Catalogue of Symbols

1.1 Introduction

The issue of the different visualization implementations of railway industry systems leads to problems with training time as well as tool development. Across Europe, several stakeholders have a great interest in visualizing and monitoring railway operations, which involve tracks, assets, and more. The railway industry has common assets and operational concepts across Europe due to its historical development and the exchange of concepts over the years. However, few efforts have been directed toward standardizing the visual representation of these concepts. The neglect of these efforts leads to isolated visualization standards and, consequently, the duplication of development and training efforts for the implementation and usage of these standards.

1.2 Purpose

This document addresses the goal of standardizing the visualization of different users in the railway industry with varying interests. As the unification of vocabulary progresses, the goal is to base the visualization on a single source of truth for the vocabulary concept. The ERA Ontology currently offers a growing number of concepts for the railway industry, and based on it, different data models are being developed to serve various use cases. One of these data models is CCSTMS, which is entirely based on ERA terminologies and targets use cases such as ETCS L2 automated engineering, ATO segment profile generation, Balise telegram generation, route compatibility checks, and more. The Catalogue of Symbols is built on CCSTMS and, accordingly, the ERA Ontology.

1.3 Approach

The Catalogue of Symbols approach is to expand per domain through the continuous development of visualization concepts based on user contributions and needs. As the ERA Ontology, is flexible to expand, a back-propagation approach can be applied upon request. Document updates can be based on the following figure. This approach ensures that standardization concepts remain clear and based on standardized terminologies.

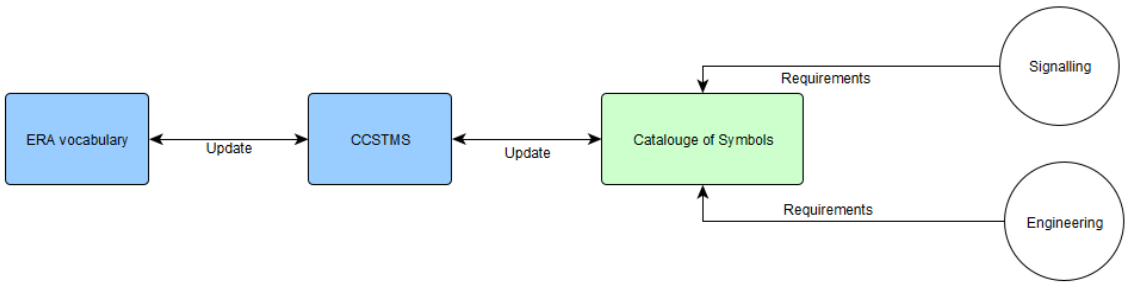


Figure 1 Catalogue of Symbols current development approach

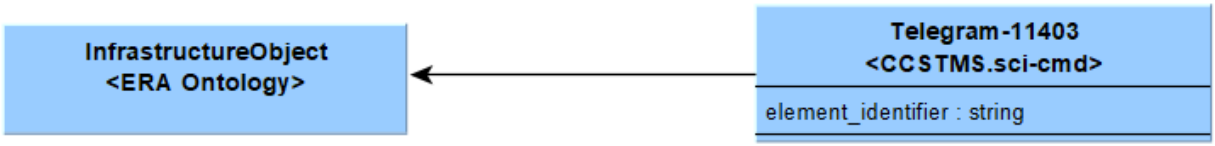


Figure 2 Sample Infromation link accross elements for Switch

1.4 How to use

The Catalogue of Symbols addresses not only the standardization of the visual aspects of assets but also their dynamic operations, if applicable. Hence, the Catalogue of Symbols is not only linked to object names but also to their properties and values. A sample use case is the signaling operation screen, where assets change colors and shapes according to their states. The Catalogue of Symbols document can be considered the user-interface end use, but it is linked to other documents that ensure the required visualization. These artifacts include:

- CCSTMS data file (XML, JSON) for topological and geometrical aspects of tracks and asset locations.
- SCI-CMD (XML, JSON), which provides a standard communication specification between different systems and assets.
- CCSTMS-UI extension for visualization.

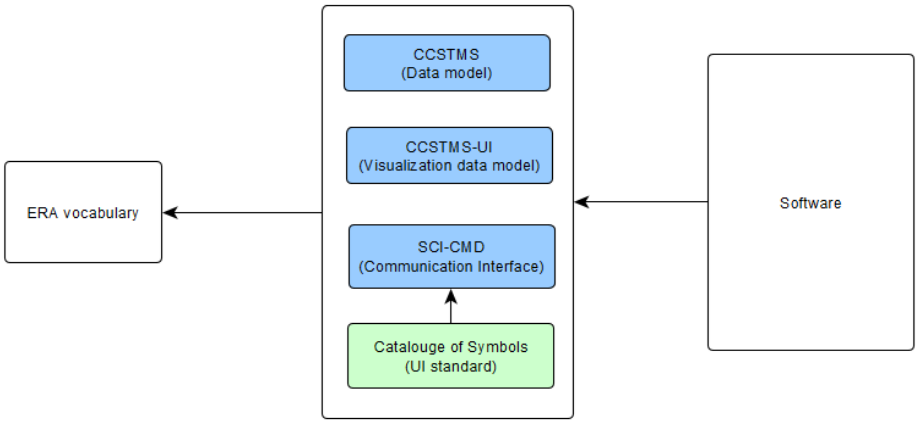


Figure 3 CCSTMS and Catalouge of Symbols as middleware

The product development approach requires the integration of CCSTMS in any required available format, as well as the UI extension. Both serve as configuration files for the visualization system, providing infrastructure information and an initial foundation for visualization. The CCSTMS-UI extension is linked to the Catalogue of Symbols through Id refrences, where the Catalogue of Symbols offers direct mapping between ERA Ontology information and visualization aspects.

The following figure illustrates the levels of information required to achieve the visualization goal:

- CCSTMS provides base infrastructure information, including topology and geometry, stored in a

map subset.

- CCSTMS-UI adds higher-level information regarding the status of elements by offering styling information and visualizing linear-based CCSTMS elements.
- CCSTMS-UI extension references the Catalogue of Symbols SVG library, which includes point objects.

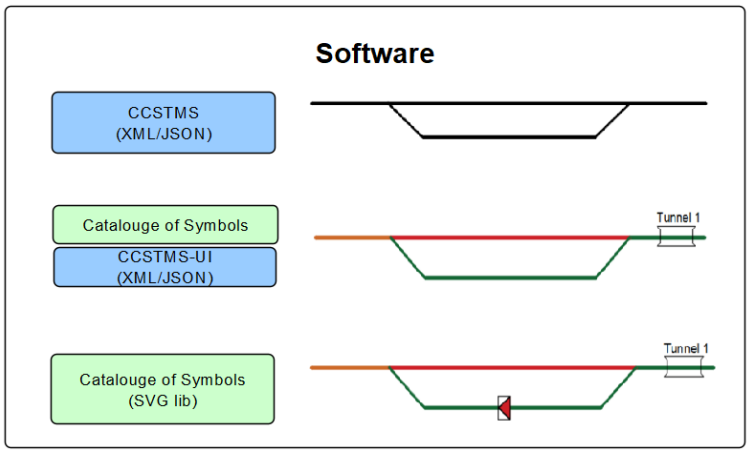


Figure 4 Figure Visualization levels using CCSTMS and Catalogue of Symbols

The Catalogue of Symbols could be used by different users to achieve their visualization goals. An example use case is monitoring the states of different elements in the field by interfacing with a desired system that uses SCI-CMD as a communication messaging standard. With knowledge of the communicated telegram content and the help of the Catalogue, the states of elements would be updated by mapping the telegram content to the Catalogue of Symbols. Figure 5 provides insights into how this process works. The operation screen use case is further illustrated in Figure 6, where domain-specific information, such as Signaling or Engineering, can be adapted by implementing different views with different CCSTMS Map data.

