

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

Part 2: Ergonomic arrangements of ERTMS/ETCS information

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National foreword

This Draft for Development is the official English language version of CLC/TS 50459-2:2005..

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It is being issued in the Draft for Development series of publications and is of a provisional nature because it is still liable to change in the light of emerging experience. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion to a European Standard. A review of this publication will be initiated 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its 3-year life. Notification of the start of the review period will be made in an announcement in the appropriate issue of *Update Standards*.

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

This Technical Specification contains features which may be required in the future but which may not be supported at present by the ERTMS/ETCS/GSM-R Class 1 specifications. The ERTMS/ETCS/GSM-R specifications are still subject to change and this document may not therefore fully align with the current version of the specifications.

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

Applications ferroviaires –
Systèmes de signalisation, de
télécommunications et de traitement –
Système européen de gestion du trafic
ferroviaire –
Interface de conduite
Partie 2: Aménagement ergonomique
des informations ERTMS/ETCS

Bahnanwendungen –
Telekommunikationstechnik, Signal-
technik und Datenverarbeitungssysteme –
Europäisches Leitsystem für den
Schienenverkehr –
Mensch-Maschine Schnittstelle
Teil 2: Ergonomische Anordnung
der ERTMS/ETCS Informationen

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

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CENELEC

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

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Foreword

This Technical Specification was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

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The following date was fixed:

- latest date by which the existence of the CLC/TS
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Introduction

This Technical Specification forms Part 2 of a series, the other parts being:

CLC/TS 50459-1	for ergonomic principles for the presentation of ERTMS/ETCS/GSM-R information
CLC/TS 50459-3	for ergonomic arrangements of ERTMS/GSM-R information
CLC/TS 50459-4	for data entry procedure for ERTMS/ETCS/GSM-R
CLC/TS 50459-5	for symbols for ERTMS/ETCS/GSM-R
CLC/TS 50459-6	for audible information for ERTMS/ETCS/GSM-R

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

1 Scope

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

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

The ergonomics covers the

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

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

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

- achieving harmonised and coherent presentation for ERTMS/ETCS and STM information. Given the large number of STM's requiring the use the ERTMS/ETCS DMI, only a harmonised approach is feasible;
- defining Driver-Machine Interface ergonomics that is compatible with agreed interoperable ERTMS specifications;
- to reduce the risk of incorrect operation by a driver working with different trains fitted with ERTMS/ETCS and ERTMS/GSM-R;
- facilitating train operation with a unified ergonomics, hence reducing the cost of driver training.

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

The scope of Part 2 of the Technical Specification CLC/TS 50459 series is to define ergonomic arrangements of ERTMS/ETCS information.

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

2 Normative references

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

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

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

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

CLC/TS 50459-4, *Railways applications – Communication, signalling and processing systems – European Rail Traffic Management System – Driver-Machine Interface – Part 4: Data entry for the ERTMS/ETCS/GSM-R systems*

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

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

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

3 Terms and definitions

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

4 Symbols and abbreviations

AIIS	All Status
ATD	Automatic Train Driving
ATO	Automatic Train Operation
CSG	Circular Speed Gauge
CSM	Ceiling Speed Monitoring
dgry	dark grey
DSD	Driver Safety Device
EOA	End Of Authority
EVC	European Vital Computer
IndS	Indication Status
IntS	Intervention speed Status
LCD	Liquid Crystal Display
LED	Light Emitting Diodes
LXG	Level Crossing
MA	Movement Authority
mgry	medium grey

MRSP	Most Restrictive Speed Profile
NL	Non Leading mode
NoFS	Not in Full Supervision Mode
NoS	No Status active
or	orange
OS	On Sight mode
OvS	Over-speed Status
PreS	Pre-indication Status
PTT	Push To Talk
RBC	Radio Block Centre
RSM	Release Speed Monitoring
SR	Staff Responsible mode
STM	Specific Transmission Module
TIU	Train Interface Unit
T_{int}	Time before intervention
TSM	Target Speed Monitoring
T_{square}	Time at which 'warning time to intervention' is displayed
UIC	Union Internationale des Chemins de Fer
UN	Unfitted
V_{int}	Intervention speed
V_{perm}	Permitted speed
$V_{release}$	Release speed
V_{target}	Target speed
V_{train}	Current speed of the train
WaS	Warning speed Status
w x h	width by height
yel	yellow

