2 S6** (i.e. the train data entry / validation process starts due to a change on the ERTMS/ETCS external interface that affects the Train data):

- For each input field affected by the change on the ERTMS/ETCS external interface, if a value is proposed, it can be either a value pre-configured onboard or a value received from another ERTMS/ETCS external source.
- For all other input fields, since the status of train data is “valid”, the proposed value for those input fields shall be the corresponding train data value stored onboard.

Note: For each input field affected by the change on the ERTMS/ETCS external interface, the source used for proposing a value is only rolling stock dependent, not an ERTMS/ETCS implementation issue.

If **S3-1** is entered from **S3-2** (i.e. the train data entry / validation process is going on):

- The proposed value for each input field shall be the data value from the previous **S3-1**.

If being in **S3-1**, the driver has pressed the ‘switch’ button (i.e. the train data entry / validation process is going on and it is a “*Switchable train data entry*”):

- If a value is proposed for an input field, it can be either a value pre-configured onboard or a value received from another ERTMS/ETCS external source (e.g. from the train interface).

Note: Since there is a switch from a “Fixed train data entry” layout to “Flexible train data entry” layout or vice versa, the train data stored onboard cannot be proposed to the driver.

ERA ERTMS unit
ETCS Driver Machine Interface

	<p><u>Note:</u> For each input field, the source used for proposing a value is only rolling stock dependent, not an ERTMS/ETCS implementation issue.</p> <p>When the 'Yes' button related to the 'Train data entry complete?' question is enabled (i.e. every input field for train data in all 'train data' windows contains a data value), if the driver presses this 'Yes' button and all data values comply with the data checks, the procedure shall go to S3-2</p> <p><u>Note:</u> In this step, when the driver presses the 'Yes' button, train data are not validated yet and consequently are not yet the train data stored onboard for the mission (see 11.7.1.6.1). This is why the term "accept" is used instead of the term "revalidate" and the term "input field for train type/data" is used instead of "train data".</p>	
S3-2	<p>The <u>Train data validation window</u> shall request the driver to validate or not the values of the input fields for train data.</p> <p>When entering S3-2, the train data validation window shall always propose the value 'Yes' in the input field for train data validation.</p> <p>Once the input field for train data validation is entered or revalidated, if the value is 'No', the procedure shall go back to S3-1. Otherwise, if the value is 'Yes', the procedure shall go to D6</p>	Figure 130 – Train data validation window
D6	<p>If Train running number is "valid", the procedure shall go to D1</p> <p>If Train running number is "invalid" or "unknown", the procedure shall go to S3-3</p>	
S3-3	<p>The <u>Train running number window</u> shall request the driver to enter the Train running number (if the status of the Train running number is "unknown") or shall request the driver to revalidate or re-enter the Train running number (if the status of Train running number is "invalid").</p> <p>Once the train running number is entered or revalidated, the procedure shall go to D1</p>	Figure 114 – Train running number window

ERA ERTMS unit
ETCS Driver Machine Interface

D1	<p>When the validated level is 2/3, the procedure shall go to D2</p> <p>When the validated level is 0, 1 or NTC, the procedure shall go back to S1 (the Main window)</p>	
D2	When the session is open, the procedure shall go to S9 , otherwise the procedure shall go back to S1 (the Main window)	
S9	<p>The Main window shall be presented to the driver with all buttons ‘disabled’.</p> <p>The symbol ST05 shall be displayed to show that the onboard awaits an answer from the RBC.</p> <p>When the train data acknowledgement is received from the RBC or when the communication session is terminated due to no reply from RBC, the procedure shall go back to S1 (the Main window)</p>	Figure 109 – Main window
S4	<p>The ERTMS/ETCS level window shall request the driver to revalidate or re-enter the Level data.</p> <p>If the entered / re-validated level is 2 or 3, the procedure shall go to D5</p> <p>If the entered / re-validated level is 0 or 1 or one of proposed NTC level(s), the procedure shall go back to S1 (the Main window)</p>	Figure 115 – ERTMS/ETCS level window
D5	<p>If at least one Mobile Terminal is registered to a Radio Network and RBC contact information is “valid”, the procedure shall go to S8</p> <p>If either no Mobile Terminal is registered to a Radio Network or RBC contact information is “invalid” or “unknown”, the procedure shall go to S5-1</p> <p><u>Exception:</u> If, following the level entry/re-validation, the ERTMS/ETCS on-board equipment switches to the TR mode (case of a transition from level 0/NTC to 2/3), the Default window shall firstly be presented with the symbol MO05. As soon as the symbol MO05 is acknowledged, the procedure shall go to S5-1</p>	

ERA ERTMS unit
ETCS Driver Machine Interface

S5-1	<p>The <u>RBC contact window</u> shall offer the possibility to the driver to select 'Contact last RBC', 'Use short number', 'Enter RBC data' and 'Radio network ID'</p> <ul style="list-style-type: none">• If the driver presses 'Contact last RBC' or 'Use short number', the procedure shall go to S8.• If the driver presses 'Enter RBC data', the procedure shall go to S5-3.• If the driver presses 'Radio network ID', the procedure shall go to S5-2-1.	Figure 113 – RBC contact window
S5-2-1	<p>The <u>RBC contact window</u> shall be presented to the driver with all buttons 'disabled'.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits the alphanumeric list of available and allowed Radio Networks.</p> <p>If this list is not empty, the procedure shall go to S5-2-2.</p> <p>If this list is empty, the procedure shall go to A5.</p>	Figure 117 – Radio network ID window
S5-2-2	<p>The <u>Radio network ID window</u> shall request the driver to revalidate or re-enter the Radio network ID</p> <p>Once the Radio network ID is entered or revalidated, the procedure shall go to S5-2-3</p>	Figure 117 – Radio network ID window
S5-2-3	<p>The <u>RBC contact window</u> shall be presented to the driver with all buttons 'disabled'.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits the registration to the Radio Network.</p> <p>Once the ERTMS/ETCS on-board equipment is registered to the Radio Network, the procedure shall go to S5-1</p>	Figure 117 – Radio network ID window
A5	<p>The text message "<u>Radio network registration failed</u>" (see chapter 15) shall be displayed.</p> <p>This procedure shall go to S1.</p>	

ERA ERTMS unit
ETCS Driver Machine Interface

S5-3	<p>The <u>RBC data window</u> shall request the driver to enter the RBC ID / phone number (if the status of the RBC ID/phone number is “unknown”) or to revalidate or re-enter the RBC ID/phone number (if the status of RBC ID/phone number is “invalid” or “valid”).</p> <p>When the ‘Yes’ button related to the ‘RBC data entry complete?’ question is enabled (i.e. all input fields contains a value), if the driver presses this ‘Yes’ button, the procedure shall go to S8</p>	Figure 118 – RBC data window
S8	<p>The <u>Main window</u> shall be presented to the driver with all buttons ‘disabled’.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits an answer from the RBC.</p>	Figure 109 – Main window
D3	<p>If the opening of the session is successful, the procedure shall go to D4</p> <p>If the opening of the session has failed or the session is terminated due to no compatible version, the procedure shall go back to S1 (the Main window)</p> <p>If the communication session is terminated due to no compatible version, the text message “<u>Trackside not compatible</u>” (see chapter 15) shall be displayed.</p>	
D4	<p>If a start of mission is ongoing, the procedure shall go to the D32 of the start up dialogue sequence.</p> <p>If no start of mission is ongoing, the procedure shall go back to S1 (the Main window)</p>	
S6	<p>The <u>Train running number window</u> shall request the driver to enter the Train running number (if the status of the Train running number is “unknown”) or shall request the driver to revalidate or re-enter the Train running number (if the status of Train running number is “invalid” or “valid”).</p> <p>Once the train running number is entered or revalidated, the procedure shall go back to S1 (the Main window)</p>	Figure 114 – Train running number window
D7	<p>When the session is open, the procedure shall go to S7, otherwise the procedure shall go back to <u>the default window</u>.</p>	

ERA ERTMS unit
ETCS Driver Machine Interface

S7	<p>The <u>Main window</u> shall be presented to the driver with all buttons ‘disabled’.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits an answer from the RBC.</p> <p>When an MA or an SR authorisation is received from the RBC, the procedure shall go back to <u>the default window</u>.</p> <p>When the communication session is terminated due to no reply from RBC, the procedure shall go back to S1 (the Main window)</p>	Figure 109 – Main window
-----------	---	--------------------------

Table 50 – Steps of the Main window dialogue sequence

11.7.4 Shunting

11.7.4.1 The “Shunting” dialogue sequence shows the interaction with the driver when he has pressed the shunting button on the main window.

