



BSI Standards Publication

Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System

Part 2: Ergonomic arrangements of GSM-R information

National foreword

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English Version

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

Bahnanwendungen - Telekommunikationstechnik,
Signaltechnik und Datenverarbeitungssysteme -
Europäisches Leitsystem für den Schienenverkehr - Teil 2:
Ergonomische Anordnung der GSM-R Informationen

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Contents

Page

European foreword	6
Introduction	7
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions	8
3.2 Abbreviated terms	11
4 General DMI-related principles.....	12
4.1 General ergonomic principles.....	12
4.2 Hardware	12
4.3 Areas on the DMI	12
4.4 Colours	16
4.5 Information	16
4.6 Flashing	22
4.7 Sounds.....	22
4.8 Lists	22
5 GSM-R functions shown on the DMI.....	23
5.1 Introduction.....	23
5.2 General functions	23
5.3 Registration functions.....	45
5.4 Network selection	49
5.5 Call-related functions: incoming non-emergency.....	50
5.6 Call-related functions: outgoing non-emergency	53
5.7 Call-related functions: incoming emergency	58
5.8 Call-related functions: outgoing emergency	59
5.9 Supplementary Services	61
5.10 Other calls	69
5.11 Select a called party	75
5.12 Use of in-call menu.....	80
5.13 Loss of network	80
5.14 Shunting	81
5.15 Direct mode	85
5.16 Text messaging.....	85
6 Sounds.....	86
6.1 General	86
6.2 Incoming calls (R1, R2, R3)	87
6.3 Outgoing calls (R4, R5, R6, R7, R8)	89
6.4 R9 - Public address – incoming / outgoing.....	93
6.5 R10 - Positive link assurance	94
6.6 R11 - Negative link assurance.....	94
6.7 R12 – Loss of the network	95
6.8 R13 – PTT pressed.....	95
6.9 R14 – Uplink Busy	96
6.10 R15 – Failed action	97
Bibliography	98

Figures

Figure 1 — Areas of the DMI Display.....	13
Figure 2 — GSM-R Cab Radio Modes and States	23
Figure 3 — Basic Screen – Train Mode	24
Figure 4 — Basic Screen - Shunting Mode	25
Figure 5 — Adjusting brightness (Light sensor ‘inactive’)	41
Figure 6 — Adjusting brightness (Light sensor ‘active’)	42
Figure 7 — Self Test	44
Figure 8 — Language Selection	45
Figure 9 — Register Train Running Number	46
Figure 10 — Forced Deregistration	47
Figure 11 — Working position selection (function code).....	48
Figure 12 — Select mobile radio network	49
Figure 13 — Receiving a point-to-point call (before connection).....	50
Figure 14 — Receiving a point-to-point call (established)	51
Figure 15 — Receiving a group call (before connection).....	52
Figure 16 — Receiving a group call (connected)	52
Figure 17 — Call primary controller	54
Figure 18 — Group call to other drivers in the same area	55
Figure 19 — Entering a group ID	56
Figure 20 — Choosing ‘group call’	57
Figure 21 — Receiving a Railway Emergency Call	58
Figure 22 — Outgoing Railway Emergency Call (established)	60
Figure 23 — Call on hold	61
Figure 24 — On-going call plus waiting call	62
Figure 25 — On-going call plus held call	63
Figure 26 — Incoming REC with Call Waiting	64
Figure 27 — Forwarding a call to another number	65
Figure 28 — Activating forwarding	65
Figure 29 — Cancelling Forwarding a call to another number	67
Figure 30 — Call Forwarding unconditional activated	67
Figure 31 — Cancelling Forwarding a call to a hand-held portable	68
Figure 32 — Call Chief Conductor (Paging).....	69
Figure 33 — Public Address call.....	70
Figure 34 — Incoming Intercom call (established)	71
Figure 35 — Selecting other drivers on train.....	72
Figure 36 — Drivers connected in a multi-party call	73
Figure 37 — Intercom call from train staff to controller (established).....	75
Figure 38 — Calling a controller with a single keystroke.....	76

Figure 39 — Free-dial a number	77
Figure 40 — Select from Telephone Book	78
Figure 41 — Select from received calls list	79
Figure 42 — Loss of radio network.....	80
Figure 43 — Select shunting area.....	81
Figure 44 — Select Shunting group ID	82
Figure 45 — Alerting of a controller	84
Figure 46 — Receiving a text message	85
Figure 47 — R1 - Internal incoming call	88
Figure 48 — R2 - External incoming call	89
Figure 49 — R3 - Incoming emergency call	89
Figure 50 — R4 - Connection	90
Figure 51 — R5 - Line ringing.....	91
Figure 52 — R6 - Line busy.....	91
Figure 53 — R7 - Barred call.....	92
Figure 54 — R8 - Outgoing emergency call	93
Figure 55 — R9 - Public address.....	93
Figure 56 — R10 - Positive link assurance	94
Figure 57 — R11 - Negative link assurance	95
Figure 58 — R12 - Loss of the network	95
Figure 59 — R13 - PTT pressed.....	96
Figure 60 — R14 - Uplink busy	97
Figure 61 — R15_Failed_action	97

Tables

Table 1 — Description of functions used in each are.....	13
Table 2 — Description of functions associated with keys	14
Table 3 — TRD Symbols	17
Table 4 — TRD menu structure	26
Table 5 — TRD menu structure (Shunting).....	35
Table 6 — Menu structure (while in a call).....	37
Table 7 — Summary of sounds	86
Table 8 — R1 - Internal incoming call.....	88
Table 9 — R2 - External incoming call.....	88
Table 10 — R3 - Incoming emergency call.....	89
Table 11 — R4 - Connection	90
Table 12 — R5 - Line ringing	90
Table 13 — R6 - Line busy	91
Table 14 — R7 - Barred call	92

Table 15 — R8 - Outgoing emergency call.....	92
Table 16 — R9 - Public address – incoming / outgoing	93
Table 17 — R10 - Positive link assurance.....	94
Table 18 — R11 - Negative link assurance.....	94
Table 19 — R12 - Loss of the network.....	95
Table 20 — R13 - PTT pressed	96
Table 21 — R14 - Uplink busy	96
Table 22 — R15 - Failed action.....	97

European foreword

This document (CLC/TS 50459-2:2021) has been prepared by CLC/SC 9XA “Communication, signalling and processing systems”, of Technical Committee CLC/TC 9X “Electrical and electronic applications for railways”.

