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Digital cellular telecommunications system (Phase 2+) (GSM); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface (GSM 04.11 version 5.2.1)

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ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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**Digital cellular telecommunications system (Phase 2+);
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support on mobile radio interface
(GSM 04.11 version 5.2.1)**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) of the European Telecommunications Standards Institute (ETSI).

This ETS defines the Short Message Service (SMS) support on mobile radio interface within the digital cellular telecommunications system (Phase 2+).

The contents of this ETS is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of this ETS, it will be resubmitted for OAP by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:

- y the third digit is incremented when editorial only changes have been incorporated in the specification;
- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI drafting rules.

Transposition dates	
Date of adoption:	5 September 1997
Date of latest announcement of this ETS (doa):	31 December 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 June 1998
Date of withdrawal of any conflicting National Standard (dow):	30 June 1998

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1 Scope

This European Telecommunication Standard (ETS) specifies the procedures used across the mobile radio interface by the signalling layer 3 function Short Message Control (SMC) and Short Message Relay function (SM-RL).

1.1 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- [1] GSM 01.04 (ETR 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 03.40 (ETS 300 901): "Digital cellular telecommunications system (Phase 2+); Technical realization of the Short Message Service (SMS) Point-to-Point (PP)".
- [3] GSM 04.06 (ETS 300 938): "Digital cellular telecommunications system; Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".
- [4] GSM 04.07 (ETS 300 939): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".
- [5] GSM 04.08 (ETS 300 940): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
- [6] ISO 7498: "Information processing systems - Open Systems Interconnection - Basic Reference Model".

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1.2 Abbreviations

Abbreviations used in this ETS are listed in GSM 01.04.

2 Overview of Short Message Service (SMS) support

The purpose of the Short Message Service is to provide the means to transfer messages between a GSM PLMN Mobile Station (MS) and a Short Message Entity via a Service Centre, as described in GSM 03.40. The terms "MO" - Mobile Originating - and "MT" - Mobile Terminating - are used to indicate the direction in which the short message is sent.

This ETS describes the procedures necessary to support the Short Message Service between the MS and the MSC and vice versa, as described in GSM 03.40.

The procedures are based on services provided by the Mobility Management sublayer as described in GSM 04.07/04.08.

2.1 Protocols and protocol architecture

The hierarchical model shows the layer structure of the MSC and the MS.

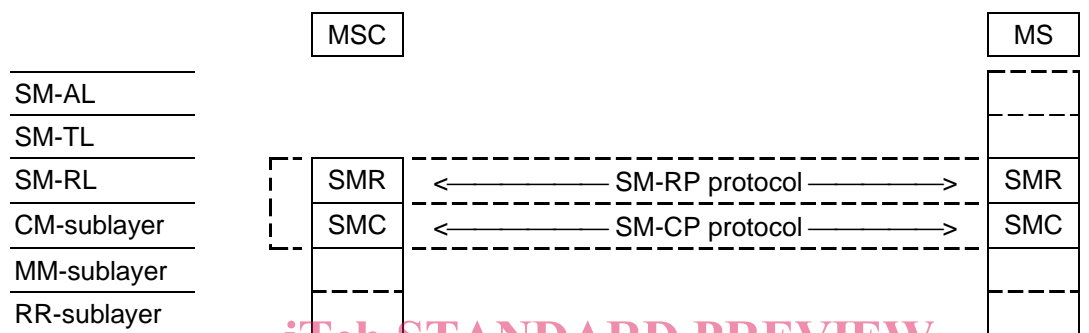


Figure 2.1/GSM 04.11: Protocol hierarchy

The CM-sublayer, in terms of the Short Message Service Support, provides services to the Short Message Relay Layer.

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On the MS-side the Short Message Relay Layer provides services to the Short Message Transfer Layer. The Short Message Relay Layer is the upper layer on the network side (MSC), and the SM-user information elements are mapped to TCAP/MAP.

The peer protocol between two SMC entities is denoted SM-CP, and between two SMR entities, SM-RP.

Abbreviations:

SM-AL Short Message Application Layer
SM-TL Short Message Transfer Layer

SM-RL Short Message Relay Layer
SM-RP Short Message Relay Protocol
SMR Short Message Relay (entity)

CM-sub Connection Management sublayer
SM-CP Short Message Control Protocol
SMC Short Message Control (entity)

MM-sub: Mobility Management sublayer
RR-sub: Radio Resource Management sublayer

2.2 Use of channels

The short message service will be supported by an SDCCH or SACCH, depending on the use of a TCH:

- when a TCH is not allocated, the short message service will use an SDCCH;
- if a TCH is allocated during a short message transaction on an SDCCH, the short message transaction will stop and continue on the SACCH associated with the TCH;
- if a TCH is allocated for the short message service, the short message service will use the associated SACCH;
- when an entity using a TCH finishes its transaction, the RR-sublayer may choose to continue an ongoing short message transfer on the SACCH, or optionally transfer it to an SDCCH.