11.7.4.2 The [close] button shall be disabled in the step S1.

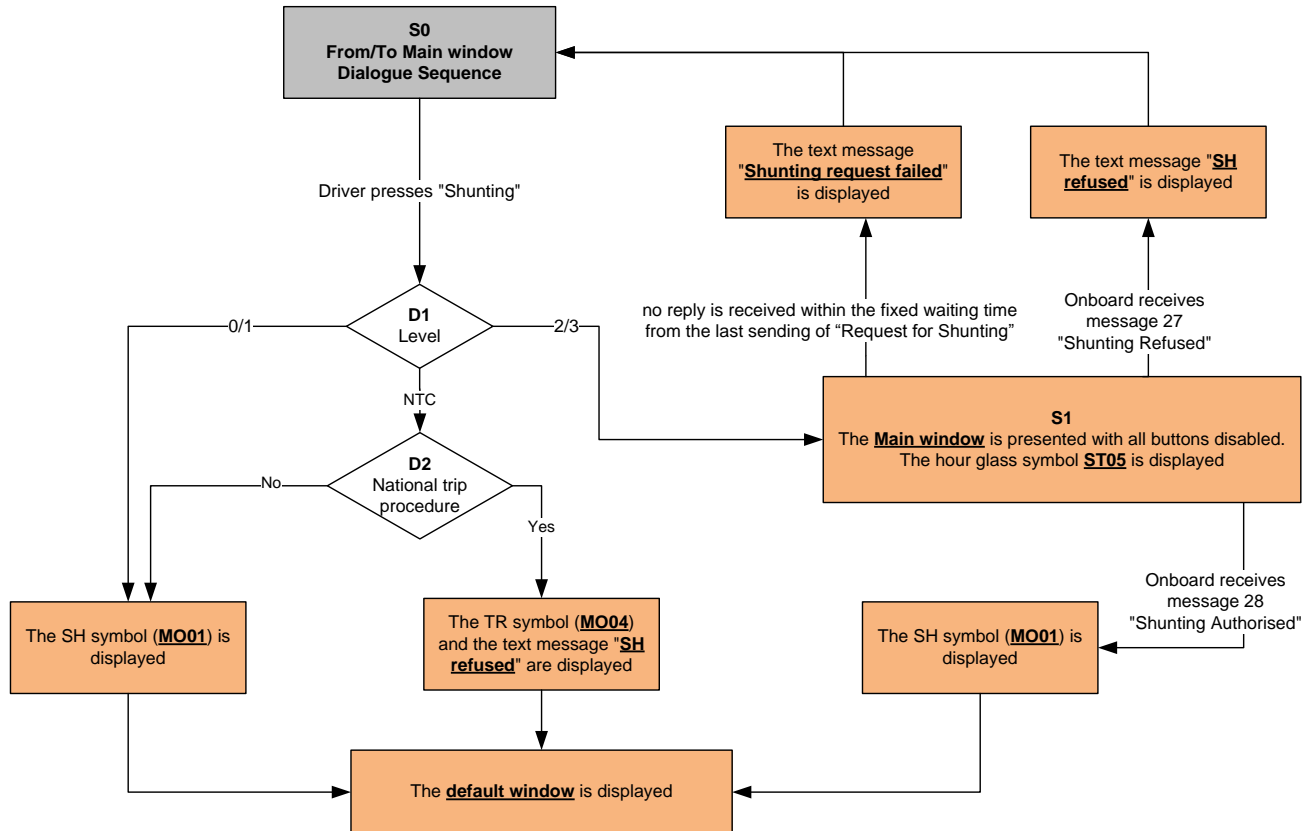


Figure 138 – Shunting dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.4.3 The steps of the “Shunting” dialogue sequence shall follow Table 51.

ID in Flow Chart	Requirements	Window
S0	When the driver presses the Shunting button in S1 of the Main window dialogue sequence, the procedure shall go to D1 .	
D1	If the level is 0/1, the SH symbol MO01 shall be presented and the procedure shall go back to the default window . If the level is 2/3, the procedure shall go to S1 . If the level is NTC, the procedure shall go to D2	
D2	If there is an on-going National Trip procedure reported by the STM, the TR symbol MO04 and the text message “SH refused” shall be presented. Otherwise the SH symbol MO01 shall be presented. In both cases, the procedure shall go back to the default window .	
S1	The Main window shall be presented to the driver with all buttons ‘disabled’. The symbol ST05 shall be displayed to show that the onboard awaits an answer from the RBC. When the message ‘Shunting Refused’ is received from the RBC or no reply is received within the fixed waiting time from the time of the last sending of “Request for Shunting”, the procedure shall go back to S0 (i.e. S1 of the Main window dialogue sequence) When the message ‘Shunting Authorised’ is received from the RBC, the SH symbol MO01 shall be presented and the procedure shall go back to the default window .	Figure 109 – Main window

Table 51 – Steps of the Shunting dialogue sequence

11.7.5 Override window

11.7.5.1 The “Override window” dialogue sequence shows the interaction with the driver when he presses the ‘Override’ button on the default window.

11.7.5.2 The [close] button shall always be enabled on the Override window.

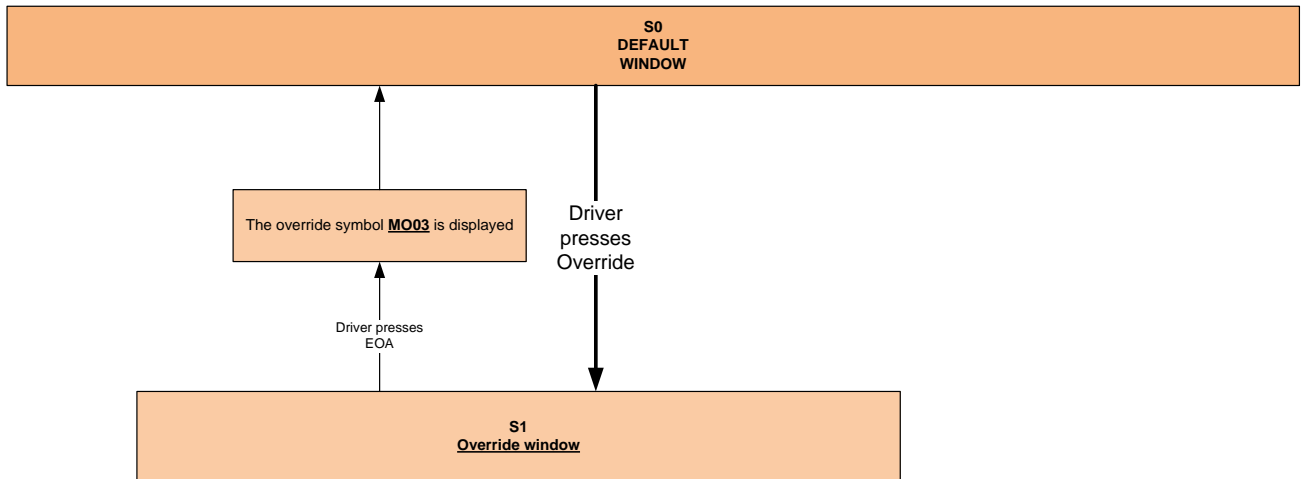


Figure 139 – Override window dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.5.3 The steps of the “Override window” dialogue sequence shall follow Table 52.

ID in Flow Chart	Requirements	Window
S0	When the driver presses the override button on <u>the default window</u> , the procedure shall go to S1 .	
S1	The <u>Override window</u> shall be presented to the driver. When the driver presses the ‘EOA’ button, the override EOA symbol <u>MO03</u> shall be presented and the procedure shall go back to <u>the default window</u> .	Figure 110 – Override window

Table 52 – Steps of the Override window dialogue sequence

11.7.6 Special window

- 11.7.6.1 The “Special window” dialogue sequence shows the interaction with the driver when he presses the ‘Special’ button on the default window.
- 11.7.6.2 The [close] button shall always be enabled on the ‘Special’, ‘Adhesion’ and ‘SR speed / distance’ windows.

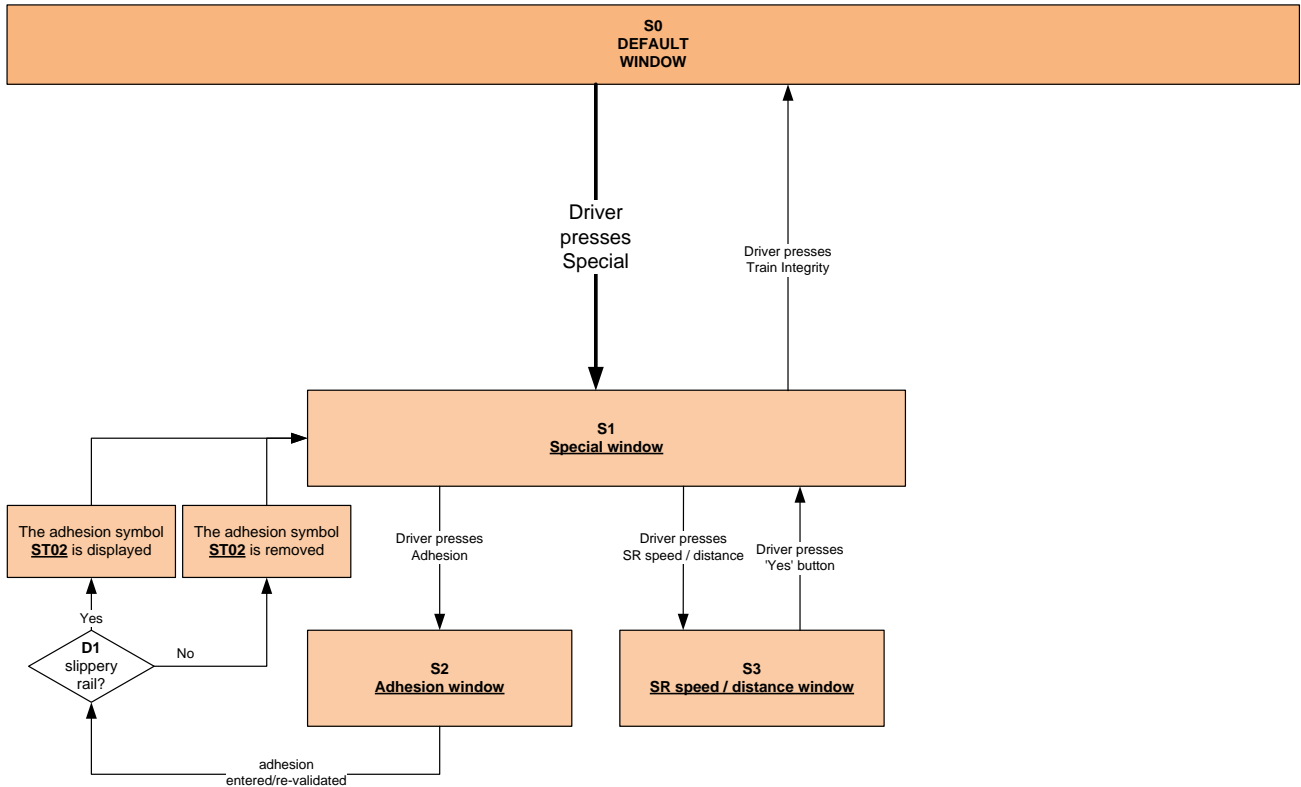


Figure 140 – Special window dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.6.3 The steps of the “Special window” dialogue sequence shall follow Table 53.

ID in Flow Chart	Requirements	Window
S0	When the driver presses the special button on <u>the default window</u> , the procedure shall go to S1 .	
S1	The <u>Special window</u> shall be presented to the driver. When the driver presses the ‘Adhesion’ button, the procedure shall go to S2 . When the driver presses the ‘Train Integrity’ button, the procedure shall go back to <u>the default window</u> . When the driver presses the ‘SR speed / distance’ button, the procedure shall go to S3 .	Figure 111 – Special window
S2	The <u>Adhesion window</u> shall request the driver to revalidate or re-enter the adhesion. Once the adhesion is entered or revalidated, the procedure shall go to D1	Figure 127 – Adhesion window
D1	When the adhesion is “slippery rail”, the adhesion symbol <u>ST02</u> shall be displayed and the procedure shall go back to S1 . When the adhesion is “non slippery rail”, the adhesion symbol <u>ST02</u> shall not be displayed and the procedure shall go back to S1 .	
S3	The <u>SR speed / distance window</u> shall request the driver to revalidate or re-enter the SR speed and/or the SR distance. When the ‘Yes’ button related to the ‘SR speed / distance entry complete?’ question is enabled (i.e. both input fields contains a value), if the driver presses this ‘Yes’ button and all data values comply with the data checks, the procedure shall go back to S1	Figure 126 – SR speed / distance window

Table 53 – Steps of the Special window dialogue sequence

11.7.7 Settings window

11.7.7.1 The “Settings window” dialogue sequence shows the interaction with the driver when he presses the ‘Settings’ button on the default window or on the Driver ID window during the start up dialogue sequence.