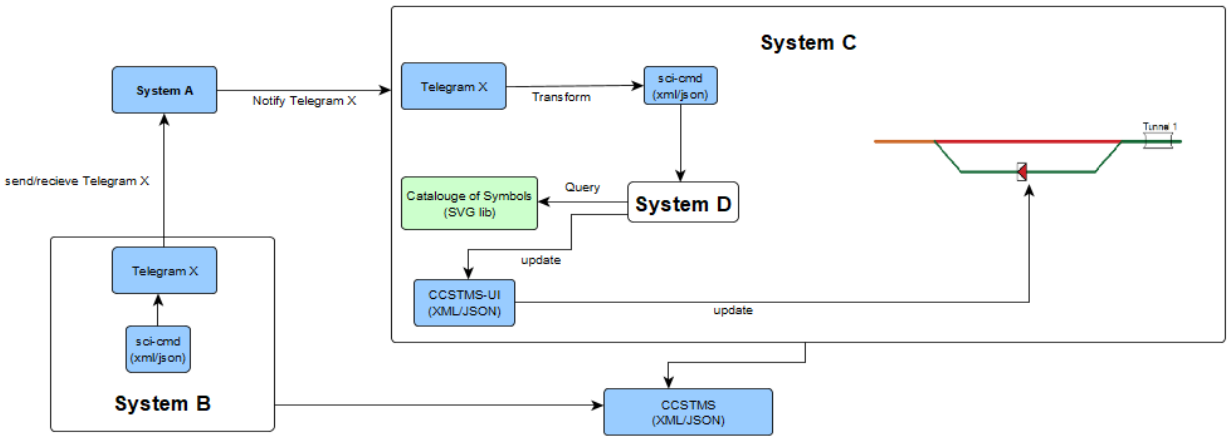


Figure 5 Catalogue of Symbols integration in a visualization system

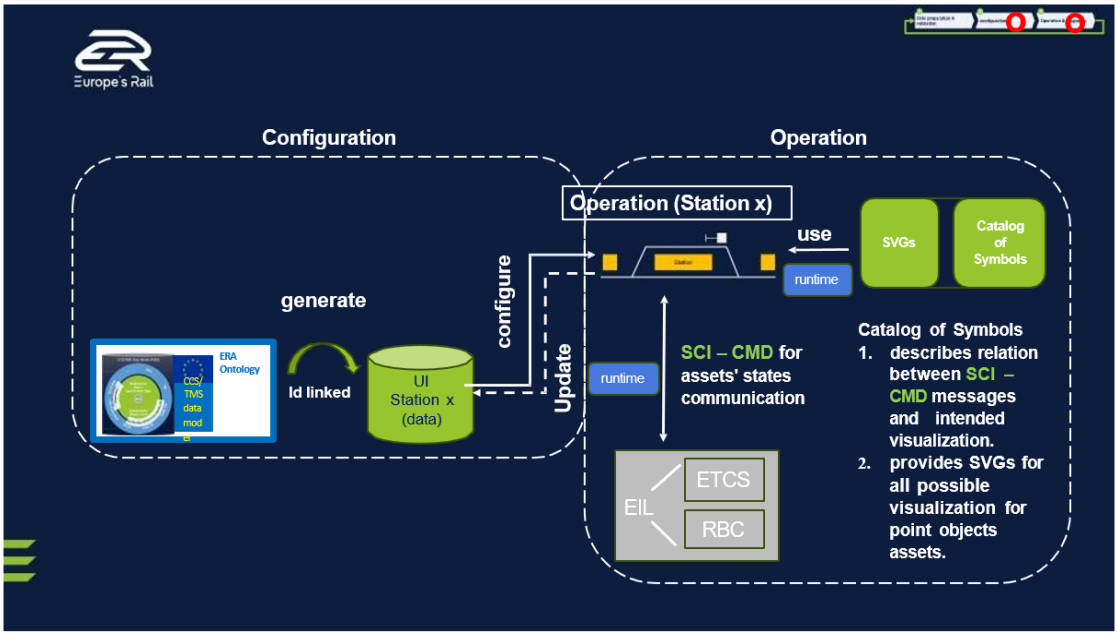
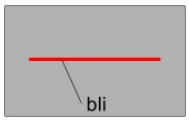
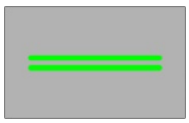


Figure 6 Sample use-case for Operation

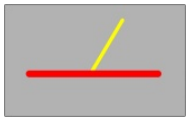
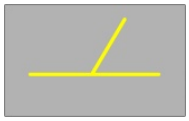
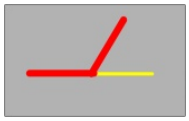
1.5 TrackEdgeSection

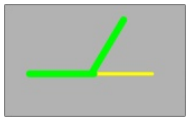
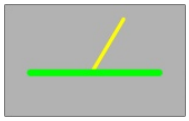
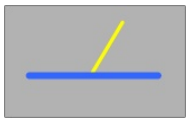
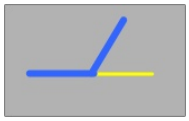
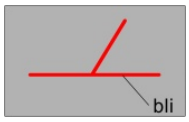
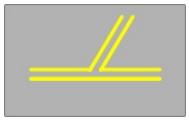
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Secured free track section	11392.current_status_data=true		No
Secured free track section with train route set	11392.route_marking_and_occupancy =1		No

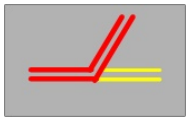
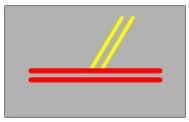
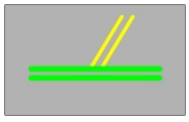
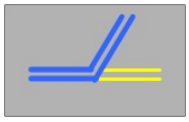
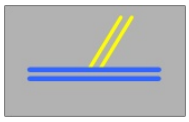
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Secured free track section with shunting route set	11392.route_marking_and_occupancy =2		No
Secured occupied track section	11392.route_marking_and_occupancy =3		No
Track section without current state data	11392.current_status_data=false		No
Secured free track section, traffic is blocked	11392.current_status_data=true AND 11392.locked =true		No
Secured occupied track section, traffic is blocked	11392.route_marking_and_occupancy =3 AND 11392.locked =true		No
Secured free track section with train route set, traffic is blocked	11392.route_marking_and_occupancy =1 AND 11392.locked =true		No

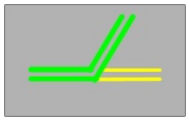
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Secured free track section with shunting route set, traffic is blocked	11392.route_marking_and_occupancy =2 AND 11392.locked =true		No

1.6 SimplePoint

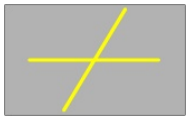
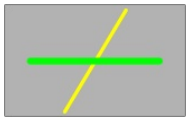
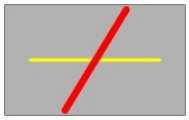
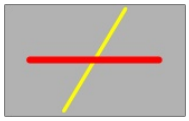
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, right	11403.position =true AND 11403.route_marking_and_occupancy =3		No
Free	(11403.position =false OR 11403.position =true) AND 11403.current_status_data=true		No
Occupied, Left	11403.position =false AND 11403.route_marking_and_occupancy =3		No

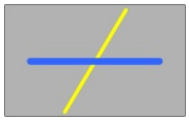
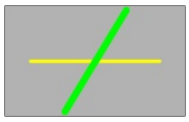
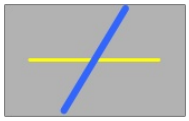
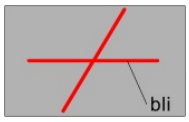
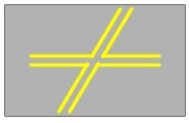
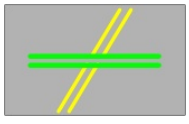
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, left, train route set	11403.position =false AND 11403.route_marking_and_occupancy =1		No
Occupied, right, train route set	11403.position =true AND 11403.route_marking_and_occupancy =1		No
Occupied, right, shunting route set	11403.position =true AND 11403.route_marking_and_occupancy =2		No
Occupied, left, shunting route set	11403.position =false AND 11403.route_marking_and_occupancy =2		No
Without current state data	11403.current_status_data=false		No
Free, traffic blocked	(11403.position =false OR 11403.position =true) AND 11403.current_status_data=true AND 11403.locked=true		No

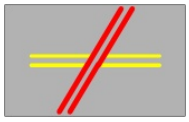
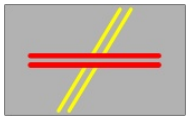
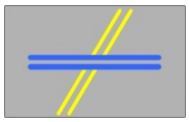
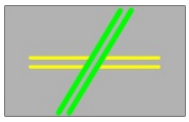
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, Left, traffic blocked	11403.position =false AND 11403.route_marking_and_occupancy =3 AND 11403.locked=true		No
Occupied, right, traffic blocked	11403.position =true AND 11403.route_marking_and_occupancy =3 AND 11403.locked=true		No
Occupied, right, train route set, traffic blocked	11403.position =true AND 11403.route_marking_and_occupancy =1 AND 11403.locked =true		No
Occupied, left, shunting route set, traffic blocked	11403.position =false AND 11403.route_marking_and_occupancy =2 AND 11403.locked =true		No
Occupied, right, shunting route set, traffic blocked	11403.position =1 AND 11403.route_marking_and_occupancy =2 AND 11403.locked =true		No

