

EMI-UCP Interface™ 4.7

Interface Manual

Copyright © Acision BV 2007-2011

All rights reserved. This document is protected by international copyright law and may not be reprinted, reproduced, copied or utilised in whole or in part by any means including electronic, mechanical, or other means without the prior written consent of Acision BV.

Whilst reasonable care has been taken by Acision BV to ensure the information contained herein is reasonably accurate, Acision BV shall not, under any circumstances be liable for any loss or damage (direct or consequential) suffered by any party as a result of the contents of this publication or the reliance of any party thereon or any inaccuracy or omission therein. The information in this document is therefore provided on an "as is" basis without warranty and is subject to change without further notice and cannot be construed as a commitment by Acision BV.

The products mentioned in this document are identified by the names, trademarks, service marks and logos of their respective companies or organisations and may not be used in any advertising or publicity or in any other way whatsoever without the prior written consent of those companies or organisations and Acision BV.

Table of Contents

| | |
|--|-----------|
| Preface | 10 |
| 1 Introduction | 12 |
| 1.1 Interface Position..... | 12 |
| 1.2 Interface History | 14 |
| 2 EMI Operations Structure | 15 |
| 2.1 Character Sets | 15 |
| 2.2 Examples..... | 16 |
| 3 EMI Operations | 17 |
| 3.1 SMT Initiated Operations..... | 17 |
| 3.2 SMSC Initiated Operations..... | 18 |
| 3.3 Legacy SMT Initiated Operations..... | 18 |
| 3.4 Legacy SMSC Initiated Operations | 19 |
| 3.5 Flow Control | 19 |
| 4 EMI Operations Syntax | 20 |
| 4.1 Address Syntax | 20 |
| 5 EMI Operations 50-Series | 21 |
| 5.1 Abstract Data Types..... | 21 |
| 5.1.1 Application – Pass Alphanumeric OAdC | 25 |
| 5.1.2 XSer Extra Services Description..... | 26 |
| 5.1.3 XSer Type Of Service 00 – Not Used..... | 26 |
| 5.1.4 XSer Type Of Service 01 – GSM UDH Information..... | 26 |
| 5.1.5 XSer Type Of Service 02 – GSM DCS Information..... | 27 |
| 5.1.6 XSer Types Of Service 03-0B – CDMA/TDMA Information Exchange | 28 |
| 5.1.7 Type Of Service 03 – Message Type | 28 |
| 5.1.8 Type Of Service 04 – Message Reference | 29 |
| 5.1.9 Type Of Service 05 – Privacy Indicator | 29 |
| 5.1.10 Type of Service 06 – Urgency Indicator | 29 |
| 5.1.11 Type Of Service 07 – Acknowledgement Request..... | 30 |
| 5.1.12 Type of Service 08 – Message Updating | 30 |
| 5.1.13 Type of Service 09 – Call Back Number | 30 |
| 5.1.14 Type Of Service 0A – Response Code | 32 |
| 5.1.15 Type Of Service 0B – Teleservice Identifier | 33 |
| 5.1.16 XSer Type Of Service 0C – Billing Identifier..... | 33 |
| 5.1.17 XSer Type Of Service 0D – Single Shot Indicator..... | 33 |
| 5.1.18 XSer Type Of Service 0E – Originator TON..... | 34 |