11.7.7.2 The [close] button shall always be enabled on all windows.

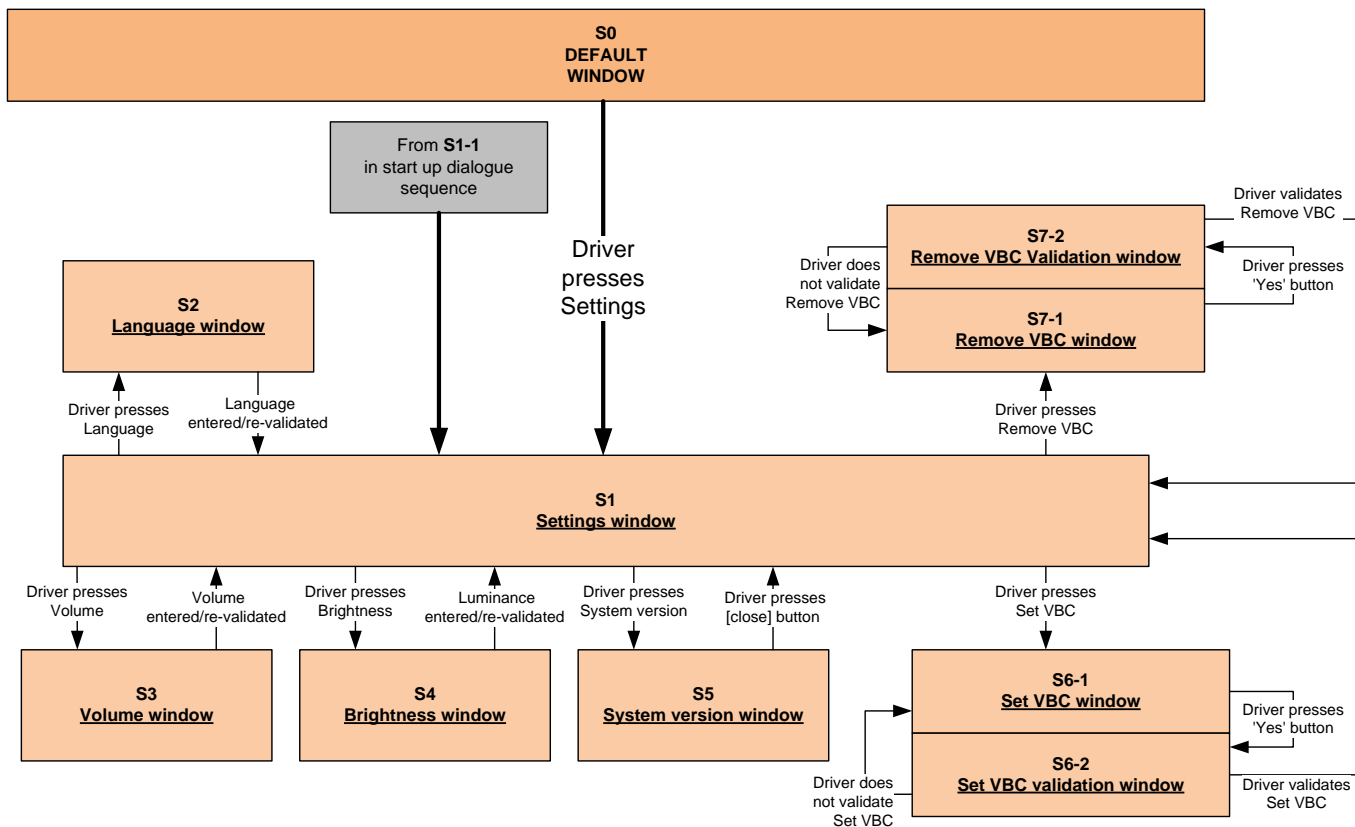


Figure 141 – Settings window dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

11.7.7.3 The steps of the “Settings window” dialogue sequence shall follow Table 54.

ID in Flow Chart	Requirements	Window
S0	When the driver presses the settings button on <u>the default window</u> or the step S1-1 of the start up dialogue sequence is reached, the procedure shall go to S1 .	
S1	The <u>Settings window</u> shall be presented to the driver. When the driver presses the ‘Language’ button, the procedure shall go to S2 . When the driver presses the ‘Volume’ button, the procedure shall go to S3 . When the driver presses the ‘Brightness’ button, the procedure shall go to S4 . When the driver presses the ‘System version’ button, the procedure shall go to S5 . When the driver presses the ‘Set VBC’ button, the procedure shall go to S6-1 . When the driver presses the ‘Remove VBC’ button, the procedure shall go to S7-1 .	Figure 112 – Settings window
S2	The <u>Language window</u> shall request the driver to revalidate or re-enter the language. Once the language is re-entered or revalidated, the procedure shall go back to S1	Figure 119 – Language window
S3	The <u>Volume window</u> shall request the driver to revalidate or re-enter the volume. Once the volume is re-entered or revalidated, the procedure shall go back to S1	
S4	The <u>Brightness window</u> shall request the driver to revalidate or re-enter the luminance. Once the luminance is re-entered or revalidated, the procedure shall go back to S1	

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S5	<p>The <u>System version window</u> displays the operated system version to the driver.</p> <p>When the driver presses the [Close] button, the procedure shall go back to S1</p>	Figure 135 – System version window
S6-1	<p>The <u>Set VBC window</u> shall request the driver to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) the input field for ‘VBC set code’.</p> <p>If S6-1 is entered from S1 (i.e. the Set VBC entry / validation process starts following a driver action on the ‘Set VBC’ button), no value shall be proposed for the input field</p> <p>If S6-1 is entered from S6-2 (i.e. the Set VBC entry / validation process is going on), the proposed value of the input field for ‘VBC set code’ shall be the data value from the previous S6-1</p> <p>When the ‘Yes’ button related to the ‘Set VBC entry complete?’ question is enabled (i.e. the input field for ‘VBC set code’ contains a data value), if the driver presses this ‘Yes’ button and all data values comply with the data checks, the procedure shall go to S6-2</p> <p><u>Note</u>: In this step, when the driver presses the ‘Yes’ button, the ‘VBC set code’ is not validated yet and consequently a new VBC is not yet added to the list of VBC’s stored onboard. This is why the term ‘input field for VBC set code’ is used instead of ‘VBC set code’.</p>	Figure 128 – Set VBC window
S6-2	<p>The <u>Set VBC validation window</u> shall request the driver to validate or not the value of the input field for ‘VBC set code’.</p> <p>When entering S6-2, the Set VBC validation window shall always propose the value ‘Yes’ in the input field for Set VBC validation.</p> <p>Once the input field for Set VBC validation is entered or revalidated, if the value is ‘No’, the procedure shall go back to S6-1. Otherwise, if the value is ‘Yes’, the procedure shall go back to S1</p>	Figure 131 – Set VBC validation window

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S7-1	<p>The <u>Remove VBC window</u> shall request the driver to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) the input field for 'VBC remove code'.</p> <p>If S7-1 is entered from S1 (i.e. the Remove VBC entry / validation process starts following a driver action on the 'Remove VBC' button), no value shall be proposed for the input field</p> <p>If S7-1 is entered from S7-2 (i.e. the Remove VBC entry / validation process is going on), the proposed value of the input field for 'VBC remove code' shall be the data value from the previous S7-1</p> <p>When the 'Yes' button related to the 'Remove VBC entry complete?' question is enabled (i.e. the input field for 'VBC remove code' contains a data value), if the driver presses this 'Yes' button and all data values comply with the data checks, the procedure shall go to S7-2</p> <p><u>Note:</u> In this step, when the driver presses the 'Yes' button, the 'VBC remove code' is not validated yet and consequently the VBC is not yet removed from the list of VBC's stored onboard. This is why the term 'input field for VBC remove code' is used instead of 'VBC remove code'.</p>	Figure 129 – Remove VBC window
S7-2	<p>The <u>Remove VBC validation window</u> shall request the driver to validate or not the value of the input field for 'VBC remove code'.</p> <p>When entering S7-2, the Remove VBC validation window shall always propose the value 'Yes' in the input field for Remove VBC validation.</p> <p>Once the input field for Remove VBC validation is entered or revalidated, if the value is 'No', the procedure shall go back to S7-1. Otherwise, if the value is 'Yes', the procedure shall go back to S1</p>	Figure 132 – Remove VBC validation window

Table 54 – Steps of the Settings window dialogue sequence

12. NTC X SUB-LEVEL WINDOWS

12.1 Introduction

12.1.1.1 The chapter 12 defines the NTC X sub-level windows based on the general requirements of chapter 10. It is applicable for all ERTMS/ETCS levels.

12.1.1.2 Note: The default window partly visible in some figures of chapter 12 uses the ETCS default window as specified in chapter 8. However, for the modes SN and NL in ERTMS/ETCS level NTC, the NTC default window of the corresponding National System will be displayed instead.

12.2 Menu Windows

12.2.1 NTC data entry selection window

12.2.1.1 The NTC data entry selection window shall comply with the requirements in chapter 10.2.

12.2.1.2 The window title shall indicate “National data entry selection”.

12.2.1.3 The buttons (for touch screen technology) / selections (for soft key technology) shall indicate the label as specified in Table 55.

12.2.1.4 The buttons of the NTC data entry selection window shall be enabled when the conditions specified in Table 55 are fulfilled and no driver’s acknowledgement is required.

12.2.1.4.1 Note: Whether ‘disabled’ buttons are displayed or not for national systems that have already completed their specific data entry or that does not need any specific data (i.e. ‘End of Specific NTC Data Entry’ has been received) or that have not answered (time out following the sending of the ETCS Train data) (see step S2 in 12.7.2) is an implementation issue by applying 5.3.2.5.5.

