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EUROPEAN STANDARD

**Global System for Mobile communication (GSM);  
Requirements for GSM operation on railways**

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**Reference**

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## Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Railway Telecommunications (RT).

National transposition dates	
Date of adoption of this EN:	12 June 2018
Date of latest announcement of this EN (doa):	30 September 2018
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2019
Date of withdrawal of any conflicting National Standard (dow):	31 March 2019

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## Modal verbs terminology

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# 1 Scope

The present document identifies the 3GPP Technical Specifications containing provisions relating to the use of GSM for application on railway networks.

The present document is applicable to GSM communication systems embraced by the European Council Directives 2008/57/EC [i.1] and 2009/131/EC [i.2] on the interoperability of the rail system within the Community.

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## 2 References

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 102 281: "Railways Telecommunications (RT); Global System for Mobile communications (GSM); Detailed requirements for GSM operation on Railways".

### 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] Commission Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community.
- [i.2] Commission Directive 2009/131/EC of 16 October 2009 amending Annex VII to Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community.

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## 3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

GSM	Global System for Mobile communications
UIC	Union Internationale des Chemins de fer

## 4 Essential requirements

All the specifications listed in Table 1 below are necessary for Railway operation and required for interoperability. These specifications are complemented by the change requests specified in ETSI TS 102 281 [1]. The present document and ETSI TS 102 281 [1] shall be implemented together.

**Table 1: List of specifications for Railway operation (mandatory)**

Index	Specification
[1]	ETSI TS 100 590: "Digital cellular telecommunications system (Phase 2+); Mobile-services Switching Centre - Base Station system (MSC-BSS) interface; Layer 3 specification (3GPP TS 08.08 version 8.15.0 Release 1999)".
[2]	ETSI TS 100 607-1: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP 11.10-1 version 8.3.0 Release 1999)".
[3]	ETSI TS 100 929: "Digital cellular telecommunications system (Phase 2+); Security-related network functions (3GPP TS 03.20 version 8.6.0 Release 1999)".
[4]	ETSI TS 100 933: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS); Stage 2 (3GPP TS 03.68 version 8.6.0 Release 1999)".
[5]	ETSI TS 100 934: "Digital cellular telecommunications system (Phase 2+); Voice Broadcast service (VBS); Stage 2 (3GPP TS 03.69 version 8.5.0 Release 1999)".
[6]	ETSI TS 100 948: "Digital cellular telecommunications system (Phase 2+) (GSM); Group Call Control (GCC) protocol (GSM 04.68 version 8.1.0 Release 1999)".
[7]	ETSI TS 100 949: "Digital cellular telecommunications system (Phase 2+) (GSM); Broadcast Call Control (BCC) protocol (GSM 04.69 version 8.1.0 Release 1999)".
[8]	ETSI TS 100 977: "Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) Interface (3GPP TS 11.11 version 8.14.0 Release 1999)".
[9]	ETSI TS 122 004: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General on Supplementary Services (3GPP TS 22.004 version 3.3.0 Release 1999)".
[10]	Void.
[11]	ETSI TS 122 087 "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); User-to-User Signalling (UUS); Service description - Stage 1 (3G TS 22.087 version 3.1.0 Release 1999)".
[12]	ETSI TS 122 094: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Follow Me Service description - Stage 1 (3G TS 22.094 version 3.1.0 Release 1999)".
[13]	ETSI TS 123 067: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Enhanced Multi-Level Precedence and Pre-emption Service (EMLPP); Stage 2 (3GPP TS 23.067 version 3.3.0 Release 1999)".
[14]	ETSI TS 123 087: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); User-to-user signalling (UUS) Supplementary Service - Stage 2 (3GPP TS 23.087 version 3.1.0 Release 1999)".
[15]	ETSI TS 123 094: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Follow-Me (FM); Stage 2 (3GPP TS 23.094 version 3.2.0 Release 1999)".
[16]	ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 3.20.0 Release 1999)".
[17]	ETSI TS 124 080: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio Layer 3 supplementary service specification; Formats and coding (3GPP TS 24.080 V3.7.1 Release 1999)".
[18]	ETSI TS 124 087: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); User-to-User Signalling (UUS) Supplementary Service - Stage3 (3G TS 24.087 version 3.0.0 Release 1999)".
[19]	ETSI TS 127 007: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; AT command set for User Equipment (UE) (3GPP TS 27.007 V3.14.0 Release 1999)".
[20]	ETSI TS 129 002: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification (3GPP TS 29.002 version 3.20.0 Release 1999)".
[21]	ETSI TS 100 925: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS); Stage 1 (3GPP TS 02.68 version 8.2.1 Release 1999)".
[22]	ETSI TS 100 926: "Digital cellular telecommunications system (Phase 2+); Voice Broadcast Service (VBS); Stage 1 (3GPP TS 02.69 version 8.2.0 Release 1999)".