This document supersedes CLC/TS 50459-2:2015.

CLC/TS 50459-2:2021 includes the following significant technical changes with respect to CLC/TS 50459-2:2015:

- updated general principles for the presentation of ERTMS/ETCS/GSM-R information correlated with ERA document ERA_ERTMS_015560;
- updated ergonomic arrangements in line with EN 16186 series.

CLC/TS 50459 series consists of the following parts under the general title *Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System — Driver-Machine Interface*:

- *Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information*;
- *Part 2: Ergonomic arrangements of GSM-R information* [the present document];
- *Part 3: Ergonomic arrangements of non ETCS information*.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Introduction

This document should be read in conjunction with ERA_ERTMS_015560, *ETCS Driver Machine Interface*, and the EN 16186 series, *Railway applications — Driver's cab*.

The CLC/TS 50459 series contains the ergonomic arrangements of information on the ERTMS/DMI Display (Control Command Display (CCD) and Train Radio Display (TRD). Most items are illustrated with an example.

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

- achieving harmonized and coherent presentation for ERTMS/ETCS and NTC information;
- defining Driver-Machine Interface ergonomics that is compatible with agreed interoperable ERTMS specifications;
- to reduce the risk of incorrect operation by a driver;
- facilitating train operation with a unified ergonomics, hence reducing the cost of driver training;
- better understanding of the tasks to be performed;
- increasing speed and accuracy of driver actions.

1 Scope

This document describes from an ergonomic point of view how GSM-R information will be arranged and displayed. More specifically it covers information that is out of the scope of ERA document ERA_ERTMS_015560. This document describes more ergonomic details than currently provided by the GSM-R specifications.

This document defines the ergonomics for the Driver-Machine Interface (DMI) for the stand alone ERTMS/GSM-R Voice Radio Systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 16186-2, *Railway applications - Driver's cab - Part 2: Integration of displays, controls and indicators*

EN 16186-3:2016+A1:2018, *Railway applications - Driver's cab - Part 3: Design of displays*

CLC/TS 50459-1:2021, *Railway applications — Communication, signalling and processing systems — European Rail Traffic Management System — Driver-Machine Interface - Part 1: General principles for the presentation of ERTMS/ETCS/GSM-R information*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain databases of terminology for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1

auto-answered

automatically answered from a mobile station to a call if the incoming call is of or exceeds a defined priority level

[SOURCE: EIRENE]

3.1.2

broadcast call

call made to all members of a pre-defined group within a local geographical area

Note 1 to entry: Only the initiator of the call may talk, with all other group members listening only.

3.1.3

call forwarding unconditional

CFU

supplementary service which permits a called mobile subscriber to have the network send incoming calls to another number no matter what the condition of the termination (radio)

3.1.4**call type**

prefix used to identify the user number dialled

Note 1 to entry: The first digit of a National EIRENE Number (see EIRENE SRS Section 9) defines how to interpret the numbers that follow.

Note 2 to entry: Of particular relevance to this document are:

- Call Type 1 – reserved for short codes;
- Call Type 7 – used for train controllers.

3.1.8**chief conductor**

member of the train crew with overall responsibility for passenger-related railway activities on-board the train

3.1.9**conductor**

member of the train crew with some degree of responsibility for passenger-related railway activities on-board the train

3.1.10**controller
dispatcher**

individual responsible for the conduct of some aspect of train operations

Note 1 to entry: For the purposes of this document, the following functional roles of controllers are defined:

- primary controller;
- secondary controller;
- power supply controller.

3.1.11**downlink**

radio transmission path from a base station to a mobile station

3.1.12**EIRENE**

railway telecommunications system based on the ETSI GSM standard, which complies with all related mandatory requirements as specified in the EIRENE FRS and SRS

Note 1 to entry: An EIRENE system could also include optional features and these are then implemented as specified in the EIRENE FRS and SRS. The EIRENE System includes terminals.

3.1.13**flash SMS**

type of SMS that appears directly on the main screen without user interaction and is not stored in the inbox

3.1.14**function code**

code which is used as an identification of, for example, the person or equipment on a particular train, or a particular team within a given area

3.1.15

functional identity

full alphanumeric description of the function performed by a called or calling party within the functional numbering scheme, identifying them by function or role rather than by a specific item of radio equipment or user subscription

Note 1 to entry: The functional identity can include characters and/or numbers.

3.1.16

functional number

full number used within the functional addressing scheme to contact an end user/system by function or role rather than by a specific item of radio equipment or user subscription

EXAMPLES Train Running Number and Locomotive Number.

3.1.17

group call

call made to all members of a pre-defined group within a local geographical area

Note 1 to entry: Only one member of the group may talk at any instant, with all other group members listening only.