5 Characteristics of the screen layout

5.1 Presentation philosophy

The information shown to the driver on the ERTMS/ETCS DMI is grouped into different areas depending on the nature of the information: speed related information, distance related information, driver inputs, etc. Figure 1 and Figure 2 show the definition and the allocation of the different areas. It shows the DMI when all information is combined into one screen.

Whilst most of the examples are based on touch screen technology for input actions, it is not the intention of this standard to restrict implementation solely to this technology. Soft key arrangements are discussed, they have the same status as touch screen arrangements, but they are not explicitly shown in an example. The areas for navigation of soft keys (e.g. the dedicated control or navigation buttons) are not shown either.

Annex B gives an overview of area and screen dimensions when using a touch device. Annexes C, D, E and F give examples of area and screen dimensions when using soft keys.

This specification and the shown figures describe what information shall be presented on the screen, regardless of its technical implementation. Clause 6 explains in detail how the different areas shall be used.



Figure 1 — The main areas of the DMI



Figure 2 — The sub areas of the DMI

5.1.1 Area description

The total size of all information areas shown on the DMI is 640 x 450 cells (w x h).

These dimensions are chosen because all areas will then properly fit into the total size. The height of 450 cells is the graphical compromise between the 9 vertical oriented buttons of equal size in the F area and a clear separation between the A, B and D area on one hand and the C and E area on the other hand. The 30 cells in the heights of the display are not needed in the touch screen option, but they can be used in the soft key option to show along the width of the display the soft key reference to hard keys along the display (see Annexes C and D).

5.1.1.1 Speed and Supervision area

- A Supervised distance information (A1, A2 and A3; total size: 54 x 300 cells (w x h))
- B Speed Information (B0, B1, B2, B3/4/5, B6 and B7; total size: 280 x 300 cells (w x h))
- C Supplementary Driving Information (C1, C2/3/4, C5/6/7, C8 and C9; total size: 334 x 50 cells (w x h)); the size of the areas C1 – C7 can vary within the range of the area C

5.1.1.2 Planning area

D Planning Information (D1, D2, D3/4/5, D6, D7, D8 and D9; total size 246 x 300 cells (w x h))

5.1.1.3 Monitoring area

Eleft Monitoring (E1, E3, E4, E5, E19/20/21/22/23 and E24/25; E2 and E18 are intentionally missing; total size 334 x 100 cells (w x h))

Eright Monitoring (E6/7/8/9/10/11/12/13/14/15, E16a/b, E17; E2 and E18 are intentionally missing; total size 246 x 150 cells (w x h))

5.1.1.4 Driver input area

F Input (F1, F2, F3, F4 and F5/6/7/8/9; total size: 60 x 450 (w x h))

5.1.2 The use of areas

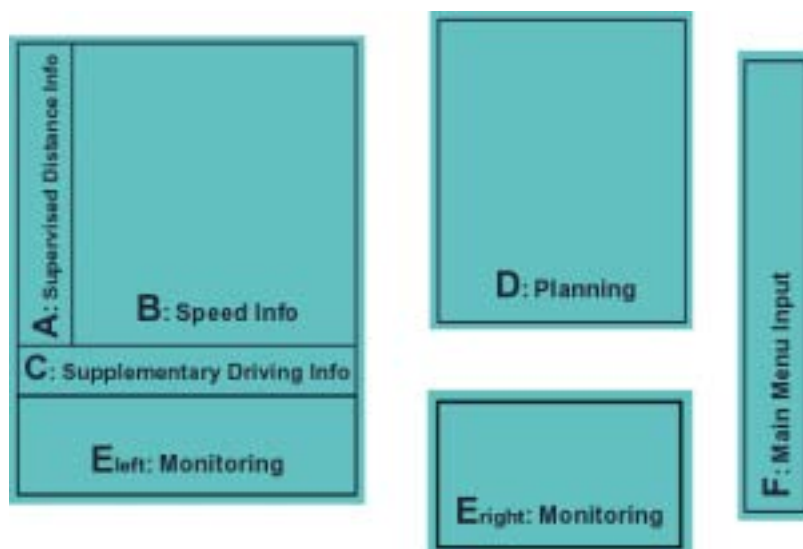


Figure 3 — The use of areas of the DMI

Preference may be given to show all areas on the same display screen, as shown in the examples in this specification.