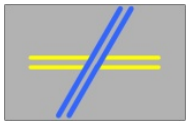
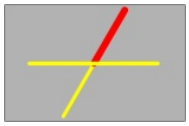
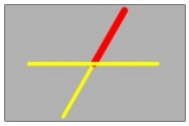
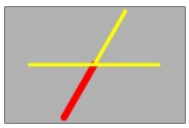
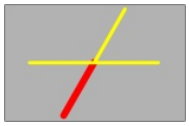
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, left, train route set, traffic blocked	11403.position =false AND 11403.route_marking_and_occupancy =true		No

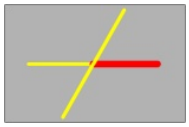
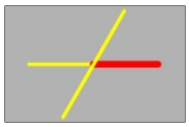
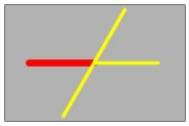
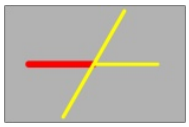
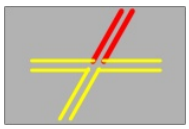
1.7 Crossing

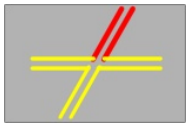
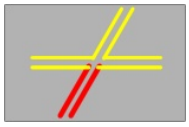
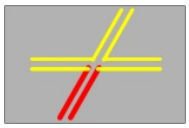
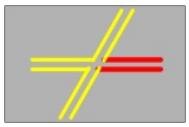
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Free	11393.current_status_data=true		No
Occupied, right, train route set	11393.position=true AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =1		No
Occupied, Left	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =3		No
Occupied, right	11393.position=true AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =3		No

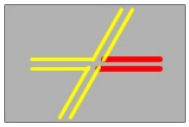
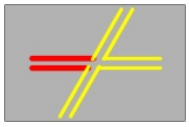
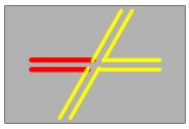
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, right, shunting route set	11393.position=true AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =2		No
Occupied, left, train route set	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =1		No
Occupied, left, shunting route set	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =1		No
Without current state data,	11393.current_status_data=false		No
Free, traffic blocked	1393.current_status_data=true AND 11393.locked=true		No
Occupied, right, train route set, traffic blocked	11393.position=true AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =1 AND 11393.locked=true		No

Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, left, traffic blocked	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =3 AND 11393.locked=true		No
Occupied, right, traffic blocked	11393.position=trueAND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =3 AND 11393.locked=true		No
Occupied, right, shunting route set, traffic blocked	11393.position=true AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =2 AND 11393.locked=true		No
Occupied, left, train route set, traffic blocked	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =1 AND 11393.locked=true		No

Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, left, shunting route set, traffic blocked	11393.position=false AND 11393.current_status_data=true AND 11393.route_marking_and_occupancy =2 AND 11393.locked=true		No
Free, train route set, above occupied	11393.current_status_data=true AND 11393.position=false AND 11393.occupancy_right_part =1		No
Free, train route set, above occupied	11393.current_status_data=true AND 11393.position=true AND 11393.occupancy_right_part =1		No
Free, train route set, below occupied	11393.current_status_data=true AND 11393.position=false AND 11393.occupancy_left_part =1		No
Free, train route set, below occupied	11393.current_status_data=true AND 11393.position=true AND 11393.occupancy_left_part =1		No

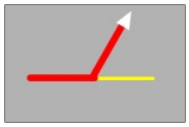
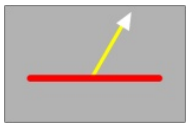
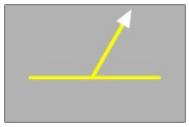
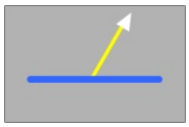
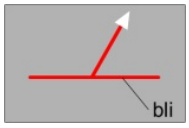
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Free, train route set, right occupied	11393.current_status_data=true AND 11393.position=false AND 11393.occupancyright_part_postive=1		No
Free, train route set, right occupied	11393.current_status_data=true AND 11393.position=true AND 11393.occupancyright_part_postive=1		No
Free, train route set, left occupied	11393.current_status_data=true AND 11393.position=true AND 11393.occupancy_left_part_postive=true		No
Free, train route set, left occupied	11393.current_status_data=true AND 11393.position=false AND 11393.occupancy_left_part_postive=true		No
Free, train route set, above occupied, traffic blocked	11393.current_status_data=true AND 11393.position=true AND 11393.OCCUPANCY_RIGHT_PART-=1 AND 11393.locked=true		No

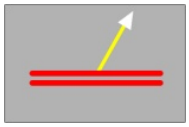
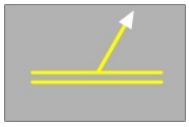
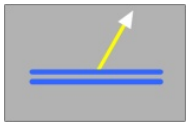
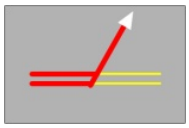
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Free, train route set, above occupied, traffic blocked	11393.current_status_data=true AND 11393.position=false AND 11393.OCCUPANCY_RIGHT_PART-=1 AND 11393.locked=true		No
Free, train route set, below occupied, traffic blocked	11393.current_status_data=true AND 11393.position=false AND 11393.OCCUPANCY_LEFT_PART-=1 AND 11393.locked=true		No
Free, train route set, below occupied, traffic blocked	11393.current_status_data=true AND 11393.position=true AND 11393.OCCUPANCY_LEFT_PART-=1 AND 11393.locked=true		No
Free, train route set, right occupied, traffic blocked	11393.current_status_data=true AND 11393.position=true AND 11393.occupancyright_part_postive=1 AND 11393.locked=true		No

Description	Information according to SCI-CMD	Symbol and text message	SVG file
Free, train route set, right occupied, traffic blocked	11393.current_status_data=true AND 11393.position=false AND 11393.occupancyright_part_postive=1 AND 11393.locked=true		No
Free, train route set, left occupied, traffic blocked	11393.current_status_data=true AND 11393.position=true AND 11393.occupancy_left_part_postive=true AND 11393.locked=true		No
Free, train route set, left occupied, traffic blocked	11393.current_status_data=true AND 11393.position=false AND 11393.occupancy_left_part_postive=true AND 11393.locked=true		No

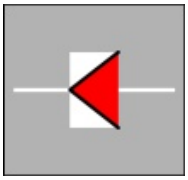
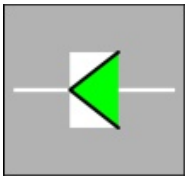
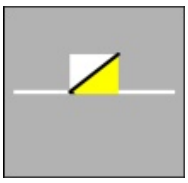
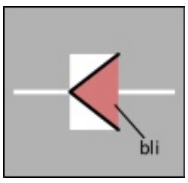
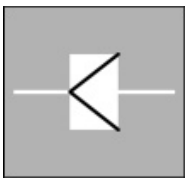
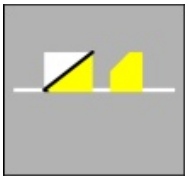
1.8 Derailer

Description	Information according to SCI-CMD	Symbol and text message	SVG file

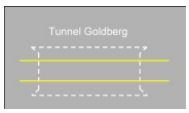
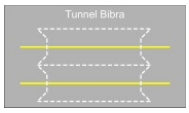
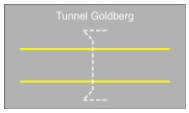
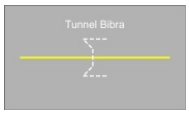
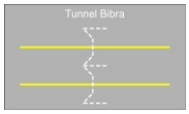
Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, put up	11403.position=false AND 11403.current_status_data=true AND 11403.route_marking_and_occupancy =3		No
Occupied, put down	11403.position=true AND 11403.current_status_data=true AND 11403.route_marking_and_occupancy =3		No
Free	11403.position=true AND 11403.current_status_data=true		No
Free, shunting route set, put down	11403.position =true AND 11403.current_status_data=true AND 11403.route_marking_and_occupancy =2		No
Without current state data.	11403.current_status_data=false		No

Description	Information according to SCI-CMD	Symbol and text message	SVG file
Occupied, put down, traffic blocked	11403.position =true AND 11403.current_status_data=true AND 11403.locked=true AND 11403.route_marking_and_occupancy =3		No
Free, traffic blocked	11403.position=true AND 11403.current_status_data=true AND 11403.locked=true		No
Free, shunting route set, put down, traffic blocked	11403.position=true AND 11403.current_status_data=true AND 11403.locked=true AND 11403.route_marking_and_occupancy=2		No
Free, Occupied, put up, traffic blocked	11403.position=false AND 11403.current_status_data=true AND 11403.locked=true AND 11403.route_marking_and_occupancy=3		No