Index	Specification
[23]	ETSI TS 122 002: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN) (3GPP TS 22.002 version 3.6.0 Release 1999)".
[24]	ETSI TS 122 003: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Circuit Teleservices supported by a Public Land Mobile Network (PLMN) (3GPP TS 22.003 version 3.3.0 Release 1999)".
[25]	ETSI EN 300 919: "Digital cellular telecommunications system (Phase 2+) (GSM); Types of Mobile Stations (MS) (GSM 02.06 version 7.0.1 Release 1998)".
[26]	ETSI TS 122 101: "Universal Mobile Telecommunication System (UMTS); Service Aspects; Service Principles (3GPP TS 22 101 version 3.17.0 Release 1999)".
[27]	ETSI TS 122 067: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); enhanced Multi Level Precedence and Pre-emption service (eMLPP) Stage 1 (3G TS 22.067 version 3.0.1 Release 1999)".
[28]	ETSI TS 122 090: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Unstructured Supplementary Service Data (USSD) - Stage 1 (3G TS 22.090 version 3.1.0 Release 1999)".
[29]	ETSI TS 123 002: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Network Architecture (3GPP TS 23.002 version 3.6.0 Release 1999)".
[30]	Void.
[31]	ETSI TS 123 090: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Unstructured Supplementary Service Data (USSD) - Stage 2 (3GPP TS 23.090 V3.2.0 Release 1999)".
[32]	ETSI TS 124 067: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 3 (3GPP TS 24.067 version 3.2.0 Release 1999)".
[33]	ETSI TS 124 090: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Unstructured Supplementary Service Data (USSD) - Stage 3 (3G TS 24.090 version 3.0.0 Release 1999)".
[34]	ETSI TS 124 082: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Call Forwarding (CF) supplementary services - Stage 3 (3G TS 24.082 version 3.0.0 Release 1999)".
[35]	ETSI TS 100 910: "Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception (3GPP TS 05.05 version 8.20.0 Release 1999)".
[36]	ETSI TS 101 267: "Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit (SAT) for the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface (3GPP 11.14 version 8.18.0 Release 1999)".
[51]	ETSI TS 100 930: "Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode and group receive mode (3GPP TS 03.22 version 8.7.0 Release 1999)".
[52]	ETSI TS 101 503: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol (3GPP TS 04.18 version 8.27.0 Release 1999)".
[53]	ETSI TS 122 081: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Line identification Supplementary Services; Stage 1 (3G TS 22.081 version 3.2.0 Release 1999)".
[54]	ETSI TS 122 082: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Call Forwarding (CF) Supplementary Services; Stage 1 (3GPP TS 22.082 version 3.0.2 Release 1999)".
[55]	ETSI TS 122 083: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Call Waiting (CW) and Call Holding (HOLD) Supplementary Services - Stage 1 (3G TS 22.083 version 3.0.1 Release 1999)".
[56]	ETSI TS 122 084: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); MultiParty (MPTY) Supplementary Services - Stage 1 (3G TS 22.084 version 3.0.1 Release 1999)".
[59]	ETSI TS 122 088: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Call Barring (CB) Supplementary Services - Stage 1 (3GPP TS 22.088 version 3.0.2 Release 1999)".
[62]	ETSI TS 123 003: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Numbering, addressing and identification (3GPP TS 23.003 version 3.15.0 Release 1999)".
[63]	ETSI TS 123 014: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Support of Dual Tone Multi Frequency (DTMF) signalling (3GPP TS 23.014 version 3.2.0 Release 1999)".
[64]	ETSI TS 100 909: "Digital cellular telecommunications system (Phase 2+); Channel coding (3GPP TS 05.03 version 8.9.0 Release 1999)".