If the information is displayed on more than one screen the way the information is presented in each area shall not be affected. A change of resolution or screen size shall not affect the general appearance of each area; but only the accuracy of the details shown.

5.1.2.1 The use of the areas A, B, C and Eleft

The main information is shown on area A, B, C and Eleft

The areas A, B, C and Eleft shall be displayed, shall be adjacent to one another and shall be within central forward field of the driver's vision.

5.1.2.2 The use of the areas D and Eright

The areas D and Eright should be shown as described in this document; however they need not be adjacent to each other or to A, B, C and Eleft.

5.1.2.3 The use of area F

The content of area F does not need to be adjacent to the other areas.

5.1.2.4 The use of areas with STM

All areas can be used for STM visualisation, as long as the required ERTMS/ETCS information can be clearly displayed.

5.1.3 Examples of screen management

To control the attention of the driver, either the driver or the ERTMS/ETCS system or the Railway Operator can decide to show or hide information. This can be achieved using several screen layers.

NOTE 1 The combination of layers with a touch screen device enables fast dialogues and an integrated interface. The same can be applied for soft keys, by pointing to a few keys along the screen, which activates the other layers.

A level crossing 10 km ahead might be known to the system (within the movement authority (MA)) but the driver only wants to be informed in advance of events within a distance of 4 km. By setting the planning scale on area D to 4 km, the driver hides information outside this range.

When the train is running too close to intervention or is running in target speed monitoring (TSM, see 5.2.2) the system shall automatically dim the planning information; the driver has to reduce speed first before the hidden or dimmed information is shown again in the original presentation. In this example, the system controls the attention of the driver by hiding certain categories of information, e.g. advisory or timetable information.

Another example of the ERTMS/ETCS DMI helping to control the driver's attention, is showing and hiding the supervised distance information (area A) and dimming the Planning area (area D), depending on whether the train is inside or outside the TSM. Dimming the Planning area ensures that route information is still visible but less conspicuous.

Some information is available in the ERTMS/ETCS system, but is only needed in special situations or in case of disturbance or malfunction, e.g. test functions, diagnostics, train data, geographical information, explanations of orders and announcements and (non-) ERTMS/ETCS information (e.g. door systems). These kinds of detail are generally available on an underlying screen layer.

NOTE 2 When using a touch screen device, the driver can reveal them by touching the screen on the appropriate area, or activating the dedicated key of the soft key arrangement. After a second driver's action or after a certain time delay, the information will be hidden again.

5.2 Colour and sound philosophy

The principle (illustrated in Figure 4) is used extensively in the description of this specification (CLC/TS 50459-2). The principle is based on the general explanation of the colour philosophy described in CLC/TS 50459-1.

For explanatory reasons Figure 4 is divided in the following sections:

- one ceiling speed monitoring section (CSM);
- two target speed monitoring sections (TSM) to explain how to manage the colour philosophy when two targets are defined;
- one release monitoring section (RSM)¹⁾.

¹⁾ RSM is a special case of TSM

NOTE 1 Figure 4 is used only to explain the DMI objects presentation in the other clauses of this specification. Figure 4 is showing the situation when ERTMS/ETCS is in Full Supervision (FS) mode.

NOTE 2 Annex A gives a complete overview of the colour philosophy for all related areas and objects.

Undesired oscillation between colour schemes and audible information shall be avoided by the appropriate means (e.g. with a delay time of 2 seconds to switch off the current colour scheme).