3.1.18

group ID

group identification number

three digit number (defined in EIRENE SRS Table 9-8) used within the EIRENE Numbering Plan

3.1.19

idle state

state of a cab radio when it is connected to a network but there are no active calls

3.1.20

active state

state of a cab radio when it is connected to a network and there is at least one call connected or on hold

3.1.21

multiparty call

voice communication method whereby a number of parties defined by the call initiator may participate in the call and whereby all parties may talk simultaneously

3.1.22

point-to-point call

voice communication method whereby two parties defined by the call initiator may participate in the call and whereby both parties may talk simultaneously

3.1.23

power supply controller

controller responsible for the management of the traction power supply

3.1.24

primary controller

co-ordinator of train emergency calls who is normally responsible for the operation of a designated area of track

Note 1 to entry: The location and direction of movement of any particular train permits the unique identification of a primary controller. The exact responsibilities of the primary controller are determined on a national basis.

3.1.25**secondary controller**

train controller who holds responsibility for the safe running of trains on a designated area of track

EXAMPLE a signaller

Note 1 to entry: Secondary Controllers requires the facility to communicate with trains in all situations in order to perform their function. The split of responsibilities between primary controllers and secondary controllers is determined on a national basis.

3.1.26**shunting group**

group of people manoeuvring trains in order to change the formation of the trains

Note 1 to entry: EIRENE also uses the term 'Shunting team' for this.

3.1.27**sidetone**

form of feedback where transmitted audio signal is instantly introduced at a low level into the receiver (earpiece) of the same handset

Note 1 to entry: It only applies when the handset is off-hook.

3.1.28**uplink**

radio transmission path from a mobile station to a base station

3.2 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ADIF	Administrador de infraestructuras ferroviarias
CCD	Control Command Display
DMI	Driver-Machine Interface
DTMF	Dual-Tone Multi-Frequency
EIRENE	European Integrated Railway Radio Enhanced Network
ERA	European Rail Agency
FC	Function Code
FRS	Functional Requirements Specification
HMI	Human Machine Interface
IC	Intercom
PA	Public Address
PTP	Point-To-Point
PTT	Push To Talk
REC	Railway Emergency Call
RU	Railway Undertaking
SIM	Subscriber Identity Module
SMS	Short Message System
SNCF	Société nationale des chemins de fer français
SRS	System Requirements Specification

TCMS	Train Control and Monitoring System
TRD	Train Radio Display
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service

NOTE For practical reasons, in this document GSM-R is used instead of ERTMS/GSM-R.

4 General DMI-related principles

4.1 General ergonomic principles

The relevant requirements of the EN 16186 series shall be followed.

The GSM-R DMI shall follow the main ergonomic principles as described in CLC/TS 50459-1.

Any additional requirements that are specific to GSM-R are defined in this document.

4.2 Hardware

4.2.1 General

It should be possible to pick up and return the handset 'blindly' (from the driving position) and with one hand. EN 16186-2 shows the preferred location of the handset.

GSM-R shall automatically detect that the handset is off-hook.

As an alternative to a handset and loudspeaker, it should be possible for a radio to use a hands-free microphone and loudspeaker. The hands-free microphone shall include a PTT function that is used when the driver wants to speak during group calls. The PTT function may also be used during other calls.

4.2.2 Use of alternative layouts for the DMI

For existing systems or systems at an advanced stage of development alternative DMI layouts may be used provided that they meet the functional requirements.

As indicated in EN 16186-2, it is possible to meet the functional requirements of the GSM-R DMI with a simpler driver interface than that shown in the examples within this document.

4.3 Areas on the DMI

GSM-R DMI's shall have the following areas: input and monitoring. Areas C, F and S3 are used to show the function of buttons through which information is input. Areas A, S1 and S2 are used to present information to the user. This is illustrated in Figure 1 — Areas of the DMI screen along with their relative sizes (in cells). Refer to CLC/TS 50459-1:2021, 4.1.3 for a fuller explanation of sizes and cells.