| | | |
|----------|---|-----------|
| 5.1.19 | XSer Type Of Service 0F – Originator NPI..... | 34 |
| 5.1.20 | XSer Type Of Service 10 – Recipient TON | 34 |
| 5.1.21 | XSer Type Of Service 11 – Recipient NPI..... | 34 |
| 5.1.22 | XSer Type Of Service 12 – Message Original Submission Time..... | 35 |
| 5.1.23 | XSer Type Of Service 13 – Destination Network Type | 35 |
| 5.1.24 | XSer Types Of Service 14 – FF, Reserved | 35 |
| 5.2 | Standard String | 35 |
| 5.3 | Submit Short Message Operation -51 | 36 |
| 5.3.1 | Submit Short Message Operation (Positive Result) | 38 |
| 5.3.2 | Submit Short Message Operation (Negative Result)..... | 38 |
| 5.4 | Delivery Short Message Operation -52 | 39 |
| 5.4.1 | Delivery Short Message Operation (Positive Result) | 40 |
| 5.4.2 | Delivery Short Message Operation (Negative Result)..... | 41 |
| 5.5 | Delivery Notification Operation -53 | 41 |
| 5.5.1 | Delivery Notification Operation (Positive Result) | 43 |
| 5.5.2 | Delivery Notification Operation (Negative Result) | 43 |
| 5.6 | Modify Short Message Operation - 54 | 43 |
| 5.6.1 | Modify Short Message Operation (Positive Result)..... | 47 |
| 5.6.2 | Modify Short Message Operation (Negative Result) | 47 |
| 5.7 | Inquiry Message Operation -55..... | 47 |
| 5.7.1 | Inquiry Message Operation (Positive Result) | 49 |
| 5.7.2 | Inquiry Message Operation (Negative Result)..... | 49 |
| 5.8 | Response Inquiry Message Operation -57..... | 49 |
| 5.8.1 | Response Inquiry Message Operation (Positive Result) | 51 |
| 5.8.2 | Response Inquiry Message Operation (Negative Result) | 51 |
| 5.9 | Delete Message Operation -56 | 51 |
| 5.9.1 | Delete Message Operation (Positive Result)..... | 53 |
| 5.9.2 | Delete Message Operation (Negative Result) | 53 |
| 5.10 | Response Delete Message Operation -58..... | 54 |
| 5.10.1 | Response Delete Message Operation (Positive Result) | 55 |
| 5.10.2 | Response Delete Message Operation (Negative Result)..... | 55 |
| 5.11 | Submit Notification Operation -59 | 56 |
| 5.11.1 | Submit Notification Operation (Positive Result)..... | 57 |
| 5.11.2 | Submit Notification Operation (Negative Result) | 58 |
| 6 | EMI Operations 60-Series | 59 |
| 6.1 | Abstract Data Types..... | 59 |
| 6.2 | Standard String | 60 |
| 6.3 | Session Management Operation -60 | 60 |
| 6.3.1 | Session Management Operation (Positive Result)..... | 62 |
| 6.3.2 | Session Management Operation (Negative Result) | 62 |
| 6.4 | Provisioning Actions Operation -61 | 62 |
| 6.4.1 | Provisioning Actions Operation (Positive Result) | 63 |

| | | |
|----------|--|------------|
| 6.4.2 | Provisioning Actions Operation (Negative Result)..... | 63 |
| 6.5 | SMT Alert Operation -31 | 64 |
| 6.5.1 | SMT Alert Operation (Positive Result)..... | 64 |
| 6.5.2 | SMT Alert Operation (Negative Result) | 65 |
| 7 | Legacy Operations Syntax | 66 |
| 7.1 | Call Input Operation -01 | 66 |
| 7.1.1 | Call Input Operation (Positive Result)..... | 66 |
| 7.1.2 | Call Input Operation (Negative Result) | 67 |
| 7.2 | Multiple Address Call Input Operation -02 | 68 |
| 7.2.1 | Multiple Address Call Input Operation (Positive Result)..... | 69 |
| 7.2.2 | Multiple Address Call Input Operation (Negative Result) | 69 |
| 7.3 | Call Input with Supplementary Services Operation -03 | 70 |
| 7.3.1 | Call Input with Supplementary Services Operation (Positive Result)..... | 71 |
| 7.3.2 | Call Input with Supplementary Services Operation (Negative Result) | 72 |
| 7.4 | MS Message Transfer Operation -30..... | 73 |
| 7.4.1 | MS Message Transfer Operation (Positive Result) | 74 |
| 7.4.2 | MS Message Transfer Operation (Negative Result)..... | 74 |
| | Abbreviations..... | 98 |
| | References | 99 |
| | Version History | 100 |

List of Figures

| | |
|---|----|
| Figure 1-1: EMI External View..... | 12 |
| Figure 1-2: Protocol Flow Example | 13 |