5.2.1 Ceiling speed monitoring (CSM)

5.2.1.1 Permitted speed

The Permitted Speed is the speed the driver is allowed to follow in Figure 4. The Permitted speed is shown to the driver by the CSG (see 6.2.1.4) and is defined by the MRSP.

5.2.1.2 Over-speed Status information

If the current train speed (V_{train}) exceeds the Permitted Speed (V_{perm}) the Over-speed Status information is activated.

Each time the Over-speed Status is activated an audible information (S1, see CLC/TS 50459-6) shall be activated

5.2.1.3 Warning Status information

The Warning Status information shall be activated whilst the On-Board system activates a Warning.

While the Warning Status information is activated an audible information (S2, see CLC/TS 50459-6) shall be activated.

5.2.1.4 Intervention Status information

The Intervention Status information shall be activated whilst the On-Board system activates an Intervention.

The Intervention Status information overwrites the Over-speed Status and Warning Status information.

When the Intervention Status is no more active an audible information (S3 see CLC/TS 50459-6) shall be activated.

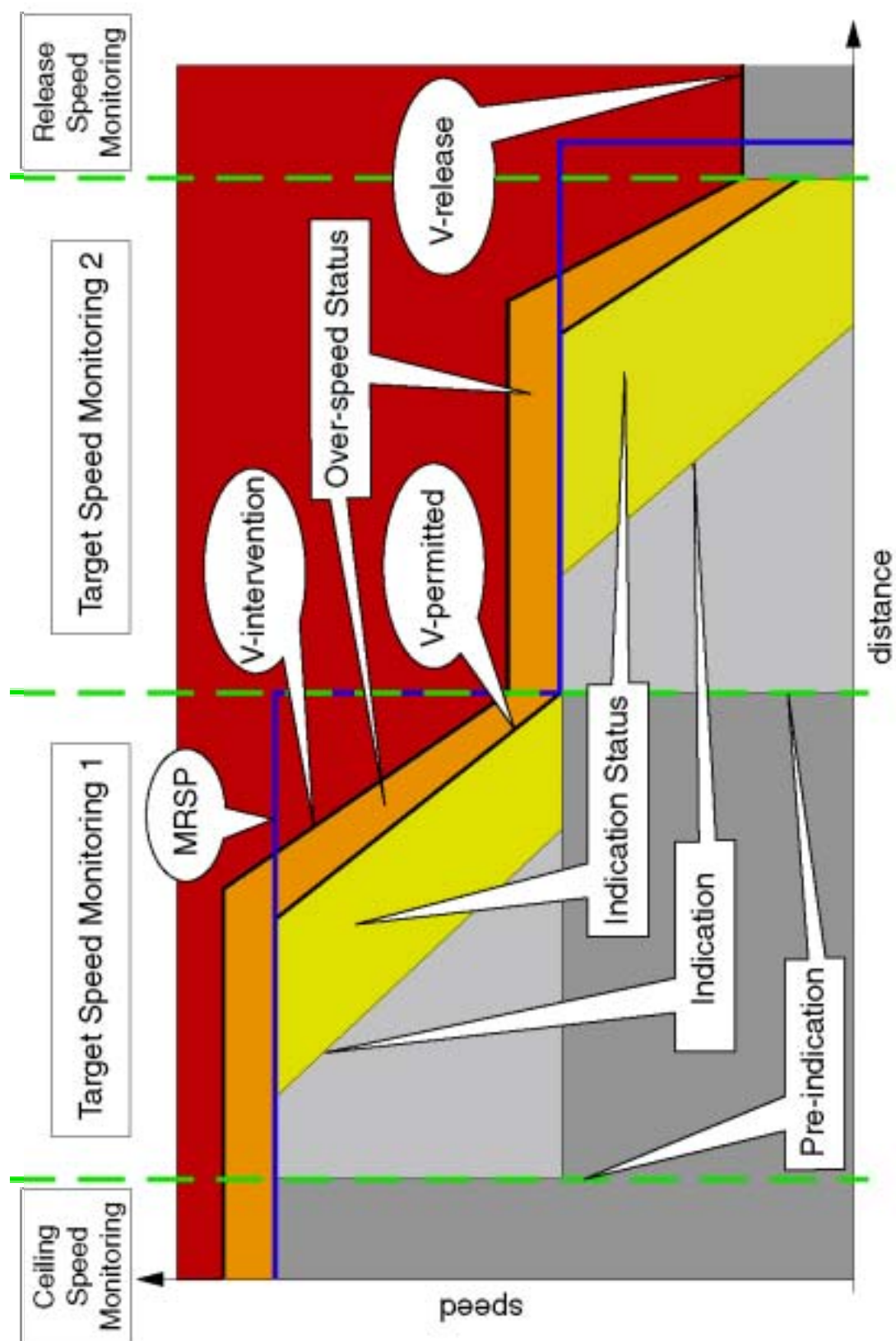


Figure 4 — Colour philosophy and DMI brake monitoring

5.2.1.5 Order and precedence of Status

The Intervention Status shall have precedence over the Over-speed Status, the Warning Status and the Permitted Speed.

— The current speed is increasing:

The starting point is the Permitted Speed. If the actual speed continues to increase first the Over-speed Status is activated and if the actual speed then continues to increase the Warning Status is activated and then finally the Intervention Status.

— The current speed is decreasing after an intervention:

The starting point is the Intervention Status. When the system allows the release of the brakes and after an acknowledgment if required the Intervention Status is cancelled.

Table 1 — Order and precedence of Status information under CSM

Shall hide → ↓ Information	Intervention Status	Warning Status	Over-speed Status
Intervention Status	-	yes	yes

5.2.2 Target speed monitoring (TSM)

5.2.2.1 Pre-indication Status information

NOTE At the moment of the Pre indication Status the driver is expected to prepare for a slow-down action. The train might have been running some time at constant speed in ceiling speed area. It is therefore useful to alert the driver of the need to start braking as soon as the (Pre-) indication is given.

As soon as the current train front-end position passes the Pre-indication location or limit V_{target} shall be displayed. The first time the Pre-indication Status is activated an audible information (S5 see CLC/TS 50459-6) shall be activated.

