

**Access and Terminals (AT);
Short Message Service (SMS) for PSTN/ISDN;
Test Suites for SMS User Based Solution;
Part 1: Protocol Implementation Conformance
Statement (PICS) proforma specification
user side for Data Link Layer (DLL) Protocol 1**



Reference

DES/AT-030014-01

Keywords

SMS, ISDN, PSTN, PICS

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

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, send your comment to:

editor@etsi.org

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2003.
All rights reserved.

DECTTM, **PLUGTESTS**TM and **UMTS**TM are Trade Marks of ETSI registered for the benefit of its Members.
TIPHONTM and the **TIPHON logo** are Trade Marks currently being registered by ETSI for the benefit of its Members.
3GPPTM is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

Contents

Intellectual Property Rights	4
Foreword.....	4
Introduction	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	6
3.1 Definitions	6
3.2 Abbreviations	6
4 Conformance	7
Annex A (normative): PICS proformas	8
A.1 Guidance for completing the ICS proforma	8
A.1.1 Purposes and structure.....	8
A.1.2 Abbreviations and conventions	8
A.1.3 Instructions for completing the PICS proforma.....	10
A.2 Identification of the implementation	10
A.2.1 Date of the statement.....	10
A.2.2 Implementation Under Test (IUT) identification	10
A.2.3 System Under Test (SUT) identification	11
A.2.4 Product supplier.....	11
A.2.5 Client (if different from product supplier).....	12
A.2.6 PICS contact person	12
A.3 Identification of the reference specification(s).....	13
A.4 Global statement of conformance.....	13
A.5 PICS proforma tables	13
A.5.1 Major capabilities	13
A.5.2 Services-related and terminal capabilities	14
A.5.3 Physical layer (voice band)	15
A.5.3.1 Bit transfer and frame delimitation	15
A.5.3.2 Physical layer timers	16
A.5.4 Data link layer	16
A.5.4.1 Data link layer general message structure and parameters	16
A.5.4.2 Data link layer messages.....	17
A.5.4.3 Data link layer procedures	18
A.5.4.4 Data link layer error causes.....	19
A.5.4.5 Data link layer timers and counters	19
Annex B (informative): Bibliography.....	20
History	21

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://webapp.etsi.org/IPR/home.asp>).

All published ETSI deliverables shall include information which directs the reader to the above source of information.

Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Access and Terminals (AT).

The present document is part 1 of a multi-part deliverables covering Short Message Service (SMS) for PSTN/ISDN; Test Suites for SMS User Based Solution:

- Part 1:** "**Protocol Implementation Conformance Statement (PICS) proforma specification user side for Data Link Layer Protocol 1**";
- Part 2: "Test Suite Structure and Test Purposes (TSS&TP) user side for Data Link Layer (DLL) Protocol 1";
- Part 3: "Abstract Test Suite (ATS) user side for Data Link Layer (DLL) Protocol 1";
- Part 4: "Protocol Implementation Conformance Statement (PICS) proforma specification user side for Data Link Layer (DLL) Protocol 2";
- Part 5: "Test Suite Structure and Test Purposes (TSS&TP) user side for Data Link Layer (DLL) Protocol 2";
- Part 6: "Abstract Test Suite (ATS) user side for Data Link Layer (DLL) Protocol 2";
- Part 7: "Test Suite Structure and Test Purposes (TSS&TP) user side for functional tests Protocol 1";
- Part 8: "Abstract Test Suite (ATS) user side for functional tests Protocol 1";
- Part 9: "Test Suite Structure and Test Purposes (TSS&TP) user side for functional tests Protocol 2";
- Part 10: "Abstract Test Suite (ATS) user side for functional tests Protocol 2".

Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given protocol. Such a statement is called an Implementation Conformance Statement (ICS). An ICS stating what capabilities and options have been implemented for a particular protocol is called a protocol ICS. This is commonly abbreviated to "PICS".