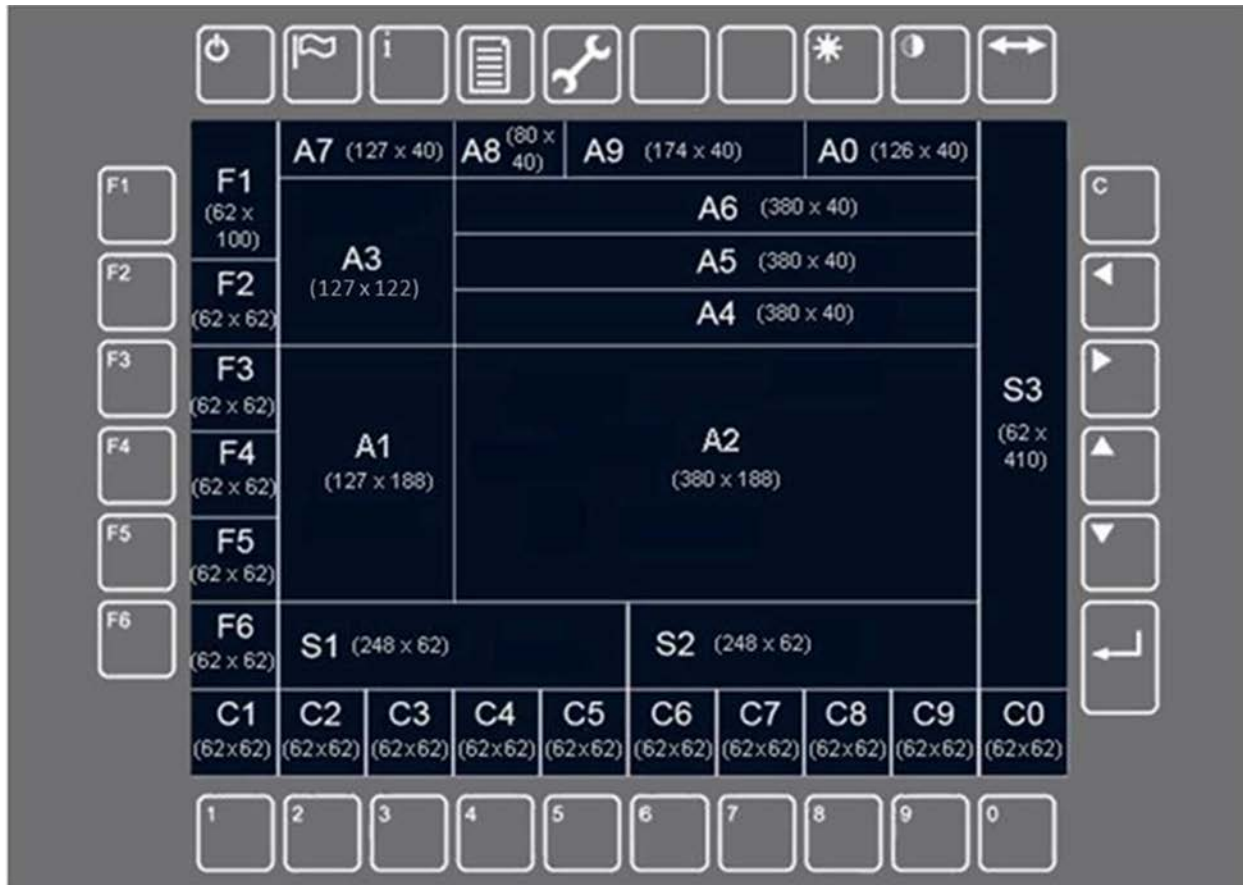


Figure 1 — Areas of the DMI Display

NOTE This layout is in line with UIC 612-04. The functions associated with the various areas and keys are given in Table 1 and Table 2 below. The descriptions are based on those given in UIC 612-04 with re-wording where it is considered helpful.

Table 1 — Description of functions used in each are

Field	Description
A1	GSM-R symbol showing call status
A2	announcement and communication field — GSM-R information — flash-SMS (incoming text, at least 160 digits without scrolling) — announcement of other than flash-SMS (symbol: envelope) — other text and symbols
A3	reserved for future use, e.g. a Driver Advisory System
A4	text heading
A5	— for train radio mode: current call number — for shunting mode: current shunting group number
A6	title of the TRD screen
A7	— for train radio mode: train number — for shunting mode: shunting area number and 2-digit group number if applicable
A8	function code

Field	Description
A9	current GSM-R operator — SNCF: virtual channel number (see UIC ERTMS/GSM-R Operators Group, document no. O-2680) — ADIF: Regulation Band Number (see UIC ERTMS/GSM-R Operators Group)
A0	current time
S1	GSM-R network status information
S2	status field (for acoustic level 5 volume steps shall permanently be provided acc. to GSM-R ; see EIRENE SRS)
S3	soft key display field (blue triangle, if navigation key is active)

Table 2 — Description of functions associated with keys

Key	Pictogram	Functional description
K1.x		Top group of keys: — see below for individual details of these keys
K1.1		Only operational in a non-activated cab: it allows a cab radio to be switched on / off in the absence of any other cab activation signal assuming that power is available
K1.2		Use this key to open the display screen “switch language”
K1.3		Not used for GSM-R
K1.4		Not used for GSM-R
K1.5		Not used for GSM-R
K1.6		Reserved for future use
K1.7		Reserved for future use
K1.8		Use this key to open the dialogue for manual brightness control
K1.9		Use this key to open the dialogue for contrast control
K1.10		Option: When subsequently pressing this key: the (partial) contents of one of the other screens are shown on the screen according to the redundancy concept (see CLC/TS 50459-1:2021, 4.1.4)

Key	Pictogram	Functional description
K2.x		Right group of keys: — see below for individual details of these six keys — in some applications soft key labels are allocated to these keys. Then they have the meaning given by the soft key labels
K2.1		Use this key to return to the level above within the display screen hierarchy
K2.2		Use this key to move from the current field to the next field to the left
K2.3		Use this key to move from the current field to the next field to the right
K2.4		Use this key to scroll up
K2.5		Use this key to scroll down
K2.6		Use this key to acknowledge entries or messages, or confirm a selection. It is also known as the Accept key
K3.1 to K3.10		Bottom group of keys: 10 keys (labelled 1–0). Only if numerical input is requested (1...0), the soft keys shall show the same numbers as the hard keys K3.1 to K 3.10. Only the soft key labels relevant for the driver's selection shall be shown. Soft key labels showing other information instead of the numerical values may be allocated to these hard keys. Then the hard keys have the meaning given by the soft key labels.
K4.X		Left group of keys: 6 keys (labelled F1 to F6)
K4.1 = F1		Increase volume
K4.2 = F2		Decrease volume
K4.3 = F3		Intercom This key is dedicated to the intercom function in order to meet the requirement of EIRENE FRS 5.2.3.11

Key	Pictogram	Functional description
K4.4 = F4		Public address call This key is dedicated to the Public Address function in order to meet the requirement of EIRENE FRS 5.2.3.11
K4.5 = F5		Chief conductor call This key is dedicated to the Call Chief Conductor function in order to meet the requirement of EIRENE FRS 5.2.3.11
K4.6 = F6		Secondary controller call
NOTE The pictograms shown in this table are for information and taken from UIC 612-01.		

4.4 Colours

The display generally uses a dark background with lighter symbols. The figures and colours on them within this document are for illustrative purposes only rather than presenting the precise colours.

The colours shall comply with those specified in EN 16186-3 and CLC/TS 50459-1.

4.5 Information

As required by EIRENE the driver shall have the following information and functions independent of the status of a call:

- functional identity of connected party (for an outgoing call);
- functional identity of calling party (for an incoming call);
- the status of a call; this indication can use text or symbols or a combination of both;
- see which (incoming) calls are waiting;
- the ability to break into the voice call of other on-train users by picking up the handset (see NOTE 1);
- the ability to terminate calls which he is entitled to terminate;
- ability to end a call not by hanging up the handset, but by using a button;
- radio network availability.