List of Tables

| | |
|---|----|
| Table Preface-1: Typographic Conventions | 11 |
| Table 2-1: Fields Operation Header | 15 |
| Table 2-2: Character Set Examples | 16 |
| Table 3-1: SMT Initiated Operations | 17 |
| Table 3-2: SMSC Initiated Operations | 18 |
| Table 3-3: Legacy SMT Initiated Operations | 18 |
| Table 3-4: Legacy SMSC Initiated Operations | 19 |
| Table 5-1: EMI Operations 50-Series | 21 |
| Table 5-2: Abstract Data Types 50-Series | 21 |
| Table 5-3: Generic ADT for EMI Positive Response | 24 |
| Table 5-4: Generic ADT for EMI Negative Response | 25 |
| Table 5-5: Information Elements | 28 |
| Table 5-6: Message Type | 28 |
| Table 5-7: Message Reference | 29 |
| Table 5-8: Privacy Indicator | 29 |
| Table 5-9: Urgency Indicator | 29 |
| Table 5-10: Acknowledgement Request | 30 |
| Table 5-11: Message Updating | 30 |
| Table 5-12: Call Back Number | 31 |
| Table 5-13: Call Back Number Nested Tag Codes | 31 |
| Table 5-14: Provision Bits | 31 |
| Table 5-15: Presentation Bits | 32 |
| Table 5-16: Response Code | 32 |
| Table 5-17: Teleservice Identifier | 33 |
| Table 5-18: Single Shot Identifier | 33 |
| Table 5-19: Originator / Recipient TON | 34 |
| Table 5-20: Originator / Recipient NPI | 34 |
| Table 5-21: Destination Network Type | 35 |
| Table 5-22: Submit Short Message Operation | 36 |
| Table 5-23: Parameter Positive Result Data Field Submit Short Message Operation | 38 |

| | |
|---|----|
| Table 5-24: Short Message Parameter Field Submit Short Message Operation | 38 |
| Table 5-25: Parameter Negative Result Data Field Submit Short Message Operation | 38 |
| Table 5-26: Delivery Short Message Operation | 39 |
| Table 5-27: Parameter Positive Result Data Field Delivery Short Message Operation | 40 |
| Table 5-28: Parameter Negative Result Data Field Delivery Short Message Operation | 41 |
| Table 5-29: Delivery Notification Operation..... | 41 |
| Table 5-30: Parameter Positive Result Data Field Delivery Notification Operation | 43 |
| Table 5-31: Parameter Negative Result Data Field Delivery Notification Operation..... | 43 |
| Table 5-32: Modify Short Message Operation..... | 45 |
| Table 5-33: Parameter Positive Result Data Field Modify Short Message Operation | 47 |
| Table 5-34: Short Message Parameter Field Modify Short Message Operation | 47 |
| Table 5-35: Parameter Negative Result Data Field Modify Short Message Operation..... | 47 |
| Table 5-36: Inquiry Message Operation | 48 |
| Table 5-37: Parameter Positive Result Data Field Inquiry Message Operation..... | 49 |
| Table 5-38: Parameter Negative Result Data Field Inquiry Message Operation | 49 |
| Table 5-39: Response Inquiry Message Operation..... | 50 |
| Table 5-40: Parameter Positive Result Data Field Response Inquiry Message Operation | 51 |
| Table 5-41: Parameter Negative Result Data Field Response Inquiry Operation | 51 |
| Table 5-42: Delete Message Operation | 52 |
| Table 5-43: Parameter Positive Result Data Field Delete Message Operation | 53 |
| Table 5-44: Parameter Negative Result Data Field Delete Message Operation | 53 |
| Table 5-45: Response Delete Message Operation | 54 |
| Table 5-46: Parameter Positive Result Data Field Response Delete Message Operation..... | 55 |
| Table 5-47: Parameter Negative Result Data Field Response Inquiry Operation | 55 |
| Table 5-48: Submit Notification Operation | 56 |
| Table 5-49: Parameter Positive Result Data Field Submit Short Message Operation..... | 57 |
| Table 5-50: SM Parameter Field of Submit Notification Operation | 58 |
| Table 5-51: Parameter Negative Result Data Field Submit Short Message Operation | 58 |
| Table 6-1: 60-Series of EMI Messages | 59 |
| Table 6-2: Abstract Data Types 60-Series | 59 |
| Table 6-3: Generic ADT for EMI Positive Response | 60 |
| Table 6-4: Generic ADT for EMI Negative Response | 60 |
| Table 6-5: Session Management Operation..... | 60 |