1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proformas for Terminal Equipment implementing the Short Message Service (SMS) for PSTN/ISDN as defined in ES 201 912 [1] for the Data Link Layer, protocol 1, in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [5].

Terminal equipment implementing the Short Message Service (SMS) for PSTN/ISDN perform circuit-switched voice-band connections to the SM-SC, following the basic call procedures of ISDN or PSTN. PICS for these procedures are not within the scope of the present document.

Protocol Implementation Conformance Statements related to the Physical Layer are made to a small extent, mainly by referring to the FSK protocol as defined in EN 300 659-1 [2] and EN 300 659-2 [3]. Detailed conformance statements related to the Physical Layer are not within the scope of the present document.

Terminal Equipment implementing the Short Message Service (SMS) for PSTN/ISDN according to protocol 1 are required to implement the Transfer Layer according to TS 100 901 [4]. PICS for the Transfer Layer are not within the scope of the present document.

The supplier of a protocol 1 implementation in a terminal equipment that is claimed to conform to ES 201 912 [1], is required to complete a copy of the PICS proforma provided in annex A of the present document and is required to provide the information necessary to identify both the supplier and the implementation.

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] ETSI ES 201 912 (V1.1.1): "Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre".
- [2] ETSI EN 300 659-1 (V1.3.1): "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On-hook data transmission".
- [3] ETSI EN 300 659-2 (V1.3.1): "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 2: Off-hook data transmission".
- [4] ETSI TS 100 901 (V7.4.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Technical realization of the Short Message Service (SMS) (GSM 03.40 version 7.4.0 Release 1998)".
- [5] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 201 912 [1], ISO/IEC 9646-7 [5] and the following apply:

Implementation Conformance Statement (ICS): statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented

NOTE: The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, and information object ICS.

Protocol Implementation Conformance Statement (PICS): ICS for an implementation or system claimed to conform to a given protocol specification

PICS proforma: document, in the form of a questionnaire, which when completed for an implementation or system becomes a PICS

SM-Call: incoming call for a SM-TE where the CLI contains the address of an SM-SC stored in the SM-TE

3.2 Abbreviations

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

Call	Synonymous for voice-band connection
CLIP	Calling Line Identification Presentation
CM	Connection Manager
DLL	Data Link Layer
DMI	Deliver Mode Identifier
DTMF	Dual Tone Multi-Frequency
FSK	Frequency Shift Keying
GSM	Global System for Mobile Communication
ICS	Implementation Conformance Statement
ISDN	Integrated Services Digital Network
ISO	International Standard Organization
IUT	Implementation Under Test
MSC	Message Sequence Chart
PICS	Protocol ICS
PSTN	Public Switched Telephone Network
SIM	Subscriber Identification Module
SM	Short Message(s)
SME	Short Message Entity
SMS	Short Message Service
SM-SC	Short Message Service Centre
SM-TE	Short Message Terminal Equipment
SM-TL	Short Message Transfer Layer
SUT	System Under Test
TL	Transfer (layer)
UBS	User Based Solution

4 Conformance

A PICS proforma that conforms to this PICS proforma specification shall be technically equivalent to annex A, and shall preserve the numbering and ordering of the items in annex A.

A PICS that conforms to this PICS proforma specification shall:

- a) describe an implementation which conforms to ES 201 912 [1] for Protocol 1;
- b) be a conforming PICS proforma, which has been completed in accordance with the instructions for completion given in clause A.1;
- c) include the information necessary to uniquely identify both the supplier and the implementation.

Annex A (normative): PICS proformas

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PICS proforma in this annex so that it can be used for its intended purposes and may further publish the completed PICS.

A.1 Guidance for completing the ICS proforma

A.1.1 Purposes and structure

The purpose of this PICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ES 201 912 for Protocol 1, may provide information about the implementation in a standardised manner.