NOTE 1 Other on-train users can include, for example, a conductor using the intercom to connect via the cab radio to a signaller, an external call routed via the cab radio to the public address, etc.

When a controller is handling a call other than the call of the driver, the driver should be informed about that. The means of providing this is out-of-scope of this document.

The symbols shall be in accordance with the Table 3 below.

The symbolic indication of the status of a call is generally shown in A1. Some of the applicable symbols given below may be replaced by symbols with a more specific meaning, for example a 'primary controller' symbol may replace the generic 'connection established' symbol.

The same symbol may be used both as a soft-key label and as a status indication, for example symbol 11.1. The background colour will differ (see EN 16186-3 and 4.4) but the basic shape of the symbol is the same.

NOTE 2 Status indications are not shown in fields C1 to C0.

The symbols used are as follows:

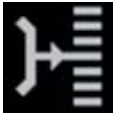
Table 3 — TRD Symbols

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
6.2		opening connection	A1	Used while a call is being established. Sound = R5 "Line ringing"
6.6		line not available / no connection	A1	Used when a driver initiated call cannot connect because there is no line available (insufficient network capacity) or the called number does not exist. Sound = R7 "Barred call"
6.9		busy	A1	Used when a driver initiated call cannot connect because the called party is busy. Sound = R6 "Line busy"
6.10		no answer / barred call	A1	Used when a driver initiated call cannot connect because the called party does not answer or the network has blocked the call. Sound = R7 "Barred call"
6.11		incoming point-to-point call	A1	Used for point-to-point call in. Sound = R2 "external incoming call"
6.12		waiting call	A1	Used for established point-to-point call plus new waiting call. Sound = R4 "Connection"
6.12a		waiting call (with group call)	A1	Used for group/broadcast call plus new waiting call. Sound = R4 "Connection"
6.13		connection established	A1 C2	Used for point-to-point call in and out. C2 when in shunting mode to access train mode functionality.
6.15		call ended / connection lost	A1	Used for point-to-point call in and out, for group call in and out, for multiparty in and out and for public address. Sound = R15 "call termination by far end" NOTE 'Call Lost' cannot be distinguished from 'Call Ended'.

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
6.16		end call / leave call	C0	End call applies to all outgoing calls and for incoming point-to-point calls. Leave call applies to other incoming calls (group, broadcast, multiparty with other drivers on the same train).
7.1a		opening group call	A1 C6	Used for group call out. Also second level menu item as part of initiating a group call or broadcast call.
7.1b		opening broadcast call	A1	Used for broadcast call out.
7.2		incoming group or broadcast call	A1	Used for group or broadcast call in. Sound = R2 "External incoming call"
7.4		Group or broadcast call established	A1	Used for group or broadcast call in or out.
8.1a		outgoing emergency call	A1	Used for emergency group call out. Sound = R8 "Outgoing emergency call"
8.2		incoming emergency call	Combined A1 to A6	Used for emergency group call in; Sound = R3 "Incoming emergency call"
9.1		opening multiparty call	A1 C6	Used in A1 for multiparty out before the first party connects. Also in C6 during a call to allow the driver to add another party to a call.
9.2		incoming multiparty call	A1	Used for multiparty in – this will be a call from the lead driver to another driver on the same train (see 5.10.5). Sound = R1 "internal incoming call"
9.4		multiparty call established	A1	Used for multiparty in and out. See 5.10.4 and 5.10.5. For incoming multiparty, this will be from the lead driver. See 5.10.5.
9.5		Remove Multiparty Member	C9	Displayed in C9 when a multiparty call is active.

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
10.1		public address call	A1, F4	Used for public address calls, both from the driver and from a controller. Sound = R9 "Public address – incoming / outgoing"
10.2		PA busy	A1	Used for a driver to PA call when the PA is already in use. Sound = R6 "Line busy"
10.3		Intercom to controller - connecting	A1	Used when an intercom call from an on-train user, typically a conductor, is being forwarded to a controller
10.4		Intercom to controller - connected	A1	Used when an intercom call from an on-train user, typically a conductor, has been forwarded to a controller.
11.1		Primary controller	A1, C1	Replaces 6.13 in A1 if the established call is with a primary controller. C1 on First Level of Basic Screen – Train Mode
11.2		Secondary controller	A1, F6	Replaces 6.13 in A1 if the established call is with a secondary controller. F6 on First Level of Basic Screen – Train Mode
11.3		Power supply controller	A1, C3	Replaces 6.13 in A1 if the established call is with a power supply controller. C3 on First Level of Basic Screen – Train Mode
11.5		Phone List	C6	First Level of Basic Screen – Train Mode and Second Level of Basic Screen – Shunting Mode
11.6		Free Dial	C1	Second Level of Basic Screen – Train Mode
11.7		Call Hold	A1, C8	Displayed in A1 when a call is held. Displayed in C8 when a call is active.

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
11.8		Undo Hold	C8	Displayed in C8 when a call is on hold.
11.9a				Symbol intentionally deleted.
11.9b				Symbol intentionally deleted.
11.9c				Symbol intentionally deleted.
11.12		Monitor	C9	Displayed in C9 while the radio is in use by an attached system. Allows the driver to monitor on the cab radio loudspeaker a call between other users who are using the cab radio.
11.12a		End Monitor	C9	Displayed in C9 while the driver is monitoring a call involving an attached system. End the monitoring
11.15		Group call: Other drivers in the same area	A1, C2	Group call: Other drivers in the same area – in or out. Replaces 7.4 in A1 if the established group call is with other drivers in the same area. C2 on First Level of Basic Screen – Train Mode
11.16		intercom call	A1, F3	Used in A1 for incoming internal call (intercom). Sound = R1 “internal incoming call” Also shown in A1 after an outgoing intercom call has connected.
11.17		System	C0	First Level of Basic Screen – Train Mode
11.18		Register	C4	Second Level of Basic Screen – Train Mode Available after pressing K3.9 on First Level.
11.19		Deregister	C9	Second Level of Basic Screen – Train Mode Available after pressing K3.9 on First Level.
11.20		Toggle Held/Waiting and Active calls	C8	Displayed in C8 when a call is active and another call is held or waiting.