Button /selection #	label	Enabling conditions	SUBSET-035 reference
1	NTC A	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN) AND ('Specific NTC data entry request' received for NTC A) AND (no 'STOP' flag has been sent to the STM supporting NTC A)	10.7.4.3
			10.7.4.5
2	NTC B	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN) AND ('Specific NTC data entry request' received for NTC B) AND (no 'STOP' flag has been sent to the STM supporting NTC B)	10.7.4.3
			10.7.4.5

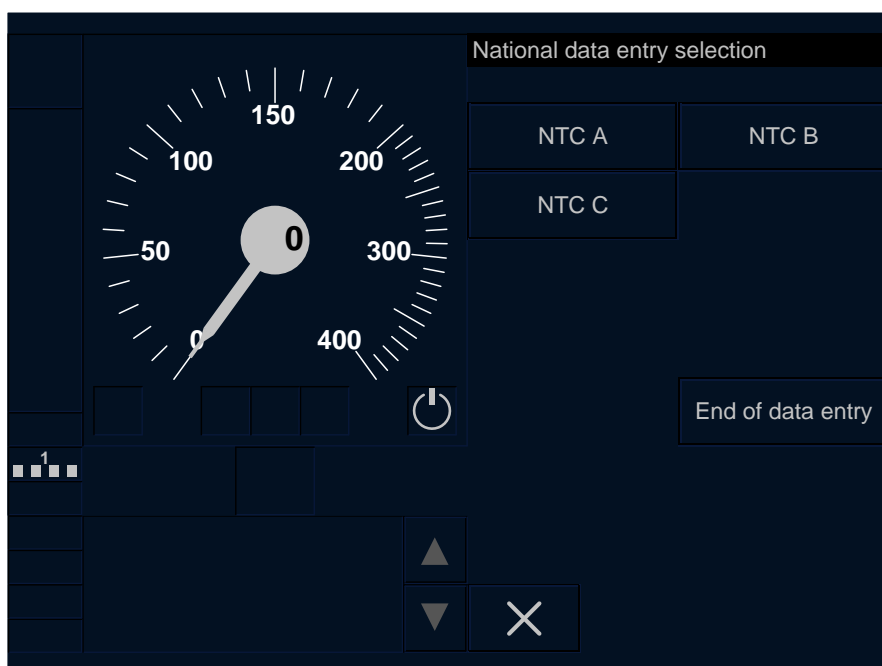
ERA ERTMS unit

ETCS Driver Machine Interface

Button /selection #	label	Enabling conditions	SUBSET-035 reference
3	NTC C	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN) AND ('Specific NTC data entry request' received for NTC C) AND (no 'STOP' flag has been sent to the STM supporting NTC C)	10.7.4.3 10.7.4.5
...	
10	End of data entry	(train is at standstill) AND (Driver ID is valid) AND (ERTMS/ETCS level is valid) AND (mode is SB/FS/LS/SR/OS/UN/SN)	10.7.3.1

Table 55 – Button / selection label

- 12.2.1.5 The labels 'NTC A', 'NTC B', ... shall be replaced with the distinct abbreviations of the concerned National Systems.
- 12.2.1.6 The button (for touch screen technology) / selection (for soft key technology) #10 shall be reserved for the 'End of data entry'.
- 12.2.1.7 When the hour glass symbol (see symbol ST05) is presented (see steps S1 and S4 in chapter 12.7.2), it shall be shown vertically centered in the NTC data entry selection window title area. The first X position of the symbol shall be 42. It shall then move 26 cells to the right every second. When it is no more possible to display the symbol ST05 inside the window title area, the symbol shall come back to its first position and shall start again moving to the right with the same pace.
- 12.2.1.8 Figure 142 shows the presentation of the "NTC data entry selection" window.



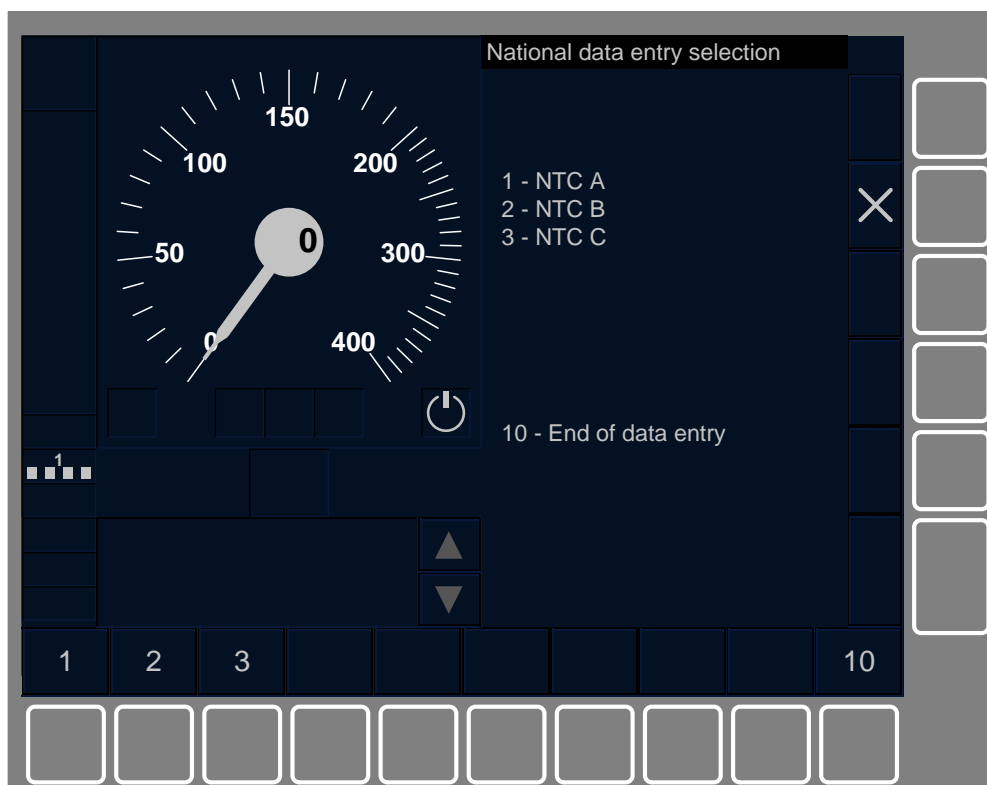


Figure 142 – NTC data entry selection window

12.3 Data entry Windows

12.3.1 NTC X data window(s)

- 12.3.1.1 The NTC X data window(s) shall comply with the requirements in chapter 10.3 for a window on total grid array with echo texts and with the question 'NTC X data entry complete?'.
- 12.3.1.2 Unless a specific window title is configured on-board (see document [4]), the window title shall indicate 'NTC X data'.
- 12.3.1.3 The part 'NTC X' of the window title (if no specific window title is configured) and of the question 'NTC X data entry complete?' shall be replaced with the distinct abbreviations of the concerned National System.
- 12.3.1.4 If there are more than one NTC X data window, the window titles shall also comply with 5.3.1.2.1 g) for the indication of the sequence number of the windows and the total number of windows related to the NTC X data.
- 12.3.1.5 If technical range check rules have been configured for some NTC X data (see document [4]), the requirements in chapter 10.3.4 shall apply for the echo texts.
- 12.3.1.6 The number of input fields, their labels, their possible default values and their associated keyboards are not mentioned since it varies depending on the content of the received "specific NTC data entry request" (see step S3-1 in 12.7.2).
 - 12.3.1.6.1 Figure 143 shows the presentation of the NTC X data window(s).

The figure displays two versions of the NTC X data window. The top version is a close-up of the main window, showing a dark blue background with a title bar 'NTC A data'. Below the title bar, there are two rows of input fields: 'label 1 data 1' and 'label 2 data 2'. Below these fields, there is a 3x3 grid of buttons labeled 1 through 9, a 'Del' button, and a '0' button. At the bottom left, there is a 'Yes' button and a close button (X). The bottom version of the window shows the same main window but with a full numeric keypad and navigation buttons (Del, X, Up, Down, Left) on the right side.

Figure 143 – NTC X data window (1st window)

12.4 Data validation windows

12.4.1 NTC X data validation window

- 12.4.1.1 The NTC X data validation window shall comply with the requirements in chapter 10.4.
- 12.4.1.2 Unless a specific window title is configured on-board (see document [4]), the window title shall indicate “Validate NTC X data”.

- 12.4.1.3 The part 'NTC X' of the window title (if no specific window title is configured) shall be replaced with the distinct abbreviations of the concerned National.
- 12.4.1.4 The echo texts shall echo data of the NTC X data window(s) (see 12.3).
- 12.4.1.5 Figure 144 shows the presentation of the NTC X data validation window with the data of the 1st input field modified by the driver and consequently shown in white applying 10.3.3.5.



Figure 144 – NTC X data validation window

12.5 Data view windows

12.5.1 NTC X data view window

- 12.5.1.1 The NTC X data view window(s) shall comply with the requirements in chapter 10.5.
- 12.5.1.2 Unless a specific window title is configured on-board (see document [4]), the window titles shall indicate “NTC X data view”.
- 12.5.1.3 The part ‘NTC X’ of the window title (if no specific window title is configured) shall be replaced with the distinct abbreviations of the concerned National System.
- 12.5.1.4 If there are more than one NTC X data view window, the window titles shall also comply with 5.3.1.2.1 g) for the indication of the sequence number of the windows and the total number of windows related to the NTC X Data view.
- 12.5.1.5 The NTC X data view items shall correspond to the received Specific NTC Data View values (see document [4]).
- 12.5.1.6 The data view windows of all the National Systems available on-board shall be considered as an extension of the ETCS data view windows. In other terms, the 1st NTC X data view window is accessed by pressing the [Next] button on the last ETCS Data view window, the 1st NTC Y data view window is accessed by pressing the [Next] button on the last NTC X data view window,...
- 12.5.1.6.1 Note: the sequence order of data view windows between the different National Systems available on-board (NTC X, NTC Y,...) is an implementation issue.
- 12.5.1.7 Figure 145 shows the presentation of a NTC X data view window.