The PICS proforma is subdivided into clauses as follows:

- A.1: guidance for completing the various parts of the PICS proforma;
- A.2: identification of the implementation;
- A.3: identification of the protocols to which this PICS proforma applies;
- A.4: global statement of conformance;
- A.5: PICS proforma tables;
 - Major capabilities;
 - Services-related and addressing capabilities;
 - Physical layer-related PICS;
 - Data link layer-related PICS.

A.1.2 Abbreviations and conventions

The PICS proformas contained in this annex are presented in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

A **prerequisite** line after a clause or before a table title indicates that the whole clause or the whole table is not required to be completed (not applicable) if the predicate is FALSE.

A prerequisite line takes the form: Prerequisite: <predicate>.

Notations used **inside** PICS tables:

"Item" column:

The item column contains identifiers related to the items in the table rows. A PICS item is uniquely identified by its identifier throughout all PICS proformas of the present document.

"Item description" column:

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

"Reference" column:

The reference column makes reference to clause(s) of one or more standards in the "References" clause. Since ES 201 912 is the main standard on which the PICS relate, all references giving clauses numbers without prefixed document reference number, are understood to refer to clauses of ES 201 912. References to other standards are preceded by the standard's document reference number [n]. In case of mixed references, those of ES 201 912 (if any) appear first.

When a particular paragraph is referenced inside a clause, the "\$" character followed by the number of the paragraph within the clause is indicated. All paragraphs except table headers, figure footers or contents of tables are counted, starting from 1.

"Status" column:

The following notations are used for the status column:

M	mandatory - the capability shall be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
O.n	qualified optional - for mutually exclusive or selectable options from a set. "n" is an integer which identifies a unique group of related optional items.
Cm	conditional – a (possibly nested) <if ... then ... else ...> construction is defined, where the block between <if> and <else> contains a qualifier (Boolean expression) and the blocks before and after <else> contain a more specific status reference, where all forms of status notations defined above and including the <Cm> notation are allowed inside the blocks.

The <O.n> and <Cm> definitions follow the PICS table rows containing items, and are local to the table.

References to items of the current table inside the conditions block of <Cm> definitions are made by giving the item identifier without a prefix. References to items of other PICS tables in the present document are made by giving the item identifier preceded by the table number plus a "." character (see examples below).

Examples for status notations:

Table A.nn: Examples for status notations

Item	Item description	Reference	Status	Support
item1			M	
item2			O	
item3			N/A	
item4			O.1	
item5			O.1	
item6			O.2	
item7			O.2	
item8			C1	
item9			C2	
O.1	Support of exactly one of the related items is required			
O.2	Support of at least one of the related items is required			
C1	If item2 then M else N/A			
C2	If Amm.itemx then O else (If item6 then N/A else M)			
Comments: <Free text>				

"**Allowed values**" column (if present):

This column shall be filled out with a value or a range of value that are allowed for the item, according to the conditions. If the type of the value item requires a unit, then the unit is indicated, too.

Example : 500 ms to 2 000 ms

"**Support**" or "**Supported value**" column:

The support column shall be filled in by the supplier of the implementation and are left blank in the present document. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).
1 000 ms	the corresponding item is implemented with a value of 1 000 ms.

NOTE: As stated in ISO/IEC 9646-7, support for a received PDU requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

A.1.3 Instructions for completing the PICS proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in clause A.1.2.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

More detailed instructions are given at the beginning of the different subclasses of the PICS proforma.

A.2 Identification of the implementation

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the PICS should be named as the contact person.

A.2.1 Date of the statement

.....

A.2.2 Implementation Under Test (IUT) identification

IUT name:

.....

.....

IUT version:

.....

A.2.3 System Under Test (SUT) identification

SUT name:

.....
.....

Hardware configuration:

.....
.....
.....

Operating system:

.....

A.2.4 Product supplier

Name:

.....

Address:

.....
.....
.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....
.....
.....