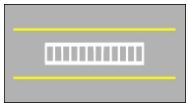
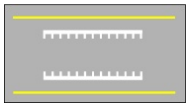
1.9 ETCSmarker

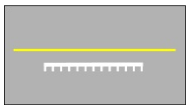
Description	Information according to SCI-CMD	Symbol and text message	SVG file
ETCS Stop Marker Stop	11401.current_status_data =true		Yes
ETCS Stop Marker Go	11401.current_status_data =true and (11401.drive=1 or 11401. drive_and_stop_at_ next_signal =true)		Yes
	11401.current_status_data =true and 11401.etcs_ma=true		Yes
Without status data	11401.current_status_data =false		Yes
Out-of-Service	11401.current_status_data =true and 11401.signal_un used=true		Yes
	11401.current_status_data =true and 11401.etcs_ma=true		Yes

1.10 Tunnel

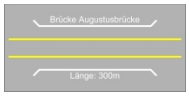
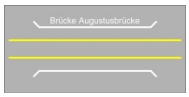
Description	Remarks	Symbol and text message	SVG file
single-tube tunnel	length is variable tunnel follows track position		No
twin-tube tunnel	length is variable tunnel follows track position		No
single tube, tunnel portal, representation of a (example two-track)	length is variable		No
single tube, tunnel portal, representation of a (example single-track)	length is variable		No
twin-tube, tunnel portal	length is variable		No
Tunnel crossing	Width variable		No

1.11 Platform

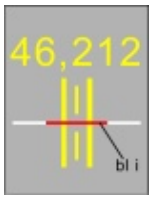
Description	Remarks	Symbol and text message	SVG file
double-sided, rail-mounted platform edge	length is variable		No
double-sided, arrangement of a, platform edge with large, track spacing on the touching side.	length is variable		No

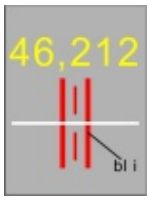
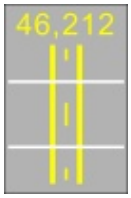
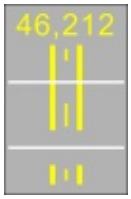
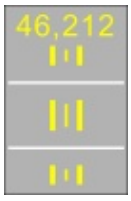
Description	Remarks	Symbol and text message	SVG file
double-sided, rail-mounted edge,	length is variable		No

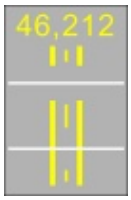
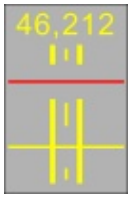
1.12 Bridge

Description	Remarks	Symbol and text message	SVG file
double-track bridge	length is variable		No
double-track bridge with naming and length	length is variable		No
double-track bridge with naming	length is variable		No

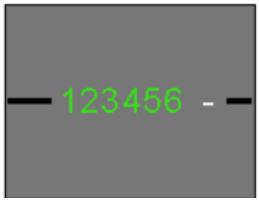
1.13 Level Crossing

Description	Remarks	Symbol and text message	SVG file
	11414.current_status_data=true		No
Accessibility barrier set for track	11414.current_status_data=true		No
Accessibility barrier set for interference stop	11414.current_status_data=true		No
Without current status – Track related	(11413.current_status_data=false AND (11414.current_status_data=false OR 11414.replacement_mode =false)) or (11413.current_status_data=false AND (11414.current_status_data=true AND 11414.replacement_mode =true)) AND 11414.current_status_data=true		No

Description	Remarks	Symbol and text message	SVG file
Without current status – Level Crossing related	11414.current_status_data=false		No
Full barrier closure without GFR	11414.current_status_data=true AND (11414.caution_message =true OR 11414.caution_message_flashing =true)		No
Hp-System double track, unclaimed, not technically **secured**	11414.current_status_data=true AND 11413.status_regarding_track =0		No
Hp-System double track, lower track, technically **secured**	11414.current_status_data=true AND 11413.status_regarding_track =0		No
Hp-System double track, both tracks technically **secured**	11414.current_status_data=true AND 11413.status_regarding_track =0		No

Description	Remarks	Symbol and text message	SVG file
Hp-System double track, upper track technically **secured**	11414.current_status_data=true AND 11413.status_regarding_track =0		No
Hp-System double track, upper track technically secured	11414.current_status_data=true AND 11413.status_regarding_track =3		No
	11414.current_status_data=true		No
	11414.current_status_data=true		No

1.14 Train Mode

Description	Remarks	Symbol and text message	SVG file
- Not Running in ETCS - Operating mode not defined (National System)	12410.m_mode = 13		No

Description	Remarks	Symbol and text message	SVG file
Automatic Driving			No
Full Supervision	12410.m_mode = 0		No
On Sight	12410.m_mode = 1		No
Reversing	12410.m_mode = 14		No
Shunting	12410.m_mode = 3		No
Supervised Maneuver	12410.m_mode = 12		No
Staff Responsible	12410.m_mode = 2		No

Description	Remarks	Symbol and text message	SVG file
Trip	12410.m_mode = 7		No
Post Trip	12410.m_mode = 8		No
Unfitted	12410.m_mode = 4		No
Sleeping	12410.m_mode = 5		No
Stand By	12410.m_mode = 6		No
System Failure	12410.m_mode = 9		No
Isolation	12410.m_mode = 10		No

Description	Remarks	Symbol and text message	SVG file
No Power			No
Non Leading	12410.m_mode = 11		No
Passive Shunting	12410.m_mode = 15		No

1.15 Ongoing - ETCS Driver Machine Interface - Speed and supervision information

1.15.1 Glossary

Term	Description	Explanation
MSRP	Most Restrictive Speed Profile	
TI Command	Train Interface command	
CSM	Ceiling speed monitoring	the speed supervision in the area where the train can run without the need to brake to a target.
TSM	Target speed monitoring	the speed and distance supervision in the area where the specific information related to a target is displayed to the driver and within which the train brakes to a target.

Term	Description	Explanation
RSM	Release speed monitoring	the speed and distance supervision in the area close to the EOA where the train is allowed to run with release speed to approach the EOA.

1.15.2 Colours schema

Colour name	Red	Green	Blue
white	255	255	255
black	0	0	0
grey	195	195	195
medium grey	150	150	150
dark grey	85	85	85
dark blue (background)	3	17	34
shadow	8	24	57
yellow	223	223	0
orange	234	145	0
red	191	0	2
PASP dark	33	49	74
PASP light	41	74	107

1.15.3 Description

the on-board equipment generates braking commands, traction cut-off commands and relevant information to the driver. There are three types of monitoring :

- Ceiling speed monitoring (CSM)
- Target speed monitoring (TSM)
- Release speed monitoring (RSM)