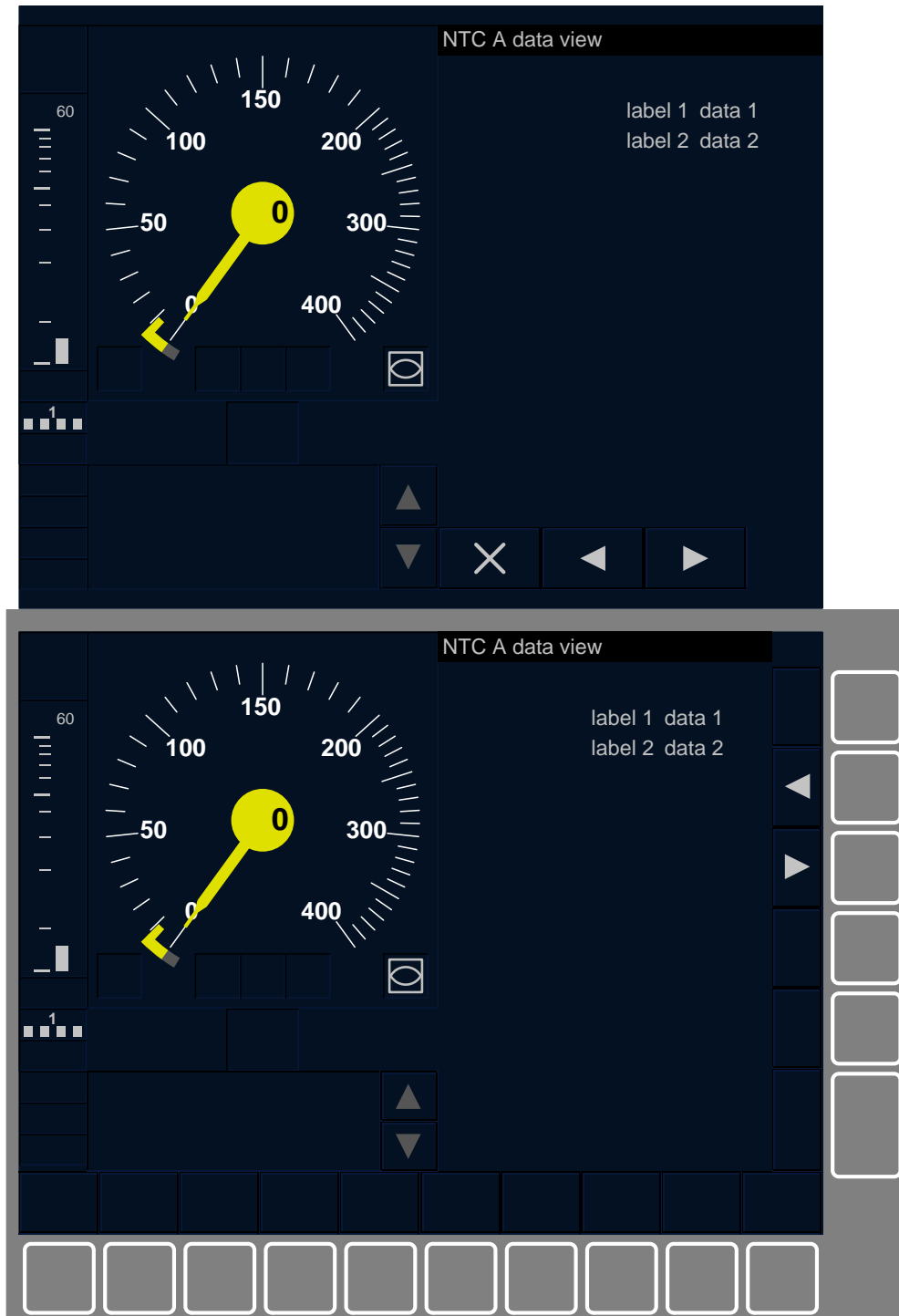


Figure 145 – NTC X data view window

12.6 Parent/child relationship

12.6.1.1 With regards to the use of the close button, the relationship between parent and child windows shall be as specified in Table 56.

12.6.1.1.1 Note: The cell “Default” refers to the default window. Its layout depends on the current ERTMS/ETCS level and mode (e.g. it could be the ETCS default window when operating in level 1/2/3 or the NTC X default window when operating in level NTC X, mode SN or NL)

Parent/child relationship			
<i>(from left to right = from parent to child)</i>			
Default	Main	National data entry selection <i>(accessible via the Train data validation window)</i>	NTC A data <i>(one or more windows)</i>
			NTC A data validation <i>(accessible via NTC A data windows)</i>
			NTC B data <i>(one or more windows)</i>
			NTC B data validation <i>(accessible via NTC B data windows)</i>
			...

Table 56 – Parent/child relationship

12.7 Dialogue sequences

12.7.1 Introduction

12.7.1.1 The latest active window including the mentioned configuration of objects/symbols (e.g. the main window with all buttons disabled and the hour glass symbol ST05 displayed) shall remain displayed until another window or another configuration of the same window is mentioned further on in the flowchart.

12.7.1.2 When an event involves a driver's action on a button, it assumes that the corresponding button is enabled (see 12.2 for the conditions enabling a button).

12.7.1.3 If one of the windows mentioned in Table 57 is currently displayed and any of the enabling conditions (see 12.2) of the corresponding button is not fulfilled anymore, the data entry / validation process shall be stopped and the parent window shall be displayed instead.

Window	Corresponding button for checking the enabling conditions
NTC A data	NTC A
NTC A data validation	NTC A
NTC B data	NTC B
NTC B data validation	NTC B
...	...

Table 57 – Relationship between windows and enabling conditions of buttons

12.7.1.4 If a data entry or validation window is currently displayed when a driver's acknowledgement is required, the data entry / validation process shall be stopped, the parent window shall be displayed instead and the driver's acknowledgement shall appear 1 second afterwards.

12.7.2 NTC data dialogue sequence

12.7.2.1 The "NTC data" dialogue sequence shows the interaction with the driver following the ETCS Train data validation while at least one NTC needs, by design, specific data from the driver to perform its national supervision, i.e. at least one STM has sent a 'Specific NTC Data Need' information indicating that it needs Specific NTC Data (see document [4], 8.2.1.4)

12.7.2.2 The [close] buttons shall be enabled in all windows except in the steps S1 and S4 where they shall be disabled.

12.7.2.3 If the driver presses the [close] button in the step S2, the ERTMS/ETCS on-board equipment shall abort the (full) train data entry procedure

12.7.2.3.1 Note: According to document [4], the 'STOP' flag will consequently be sent to all the connected STMs when the [close] button is pressed in step S2. Conversely, when the [close] button is pressed in the step S3-1 or S3-2, the NTC X data entry/validation process is only interrupted and no 'STOP' flag is sent in that case.

ERA ERTMS unit

ETCS Driver Machine Interface

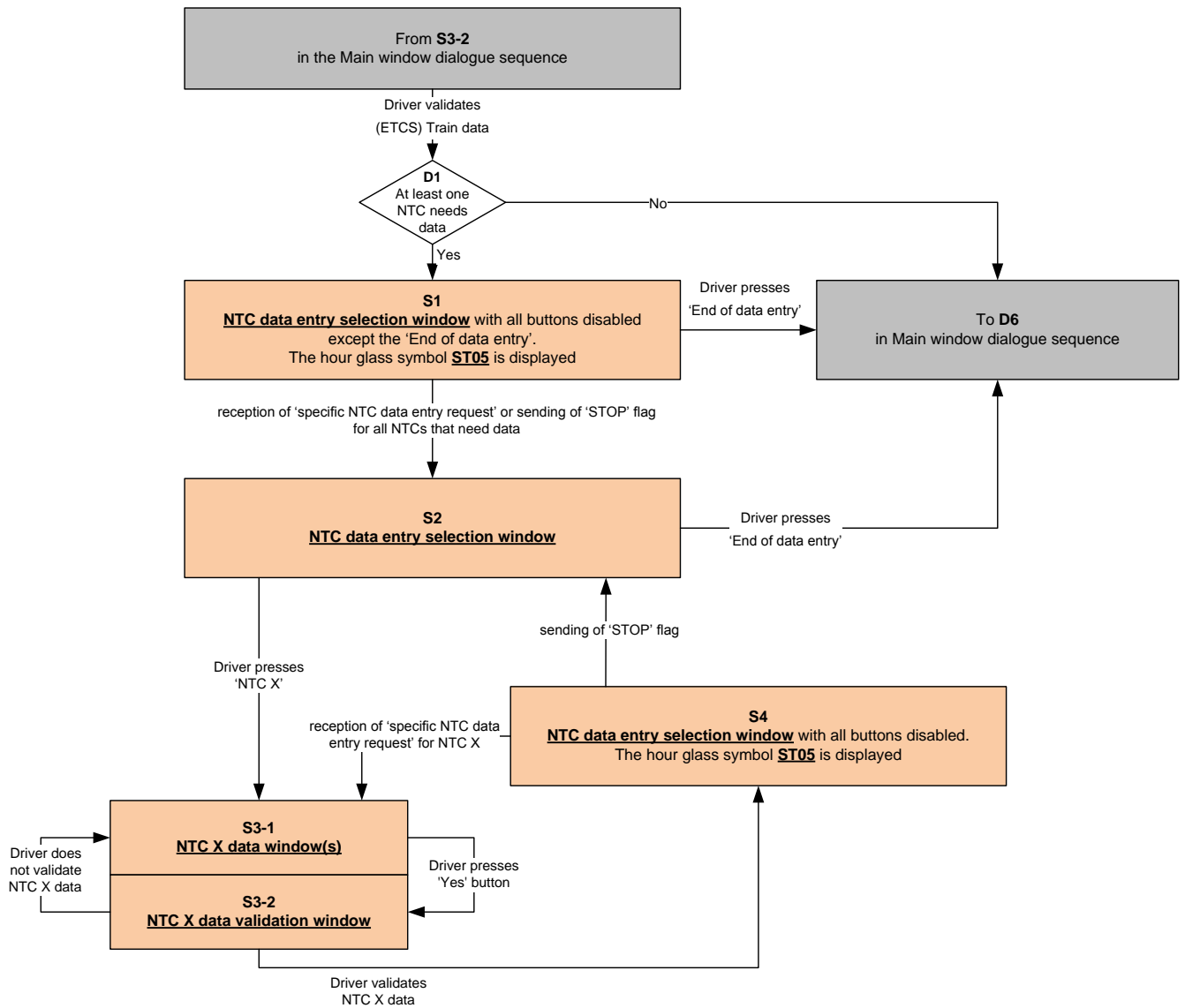


Figure 146 – NTC data dialogue sequence

ERA ERTMS unit
ETCS Driver Machine Interface

12.7.2.4 The steps of the “NTC data” dialogue sequence shall follow Table 58.

ID in Flow Chart	Requirements	Window
S3-2, Main dialogue sequence	The <u>Train data validation window</u> requests the driver to validate or not the values of the input fields for ETCS train data. Once the input field for train data validation is entered or revalidated with the value ‘Yes’, the procedure shall go to D1 (instead of D6 of the “Main window” dialogue sequence)	Figure 130 – Train data validation window
D1	If at least one NTC needs data i.e. at least one STM has sent ‘Specific NTC Data Need’ information indicating that it needs Specific NTC Data, the procedure shall go to S1 ; otherwise it shall go to D6 in the “Main window” dialogue sequence.	