A.2.5 Client (if different from product supplier)

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

A.2.6 PICS contact person

(A person to contact if there are any queries concerning the content of the PICS)

Name:

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

A.3 Identification of the reference specification(s)

This PICS proforma applies to the following standard:

- ES 201 912

References to capabilities defined in other standards being identified as normative references for ES 201 912 are made when necessary, e.g. to express options defined in ES 201 912. When such references appear, they are made in a global manner, because conformance statements related to details specified in other standards are outside the scope of the present document.

A.4 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)

NOTE: Answering "No" to this question indicates non-conformance to the EN specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

A.5 PICS proforma tables

A.5.1 Major capabilities

Table A.1 lists the conformance statements related to the major capabilities of an SMS-TE:

Table A.1: Major capabilities

Item	Item description	Reference	Status	Support
MC1	The SM-TE contains at least one SME	5.5.1	M	
MC2	The SM-TE contains more than one SME	5.5.1	O	
MC3	Establish a voice-band connection between the SM-TE and the SM-SC via ISDN (as initiator and as responder) (ISDN basic call control procedures are used to establish a voice-band communication path between SM-TE and SM-SC) (see note 1)	4, 5.1	O.1	
MC4	Establish a voice-band connection between the SM-TE and the SM-SC via PSTN (as initiator and as responder) (PSTN basic call control procedures are used to establish a voice-band communication path between SM-TE and SM-SC) (see note 1)	4, 5.1	O.1	
MC5	Submitting SMs to the SM-SC (outgoing SMs)	5.1	M	
MC6	Delivery of SMs from the SM-SC (incoming SMs)	5.1	M	
MC7	Receiving and recognizing CLI (see note 2)	5.1	M	
O.1	Support of exactly one of these options is required.			
Comments:				
NOTE 1: Details of these procedures are outside the scope of the present document.				
NOTE 2: CLI can be received via DSS1 call control signalling (ISDN access), FSK signalling or DTMF signalling (PSTN access). Details of the CLI reception are outside the scope of the present document.				

A.5.2 Services-related and terminal capabilities

Table A.2 lists the conformance statements related to the SM services and the addressing used to access the services by an SMS-TE.

Table A.2: Services-related and terminal capabilities

Item	Item description	Reference	Status	Support
SMSER1	Send SMs	5.2.1	M	
SMSER2	Receive SMs	5.2.2	M	
SMSER3	Collect received SMs from SC	5.2.2	M	
SMSER4	Send delivery report	5.3.3.1	M	
SMSER5	Receive submission report	5.3.3.1	M	
SMSER6	Use FSK to transport DLL and TL messages	5.1	M	
SMSER7	For each Short Message Service Provider supported by the SM-TE the SM-TE is able to store at least one SM-SC number including at least one SME Subaddress digit.	5.5.1	M	
SMSER8	If a SM-TE contains more than one SME, the SM-TE provides the possibility to store one SME Subaddress value for each SME contained in the SM-TE.	5.5.1	C1	
SMSER9	If there is an SM to submit, the SM-TE dials the number of the SM-SC which is stored in the SM-TE, extended by its own SME Subaddress and the digit "0".	5.5.7 §2	M	
SMSER10	If there is an SM to collect (the SM-TE has formerly received a call from the SM-SC with a Deliver Mode Identifier = 2..9), the SM-TE dials the number of the SM-SC extended by its own SME Subaddress and the formerly received Deliver Mode Identifier.	5.5.7 §3	M	
SMSER11	The called SM-TE does not accept an incoming call automatically before receiving CLI or determining that no CLI is provided. (see note 1)	5.2.2	M	
SMSER12	The called SM-TE, having recognized that the received CLI contains one of the basic SM-SC numbers stored in the SM-TE, accepts the call only if the subaddress value received in the CLI is equal to the stored subaddress value of an SME in the SM-TE. If under these conditions the subaddress value received in the CLI is not equal to the stored subaddress value of an SME in the SM-TE, the SM-TE does neither answer nor process nor signalize the call.	5.2.2, 5.5.1, 5.5.6	M	
SMSER13	The idle called SM-TE/SME, being addressed by the received CLI for an SM-Call and having sufficient memory for at least one SM, evaluates the received Deliver Mode Identifier (DMI) to decide how to process the call: If the DMI is 0 or 1, the SM-TE accepts the call. Otherwise the SM-TE does not accept the call and calls the SM-SC back after a delay to collect the SM(s) to be delivered.	5.2.2, 5.5.6, table 3	M	
SMSER14	The idle called SM-TE/SME, being addressed by the received CLI for an SM-Call and having not sufficient memory for at least one SM, evaluates the received Deliver Mode Identifier (DMI) to decide how to process the call: If the DMI is 0 the SM-TE The SM-TE accepts the call and rejects the SM with the TL message SMS_DELIVER_REPORT, failure cause "SIM SMS storage full". If the DMI is between 1 and 9, the SM-TE does not accept the call. (see note 2)	5.2.2, 5.5.6, table 3	M	
SMSER15	The busy called SM-TE/SME, supporting off-hook CLIP and being addressed by the received CLI, does not accept the call. (see note 3)	5.2.2, 5.5.6, table 3	M	