In the case that a more restrictive target becomes applicable the audible information (S5) shall be activated again.

5.2.2.2 Indication Status information

The Indication Status shall be activated when the Indication Limit is exceeded by the train.

NOTE This Indication Status shall be given early enough to enable the driver to start braking before the Permitted speed begins to decrease.

The Indication Status information overwrites the Pre-indication Status information.

An audible information (S10, CLC/TS 50459-6) may be used to inform the driver that the brake can be released without the risk of intervention.

5.2.2.3 Over-speed Status information

The Over-speed Status information is supplementary to the Pre-indication and Indication Status information.

The Over-speed Status shall not change the presentation of the Pre-indication Status, the Indication Status and the Release speed.

Each time the Over-speed Status is activated an audible information (S1, see CLC/TS 50459-6) shall be activated.

5.2.2.4 Warning Status information

The Warning Status information shall be activated whilst the On-Board system activates a Warning.

While the Warning Status is activated an audible information (S2, see CLC/TS 50459-6) shall be activated.

5.2.2.5 Intervention Status information

The Intervention Status information shall be activated whilst the On-Board system activates an Intervention.

The Intervention Status information overwrites the Over-speed Status information.

When the Intervention Status is no longer active an audible information (S3 see CLC/TS 50459-6) shall be activated.

5.2.2.6 Order and precedence of Status

The Intervention Status shall have precedence over the Permitted Speed or the Pre-indication Status or the Indication Status or the Warning status.

— The current speed is maintained or not decreasing sufficiently

The starting point is the Pre-indication Status or the Indication Status. If the actual speed is maintained or not decreasing sufficiently the Over-speed status is activated. If the actual speed then continues not to decrease sufficiently the Warning Status is activated and finally the Intervention Status.

— The current speed is decreasing sufficiently after an intervention

The starting point is the Intervention Status. When the system allows to release of the brakes and after an acknowledgment if required the Intervention Status is cancelled and the Pre-Indication Status or Indication Status is applicable.