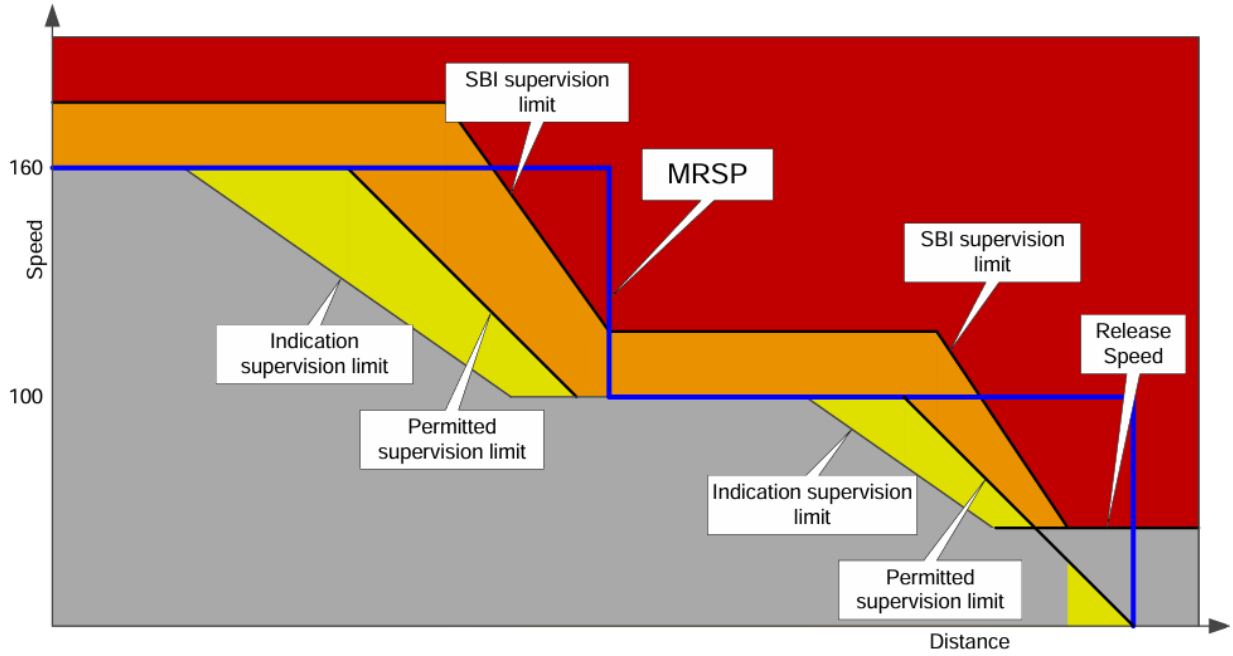


Figure 7 Colour philosophy depending on supervision status

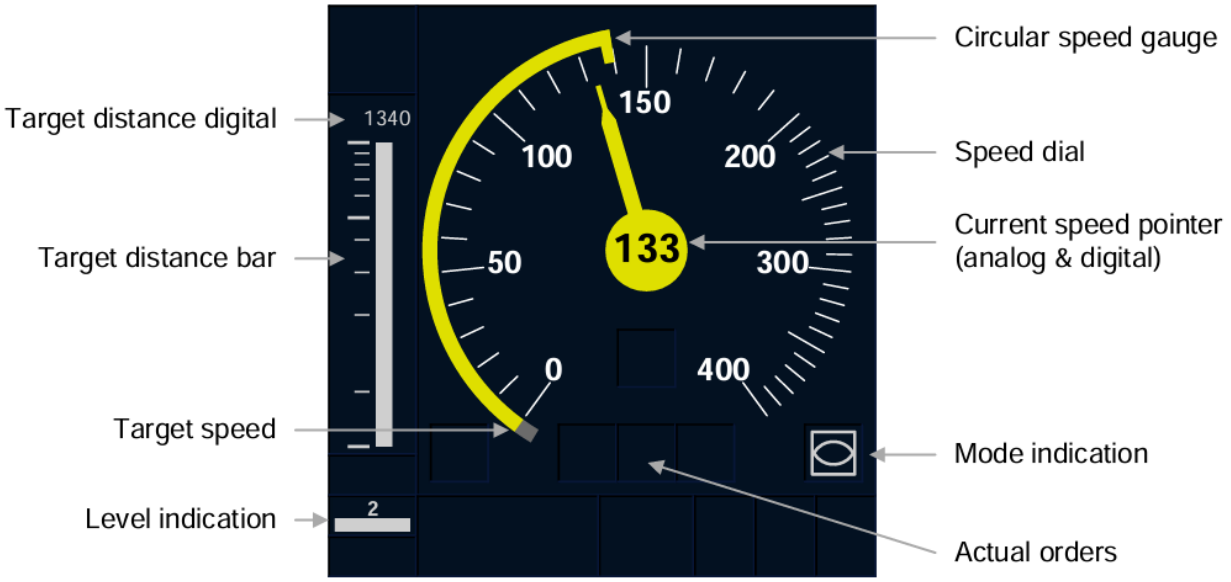


Figure 8 Overview of the main objects in the speed and supervision areas

1.15.4 Information activation

Information status	Data change	SCI-CMD Command	Sample view
Ceiling Speed Monitoring (CSM) - Normal Status information (NoS) - active	V<= Permitted supervision limit (P)		
Ceiling Speed Monitoring (CSM) - Over-speed Status information (OvS) - active	V > Permitted supervision limit (P)		
Ceiling Speed Monitoring (CSM) - Over-speed Status information (OvS) - deactive	V < Permitted supervision limit (P)		
Ceiling Speed Monitoring (CSM) - Warning Status information (WaS) - active	V > Warning supervision limit (W)		

Information status	Data change	SCI-CMD Command	Sample view
Ceiling Speed Monitoring (CSM) - Warning Status information (WaS) - deactive	V < Permitted supervision limit (P)		
Ceiling Speed Monitoring (CSM) - Intervention Status information (IntS) -active	V > service brake intervention supervision limit (SBI)		
Ceiling Speed Monitoring (CSM)- Intervention Status information (IntS) -deactive	service == empty || !emergency brake command		
Target Speed Monitoring (TSM) - Indication Status information (IndS) - active	V<= Permitted supervision limit (P)		
Target Speed Monitoring (TSM) - Over-speed Status information (OvS) -active	V> Permitted supervision limit (P)		
Target Speed Monitoring (TSM) - Over-speed Status information (OvS) -deactive	V<= Permitted supervision limit (P)		
Target Speed Monitoring (TSM) - Warning Status information (WaS) - active	V > Warning supervision limit (W)		
Target Speed Monitoring (TSM) - Warning Status information (WaS) - deactive	V <= Warning supervision limit (W)		

Information status	Data change	SCI-CMD Command	Sample view
Target Speed Monitoring (TSM) - Intervention Status information (IntS) -active	V > service brake intervention supervision limit (SBI)		
Target Speed Monitoring (TSM) - Intervention Status information (IntS) -deactive	Automatic Driving mode && V > service brake intervention supervision limit (SBI)		
Target Speed Monitoring (TSM) - Intervention Status information (IntS) -deactive	service == empty || !emergency brake command		
Release Speed Monitoring (RSM)-Indication Status information (IndS) -active	V < the Release Speed (Vrelease)		
Release Speed Monitoring (RSM)-Intervention Status information (IntS) - active	V > Release Speed (Vrelease)		
Release Speed Monitoring (RSM)-Intervention Status information (IntS) - deactive	service == empty || !emergency brake command		

1.15.5 Current speed pointer

Data change	SCI-CMD Command	Color
Mode == FS / SM/ OS && Supervision Status == CSM-NoS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == FS / SM/ OS && Supervision Status == CSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == CSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == CSM-IntS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == FS / SM/ OS && Supervision Status == CSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == FS / SM/ OS && Supervision Status == CSM (with target information)**-NoS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == FS / SM/ OS && Supervision Status == CSM (with target information)**-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == CSM (with target information)**-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == CSM (with target information)**-IntS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == FS / SM/ OS && Supervision Status == CSM (with target information)**-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == FS / SM/ OS && Supervision Status == TSM-IndS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	yellow

Data change	SCI-CMD Command	Color
Mode == FS / SM/ OS && Supervision Status == TSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == TSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == FS / SM/ OS && Supervision Status == TSM-IntS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	yellow
Mode == FS / SM/ OS && Supervision Status == TSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == FS / SM/ OS && Supervision Status == RSM-IndS && 0 km/h ≤ Pointer ≤ Vrelease*(when Vrelease exists)	STM-43.m_colour_sp =	yellow
Mode == FS / SM/ OS && Supervision Status == RSM-IntS && 0 km/h ≤ Pointer ≤ Vrelease*(when Vrelease exists)	STM-43.m_colour_sp =	yellow
Mode == FS / SM/ OS && Supervision Status == RSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == AD && Supervision Status == CSM-NoS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == AD && Supervision Status == CSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	grey
Mode == AD && Supervision Status == CSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	grey
Mode == AD && Supervision Status == CSM (with target information)**-NoS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == AD && Supervision Status == CSM (with target information)**-NoS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == AD && Supervision Status == CSM (with target information)**-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	white

Data change	SCI-CMD Command	Color
Mode == AD && Supervision Status == CSM (with target information)**-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	white
Mode == AD && Supervision Status == TSM-IndS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == AD && Supervision Status == TSM-IndS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == AD && Supervision Status == TSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	white
Mode == AD && Supervision Status == TSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	white
Mode == AD && Supervision Status == RSM-IndS && 0 km/h ≤ Pointer ≤ Vrelease*(when Vrelease exists)	STM-43.m_colour_sp =	white
Mode == LS && Supervision Status == CSM-NoS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == LS && Supervision Status == CSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == LS && Supervision Status == CSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == LS && Supervision Status == CSM-IntS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == LS && Supervision Status == CSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == LS && Supervision Status == TSM-IndS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == LS && Supervision Status == TSM-IndS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	grey