Item	Item description	Reference	Status	Support
SMSER16	The SM-TE receiving a call suppresses ringing if the CLI is available when the first ringing is outstanding, and the CLI addresses the SM-TE for an SM-Call. (see note 4)	5.5.2	O	
SMSER17	The SM-TE receiving a call suppresses ringing for the first ringing cadence if the CLI is not available at that time.	5.5.2	C2	
SMSER18	The SM-TE receiving a call and having suppressed ringing for the first ringing cadence because the CLI was not available at that time, suppresses ringing for the following ringing cadences if the CLI is available then and addresses the SM-TE for an SM-Call.	5.5.2	C2	
C1	If A1.MC2 then M else N/A			
C2	If A1.MC3 then N/A else O			
Comments:				
NOTE 1: To offer the SM service described in ES 201 912, the PSTN/ISDN is required to support the CLIP function.				
NOTE 2: If the DMI is between 2 and 9, the SM-TE may call the SM-SC later to collect the SM(s), when memory is available.				
NOTE 3: If the DMI is between 2 and 9, the SM-TE may call the SM-SC later to collect the SM(s), when the idle state is entered and memory is available.				
NOTE 4: This is applicable to SM-TE connected to the ISDN, or to SM-TE connected to the PSTN if the network provides the CLI before the first ringing cadence.				

A.5.3 Physical layer (voice band)

A.5.3.1 Bit transfer and frame delimitation

Table A.3 lists the conformance statements related to the physical layer functions of an SM-TE:

Table A.3: Bit transfer and frame delimitation

Item	Item description	Reference	Status	Support
PHBIT1	Transmission in voice-band path using bi-directional, half duplex 1 200 Baud FSK modulation	5.3.1,	M	
PHBIT2	Reception in voice-band path using bi-directional, half duplex 1 200 Baud FSK modulation	5.3.1,	M	
PHBIT3	The SM-TE sends the first FSK frame after voice-path establishment if and only if the SM-SC has initiated the voice-path connection (incoming SM), i.e. the SM-TE receives the first FSK frame after voice-path establishment in case of an outgoing SM.	5.3.1, A.1, A.2	M	
PHBIT4	The SM-TE sends FSK frames with the mark signal at the beginning of the frame being composed of 80 ± 25 mark bits.	5.3.2.1	M	
PHBIT5	The SM-TE receives an FSK frame correctly when the mark signal at the beginning of the frame is composed of 80 ± 25 mark bits.	5.3.2.1	M	
Comments:				

A.5.3.2 Physical layer timers

Table A.4 lists the conformance statements related to the physical layer timers of an SM-TE:

Table A.4: Physical layer timers

Item	Item description	Reference	Status	Support
PHTIM1	Minimum delay time (T10min) between the accepting of the call and the sending of the first FSK-Frame (see note).	5.3.1	M	
PHTIM2	Minimum delay time between two successive FSK frames (T11min = 100 ms).	5.3.1	M	
Comments:				
NOTE: T10min = n x 100 ms; n = 1..256, determined by the network operator.				