Table 2 — Order and precedence of Status information under TSM

Shall hide → ↓ Information	Intervention Status	Warning Status	Over-speed Status	Indication Status	Pre-indication Status
Intervention Status	-	yes	yes	no	no
Indication Status	no	no	no	-	yes

5.2.3 Release speed monitoring (RSM)

Release speed monitoring is a function of the target speed monitoring.

5.2.3.1 Release speed

While the Indication Status is activated the release speed is shown to the driver if there is any release speed at current train location.

5.2.3.2 Warning Status Indication

The Warning Status information shall be activated whilst the On-Board system activates a Warning.

While the Warning Status is activated an audible information (S2, see CLC/TS 50459-6) shall be activated.

5.2.3.3 Intervention Status Indication

The Intervention Status information shall be activated whilst the On-Board system activates an Intervention.

The Intervention Status overwrites the normal Release speed information presentation.

5.2.3.4 Order and precedence of Status Indication

The Intervention Status shall have precedence over the Warning Status and the Release Speed.

— The current speed is increasing

Before reaching the Release Speed (at the warning limit) the Warning Status is activated. When the current train speed exceeds the release speed, the Intervention Status is activated.

— The current speed is decreasing after an intervention

The starting point is the Intervention Status. When the system allows the release of the brakes and after an acknowledgment if required the Intervention Status is cancelled.

5.2.4 Other supervisions or protections

If other supervisions or protections apply the brakes (e.g. Roll Away Protection, Reverse Movement Protection and Standstill Supervision), the Intervention Status Indication is activated.

6 ERTMS/ETCS driving information shown on the DMI

6.1 Principles

The figures²⁾ in this clause show the DMI when all information is combined into one screen.

NOTE 1 The figures are shown as examples to help explaining the requirements and do not mandate any technology although the figures are based on a screen using touch screen technology.

NOTE 2 All information about speed is in km/h to seek consistency with the ERTMS/ETCS system.

²⁾ The figures are based on an ergonomic study initially done for the UIC (see bibliography).