Data change	SCI-CMD Command	Color
Mode == LS && Supervision Status == TSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == LS && Supervision Status == TSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == LS && Supervision Status == TSM-IntS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == LS && Supervision Status == TSM-IntS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	grey
Mode == LS && Supervision Status == TSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == LS && Supervision Status == RSM-IntS && 0 km/h ≤ Pointer ≤ Vrelease*(when Vrelease exists)	STM-43.m_colour_sp =	yellow
Mode == LS && Supervision Status == RSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == SR / UN && Supervision Status == CSM-NoS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == SR / UN && Supervision Status == CSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == CSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == CSM-IntS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == SR / UN && Supervision Status == CSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == SR / UN && Supervision Status == CSM (with target information)**-NoS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey

Data change	SCI-CMD Command	Color
Mode == SR / UN && Supervision Status == CSM (with target information)**-NoS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == SR / UN && Supervision Status == CSM (with target information)**-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == CSM (with target information)**-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == CSM (with target information)**-IntS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == SR / UN && Supervision Status == CSM (with target information)**-IntS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	white
Mode == SR / UN && Supervision Status == CSM (with target information)**-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == SR / UN && Supervision Status == TSM-IndS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == SR / UN && Supervision Status == TSM-IndS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	yellow
Mode == SR / UN && Supervision Status == TSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == TSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SR / UN && Supervision Status == TSM-IntS && 0 km/h ≤ Pointer < VTarget	STM-43.m_colour_sp =	grey
Mode == SR / UN && Supervision Status == TSM-IntS && VTarget ≤ Pointer ≤ VPerm	STM-43.m_colour_sp =	yellow

Data change	SCI-CMD Command	Color
Mode == SR / UN && Supervision Status == TSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == SH / RV && Supervision Status == CSM-NoS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == SH / RV && Supervision Status == CSM-OvS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SH / RV && Supervision Status == CSM-WaS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	orange
Mode == SH / RV && Supervision Status == CSM-IntS && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == SH / RV && Supervision Status == CSM-IntS && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red
Mode == NL / SB/ PT && Supervision Status == CSM-- && 0 km/h ≤ Pointer≤ VPerm	STM-43.m_colour_sp =	grey
Mode == TR && Supervision Status == CSM-- && Pointer >VPerm (in CSM or TSM) or > Vrelease (in RSM)	STM-43.m_colour_sp =	red

1.15.6 Circular speed gauge

Data change	SCI-CMD Command	Color
Mode == FS && Supervision Status == CSM-NoS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == FS && Supervision Status == CSM-OvS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == FS && Supervision Status == CSM-OvS && Vperm < CSG ≤ VSBI		orange

Data change	SCI-CMD Command	Color
Mode == FS && Supervision Status == CSM-WaS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == FS && Supervision Status == CSM-WaS && Vperm < CSG ≤ VSBI		orange
Mode == FS && Supervision Status == CSM-IntS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == FS && Supervision Status == CSM-IntS && Vperm < CSG ≤ VSBI		red
Mode == FS && Supervision Status == CSM (with target information)**-NoS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == CSM (with target information)**-NoS && Vtarget ≤ CSG ≤ Vperm		white
Mode == FS && Supervision Status == CSM (with target information)**-OvS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == CSM (with target information)**-OvS && Vtarget ≤ CSG ≤ Vperm		white
Mode == FS && Supervision Status == CSM (with target information)**-OvS && Vperm < CSG ≤ VSBI		orange
Mode == FS && Supervision Status == CSM (with target information)**-WaS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == CSM (with target information)**-WaS && Vtarget ≤ CSG ≤ Vperm		white
Mode == FS && Supervision Status == CSM (with target information)**-WaS && Vperm < CSG ≤ VSBI		orange
Mode == FS && Supervision Status == CSM (with target information)**-IntS && 0 km/h ≤ CSG< Vtarget		dark grey

Data change	SCI-CMD Command	Color
Mode == FS && Supervision Status == CSM (with target information)**-IntS && Vtarget ≤ CSG ≤ Vperm		white
Mode == FS && Supervision Status == CSM (with target information)**-IntS && Vperm < CSG ≤ VSBI		red
Mode == FS && Supervision Status == TSM-IndS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == TSM-IndS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == TSM-IndS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == FS && Supervision Status == TSM-OvS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == TSM-OvS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == TSM-OvS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == FS && Supervision Status == TSM-OvS && Vperm < CSG ≤ VSBI		orange
Mode == FS && Supervision Status == TSM-WaS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == TSM-WaS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == TSM-WaS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == FS && Supervision Status == TSM-WaS && Vperm < CSG ≤ VSBI		orange

Data change	SCI-CMD Command	Color
Mode == FS && Supervision Status == TSM-IntS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == TSM-IntS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == FS && Supervision Status == TSM-IntS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == FS && Supervision Status == TSM-IntS && Vperm < CSG ≤ VSBI		red
Mode == FS && Supervision Status == RSM-IndS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == RSM-IndS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == FS && Supervision Status == RSM-IntS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == FS && Supervision Status == RSM-IntS && Vtarget ≤ CSG ≤ Vperm		yellow
Mode == AD && Supervision Status == CSM-NoS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == AD && Supervision Status == CSM-OvS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == AD && Supervision Status == CSM-OvS && Vperm < CSG ≤ VSBI		dark grey
Mode == AD && Supervision Status == CSM-WaS && 0 km/h ≤ CSG≤ Vperm		dark grey
Mode == AD && Supervision Status == CSM-WaS && Vperm < CSG ≤ VSBI		dark grey

Data change	SCI-CMD Command	Color
Mode == AD && Supervision Status == CSM (with target information)**-NoS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == AD && Supervision Status == CSM (with target information)**-NoS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == CSM (with target information)**-OvS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == AD && Supervision Status == CSM (with target information)**-OvS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == CSM (with target information)**-OvS && Vperm < CSG ≤ VSBI		white
Mode == AD && Supervision Status == CSM (with target information)**-WaS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == AD && Supervision Status == CSM (with target information)**-WaS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == CSM (with target information)**-WaS && Vperm < CSG ≤ VSBI		white
Mode == AD && Supervision Status == TSM-IndS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == AD && Supervision Status == TSM-IndS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == AD && Supervision Status == TSM-IndS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == TSM-OvS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == AD && Supervision Status == TSM-OvS && 0 km/h ≤ CSG< Vtarget		dark grey

Data change	SCI-CMD Command	Color
Mode == AD && Supervision Status == TSM-OvS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == TSM-OvS && Vperm < CSG ≤ VSBI		white
Mode == AD && Supervision Status == TSM-WaS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == AD && Supervision Status == TSM-WaS && 0 km/h ≤ CSG< Vtarget		dark grey
Mode == AD && Supervision Status == TSM-WaS && Vtarget ≤ CSG ≤ Vperm		white
Mode == AD && Supervision Status == TSM-WaS && Vperm < CSG ≤ VSBI		white
Mode == AD && Supervision Status == RSM-IndS && 0 km/h ≤ CSG≤ Vrelease*(when Vrelease exists)		medium grey
Mode == AD && Supervision Status == RSM-IndS && Vtarget ≤ CSG ≤ Vperm		white

1.15.7 Basic Speed Hook(s)

Data change	Command	Color
Mode == SM / OS* / SR* && Supervision Status == CSM-AllS		hook at Vperm == white && hook at Vtarget == -
Mode == SM / OS* / SR* && Supervision Status == CSM (with target information)**-AllS		hook at Vperm == white && hook at Vtarget == medium grey

Data change	Command	Color
Mode == SM / OS* / SR* && Supervision Status == TSM-AIIS		hook at Vperm == white && hook at Vtarget == medium grey
Mode == SM / OS* / SR* && Supervision Status == RSM (not applicable for SR)-AIIS		hook at Vperm == white && hook at Vtarget == medium grey
Mode == SH* && Supervision Status == CSM-AIIS		hook at Vperm == white && hook at Vtarget == -
Mode == RV && Supervision Status == CSM-AIIS		hook at Vperm == white && hook at Vtarget == -

1.15.8 Realease speed digital

Data change	Command	Color
Mode == FS / SM / OS* / LS && Supervision Status == CSM-AIIS		no
Mode == FS / SM / OS* / LS && Supervision Status == CSM (with target information)**-AIIS		no
Mode == FS / SM / OS* / LS && Supervision Status == TSM-AIIS		yes (yellow)
Mode == FS / SM / OS* / LS && Supervision Status == RSM-AIIS		yes (yellow)
Mode == AD && Supervision Status == CSM-AIIS		no
Mode == AD && Supervision Status == CSM (with target information)**-AIIS		no
Mode == AD && Supervision Status == TSM-AIIS		yes (medium grey)
Mode == AD && Supervision Status == RSM-AIIS		yes (medium grey)