A.5.4 Data link layer

A.5.4.1 Data link layer general message structure and parameters

Table A.5 lists the conformance statements related to the general message structure and the message parameter structures and contents contained in the messages supported by an SM-TE.

Table A.5: Data link layer general message structure and parameters

Item	Item description	Reference	Status	Support
DLPAR1	General message format	5.3.2.1 figure 8	M	
DLPAR2	Message Type (indicates the type of the message and the extension bit)	5.3.2.1	M	
DLPAR3	Message length (binary-encoded message length in octets)	5.3.2.1	M	
DLPAR4	Payload (Octet string of 176 octets maximum length)	5.3.2.1	M	
DLPAR5	Checksum (Two complement of the modulo 256 sum of all the octets in the message starting from the message type octet up to the end of the message (excluding the checksum itself))	5.3.2.1	M	
Comments:				
NOTE: The "Mark signal" which serves for receiver synchronization, is not an octet-oriented field, and has been treated in the Physical layer PICS item A3.PHBIT5.				

A.5.4.2 Data link layer messages

Table A.6 lists the conformance statements related to the data link layer messages to be supported by an SM-TE for transmission and reception.

Table A.6: Data link message formats

Item	Item description	Reference	Status	Support
DLMSG1	DLL_SMS_EST message (Data Link Layer connection established indication).	5.3.2.1, table 1	M	
DLMSG2	DLL_SMS_DATA message (Carries SM data).	5.3.2.1, table 1	M	
DLMSG3	DLL_SMS_REL message (Data Link Layer connection release indication).	5.3.2.1, table 1	M	
DLMSG4	DLL_SMS_ACK message (Carries a positive SM acknowledgement).	5.3.2.1, table 1	M	
DLMSG5	DLL_SMS_NACK message (Carries a negative SM acknowledgement).	5.3.2.1, table 1	M	
DLMSG6	DLL_SMS_ERROR message (Data Link Layer error indication).	5.3.2.1, table 1	M	
Comments:				

A.5.4.3 Data link layer procedures

Table A.7 lists the conformance statements related to the data link layer procedures performed by an SM-TE. The data link layer procedures are not explicitly defined with procedure names in ES 201 912, but by using MSCs in annex A, which are normative for the data link layer behaviour. States are also implicitly defined there.

The "References" column of table A.7 addresses the annex A globally and gives for each procedure an example MSC.