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S1	<p>The <u>NTC data entry selection window</u> shall be presented to the driver with all buttons 'disabled' except the 'End of data entry' button.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits an answer from all the connected STMs supporting NTCs that need specific data.</p> <p>Note: When the ETCS Train data are validated (step S3-2, Main dialogue sequence), the START flag is sent to the STMs and then it is followed by the sending of the ETCS Train data (see document [4]).</p> <p>When, for each concerned STM, the ERTMS/ETCS on-board equipment has either received a 'Specific NTC data entry request' or has sent the 'STOP' flag (see document [4], 10.7.4.3 a) and b)), the procedure shall go to S2</p> <p>The driver can choose to skip at once the data entry/validation process of all the NTCs supported by STMs: If the driver presses 'End of data entry', the procedure shall immediately go to D6 in the "Main window" dialogue sequence.</p> <p>Note: When the driver presses 'End of data entry', , the ERTMS/ETCS on-board sends a 'STOP' flag (see document [4]) to those STMs to which no 'STOP' flag has been sent yet.</p>	Figure 142 – NTC data entry selection window

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S2	<p>The <u>NTC data entry selection window</u> shall offer the possibility to the driver to select 'NTC A', 'NTC B',... and 'End of data entry'</p> <ul style="list-style-type: none"> • If the driver presses 'NTC X', the procedure shall go to S3-1. <p>Note: the button 'NTC X' represents any of the enabled NTC buttons ('NTC A', 'NTC B', ...)</p> <ul style="list-style-type: none"> • If the driver presses 'End of data entry', the procedure shall go to D6 in the "Main window" dialogue sequence i.e. it allows the driver to skip some NTC data entry/validation processes that are not needed for the mission. <p>Note: When the driver presses 'End of data entry', the ERTMS/ETCS on-board sends a 'STOP' flag (see document [4]) to those STMs to which no 'STOP' flag has been sent yet.</p>	Figure 142 – NTC data entry selection window
S3-1	<p>When entering S3-1, the 1st <u>NTC X data window</u> shall be presented to the driver to initiate to entry of NTC X data.</p> <p>The <u>NTC X data window(s)</u> shall request the driver to enter (if no value is proposed) or to accept / re-enter (if a value is proposed) each input field for NTC X data.</p> <p>The labels of the input fields for NTC X data shall correspond to the labels contained in the "specific NTC data entry request".</p> <p>An alphanumeric keyboard shall by default be presented for an input field, unless values for a dedicated keyboard have been received in the "specific NTC data entry request" or the type of keyboard is configured on-board (see document [4]).</p> <p>When the ERTMS/ETCS on-board receives values for a dedicated keyboard as part of the "Specific NTC Data request", it shall display the dedicated keyboard</p>	Figure 143 – NTC X data window (1st window)

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
	<p>when the corresponding input field is selected.</p> <p>When no values for a dedicated keyboard have been received in the “specific NTC data entry request” but a type of keyboard is configured on-board, the ERTMS/ETCS on-board shall display this type of keyboard.</p> <p>If S3-1 is entered from S2 (i.e. the NTC X data entry / validation process starts following a driver action on the ‘NTC X’ button) or from S4 (i.e. a new NTC X data entry / validation process starts following a new specific NTC data entry request from the STM supporting NTC X):</p> <ul style="list-style-type: none">• If a value is proposed, it corresponds to the default value received in the specific NTC data entry request <p>If S3-1 is entered from S3-2 (i.e. the NTC X data entry / validation process is going on):</p> <ul style="list-style-type: none">• The proposed value for each input field shall be the data value from the previous S3-1. <p>When the ‘Yes’ button related to the ‘NTC X data entry complete?’ question is enabled (i.e. every input field for NTC X data in all ‘NTC X data’ windows contains a data value), if the driver presses this ‘Yes’ button and all data values comply with the data checks, the procedure shall go to S3-2</p> <p>Note: In this step, when the driver presses the ‘Yes’ button, NTC X data are not validated yet and consequently are not yet the NTC X data sent to the STM supporting the NTC X. This is why the term “accept” is used instead of the term “revalidate” and the term “input field for NTC X data” is used instead of “NTC X data”.</p>	

ERA ERTMS unit
ETCS Driver Machine Interface

ID in Flow Chart	Requirements	Window
S3-2	<p>The <u>NTC X data validation window</u> shall request the driver to validate or not the values of the input fields for NTC X data.</p> <p>When entering S3-2, the NTC X data validation window shall always propose the value 'Yes' in the input field for NTC X data validation.</p> <p>Once the input field for NTC X data validation is entered or revalidated, if the value is 'No', the procedure shall go back to S3-1. Otherwise, if the value is 'Yes', the procedure shall go to S4</p> <p>Note: In this step, when the NTC X data validation window is left with the value of its input field set to 'Yes', NTC X data are sent to the STM supporting the NTC X.</p>	Figure 144 – NTC X data validation window
S4	<p>The <u>NTC data entry selection window</u> shall be presented to the driver with all buttons 'disabled'.</p> <p>The symbol <u>ST05</u> shall be displayed to show that the onboard awaits an answer from the STM supporting NTC X.</p> <p>If the ERTMS/ETCS on-board equipment receives a new 'Specific NTC data entry request' from the STM supporting NTC X, the procedure shall go back to S3-1</p> <p>If the ERTMS/ETCS on-board equipment sends the 'STOP' flag (see document [4], 10.7.4.3 a) and b)) to the STM supporting NTC X, the procedure shall go to S2</p>	Figure 142 – NTC data entry selection window

Table 58 – Steps of the NTC data dialogue sequence

13. SYMBOLS








13.1 Introduction

13.1.1.1 The symbol sizes contained in the following tables refer to the outline box in which the symbol is positioned according to the bitmap file.



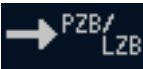






13.1.1.2 The dark blue colour is not part of the symbol; it is only shown for readability.

13.2 Level Symbols

13.2.1.1 Level symbols are presented in Table 59.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
LE01		LE_01.bmp	Level 0; grey	52 x 21	C8	
LE02	 example: 	LE_02.bmp LE_02a.bmp	level NTC; grey	52 x 21	in level NTC, the location is not specified	For NTC level the text 'NTC' is replaced by the distinct abbreviation of the corresponding National System
LE03		LE_03.bmp	Level 1, Intermittent transmission; grey	52 x 21	C8	
LE04		LE_04.bmp	Level 2, Continuous transmission; grey	52 x 21	C8	
LE05		LE_05.bmp	Level 3, Continuous transmission; grey	52 x 21	C8	
LE06		LE_06.bmp	Level 0 announcement; grey	52 x 21	C1 exception: in level NTC, the location is not specified	

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
LE07		LE_07.bmp	Level 0 announcement; yellow	52 x 21	C1 exception: in level NTC, the location is not specified	Always with a flashing frame
LE08	 example: 	LE_08.bmp LE_08a.bmp	level NTC announcement; grey	52 x 21	C1 exception: in level NTC, the location is not specified	For NTC level the text 'NTC' is replaced by the distinct abbreviation of the corresponding National System
LE09	 example: 	LE_09.bmp LE_09a.bmp	level NTC announcement; yellow	52 x 21	C1 exception: in level NTC, the location is not specified	Always with a flashing frame For NTC level the text 'NTC' is replaced by the distinct abbreviation of the corresponding National System
LE10		LE_10.bmp	Level 1 announcement, Intermittent transmission; grey	52 x 21	C1 exception: in level NTC, the location is not specified	
LE11		LE_11.bmp	Level 1 announcement, Intermittent transmission; yellow	52 x 21	C1 exception: in level NTC, the location is not specified	Always with a flashing frame
LE12		LE_12.bmp	Level 2 announcement, Continuous transmission; grey	52 x 21	C1 exception: in level NTC, the location is not specified	
LE13		LE_13.bmp	Level 2 announcement, Continuous transmission; yellow	52 x 21	C1 exception: in level NTC, the location is not specified	Always with a flashing frame

ERA ERTMS unit
ETCS Driver Machine Interface



Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
LE14		LE_14.bmp	Level 3 announcement, Continuous transmission; grey	52 x 21	C1 exception: in level NTC, the location is not specified	
LE15		LE_15.bmp	Level 3 announcement, Continuous transmission; yellow	52 x 21	C1 exception: in level NTC, the location is not specified	Always with a flashing frame

Table 59 – Level Symbols

13.3 Mode Symbols

13.3.1.1 Mode symbols are presented in Table 60.

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
MO01		MO_01.bmp	Shunting; grey	32 x 32	B7	
MO02		MO_02.bmp	Acknowledgement for Shunting; yellow	32 x 32	C1	Always with a flashing frame
MO03		MO_03.bmp	Override EOA is active; grey	32 x 32	C7	
MO04		MO_04.bmp	Trip; red with grey	32 x 32	B7	
MO05		MO_05.bmp	Acknowledgement for Trip; yellow	32 x 32	C1	Always with a flashing frame
MO06		MO_06.bmp	Post trip; grey	32 x 32	B7	
MO07		MO_07.bmp	On Sight; grey	32 x 32	B7	
MO08		MO_08.bmp	Acknowledgement for On Sight; yellow	32 x 32	C1	Always with a flashing frame
MO09		MO_09.bmp	Staff Responsible; grey	32 x 32	B7	
MO10		MO_10.bmp	Acknowledgement for Staff Responsible; yellow	46 x 46	C1	Always with a flashing frame

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
MO11		MO_11.bmp	Full Supervision; grey	32 x 32	B7	
MO12		MO_12.bmp	Non-leading; grey	32 x 32	B7	
MO13		MO_13.bmp	Stand By; grey	32 x 32	B7	
MO14		MO_14.bmp	Reversing; grey	32 x 32	B7	
MO15		MO_15.bmp	Acknowledgement for Reversing; yellow	32 x 32	C1	Always with a flashing frame
MO16		MO_16.bmp	Unfitted; grey	32 x 32	B7	
MO17		MO_17.bmp	Acknowledgement for Unfitted; yellow	32 x 32	C1	Always with a flashing frame
MO18		MO_18.bmp	System failure; red with grey	32 x 32	B7	
MO19		MO_19.bmp	National System; grey	32 x 32	in level NTC, the location is not specified	
MO20		MO_20.bmp	Acknowledgement for National System; yellow	32 x 32	C1	Always with a flashing frame
MO21		MO_21.bmp	Limited Supervision; grey	32 x 32	B7	