Data change	Command	Color
Mode == SB / SH / UN / PT / TR / NL / SR / RV && Supervision Status == RSM-AllS		no

1.15.9 General

Data change	Command
IF(LENGTH(V) < 3)	DISPLAY_DIGITAL(V, POSITION= [I,H])
IF (M_COLOUR_SP == RED)	M_COLOUR_DN = WHITE
IF (M_COLOUR_SP != RED)	M_COLOUR_DN = BLACK
SUPERVISION_STATUS = (CSM || CSM_TARGET_INFO || TSM || RSM)	CSG_DISPLAY(V_PERMIT, V_TARGET, V_SBI)
IF (CSG_DISPLAY != EMPTY)	CSG_SET_WIDTH(START_POSITION=0, END_POSITION = HOOK_POSITION, 9)
Vperm == true	CSG_DISPLAY(HOOK, POSITION = OUTER_BORDER_SPEED_DIAL, SIZE = (6, 20), HOOK_UPPER_LIMIT = V_PERMIT)
IF(STATUS_INFORMATION == OVS || STATUS_INFORMATION == WAS ||STATUS_INFORMATION == INTS)	CSG_DISPLAY(START_POSITION = V_PERMIT, END_POSITION = V_SBI, SIZE = HOOK_SIZE)
IF (SUPERVISION_STATUS == CSM || SUPERVISION_STATUS == TSM || SUPERVISION_STATUS == RSM || CSM_TARGET_INFO)	CSG_DISPLAY(HOOK, POSITION = B2)

Data change	Command
Vperm == true	CSG_DISPLAY(HOOK, POSITION = OUTER_BORDER_SPEED_DIAL, SIZE = (10, 20), HOOK_UPPER_LIMIT = V_PERMIT)
Vtarget == true	CSG_DISPLAY(HOOK, POSITION = OUTER_BORDER_SPEED_DIAL, SIZE = (10, 20), HOOK_UPPER_LIMIT = V_TARGET)
IF (OVERLAPS(HOOK_POSITION(V_PERMIT), HOOK_POSITION(V_TARGET)))	HOOK_OVERLAY = [V_PERMIT, V_TARGET]
IF (V_RELEASE > 0)	CSG_DISPLAY(V_RELEASE, FORMAT = TABLE_9)
IF (V_RELEASE > 0 && V_RELEASE < V_PERMIT)	CSG_DISPLAY (END_POSITION= V_PERMIT) CSG_DISPLAY (END_POSITION= V_RELEASE, POSITION= OUTER_BORDER_SPEED_DIAL, SIZE= 6)

Data change	Command
IF (V_RELEASE > 0 && V_RELEASE > V_PERMIT)	CSG_DISPLAY (END_POSITION= V_RELEASE) CSG_DISPLAY (END_POSITION= V_RELEASE, POSITION= OUTER_BORDER_SPEED_DIAL, SIZE= 6) CSG_SET_WIDTH(9) DRAW_LINE(START_POSITION = V_RELEASE; END_POSITION = V_PERMIT, SIZE = 1, COLOUR = BACKGROUND_COLOUR
IF (V_RELEASE > 0)	DISPLAY_DIGITAL(V_RELEASE, FORMAT = TABLE_11)
IF (LSSMA_CONDITION == TRUE)	DISPLAY_DIGITAL(LSSMA_NUMBER, POSITION = A1, COLOR = GREY) DISPLAY_DIGITAL("LS01", POSITION = A1)
IF (LSSMA_CONDITION ==TRUE)	OVERLAY(LSSMA_NUMBER, SYMBOL = "LS01", POSITION = A1)
IF (DRIVER_ACKNOWLEDGEMENT_REQUIRED_BRAKE_RELEASE == TRUE && BRAKE_RELEASE_CONDITIONS == TRUE)	DISPLAY_DIGITAL("ST01", FORMAT = document 5.4)
IF (SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY)	ENABLE_SENSITIVITY(C9, C8, E1) DISPLAY_FRAME(C9)
IF (SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && ONBOARD_MODE == TRUE)	ENABLE_SENSITIVITY(A, B)
IF (SCREEN_TECHNOLOGY == SOFTZ_KEY_TECHNOLOGY && ONBOARD_MODE==TRUE)	ENABLE_BUTTON(F7, BUTTON_TYPE = UP) DISPLAY_DIGITAL("DR01", POSITION = F7)
IF (SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && ONBOARD_MODE == FALSE)	DISABLE_SENSITIVITY(A, B) DISABLE_BUTTON(F7)

Data change	Command
IF (SCREEN_TECHNOLOGY == SOFTZ_KEY_TECHNOLOGY && ONBOARD_MODE==TRUE)	ENABLE_BUTTON(F7, BUTTON_TYPE = UP) DISPLAY_DIGITAL("DR01", POSITION = F7)
IF (SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && ONBOARD_MODE == FALSE)	DISABLE_SENSITIVITY(A, B) DISABLE_BUTTON(F7)
IF (ONBOARD_MODE== TRUE)	TOGGLE_DISPLAY(OFF)
IF (IS_MODE== TRUE)	INDICATE(IS_MODE)
IF (DISPLAY_DIGITAL(MO10) != EMPTY)	SET_ACK_BUTTON(TYPE = DELAY)
IF (DIGITAL_DISPLAY(ERTMS_ETCS_LEVEL_ANNOUNCEMENT) == TRUE && ACKNOWLEDGEMENT_ERTMS_ETCS_LEVEL_ANNOUNCEMENTT== FALSE)	DIGITAL_DISPLAY(MODE_ACKNOWLEDGEMENT; POSITION = C1)
IF (ACKNOWLEDGEMENT_ERTMS_ETCS_LEVEL_ANNOUNCEMENTT== TRUE)	DIGITAL_DIGITAL(ERTMS_ETCS_LEVEL_ANNOUNCEMENT, POSITION=C1)
IF (OVERRIDE_FUNCTION_ACTIVE==TRUE)	DISPLAY_DIGITAL("MO03")
IF(VAILD_ERTMS_LEVEL== TRUE)	IF(CURRENT_ERTMS_LEVEL==0 || CURRENT_ERTMS_LEVEL==NTC || CURRENT_ERTMS_LEVEL==1 || CURRENT_ERTMS_LEVEL==2) DISPLAY_DIGITAL(CURRENT_ERTMS_LEVEL, POSITION=C8)
IF(VAILD_ERTMS_LEVEL==FALSE && CURRENT_ERTMS_LEVEL==UNKNOWN)	DIGITAL_DISPLAY ("NONE"; POSITION=C8)
IF(MODE_ACKNOWLEDGEMENT=="ENABLED")	DISPLAY_DIGITAL(MODE_ACKNOWLEDGEMENT; POSITION=C1) WAIT_UNTIL(MODE_ACKNOWLEDGEMENT=="ENABLED") DISPLAY(ERTMS_ETCS_LEVEL_ANNOUNCEMENT)

Data change	Command
IF (ERTMS_ETCS_LEVEL_ANNOUNCEMENT == TRUE && ACKNOWLEDGEMENT_ERTMS_ETCS_LEVEL_ANNOUNCEMENTT == FALSE)	DISPLAY_DIGITAL(LE07 || LE09)
IF (ERTMS_ETCS_LEVEL_ANNOUNCEMENT == FALSE || ACKNOWLEDGEMENT_ERTMS_ETCS_LEVEL_ANNOUNCEMENTT == TRUE)	DISPLAY_DIGITAL(LE06 || LE08)
IF (CURRENT_ERTMS_LEVEL == NTC_level)	DISPLAY_DIGITAL((LE02 || LE08 || LE09) DISPLAY_DIGITAL (NATIONAL_SYSTEM_ABBREVIATION))
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY)	DISPLAY(QUESTION_BOX, POSITION_BOX = (0,50))
IF(SCREEN_TECHNOLOGY== SOFT_KEY_TECHNOLOGY)	DISPLAY(QUESTION_BOX, POSITION_BOX= (0,100))
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY)	ENABLE_BUTTON(ANSWER_PART, BUTTON_TYPE="UP")
IF(SCREEN_TECHNOLOGY== SOFT_KEY_TECHNOLOGY)	DISPLAY_DIGITAL("YES", POSITION=H3, TYPE= ANSWER_PART)
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY)	DISPLAY_DIGITAL(TEXT_MESSAGES, POSITION= [E5, E6, E7, E8, E9])
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY && TUNNEL_STOPPING_AREA = TOGGLED_OFF)	DISPLAY_DIGITAL(DR05, POSITION = (C2 || C3 || C4))
IF(SCREEN_TECHNOLOGY== SOFT_KEY_TECHNOLOGY && CONDITION_8.2.3.6.3== FALSE)	ENABLE_BUTTON(EMPTY, POSITION = F6)
IF (B3 == EMPTY)	DISPLAY_DIGITAL(object, B3)
IF (B4 == EMPTY)	DISPLAY_DIGITAL(object, B4
IF (B5 == EMPTY)	DISPLAY_DIGITAL(object, B5) WAIT_UNTIL (B3 == EMPTY || B4 == EMPTY || B5 == EMPTY) DISPLAY_DIGITAL(object, FIRST_AVAILABLE_AREA)
IF (PLANNING_INFORMATION == FALSE)	DISABLE_SENSITIVEITY(ZOOM_AREA) DISABLE_BUTTON(ZOOM_AREA)