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
11.21		Broadcast call	Not Used	Not Used.
11.22		Shunting Mode	C4	First Level of Basic Screen – Train Mode
11.22a		Leave Shunting Mode	C0	First Level of Basic Screen – Shunting Mode
11.24		Call forwarding active to driver's hand portable	A1	Used when the driver has forwarded calls to his hand portable radio.
11.26		Chief conductor	A1, F5	Used in F5 to initiate a call to the Chief Conductor via GSM-R or paging him via the Public Address. Used in A1 to show that a call to the Chief Conductor is active.
11.27		Text message	A2, C7	Used when a SMS arrives (A2). Provides access to various text message facilities (C7) on both the First Level of Basic Screen – Train Mode and First Level of Basic Screen – Shunting Mode.
11.29		In-call Menu	C5	Present in C5 while a call is active or held. Opens a menu of features that are useful while in a call.
11.30		Open Level 2 TRD screen when in shunting mode	C4	Allows entry of shunting group area, shunting group number or selection of a called party. First level of shunting mode.
11.32		Call dispatcher by Call Type 7.	C7	Second level of shunting mode. Available after pressing K3.4 on First Level.
11.33		Call a dispatcher by short code number.	C1	Second level of shunting mode. Available after pressing K3.4 on First Level.
11.34		Return to Basic Screen	C0	Second level of Basic Screen – Train Mode. Available after pressing K3.4 on First Level.

Symbol number	Symbol form/shape	Symbol description	Symbol area(s)	Remarks
11.35		Call forwarding active	A1	Used when the driver has forwarded some or all calls to another number.
11.37		Entry of train running number	C1	Second level of Basic Screen – Train Mode Available after pressing K3.9 on First Level.
11.38		Working position (Function Code)	C2	Second level of Basic Screen – Train Mode Available after pressing K3.9 on First Level.
11.39		Accept	S3	Indicates that the Accept key is active.
11.40		Select network	C5	First Level of Basic Screen – Train Mode
11.41		Increase Volume	F1	
11.42		Decrease volume	F2	

4.6 Flashing

In general, the use of flashing is not recommended with GSM-R as it can cause an unnecessary distraction to the driver.

If flashing is used, the flashing frame should be associated with a yellow symbol or a yellow text message.

4.7 Sounds

Sounds to be used are described in Clause 6. The reference to the sound numbers can also be found there.

Any sound is related to one or more status symbol or command as described throughout this document.

4.8 Lists

A vertical scrollable list should be used to presenting the choices for the following GSM-R items:

- language selection;
- network selection;
- overview of recent incoming calls;
- predefined telephone numbers;
- selection of group numbers;
- selection of shunting group numbers

A wrap-around principle is used such that pressing the 'up' key when at the top of the list results in the bottom item of the list becoming highlighted. Similarly selecting the 'down' key when at the bottom results in the top item being selected.

5 GSM-R functions shown on the DMI

5.1 Introduction

The following subclauses and figures illustrate the key functions of the proposed standalone GSM-R Driver-Machine Interface.

NOTE The order of the subclauses has been chosen to match, as far as is practical, the order of screens shown within UIC 612-04.

Within each subclause, the figure and text together explain how a function can be activated and how the user should perform the navigation.

The examples below focus on soft key displays controlled via hard keys situated outside of the screen (see Figure 1). A touch screen display, with buttons integrated into the screen, may be used to provide the driver with the same interfaces. If a touch screen is used, buttons shall be placed only in the areas C, F and S3.

Subclause 5.2 gives requirements of a more general nature. Starting with 5.3, a more detailed description of functions and related requirements is given.

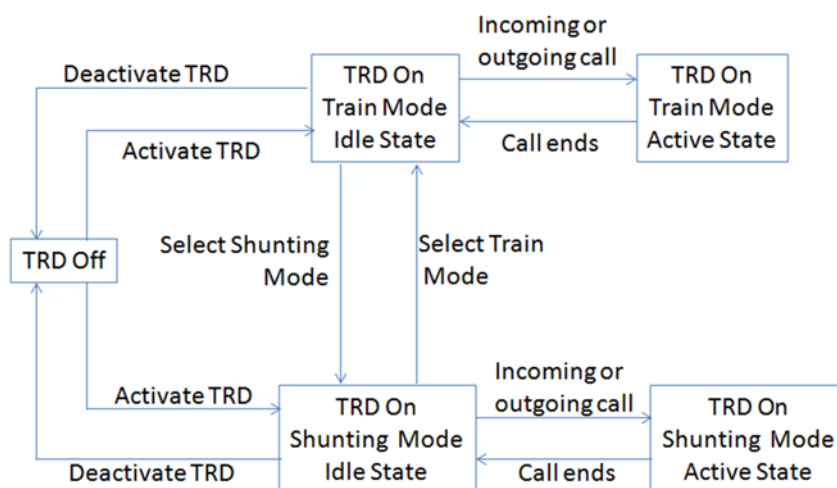
The descriptions below assume the use of a handset and loudspeaker. The mode of operation is generally similar if a hands-free microphone is used in place of the handset.

5.2 General functions

5.2.1 Introduction

The wording on the screen shots generally aligns with UIC 612-04.