ERA ERTMS unit
ETCS Driver Machine Interface


Symbol number	Symbol form/shape	Bitmap file	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
MO22		MO_22.bmp	Acknowledgement for Limited Supervision; yellow	32 x 32	C1	Always with a flashing frame

Table 60 – Mode Symbols

13.4 Status Symbols

13.4.1.1 Status symbols are presented in Table 61.







Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
ST01		ST_01.bmp	Service brake intervention or emergency brake intervention; red with grey	52 x 21	C9	possibly with a flashing frame
ST02		ST_02.bmp	Adhesion factor "slippery rail"; grey	52 x 21	A4	
ST03		ST_03.bmp	Safe radio connection "Connection Up"; grey	52 x 21	E1	
ST04		ST_04.bmp	Safe radio connection "Connection Lost/Set-Up failed"; red with grey	52 x 21	E1	
ST05		ST_05.bmp	Hour glass; grey	20 x 20	Window title of 'Main' and of 'RBC contact' menu windows	
ST06		ST_06.bmp	Reversing permitted	32 x 32	C6	

Table 61 – Status Symbols

13.5 Orders and Announcement of Track Condition Symbols










13.5.1.1 Orders and announcement of track condition symbols are presented in Table 62.

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
TC01		TC_01.bmp	Pantograph lowered; grey	32 x 32	B3/4/5	
TC02		TC_02.bmp	Lower pantograph; grey	32 x 32	B3/4/5	
TC03		TC_03.bmp	Lower pantograph; yellow	32 x 32	B3/4/5	
TC04		TC_04.bmp	Raise pantograph; grey	32 x 32	B3/4/5	
TC05		TC_05.bmp	Raise pantograph; yellow	32 x 32	B3/4/5	
TC06		TC_06.bmp	Neutral section and Neutral section announcement; grey	32 x 32	B3/4/5	
TC07		TC_07.bmp	Neutral section announcement; yellow	32 x 32	B3/4/5	
TC08		TC_08.bmp	End of neutral section; grey	32 x 32	B3/4/5	
TC09		TC_09.bmp	End of neutral section; yellow	32 x 32	B3/4/5	
TC10		TC_10.bmp	Non stopping area; grey	32 x 32	B3/4/5	
TC11		TC_11.bmp	Non stopping area announcement; yellow	32 x 32	B3/4/5	

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
TC12		TC_12.bmp	Radio hole; grey	32 x 32	B3/4/5	
TC13		TC_13.bmp	Inhibition of magnetic shoe brake and Inhibition of magnetic shoe brake announcement; grey	32 x 32	B3/4/5	
TC14		TC_14.bmp	Inhibition of magnetic shoe brake announcement; yellow	32 x 32	B3/4/5	
TC15		TC_15.bmp	Inhibition of eddy current brake and Inhibition of eddy current brake announcement; grey	32 x 32	B3/4/5	
TC16		TC_16.bmp	Inhibition of eddy current brakes announcement; yellow	32 x 32	B3/4/5	
TC17		TC_17.bmp	Inhibition of regenerative brake and Inhibition of regenerative brake announcement; grey	32 x 32	B3/4/5	
TC18		TC_18.bmp	Inhibition of regenerative brake announcement; yellow	32 x 32	B3/4/5	
TC19		TC_19.bmp	Air conditioning intake closed and Close air conditioning intake announcement; grey	32 x 32	B3/4/5	
TC20		TC_20.bmp	Open air conditioning intake; grey	32 x 32	B3/4/5	
TC21		TC_21.bmp	Close air conditioning intake announcement; yellow	32 x 32	B3/4/5	

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
TC22		TC_22.bmp	Open air conditioning intake; yellow	32 x 32	B3/4/5	
TC23		TC_23.bmp	New traction system and Change of Traction system announcement "the line is not fitted with any traction system"; grey	32 x 32	B3/4/5	
TC24		TC_24.bmp	Change of Traction system announcement "the line is not fitted with any traction system"; yellow	32 x 32	B3/4/5	
TC25		TC_25.bmp	New traction system and Change of Traction system announcement "AC 25 kV 50 Hz"; grey	32 x 32	B3/4/5	
TC26		TC_26.bmp	Change of Traction system announcement "AC 25 kV 50 Hz"; yellow	32 x 32	B3/4/5	
TC27		TC_27.bmp	New traction system and Change of Traction system announcement "AC 15 kV 16.7 Hz"; grey	32 x 32	B3/4/5	
TC28		TC_28.bmp	Change of Traction system announcement "AC 15 kV 16.7 Hz"; yellow	32 x 32	B3/4/5	
TC29		TC_29.bmp	New traction system and Change of Traction system announcement "DC 3 kV"; grey	32 x 32	B3/4/5	
TC30		TC_30.bmp	Change of Traction system announcement "DC 3 kV"; yellow	32 x 32	B3/4/5	

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
TC31		TC_31.bmp	New traction system and Change of Traction system announcement "DC 1.5 kV"; grey	32 x 32	B3/4/5	
TC32		TC_32.bmp	Change of Traction system announcement "DC 1.5 kV"; yellow	32 x 32	B3/4/5	
TC33		TC_33.bmp	New traction system and Change of Traction system announcement "DC 600/750 V"; grey	32 x 32	B3/4/5	
TC34		TC_34.bmp	Change of Traction system announcement "DC 600/750 V"; yellow	32 x 32	B3/4/5	
TC35		TC_35.bmp	Sound horn; yellow	32 x 32	B3/4/5	
TC36		TC_36.bmp	Tunnel stopping area; grey	32 x 32	C2	
TC37		TC_37.bmp	Tunnel stopping area announcement; yellow	32 x 32	C2	

Table 62 – Orders and Announcement of Track Condition Symbols

13.6 Planning Information Symbols

13.6.1.1 Planning information symbols are presented in Table 63.

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
PL01		PL_01.bmp	Lower pantograph; grey	20 x 20	D2/3/4	
PL02		PL_02.bmp	Lower pantograph; yellow	20 x 20	D2/3/4	
PL03		PL_03.bmp	Raise pantograph; grey	20 x 20	D2/3/4	
PL04		PL_04.bmp	Raise pantograph; yellow	20 x 20	D2/3/4	
PL05		PL_05.bmp	Neutral section announcement; grey	20 x 20	D2/3/4	
PL06		PL_06.bmp	Neutral section announcement; yellow	20 x 20	D2/3/4	
PL07		PL_07.bmp	End of neutral section; grey	20 x 20	D2/3/4	
PL08		PL_08.bmp	End of neutral section; yellow	20 x 20	D2/3/4	
PL09		PL_09.bmp	Non stopping area announcement; yellow	20 x 20	D2/3/4	
PL10		PL_10.bmp	Radio hole; grey	20 x 20	D2/3/4	
PL11		PL_11.bmp	Inhibition of magnetic shoe brake announcement; grey	20 x 20	D2/3/4	
PL12		PL_12.bmp	Inhibition of magnetic shoe brake announcement; yellow	20 x 20	D2/3/4	
PL13		PL_13.bmp	Inhibition of eddy current brake announcement; grey	20 x 20	D2/3/4	

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
PL14		PL_14.bmp	Inhibition of eddy current brake announcement; yellow	20 x 20	D2/3/4	
PL15		PL_15.bmp	Inhibition of regenerative brake announcement; grey	20 x 20	D2/3/4	
PL16		PL_16.bmp	Inhibition of regenerative brake announcement; yellow	20 x 20	D2/3/4	
PL17		PL_17.bmp	Close air conditioning intake announcement; grey	20 x 20	D2/3/4	
PL18		PL_18.bmp	Open air conditioning intake; grey	20 x 20	D2/3/4	
PL19		PL_19.bmp	Close air conditioning intake announcement; yellow	20 x 20	D2/3/4	
PL20		PL_20.bmp	Open air conditioning intake; yellow	20 x 20	D2/3/4	
PL21		PL_21.bmp	Speed increase: grey	20 x 20	D6 (half left part) / D7 (half right part)	
PL22		PL_22.bmp	Speed decrease: grey	20 x 20	D6 (half left part) / D7 (half right part)	
PL23		PL_23.bmp	Speed decrease to a zero target: grey	20 x 20	D6 (half left part) / D7 (half right part)	
PL24		PL_24.bmp	Sound horn; yellow	20 x 20	D2/3/4	
PL25		PL_25.bmp	Change of Traction system announcement "the line is not fitted with any traction system"; grey	20 x 20	D2/3/4	

ERA ERTMS unit
ETCS Driver Machine Interface























Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
PL26		PL_26.bmp	Change of Traction system announcement “the line is not fitted with any traction system”; yellow	20 x 20	D2/3/4	
PL27		PL_27.bmp	Change of Traction system announcement “AC 25 kV 50 Hz”; grey	20 x 20	D2/3/4	
PL28		PL_28.bmp	Change of Traction system announcement “AC 25 kV 50 Hz”; yellow	20 x 20	D2/3/4	
PL29		PL_29.bmp	Change of Traction system announcement “AC 15 kV 16.7 Hz”; grey	20 x 20	D2/3/4	
PL30		PL_30.bmp	Change of Traction system announcement “AC 15 kV 16.7 Hz”; yellow	20 x 20	D2/3/4	
PL31		PL_31.bmp	Change of Traction system announcement “DC 3 kV”; grey	20 x 20	D2/3/4	
PL32		PL_32.bmp	Change of Traction system announcement “DC 3 kV”; yellow	20 x 20	D2/3/4	
PL33		PL_33.bmp	Change of Traction system announcement “DC 1.5 kV”; grey	20 x 20	D2/3/4	
PL34		PL_34.bmp	Change of Traction system announcement “DC 1.5 kV”; yellow	20 x 20	D2/3/4	
PL35		PL_35.bmp	Change of Traction system announcement “DC 600/750 V”; grey	20 x 20	D2/3/4	
PL36		PL_36.bmp	Change of Traction system announcement “DC 600/750 V”; yellow	20 x 20	D2/3/4	

