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*European Standard (Telecommunications series)*

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

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Reference

REN/RT-00001

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GSM, UIC

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Railway Telecommunications (RT).

<b>National transposition dates</b>	
Date of adoption of this EN:	4 February 2005
Date of latest announcement of this EN (doa):	31 May 2005
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 2005
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# 1 Scope

The present document identifies the 3GPP Technical Specifications which contain 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 96/48/EC [1] and 2001/16/EC [2] on the interoperability of the trans-European high-speed and conventional rail system.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] Council Directive 96/48/EC of 23 July 1996 on the interoperability of the trans-European high-speed rail system.
- [2] Directive 2001/16/EC of the European Parliament and of the Council of 19 March 2001 on the interoperability of the trans-European conventional rail system.
- [3] ETSI TR 102 281: "Railways Telecommunications (RT); Global System for Mobile communications (GSM); Detailed requirements for GSM operation on Railways".

## 2.1 Essential requirements normative references

The document versions listed below represent the minimum requirements for interoperability. It should be noted that these specifications might be improved by change requests. These change requests can be found in the TR 102 281 [3] that refers to the present version of this document.

NOTE: The following list includes the ETSI specifications that include specific functions necessary for Railway operation.

Index	Specification
[1]	ETSI TS 100 590: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification (GSM 08.08 version 8.5.0 Release 1999)".
[2]	ETSI TS 100 607-1: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile Station (MS) conformance specification; Part 1: Conformance specification (GSM 11.10-1 version 8.2.0 Release 1999)".
[3]	ETSI TS 100 929: "Digital cellular telecommunications system (Phase 2+) (GSM); Security related network functions (GSM 03.20 version 8.0.0 Release 1999)".
[4]	ETSI TS 100 933: "Digital cellular telecommunications system (Phase 2+) (GSM); Voice Group Call Service (VGCS); Stage 2 (GSM 03.68 version 8.2.0 Release 1999)".
[5]	ETSI TS 100 934: "Digital cellular telecommunications system (Phase 2+) (GSM); Voice Broadcast Service (VBS); Stage 2 (GSM 03.69 version 8.2.0 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)".

Index	Specification
[8]	ETSI TS 100 977: "Digital cellular telecommunications system (Phase 2+) (GSM); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11 version 8.3.0 Release 1999)".
[9]	ETSI EN 300 918: "Digital cellular telecommunications system (Phase 2+) (GSM); General on supplementary services (GSM 02.04 version 7.1.2 Release 1998)".
[10]	ETSI TS 122 030: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Man-Machine Interface (MMI) of the User Equipment (UE) (3G TS 22.030 version 3.3.0 Release 1999)".
[11]	ETSI EN 301 702: "Digital cellular telecommunications system (Phase 2+) (GSM); User-to-User Signalling (UUS); Service description, Stage 1 (GSM 02.87 version 7.1.2 Release 1998)".
[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 100 932: "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2 (3GPP TS 03.67 version 7.1.0 Release 1998)".
[14]	ETSI EN 301 710: "Digital cellular telecommunications system (Phase 2+) (GSM); User-to-User Signalling (UUS); Stage 2 (GSM 03.87 version 7.0.2 Release 1998)".
[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 EN 300 940: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile radio interface layer 3 specification (GSM 04.08 version 6.3.1 Release 1997)".
[17]	ETSI TS 100 950: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile radio interface layer 3 supplementary services specification; Formats and coding (GSM 04.80 version 7.0.1 Release 1998)".
[18]	ETSI EN 301 711: "Digital cellular telecommunications system (Phase 2+) (GSM); User-to-User Signalling (UUS); Stage 3 (GSM 04.87 version 7.0.2 Release 1998)".
[19]	ETSI TS 100 916: "Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (3GPP TS 07.07 version 6.5.0 Release 1997)".
[20]	ETSI TS 129 002: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification (3G TS 29.002 version 3.5.2 Release 1999)".
[21]	ETSI EN 300 925: "Digital cellular telecommunications system (Phase 2+) (GSM); Voice Group Call Service (VGCS) - Stage 1 (GSM 02.68 version 7.0.2 Release 1998)".
[22]	ETSI EN 300 926: "Digital cellular telecommunications system (Phase 2+) (GSM); Voice Broadcast Service (VBS) - Stage 1 (GSM 02.69 version 8.0.1 Release 1999)".
[23]	ETSI EN 300 904: "Digital cellular telecommunications system (Phase 2+) (GSM); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.02 version 6.1.1 Release 1997)".
[24]	ETSI TS 100 905: "Digital cellular telecommunications system (Phase 2+) (GSM); Teleservices supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.03 version 7.0.0 Release 1998)".
[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 100 906: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile Stations (MS) features (GSM 02.07 version 7.1.0 Release 1998)".
[27]	ETSI EN 300 924: "Digital cellular telecommunications system (Phase 2+) (GSM); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1 (GSM 02.67 version 7.0.1 Release 1998)".
[28]	ETSI TS 100 625: "Digital cellular telecommunications system (Phase 2+) (GSM); Unstructured Supplementary Service Data (USSD) - Stage 1 (GSM 02.90 version 7.0.0 Release 1998)".
[29]	ETSI TS 100 522: Digital cellular telecommunications system (Phase 2+) (GSM); Network architecture (GSM 03.02 version 7.1.0 Release 1998).
[30]	ETSI TR 101 631: "Digital cellular telecommunications system (Phase 2+) (GSM); Technical performance objectives (GSM 03.05 version 8.0.0 Release 1999)".
[31]	ETSI TS 100 549: "Digital cellular telecommunications system (Phase 2+) (GSM); Unstructured Supplementary Service Data (USSD) - Stage 2 (GSM 03.90 version 7.0.0 release 1998)".
[32]	ETSI EN 300 947: "Digital cellular telecommunications system (Phase 2+) (GSM); enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 3 (GSM 04.67 version 7.0.1 Release 1998)".