Table 2.1/GSM 04.11 summarizes the use of channels for the short message service. Arrows indicate changes of channel.

Table 2.1/GSM 04.11: Channels used for short message transfer

Channel dependency	Channel used
TCH not allocated	SDCCH
TCH not allocated -> TCH allocated	SDCCH -> SACCH
TCH allocated	SACCH
TCH allocated -> TCH not allocated	SACCH -> SACCH opt. SDCCH ³

2.3 Layer 2 SAPI 3 handling

General rule:

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The Radio Resource Management (RR reference GSM 04.08) in the Mobile Station and on the network side (i.e. in the BSC) shall establish the acknowledged mode of operation on SAPI 3 whenever needed, i.e. when a message requiring SAPI 3 transfer shall be transmitted.

RR shall control the layer 2 also for SAPI 3, and keep knowledge of the mode.

The network side may initiate release of the acknowledged mode for SAPI 3 either explicitly (by the use of DISC- and UA-frames, see GSM 04.06) or indirectly by channel release (see GSM 04.08).

This means:

- the Mobile Station side will initiate establishment of SAPI 3 acknowledged mode in the case of mobile originating short message transfer;
- the network side will initiate establishment of SAPI 3 acknowledged mode in the case of mobile terminating short message transfer;
- the network side may choose to keep the channel and the acknowledged mode of operation to facilitate transfer of several short messages for or from the same Mobile Station. The queuing and scheduling function for this should reside in the MSC.

3 Service definition

3.1 General

The layer service is described as a set of service primitives. These service primitives are abstractions and attempt to capture only those details of the interaction between the entities that are aspects of the layer service itself. A service primitive neither specifies nor constrains the implementation of entities or the interface between them.

The general syntax of a primitive and the initials of them are in line with the 04-series of GSM Technical Specifications.

NOTE: In order to limit the number of primitives and state definitions to a reasonable amount, a description method has been chosen which does not claim to be totally in line with the formal description method of the layered ISO reference model (ISO 7498) for Open Systems Interconnection.

3.2 Service provided by the CM-sublayer

In order to support the Short Message Service, the CM-sublayer provides services to the Short Message Relay Layer.

The CM-sublayer services are provided using layer specific functions and lower layer services offered to the CM-sublayer, controlled by short message service control entities called SMCs.

An SMC entity in the MS communicates with an SMC entity in the MSC by means of a peer protocol, SM-CP (Short Message Service Control Protocol). The arrow diagrams in annex A give an overview of the messaging on the CM-sublayer during a short message transfer.

A mobile station supporting the Short Message Service shall have a minimum of two SMC entities. This enables the MS to receive MT messages during an MO message transfer.

To ensure that an MS having the minimum of two SMC entities is able to receive MT messages during an MO message transfer, and to send MO messages during MT message transfer, parallel message transfer in the same direction is prohibited. This means that the SMC entities shall not simultaneously perform messaging in the same direction. The rules for concatenation of message transfers are described in subclause 5.4.

The MSC shall have a minimum of two SMC entities available during an MT message transfer to a mobile station, one being reserved for MO message transfer. In an MO message transfer, the MSC shall have one SMC entity reserved for handling of an MT message.

3.2.1 Definition of primitives on the MS side

This subclause defines the service primitives used on the MS side. Table 3.1/GSM 04.11 gives an overview of the service primitives and main parameter linked to the primitives. All necessary control parameters to be used in the Short Message Service are defined in clause 7. All MNSMS service primitives defined in this subclause are passed to an SMC-entity.

Table 3.1/GSM 04.11: MNSMS service primitives on the MS-side

SERVICE PRIMITIVES		PARAMETER
NAME	TYPE	
MNSMS-ABORT-	Req	Cause
MNSMS-DATA	Req	MT RPDU
	Ind	MO RPDU
MNSMS-EST-	Req	MO RPDU
	Ind	MT RPDU
MNSMS-ERROR-	Ind	Cause
MNSMS-REL-	Req	Cause

3.2.1.1 MNSMS-ABORT-REQuest

A request from an SMR entity to release a CM-connection in abnormal cases.

When the CM-sublayer receives this request, and if the MM connection exists, it shall form and send the CP-ERROR message. Irrespective of whether or not the CP-ERROR message was sent, the CM-sublayer shall then release the lower layer services.

3.2.1.2 MNSMS-DATA-REQuest

A request from an SMR entity to send a RPDU on the established CM-connection.

The SMC entity forms the CP-DATA message, the user information element being the RPDU, and transfers the message by means of the lower layer services.

NOTE: After reception of an incoming RP-DATA, the SMR entity typically returns the acknowledgement RP-ACK, or an error indication, RP-ERROR, to the Service Centre.

3.2.1.3 MNSMS-DATA-INDication

An indication used by the SMC entity to pass the user information element (RPDU) of a received CP-DATA message to SM-RL.

NOTE: The RPDU is typically an RP-ACK or an RP-ERROR. Normally this service is used to report the outcome of either a MO message transfer attempt or a mobile station memory available notification attempt.