6.2 Speed and Supervision information

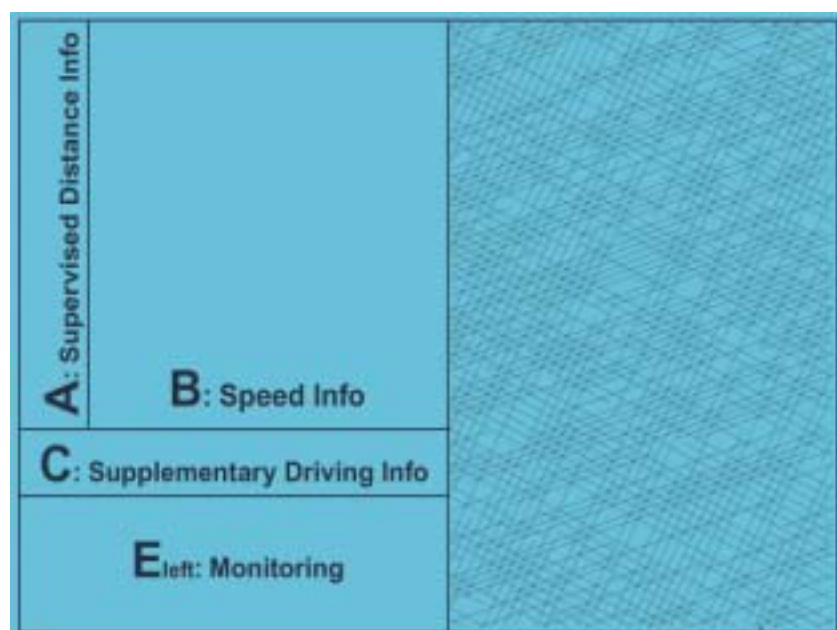


Figure 5 — Speed and supervision areas

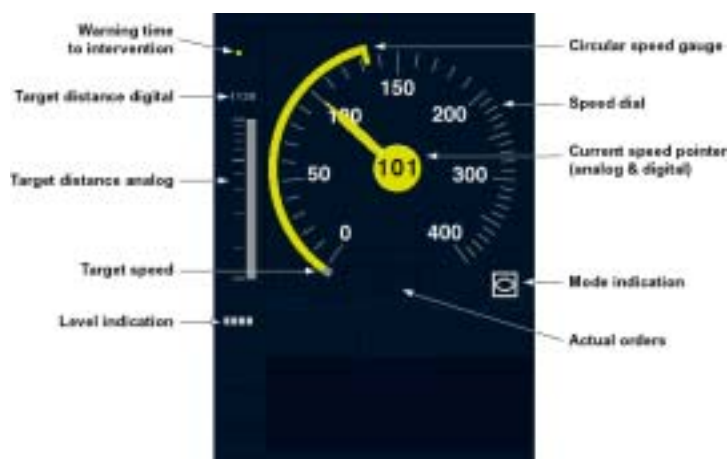


Figure 6 — Overview of the main elements in the speed and supervision areas

6.2.1 Speed Information

6.2.1.1 Speed dial

This DMI object displays the speed dial.

The speed dial shall be displayed in area B0 (see Figure 7). The area size is 280 x 300 (w x h) cells.



Figure 7 — Screen location of the speed dial

Figure 8 and Figure 9 show examples of dials with different indications.

The speed dial is circular and indicates speeds from 0 km/h to 400 km/h or from 0 km/h to 250 km/h depending on the type of the driving cab. It shall not be possible to use different dials on the same classes of traction unit.

The numbers and speed indicator lines of the speed dial shall be white. The speeds are spaced around the border of the circle as follows.



Figure 8 — 400 km/h indication for the DMI



Figure 9 — 250 km/h indication for the DMI

For the 400 km/h dial:

Assuming that 0 degrees is vertically upwards from the centre, 0 km/h is shown at an angle of -140 degrees and 400 km/h is shown at an angle of +140 degrees, while 200 km/h is shown at an angle of +40 degrees.

This means that the mapping from speed to the angle of the pointer indicating the speed is divided into two segments: the first segment ranges over the angles -140 degrees to +40 degrees with speeds from 0 km/h to 200 km/h and the second segment ranges over the angles +40 degrees to +140 degrees with speeds from 200 km/h to 400 km/h.

Both segments have linear mapping between speed and angles.

The speed dial with the 400 km/h shall indicate the following numbers: 0, 50, 100, 150, 200, 300 and 400, positioned inside the circle of the dial. At each of these positions a speed indicator line is drawn radially between the border of the circle and the number. In between these lines are, evenly spaced by 10 km/h similar speed indicator lines, but a little shorter.

This means that in the first segment (from 0 to 200) the distance between the 10 km/h indications is wider than in the second segment (from 200 to 400).

The functions displayed in B1 and B2 also use the mapping described here.

For the 250 km/h dial:

Assuming that 0 degrees is vertically upwards from the centre, 0 km/h is shown at an angle of -140 degrees and 250 km/h is shown at an angle of +140 degrees.

The speed dial with the 250 km/h may indicate the following numbers: 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220 and 240, or 0, 50, 100, 150, 200 and 250. At these speeds also a speed indicator line is drawn from the border of the circle into the direction of the centre. In between these lines are, evenly spaced by 10 km/h similar speed indicator lines, but shorter. This scale shall have a constant mapping.

When not under Full Supervision (e.g. SR, OS) the information shown on area B should be limited to the national speed value for an unfitted line plus a margin of 10 km/h (e.g. 170 km/h on a line of 160 km/h) and the dial ends at that value (see Figure 20 in 6.2.1.5); the section of the dial above the national value is not shown. This is done to distinguish clearly between FS and other modes.

Any scale shall be designed and elaborated using the best graphical techniques (e.g. anti-aliasing) to achieve a smooth appearance of the numbers and markers.

Additional dimensions: large markers 25 cells (length); short markers 15 cells (length).

6.2.1.2 Current train speed pointer

This DMI object displays the current speed of the train.

The current train speed pointer shall be displayed in area B1 (see Figure 10). Figure 11 shows an example of the size of the pointer.