Table A.7: Data link procedures

Item	Item description	Reference	Status	Support
DLPRC1	Data link establishment acceptance (Receiving a DLL_SMS_EST message after having initiated the voice-band connection.)	A.1.1	M	
DLPRC2	Data link establishment initiation (Sending a DLL_SMS_EST message after having received and completed the voice-band connection.)	A.2.2	M	
DLPRC3	Successful data submission (Sending a DLL_SMS_DATA message and receiving a DLL_SMS_ACK message as response.)	A.1.1	M	
DLPRC4	Receiving negative acknowledgement (Sending a DLL_SMS_DATA message and receiving a DLL_SMS_NACK message as response, indicating a TL failure recognized by the peer TL entity.)	A.1.2	M	
DLPRC5	Receiving DLL error (Receiving a DLL_SMS_ERROR message as a response to a previously transmitted data link layer message, indicating that the peer DLL entity has recognized a DLL-related error. The frame is retransmitted until a positive acknowledgement or the maximum number of transmissions has been reached, whatever occurs first.)	A.1.3	M	
DLPRC6	Sending DLL error (Sending a DLL_SMS_ERROR message as a response to a previously received data link layer message containing a DLL-related error. It is expected that the erroneous frame is corrected/retransmitted.)	5.3.2.2, A.2.5	M	
DLPRC7	Sending negative acknowledgement (Sending a DLL_SMS_NACK message as response to a received DLL_SMS_DATA message containing a TL error.)	A.2.4	M	
DLPRC8	Sending DLL release (Sending a DLL_SMS_REL message, after an error that cannot be corrected, or, as an initiator, when the SM submission is completed.)	A.1.1	M	
DLPRC9	Receiving DLL release (Receiving a DLL_SMS_REL message, after an error that cannot be corrected, or, as a responder, when the SM delivery is completed by the SM-SC.)	A.2.1	M	
DLPRC10	Extension mechanism (reception, "no extension") (receive messages with the extension bit set to "1", i.e. no segmentation.)	5.3.2.1	M	
DLPRC11	Extension mechanism (transmission, "no extension") (send messages with the extension bit set to "1", i.e. no segmentation used.)	5.3.2.1	M	
DLPRC12	Extension mechanism (reception, "extension") (reassemble payloads in received protocol messages, i.e. receive messages with the extension bit set to "0" and assemble until the extension bit is "1".) (see notes 1 and 2)	5.3.2.1, table 2	O	
DLPRC13	Extension mechanism (transmission, "extension") (segment data to be transmitted into payload portions not greater than the maximum length (176 octets), using the extension bit as "not complete/complete" indicator.) (see notes 1 and 2)	5.3.2.1, table 2	O	
Comments:				
NOTE 1: The extension mechanism is not used because TL messages > 176 octets are not possible.				
NOTE 2: The transfer of "long SM" is done by using the GSM concatenation mechanism.				

A.5.4.4 Data link layer error causes

Table A.8 lists the data link layer error causes that are permitted to be included by an SM-TE in a DLL_SMS_ERROR message and are required to be accepted and understood in received DLL_SMS_ERROR messages.

NOTE: The Data link layer error handling procedure is addressed in items A.7.DLPRC5 and A.7.DLPRC6.

Table A.8: Data link error treatment

Item	Item description	Reference	Status	Support
DLERR1	Error causes for DLL_SMS_ERROR	5.3.2.2, table 2	M	
Comments:				

A.5.4.5 Data link layer timers and counters

Table A.9 lists the conformance statements related to the timers and counters defined for the data link layer procedures performed by an SM-TE.

Table A.9: Data link layer timers and counters

Item	Item description	Reference	Status	Support
DLTIM1	Verify receipt of a response upon a transmitted DLL message (Timer T12). (see note 1)	5.3.2.3	M	
DLTIM2	Maximum number of transmissions of a DLL message. (see note 2)	5.3.2.2	M	
Comments:				
NOTE 1: The timeout value is fixed to 4 000 ms . The connection is released by the sending entity after timeout of T12.				
NOTE 2: The number is fixed to 2 : when a transmitted DLL message is responded by an DLL_SMS_ERROR message, it is retransmitted once. If the retransmitted DLL message is also responded by an DLL_SMS_ERROR message, the connection is released by both entities.				

Annex B (informative): Bibliography

ETSI TS 100 939 (V7.3.0): "Digital cellular telecommunications system (Phase2+); Mobile radio interface signalling layer 3; General aspects" (GSM 04.07 version 7.3.0).

ETSI ES 300 659-3 (V1.3.1): "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 3: Data link message and parameter codings".

ETSI ES 200 778-1 (V1.3.1): "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Protocol over the local loop for display and related services; Terminal Equipment requirements; Part 1: On-hook data transmission".

ETSI ES 200 778-2 (V1.3.1): "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Protocol over the local loop for display and related services; Terminal Equipment requirements; Part 2: Off-hook data transmission".

ETSI TS 100 942 (V7.0.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface (GSM 04.11 version 7.0.0)".

ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

History

Document history		
V1.1.1	December 2002	Membership Approval Procedure MV 20030207: 2002-12-10 to 2003-02-07
V1.1.1	February 2003	Publication