Table 63 – Planning information Symbols

13.7 Navigation Symbols

13.7.1.1 Navigation symbols are presented in Table 64.

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
NA01		NA_01.bmp	Hide information; planning grey	12 x 12	D14	Touch screen
NA02		NA_02.bmp	Show/Hide information; planning grey	32 x 32	H2	Soft key
NA03		NA_03.bmp	Scale up planning information; grey	12 x 12	D9	Touch screen
NA04		NA_04.bmp	Scale down planning information; grey	12 x 12	D12	Touch screen
NA05		NA_05.bmp	Scale up planning information; dark grey	12 x 12	D9	Touch screen (used for disabled button)
NA06		NA_06.bmp	Scale down planning information; dark grey	12 x 12	D12	Touch screen (used for disabled button)
NA07		NA_07.bmp	Scale up planning information; grey	32 x 32	F10	Soft key
NA08		NA_08.bmp	Scale down planning information; grey	32 x 32	F9	Soft key
NA09		NA_09.bmp	Scale up planning information; dark grey	32 x 32	F10	Soft key (used for disabled button)
NA10		NA_10.bmp	Scale down planning information; dark grey	32 x 32	F9	Soft key (used for disabled button)
NA11		NA_11.bmp	Close window; grey	32 x 32	[close] button in D/F/G area H5	Touch screen Soft key

ERA ERTMS unit
ETCS Driver Machine Interface

Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
NA12		NA_12.bmp	Close window; dark grey	32 x 32	[close] button in D/F/G area H5	Touch screen Soft key (used for disabled button)
NA13		NA_13.bmp	Scroll up; grey	32 x 32	E10 H5	Touch screen Soft key
NA14		NA_14.bmp	Scroll down; grey	32 x 32	E11 H6	Touch screen Soft key
NA15		NA_15.bmp	Scroll up; dark grey	32 x 32	E10 H5	Touch screen Soft key (used for disabled button)
NA16		NA_16.bmp	Scroll down; dark grey	32 x 32	E11 H6	Touch screen Soft key (used for disabled button)
NA17		NA_17.bmp	Next; grey	32 x 32	[Next] button in D/F/G area H4	Touch screen Soft key
NA18		NA_18.bmp	Previous; grey	32 x 32	[previous] button in D/F/G area H3	Touch screen Soft key
NA18.2		NA_18.2.bmp	Next; dark grey	32 x 32	[Next] button in D/F/G area H4	Touch screen Soft key (used for disabled button)
NA19		NA_19.bmp	Previous; dark grey	32 x 32	[previous] button in D/F/G area H3	Touch screen Soft key (used for disabled button)
NA20		NA_20.bmp	Enter, grey	32 x 32	H7	Soft key

ERA ERTMS unit
ETCS Driver Machine Interface




Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
NA21		NA_21.bmp	Delete, grey	32 x 32		
NA22		NA_22.bmp	Enter, dark grey	32 x 32	H7	Soft key (used for disabled button)
NA23		NA_23.bmp	More; grey	32 x 32	Key 12 for dedicated keyboard F10	Touch screen Soft key

Table 64 – Navigation Symbols

13.8 Settings Symbols

13.8.1.1 Settings symbols are presented in Table 65.





Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
SE01		SE_01.bmp	Luminance adjustment, grey	32 x 32		
SE02		SE_02.bmp	Volume adjustment, grey	32 x 32		
SE03		SE_03.bmp	Language selection, grey	32 x 32		
SE04		SE_04.bmp	Settings menu, grey	32 x 32		

Table 65 – Settings Symbols

13.9 Driver Request Symbols

13.9.1.1 Driver request symbols are presented in Table 66.






Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
DR01		DR_01.bmp	Toggling function for speed/distance information; grey	32 x 32	F7	Soft key
DR02		DR_02.bmp	Track Ahead Free, grey with dark grey	75 x 46	D	
DR03		DR_03.bmp	Geographical Position; grey	32 x 32	G12 F8	Touch screen Soft key
DR04		DR_04.bmp	Acknowledgement; yellow	32 x 32	H7	Soft key
DR05		DR_05.bmp	Toggling function for tunnel stopping area; grey	32 x 32	C2/C3/C4 F6	Touch screen Soft key

Table 66 – Driver request Symbols

13.10 Level Crossing Symbol

13.10.1.1 Level Crossing symbol is presented in Table 67.


Symbol number	Symbol form/shape	Bmp file name	Symbol and colour description	Symbol size (cells)	Symbol area(s)	Remarks
LX01		LX_01.bmp	LX not protected; grey	32 x 32	B3/4/5	

Table 67 – Level Crossing Symbol

14. AUDIBLE INFORMATION

14.1 Introduction

14.1.1.1 Audible information is used to draw the driver's attention from the outside to the display.

14.2 Feedback Audible information

14.2.1 click

14.2.1.1 The audible information 'click' is given as feedback while pressing the finger on a button.

14.2.1.2 This 'click' sound shall be played once.

14.2.1.3 The 'click' sound shall be compliant with the "S_click.wav" file.

14.3 ERTMS/ETCS Audible information

14.3.1 Sinfo - Information on DMI

14.3.1.1 This is to draw the attention of the driver to some new visual information.

14.3.1.2 This Sinfo sound shall be played once.

14.3.1.3 The Sinfo sound shall be compliant with the "S_info.wav" file.

14.3.2 S1 - Over-speed

14.3.2.1 This is to draw the driver's attention that the current train speed/position has exceeded the Permitted supervision limit (P) in TSM (i.e. the Over-speed status is activated).

14.3.2.2 This S1 sound shall be played once.

14.3.2.3 The S1 sound shall be compliant with the "S1_toofast.wav" file.

14.3.3 S2 - Warning

14.3.3.1 This is to draw the driver's attention that the current train speed/position is close to the first line of intervention supervision limit (FLOI) (i.e. the Warning status is activated).

14.3.3.2 This S2 sound shall be played as long as the Warning status information is active.

14.3.3.3 The S2 sound shall be compliant with the "S2_warning.wav" file.

15. LIST OF SYSTEM STATUS MESSAGES

- 15.1.1.1 The system status messages mentioned in Table 68 shall be displayed to the driver to fulfil the driver information required by the corresponding clauses in document [3].
- 15.1.1.2 The system status messages mentioned in Table 69 shall be displayed to the driver to fulfil the driver information required by the corresponding clauses in document [4].
- 15.1.1.3 The case of the displayed system status messages shall comply with the case of the texts in Table 68 and Table 69.
- 15.1.1.4 The system status messages shall be displayed as text messages not to be acknowledged.
- 15.1.1.4.1 Exception: The system status message “[name of NTC] failed” shall be displayed as a text message to be acknowledged.
- 15.1.1.4.2 Note: the system status messages are provided in English. However, the actual system status messages displayed to the driver depend on the selected language (see chapter 5.5).
- 15.1.1.5 The part [name of NTC] of a system status shall be replaced with the distinct abbreviations of the concerned National System.

System status message	SRS reference	Comment
Balise read error	3.16.2.6.1	
	3.16.2.4.4.3	
	3.16.2.5.3	
	3.16.2.7.1.1	
	3.16.2.7.2.2	
	4.6.3 [17]	Trip reason
	3.16.2.3.2	Trip reason
	4.6.3 [66]	Trip reason
Trackside malfunction	3.16.2.4.9	
Communication error	3.16.3.4.4	
	4.6.3 [41]	Trip reason
Entering FS	4.4.9.1.4	
	4.7.2	
Entering OS	4.4.12.1.7	
	4.7.2	
Runaway movement	3.14.2.6	Roll Away Protection
	3.14.3.4	Reverse Movement Protection
	3.14.4.5	Standstill supervision

ERA ERTMS unit
ETCS Driver Machine Interface

System status message	SRS reference	Comment
	3.18.3.3.1	Movement detected during data entry 'Train Data'
	4.4.11.1.5.1	Movement detected during data entry 'SR speed/distance'
	4.4.14.1.3	PT distance exceeded
	4.4.14.1.3.2	Movement in the direction opposite to the train orientation detected while the PT distance is still exceeded
SH refused	5.6.3 A220	
	4.7.2	
	4.6.3 [35]	Trip reason
SH request failed	5.6.4.1.1	
	4.7.2	
Trackside not compatible	3.5.3.8 b	
	3.17.3.5 d	Trip reason
	4.6.3 [65]	Trip reason
Train data changed	4.7.2	
	5.17.2.2 A1	
	5.17.2.2 S2	
	5.17.2.2 S4	
Train is rejected	5.4.3.2 A40	
Unauthorized passing of EOA / LOA	3.12.2.8	Trip reason
	3.13.10.2.6	Trip reason
	3.13.10.2.7	Trip reason
	4.6.3 [12]	Trip reason
	4.6.3 [16]	Trip reason
	3.11.6.4	Trip reason
	4.6.3 [18]	Trip reason
	4.6.3 [43]	Trip reason
No MA received at level transition	4.6.3 [39]	Trip reason
	5.10.3.2.3	Trip reason
	5.10.3.4.1	Trip reason
	5.10.3.7.3	Trip reason
	5.10.3.8.1	Trip reason
	4.6.3 [67]	Trip reason

ERA ERTMS unit
ETCS Driver Machine Interface

System status message	SRS reference	Comment
SR distance exceeded	4.4.11.1.3 b	Trip reason
	4.6.3 [42]	Trip reason
SH stop order	4.4.8.1.1 c	Trip reason
	4.6.3 [49]	Trip reason
	4.4.8.1.1 b	Trip reason
	4.6.3 [52]	Trip reason
SR stop order	4.4.11.1.3 d	Trip reason
	4.6.3 [54]	Trip reason
	4.4.11.1.3 c	Trip reason
	4.6.3 [36]	Trip reason
Emergency stop	3.10.2.6	
	3.10.2. 3	Trip reason
	4.6.3 [20]	Trip reason
	4.7.2	Trip reason
	4.7.2	
RV distance exceeded	4.4.18.1.3 b	
	4.4.18.1.4	Movement in the direction opposite to the train orientation detected while the RV distance is still exceeded
No track description	4.6.3 [69]	Trip reason
[name of NTC] brake demand	4.6.3 [38]	Trip reason
Route unsuitable – axle load category	3.12.2.4	
	4.7.2	
Route unsuitable – loading gauge	3.12.2.4	
	4.7.2	
Route unsuitable – traction system	3.12.2.4	
	4.7.2	
Radio network registration failed	4.7.2	
	5.4.3.2 S3	

Table 68 - System status messages related to SRS requirements

System status message	SUBSET-035 reference	Comment
[name of NTC] needs data	10.7.3.4	
Runaway movement	10.7.3.9	
[name of NTC] failed	10.14	

Table 69 - System status messages related to SUBSET-035 requirements