Figure 10 — Screen location for the current train speed pointer

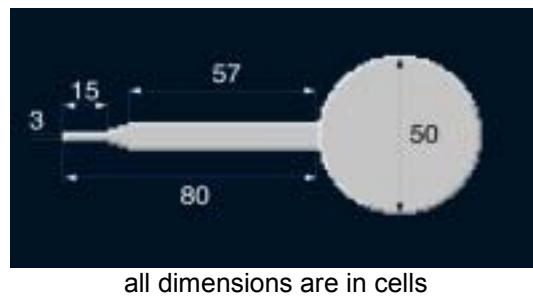


Figure 11 — Size of the current train speed pointer

The speed is shown by a pointer in the centre of the speedometer. It shows the same speed as the DMI object current speed digital.

The pointer indicates a speed between 0 km/h and 400 km/h (or 250 km/h), according to the speed dial (see 6.2.1.1). The pointer consists of a needle and a circular centre point. Both parts always have the same colour.

In the centre of the pointer the numeric value of the current speed shall be presented in digits; see for more details 6.2.1.3.

Figure 12 gives an example of the current train speed pointer.



Figure 12 — Current train speed pointer

The width of the circular centre shall have at least the size to cover the maximum three digits of the digital current train speed. The length of the pointer shall not reach the hook of the CSG (see 6.2.1.4).

The width of the top of the pointer shall not be wider than the hook of the CSG.

The example of Figure 11 should be used as a guideline.

When in FS mode the pointer follows the DMI colour philosophy (see Table 3).

In all other modes the pointer shall remain grey. One exception, when in FS: if the CSG area for the speed is dark grey, the pointer shall be grey to provide a better contrast.

Table 3 — Conditions for display and colour philosophy of the current train speed pointer

		Pointer between 0 km/h – V_{Perm}	Pointer between 0 km/h – V_{Target}	Pointer between V_{Target} – V_{Perm}	Pointer above V_{Perm} [SLD1]
CSM	NoS	grey	N. A.	N. A.	N. A.
	OvS	grey	N. A.	N. A.	orange
	WaS	grey	N. A.	N. A.	orange
	IntS	grey	N. A.	N. A.	red
TSM	PreS	grey	N. A.	N. A.	N. A.
	IndS	N. A.	grey	yellow	N. A.
	OvS	N. A.	grey	yellow	orange
	WaS	N. A.	grey	yellow	orange
	IntS	N. A.	grey	yellow	red
RSM	NoS	yellow	N. A.	N. A.	N. A.
	IntS	red	N. A.	N. A.	red
NoFS	NoS	grey			
	IndS	grey			
	OvS	grey			
	WaS	grey			
	IntS	grey			
N. A. means not applicable.					

6.2.1.3 Current train speed digital

The current speed of the train is also displayed digitally. It shows the same speed as the function "Current train speed pointer" (see 6.2.1.2).

The current train speed digital shall be displayed in the centre of the pointer in area B1 (see Figure 13).

The characters of the current train speed digital shall be at least 17 cells height.



Figure 13 — Screen location for the current train speed digital

Figure 14 gives an example of the current train speed digital.



Figure 14 — Current train speed digital

The current speed is shown digitally in B1 with three digits. Area B1 is divided into three equally sized sub areas centred in B1. Every digit is placed in such a sub area and aligned to the right of the sub area: in this way the digits will not change location depending on the different widths of the 10 digits. Preceding zeros are never shown. The digits shall not be proportional (fixed width shall be used).

The digital numbers shall be black, except if the speed pointer has the red colour (i.e. the Intervention Status). In that case the digital numbers shall be white.

6.2.1.4 Circular Speed Gauge (CSG)

The Circular Speed Gauge (CSG) displays, around the speed dial, the V_{perm} , V_{target} , V_{int} and $V_{release}$ information.

The sounds S1, S2, S3 and S5, see CLC/TS 50459-6, are used depending on the current train speed and the activated status (see 5.2).

The CSG shall be displayed in area B2 (see Figure 15). Figure 16 shows an example of the size of the CSG. The size of the hook shall be 6x20 cells.



Figure 15 — Screen location of the Circular Speed Gauge (CSG)