Data change	Command
IF (LENGTH(GRADIENT_ELEMENT) >= MIN_LENGTH_FOR_GRADIENT_DIRECTION)	IF (GRADIENT_DIRECTION == UPHILL) DISPLAY_DIGITAL('+', POSITION_OFFSET(GRADIENT_ELEMENT, ABOVE))
IF (GRADIENT_DIRECTION == DOWNHILL)	DISPLAY_DIGITAL('-', POSITION_OFFSET(GRADIENT_ELEMENT, BELOW)
IF (LENGTH(GRADIENT_ELEMENT) >= MIN_LENGTH_FOR_GRADIENT_NUMBER)	DISPLAY(GRADIENT_NUMBER, POSITION_OFFSET(GRADIENT_ELEMENT, CENTER))
IF (AUTOMATIC_DRIVING_MODE == TRUE)	REPLACE_SYMBOL(PL23, PL37)
IF (AUTOMATED_DRIVING_MODE == TRUE)	DISPLAY_DIGITAL(V_TARGET, COLOR = WHITE)
IF(AUTOMATIC_DRIVING_MODE == TRUE)	DISPLAY_DIGITAL(INDICATION_MARKER, COLOR = WHITE)
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY)	ENABLE_SENSITIVITY(D9, SIZE = (40,30), POSITION_OFFSET = ABOVE)
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY)	ENABLE_SENSITIVITY(D12, SIZE = (40,30), POSITION_OFFSET = BELOW)
IF (SCALE_BUTTON == UP)	CHANGE_DISTANCE_SCALE(SCALE = PREVIOUS_SHORTER_RANGE)
IF (SCALE_BUTTON == DOWN)	CHANGE_DISTANCE_SCALE(SCALE = NEXT_LONGER_RANGE)
IF (SAFE_RADIO_CONNECTION_STATUS == CONNECTION_UP)	DISPLAY_DIGITAL(ST03, POSITION = E1)
IF (SAFE_RADIO_CONNECTION_STATUS == NO_CONNECTION)	DISPLAY_DIGITAL(E1=EMPTY)
IF (SAFE_RADIO_CONNECTION_STATUS == CONNECTION_LOST || SAFE_RADIO_CONNECTION_STATUS == SETUP_FAILED)	DISPLAY_SDIGITAL(ST04, POSITION = E1)
IF (TRAIN_STATUS == STANDSTILL && REVERSING_AREA==TRUE)	DISPLAY_DIGITAL(ST06, POSITION= C6)
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY && GEO_POSITION_STATUS == "DISABLED")	DISPLAY_DIGITAL("DR03", POSITION=G12)

Data change	Command
IF(SCREEN_TECHNOLOGY== SOFT_KEY_TECHNOLOGY && GEO_POSITION_STATUS == "DISABLED")	DISPLAY_DIGITAL("DR03", POSITION=F8)
IF(GEO_POSITION_STATUS=="ENABLED")	DISPLAY(G12, BACKGROUND_COLOUR = "GREY") DISPLAY_DIGITAL(GEO_POSITION, POSITION=G12; COLOUR="BLACK")
IF (TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && GEO_POSITION_STATUS == DISABLE)	DISABLE_SENSITIVITY(G12)
IF (TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && GEO_POSITION_STATUS == DISABLE)	DISABLE_SENSITIVITY(G12)
IF (SCREEN_TECHNOLOGY == SOFT_KEY_TECHNOLOGY && GEO_POSITION_STATUS== DISABLE)	DISABLE_BUTTONS(F8)
IF (ATO_SELECTOR == "ENABLE")	DISPLAY_DIGITAL(ATO_INFORMATION, POSITION=[B0, B8, D2, D3, D4, D7, G1, G2, G3, G4, G5])
IF(SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && DISPLAY_DIGITAL(ATO02, POSITION=G1) == TRUE)	ENABLE_BUTTON(G1, BUTTON_TYPE="UP") DISPLAY_DIGITAL(G1)
IF(SCREEN_TECHNOLOGY == TOUCH_SCREEN_TECHNOLOGY && (DISPLAY_DIGITAL(ATO03, POSITION=G1) == TRUE || DISPLAY_DIGITAL(ATO04, POSITION=G1) == TRUE))	ENABLE_BUTTON(G1, BUTTON_TYPE="UP") DISPLAY_DIGITAL(G1)
IF(SCREEN_TECHNOLOGY == SOFT_KEY_TECHNOLOGY && DISPLAY_DIGITAL(ATO02, POSITION=G1) == TRUE)	ENABLE_BUTTON(F9, BUTTON_TYPE="UP", ECHO=G1)
IF(SCREEN_TECHNOLOGY == SOFT_KEY_TECHNOLOGY && (DISPLAY_DIGITAL(ATO03, POSITION=G1) == TRUE || DISPLAY_DIGITAL(ATO04, POSITION=G1) == TRUE))	ENABLE_BUTTON(F9, BUTTON_TYPE="UP", ECHO=G1)
IF(REMAINING_TIME <= 59)	DISPLAY_DIGITAL(REMAINING_TIME, FORMAT=[s]s, ALIGNMENT=RIGHT, INDENT= 18, POSITION = G3(CENTER_VERTICAL))

Data change	Command
IF(REMAINING_TIME > 59)	DISPLAY_DIGITAL(REMAINING_TIME, FORMAT=[m]m:ss, ALIGNMENT=RIGHT, INDENT= 11, POSITION = G3(CENTER_VERTICAL))
IF(ERTMS_ATO_REQUEST_TRAIN_HOLD==TRUE)	DISPLAY_DIGITAL(ATO09)
IF(SCREEN_TECHNOLOGY== TOUCH_SCREEN_TECHNOLOGY && DISPLAY_DIGITAL(ATO17, POSITION=G5)==TRUE || DISPLAY_DIGITAL(ATO19, POSITION=G5)==TRUE)	ENABLE_BUTTON(G5, BUTTON_TYPE="DELAY")
IF(SCREEN_TECHNOLOGY== SOFT_KEY_TECHNOLOGY && DISPLAY_DIGITAL(ATO17, POSITION=G5)==TRUE || DISPLAY_DIGITAL(ATO19, POSITION=G5)==TRUE)	ENABLE_BUTTON(F9, ECHO=G5, BUTTON_TYPE="DELAY")

1.16 Related References

1. ERTMS/ETCS: ETCS DRIVER MACHINE INTERFACE ERA_ERTMS_015560
2. EN 16186-3:2022

Railway applications. Driver’s cab – Part 3: Design of displays for heavy rail vehicles

1. CLC/TS 50459-1:2021

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

1. CLC/TS 50459-2: 2021

Railway applications - Communication, signalling and processing systems - European Rail Traffic Management System - Part 2: Ergonomic arrangements of GSM-R information

1. CLC/TS 50459-3:2021

Railway applications. Communication, signalling and processing systems. European Rail Traffic Management System – Part 3: Ergonomic arrangements of non ETCS information

1. CLC/TS 50459-4:2005

Railway applications. Communication, signalling and processing systems. European rail traffic

management system – Part 4: Driver-machine interface: Data entry for the ERTMS/ETCS/GSM-R systems

1. CLC/TS 50459-5:2005

Railway applications. Communication, signalling and processing systems. European rail traffic management system – Part 5: Driver-machine interface: Symbols

1. CLC/TS 50459-6:2005

Railway applications. Communication, signalling and processing systems. European rail traffic management system – Part 6: Driver-machine interface: Audible information

1. CLC/TR 50459-7:2007

Railway applications. Communication, signalling and processing systems. European rail traffic management system – Part 7: Driver-machine interface: Specific transmission modules *(please mind: not applicable in the scope of the System Pillar)*

1. UIC 612-x