Index	Specification
[33]	ETSI EN 300 957: "Digital cellular telecommunications system (Phase 2+) (GSM); Unstructured Supplementary Service Data (USSD); Stage 3 (GSM 04.90 version 7.0.1 Release 1998)".
[34]	ETSI EN 300 952: "Digital cellular telecommunications system (Phase 2+) (GSM); Call Forwarding (CF) supplementary services; Stage 3 (GSM 04.82 version 7.0.2 Release 1998)".
[35]	ETSI EN 300 910: Digital cellular telecommunications system (Phase 2+) (GSM); Radio transmission and reception (GSM 05.05 version 6.7.1 Release 1997).
[36]	ETSI TS 101 267: "Digital cellular telecommunications system (Phase 2+) (GSM); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.14 version 8.3.0 Release 1999)".

## 2.2 Optional requirements references

The document versions listed below represent optional requirements in addition to the minimum requirements listed in clause 2.1. They are not mandatory for interoperability.

Index	Specification
[37]	ETSI TS 100 596: "Digital cellular telecommunications system (Phase 2+) (GSM); Base Station Controller - Base Transceiver Station (BSC - BTS) interface; Layer 3 specification (GSM 08.58 version 8.4.0 Release 1999)".
[38]	ETSI TS 101 349: "Digital cellular telecommunications system (Phase 2+) (GSM); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol (GSM 04.60 version 8.5.0 Release 1999)".
[39]	ETSI TS 101 350: "Digital cellular telecommunications system (Phase 2+) (GSM); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2 (GSM 03.64 version 8.5.0 Release 1999)".
[40]	ETSI TS 101 351: "Digital cellular telecommunications system (Phase 2+) (GSM); General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification (GSM 04.64 version 8.4.0 Release 1999)".
[41]	ETSI TS 101 503: "Digital cellular telecommunications system (Phase 2+) (GSM); Mobile radio interface layer 3 specification; Radio Resource Control Protocol (GSM 04.18 version 8.5.0 Release 1999)".
[42]	ETSI TS 101 627: "Digital cellular telecommunications system (Phase 2+) (GSM); Subscriber and equipment trace (GSM 12.08 version 5.1.1 Release 1996)".
[43]	ETSI TR 101 748: "Digital cellular telecommunications system (Phase 2+) (GSM); Abbreviations and acronyms (GSM 01.04 version 8.0.0 Release 1999)".
[44]	ETSI TS 123 060: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2 (3G TS 23.060 version 3.4.0 Release 1999)".
[45]	ETSI TS 132 005: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Telecommunication Management; Charging and billing; GSM call and event data for the Circuit Switched (CS) domain (3G TS 32.005 Version 3.1.0 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 6.1.0 Release 6)".
[47]	3GPP TS 55.216 (V6.2.0): "Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 1: A5/3 and GEA3 specification (Release 6)".
[48]	3GPP TS 55.217 (V6.1.0): "Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 2: Implementors" test data (Release 6)".
[49]	3GPP TS 55.218 (V6.1.0): "Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 3: Design and conformance test data (Release 6)".
[50]	3GPP TR 55.919 (V6.1.0): "Specification of the A5/3 encryption algorithms for GSM and EDGE, and the GEA3 encryption algorithm for GPRS; Document 4: Design and evaluation report (Release 6)".

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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

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## 4 GSM for use in UIC systems

The GSM specifications originally developed within ETSI Technical Committee (TC) Special Mobile Group (SMG) were transferred to 3GPP on the closure of that TC. During development of the specifications, modifications were introduced to cater for the requirements of the railway industry. The specifications containing such modifications are included in clauses 2.1 and 2.2.



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## History

<b>Document history</b>			
V1.0.1	October 2001	Publication	
V2.1.0	June 2004	One-step Approval Procedure (Withdrawn)	OAP 20041001: 2004-06-02 to 2004-10-01
V2.3.0	October 2004	One-step Approval Procedure	OAP 20050204: 2004-10-06 to 2005-02-04
V2.3.0	February 2005	Publication	