When the TRD is switched on, the GSM-R Cab Radio may be in one of two modes (Train Mode or Shunting Mode) and, in each of these modes it may be in one of two states (Idle state when there is no on-going call and active state when there is an on-going call). The relation between these states and the situation where the TRD is switched off is shown in Figure 2 — GSM-R Cab Radio Modes and States.



Activating the TRD should cause the GSM-R radio to enter the mode it was in when last deactivated

Figure 2 — GSM-R Cab Radio Modes and States

5.2.2 Switch DMI on/off

The on/off status of the display used by GSM-R shall be clearly indicated, e.g. by a blank screen which indicates that it is switched off.

5.2.3 Basic screen – Train mode

There are no on-going actions from the GSM-R user, monitoring of incoming calls and alarms is possible.

Figure 3 displays an example of no call activity for a cab radio which has a registered train running number. This is the 'Basic Screen' shown by the display while the radio is in train mode.

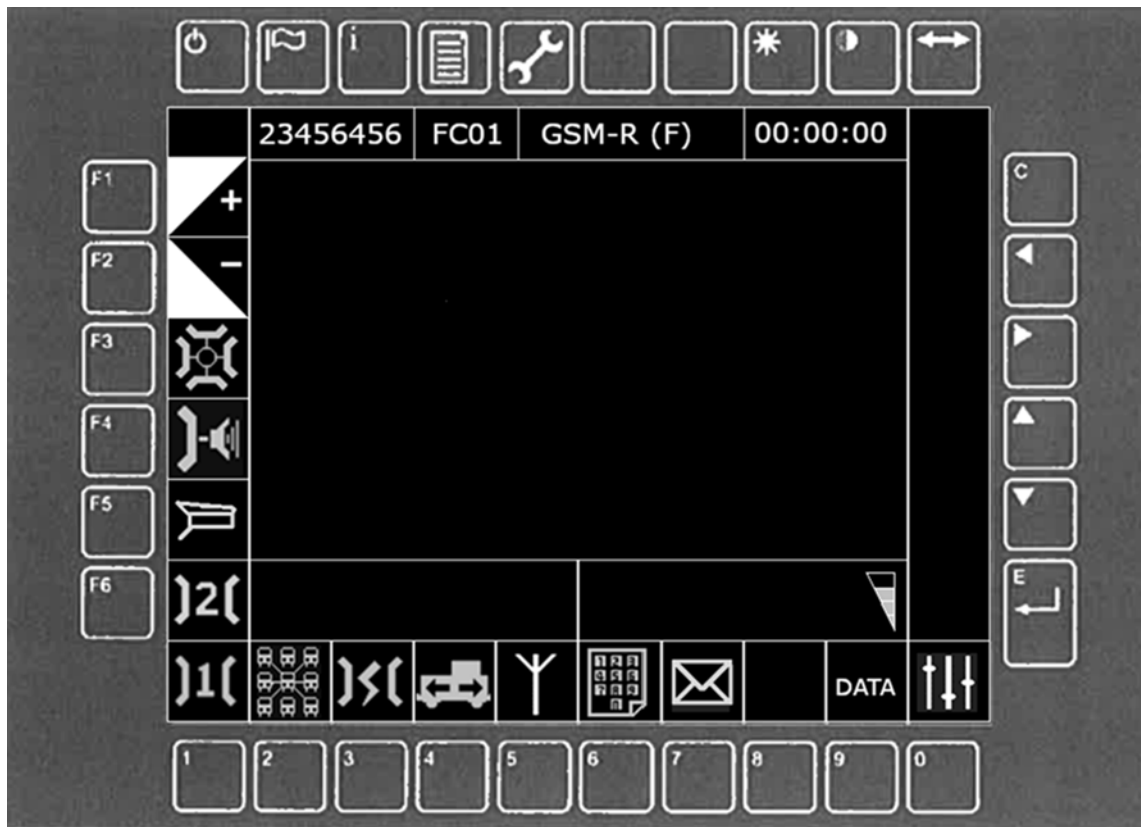


Figure 3 — Basic Screen – Train Mode

5.2.4 Basic screen – Shunting mode

There are no on-going actions from the GSM-R user, monitoring of incoming calls and alarms is possible.

Figure 4 displays an example of no call activity for a cab radio in shunting area 12345 while in shunting mode. This is the 'Basic Screen' shown by the display while the radio is in shunting mode.