Index	Specification
[65]	ETSI TS 100 573: "Digital cellular telecommunications system (Phase 2+); Physical Layer on the Radio Path (General Description) (3GPP TS 05.01 version 8.9.0 Release 1999)".
[66]	ETSI TS 100 911: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control (3GPP TS 05.08 version 8.23.0 Release 1999)".
[67]	ETSI TS 101 087: "Digital cellular telecommunications system (Phase 2+); Base Station System (BSS) equipment specification; Radio aspects (3GPP TS 11.21 version 8.11.0 Release 1999)".

## 5 Optional requirements

The specifications listed in Table 2 below represent optional requirements in addition to the requirements listed in clause 4. They have to be fulfilled only under the condition that the optional feature is selected.

**Table 2: List of specifications for Railway operation (optional)**

Index	Specification
[37]	Void.
[38]	ETSI TS 101 349: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol (3GPP TS 04.60 version 8.27.0 Release 1999)".
[39]	ETSI TS 101 350: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2 (3GPP TS 03.64 version 8.12.0 Release 1999)".
[40]	ETSI TS 101 351: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification (3GPP TS 04.64 version 8.7.0 Release 1999)".
[41]	Void.
[42]	Void.
[43]	Void.
[44]	ETSI TS 123 060: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2 (3GPP TS 23.060 version 3.17.0 Release 1999)".
[45]	ETSI TS 132 005: "Universal Mobile Telecommunications System (UMTS); Telecommunication Management; Charging and billing; 3G call and event data for the Circuit Switched (CS) domain (3GPP TS 32.005 version 3.7.0 Release 1999)".
[46]	ETSI TS 155 205: "Digital cellular telecommunications system (Phase 2+); Specification of the GSM-MILENAGE algorithms: An example algorithm set for the GSM Authentication and Key Generation Functions A3 and A8 (3GPP TS 55.205 version 6.2.0 Release 6)".
[47]	ETSI TS 155 216: "Digital cellular telecommunications system (Phase 2+); Specification of the A5/3 encryption algorithms for GSM and ECSD, and the GEA3 encryption algorithm for GPRS; Document 1: A5/3 and GEA3 specification (3GPP TS 55.216 version 6.3.0 Release 6)".
[48]	ETSI TS 155 217: "Digital cellular telecommunications system (Phase 2+); Specification of the A5/3 encryption algorithms for GSM and ECSD, and the GEA3 encryption algorithm for GPRS; Document 2: Implementors' test data (3GPP TS 55.217 version 6.2.0 Release 6)".
[49]	ETSI TS 155 218: "Digital cellular telecommunications system (Phase 2+); Specification of the A5/3 encryption algorithms for GSM and ECSD, and the GEA3 encryption algorithm for GPRS; Document 3: Design and conformance test data (3GPP TS 55.218 version 6.2.0 Release 6)".
[50]	ETSI TR 155 919: "Digital cellular telecommunications system (Phase 2+); Specification of the A5/3 encryption algorithms for GSM and ECSD, and the GEA3 encryption algorithm for GPRS; Document 4: Design and evaluation report (3GPP TR 55.919 version 6.2.1 Release 6)".
[57]	ETSI TS 122 085: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Closed User Group (CUG) Supplementary Services - Stage 1 (3G TS 22.085 version 3.1.0 Release 1999)".
[58]	ETSI TS 122 086: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Advice of Charge (AoC) Supplementary Services - Stage 1 (3G TS 22.086 version 3.1.0 Release 1999)".



Index	Specification
[60]	ETSI TS 122 091: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Explicit Call Transfer (ECT) (3GPP TS 22.091 version 3.1.0 Release 1999)".
[61]	ETSI TS 122 093: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1 (3G TS 22.093 version 3.0.1 Release 1999)".
[68]	ETSI TS 100 607-2: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification (3GPP TS 11.10-2 version 4.16.0 GSM Phase 2)".
[69]	ETSI TS 123 205: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Bearer-independent circuit-switched core network; Stage 2 (3GPP TS 23.205 version 12.0.0 Release 12)".

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## History

<b>Document history</b>		
V1.0.1	October 2001	Publication
V2.3.0	February 2005	Publication
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