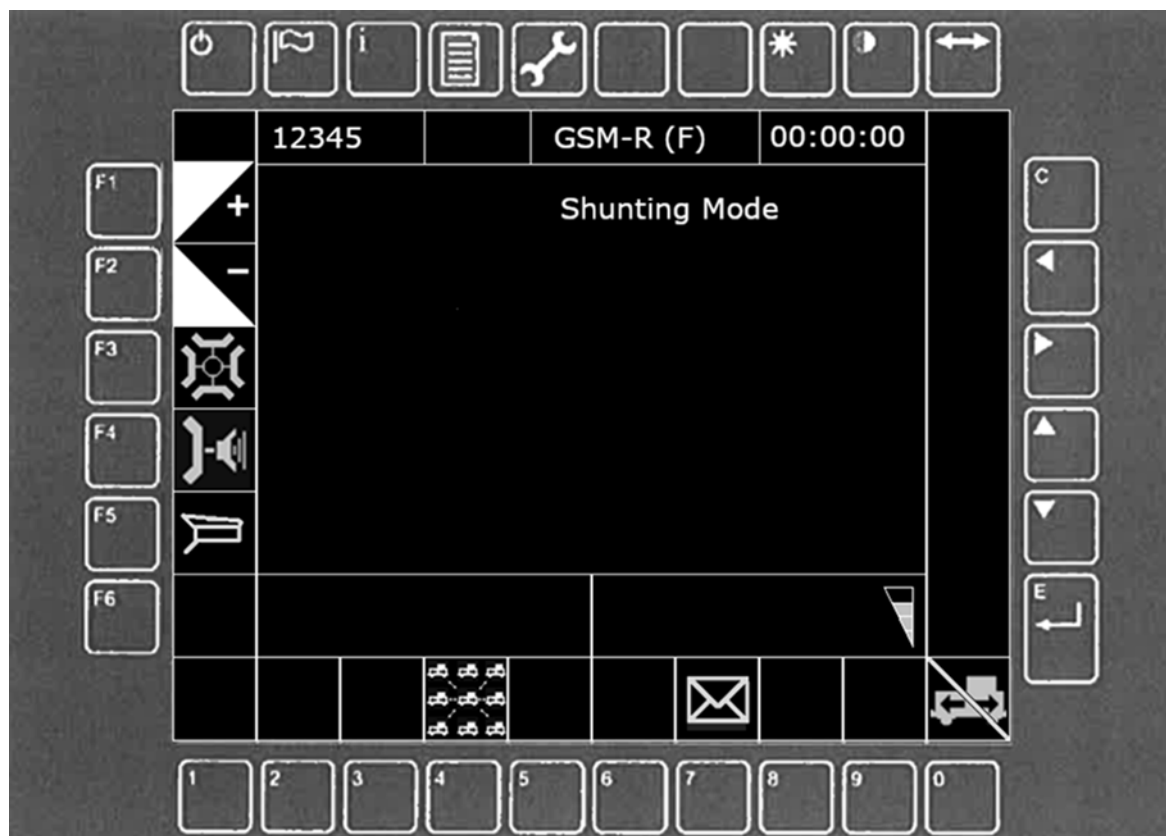


Figure 4 — Basic Screen - Shunting Mode

5.2.5 Menu structure

5.2.5.1 Menu structure – Idle state in train mode

Table 4 presents the menu structure and icons which are applicable when the radio is not involved in a call.

Some features are only applicable when there is a call present. An example is the use of DTMF. Such features are accessed via an in-call menu – see 5.12.

The following table describes the various steps within the menu structure that follows from the Basic Screen – Train Mode. It is based on the menu structure in UIC 612-04 but has been modified where necessary to provide EIRENE features that were not included in the UIC 612-04 structure.

Table 4 — TRD menu structure

Softkey (Level 1) Cx	Level 1 TRD Screen buttons	Softkey (Level 2) Cx	Level 2 TRD Screen buttons
1	 Primary controller (area controller, dispatcher) See 5.6.1 This function initiates a call to the primary controller.	1 to 0	Empty
2	 Drivers in the area See 5.6.2 This function initiates a call to all trains in the same area.	1 to 0	Empty
3	 Power supply controller See 5.6.1 This function initiates a call to the power supply controller.	1 to 0	Empty
4	 Shunting mode See 5.14.1 The display changes from Basic Screen – Train Mode to Basic Screen – Shunting Mode.		Refer to separate menu structure for Shunting Mode (see Table 5).
5	 Network selection See 5.4. This function shall open to a screen providing all available networks for manual driver selection.	1 to 0	Empty

Softkey (Level 1) Cx	Level 1 TRD Screen buttons	Softkey (Level 2) Cx	Level 2 TRD Screen buttons
6	 This function shall open all submenus for phone numbers. It shall be possible for the operator to edit this menu.	1	 Free Dial Call See 5.11.2. This function shall provide free dialling of any phone number of the selected network.
		2	→→ Re-dial See 5.11.4. This function shall repeat the dialling to the last dialled numbers.
		3	←← Call back This function shall provide the list of at least the last 10 calls that came in and allow the driver to call any of them. This feature is only required for point-to-point calls.
		4	 Drivers' conference See 5.10.4. This function shall open to a sub-menu providing possible participants to a drivers' conference: GSM-R work stations (FC 01 – FC 05).
		5	 Call Train Staff See 5.10.6. This function shall allow the user to select a function on the train to which a call shall be made. The available functions shall be presented in a list. NOTE This is a change relative to UIC 612-04.

Softkey (Level 1) Cx	Level 1 TRD Screen buttons	Softkey (Level 2) Cx	Level 2 TRD Screen buttons
		6	 Selected group call See 5.6.3. This function shall allow entering the group ID to which the user wants to be connected. After selection, a list is presented for the final item: 1 – Group call 2 – Broadcast call.
		7	 Forwarding the call to another one See 5.9.4. This function shall allow the driver to forward some or all future calls to another receiver.

Softkey (Level 1) Cx	Level 1 TRD Screen buttons	Softkey (Level 2) Cx	Level 2 TRD Screen buttons
		8	 Telephone book See 5.11.3. This function shall provide a number of phone contacts that are defined by the chosen RU. Structuring of the telephone book is up to the RU. — Scrolling by pages shall be done by navigation keys “left” (see UIC 612-01:2009, K2.2) and “right” (see UIC 612-01:2009, K2.3). — Scrolling by lines and selecting a phone number shall be done by cursor navigation going line by line with the navigation keys “up” (see UIC 612-01:2009, K2.4) and “down” (see UIC 612-01:2009, K2.5). — Sorting by using specific characters should be possible: — identifier: ! (exclamation mark): e.g. for hotline — identifier: ~ (small tilde): e.g. for SIM log-on (Lötschberg-Simplon) — identifier: { (curly left bracket): e.g. VGCS — identifier: } (curly right bracket): e.g. VBS — Confirmations shall be reduced to a minimum.
		9	Hot Option: Hotline. This function shall connect directly with the Hotline defined by the railway undertaking.
		0	 Basic Screen This function shall bring back the Basic Screen – Train Mode.