| | |
|---|----|
| Table 6-6: Parameter Positive Result Data Field Session Management Operation | 62 |
| Table 6-7: Parameter Negative Result Data Field Session Management Operation..... | 62 |
| Table 6-8: Provisioning Actions Operation | 62 |
| Table 6-9: Parameter Positive Result Data Field Provisioning Actions Operation..... | 63 |
| Table 6-10: Parameter Negative Result Data Field Provisioning Actions Operation | 64 |
| Table 6-11: Parameter Operation Data Field SMT Alert Operation | 64 |
| Table 6-12: Parameter Positive Result Data Field SMT Alert Operation | 64 |
| Table 6-13: Parameter Negative Result Data Field SMT Alert Operation | 65 |
| Table 7-1: Parameters Operation Data Field Call Input Operation | 66 |
| Table 7-2: Parameter Positive Result Data Field Call Input Operation | 67 |
| Table 7-3: Short Message Parameter Field Call Input Operation | 67 |
| Table 7-4: Parameter Negative Result Data Field Call Input Operation | 67 |
| Table 7-5: Parameters Operation Data Field Multiple Address Call Input Operation | 68 |
| Table 7-6: Parameter Positive Result Data Field Multiple Address Call Input Operation | 69 |
| Table 7-7: Short Message Parameter Field Multiple Address Call Input Operation | 69 |
| Table 7-8: Parameter Negative Result Data Field Multiple Address Call Input Operation..... | 69 |
| Table 7-9: Parameter Operation Data Field Call Input with Services Operation..... | 70 |
| Table 7-10: Parameter Positive Result Data Field Call Input with Services Operation..... | 71 |
| Table 7-11: Short Message Parameter Field Call Input with Services Operation | 71 |
| Table 7-12: Parameter Negative Result Data Field Call Input with Services Operation | 72 |
| Table 7-13: Parameter Operation Data Field MS Message Transfer Operation..... | 73 |
| Table 7-14: Parameter Positive Result Data Field MS Message Transfer Operation..... | 74 |
| Table 7-15: Short Message Parameter Field MS Message Transfer..... | 74 |
| Table 7-16: Parameter Negative Result Data Field MS Message Transfer Operation | 74 |
| Table A-17: Error Codes..... | 76 |
| Table A-18: Error Code – Special Occurrences..... | 77 |
| Table B-19: Notification Error Messages/ Reason Codes..... | 78 |
| Table C-20: 7-Bit Default Alphabet Table..... | 80 |
| Table C-21: 7-Bit Default Alphabet Extension Table..... | 81 |
| Table C-22: GSM 7-bit to Unicode Mapping | 82 |
| Table D-23: Protocol Sequence Example | 87 |
| Table E-24: C.C. – Command Code | 89 |

Preface

Purpose

The purpose of this document is to specify the interface used between the Short Message Service Centre (SMSC) and other computer systems/ applications. The interface is based on the ERMES Universal Computer Protocol (UCP) with SMSC-specific extensions.

Throughout this document, the interface is called 'EMI': External Machine Interface.

The interface that is described in this document has been implemented in an SMSC API built by Acision. Hereby, application programmers are able to build applications to communicate with a Acision SMSC in order to send and receive short messages to/from mobile stations.

Audience

The target audience of this document is all people involved in the design and implementation of applications on external computer systems that have to interact with the SMSC.

Scope

The scope of the document is to describe the general specification of the external machine interface of the Acision's SMSC. Since the available functions depend on the specific SMSC implementation of the Mobile Telecommunication Operator, please contact your local operator for the available implemented SMSC functions and features.

Organisation

This document is organised in eleven chapters. The first chapter contains the introduction to the EMI. It describes the position of the EMI between the SMSC components and the external machines.

The second chapter shows the structure of EMI messages and provides examples of valid exchanges of operations between the SMSC and the applications.

The third chapter defines the EMI operations, and describes briefly the expected actions from the SMSC and the Application upon reception of the operations.

The fourth chapter shows the syntax of EMI operations.

The fifth chapter shows the syntax of the 50-series of EMI operations.

The sixth chapter shows the syntax of the 60-series of EMI operations.

The seventh chapter shows the syntax of the legacy EMI operations.



The External Machine Interface specification describes the features that can be used in the EMI operations. However, many features are subject to provisioning by the SMSC operator, i.e. if the operator has granted you the rights to use these features in the EMI operations.

Typographic Conventions

In this document, the typographic conventions listed in Table Preface-1 are used.

Table Preface-1: Typographic Conventions

| Typeface/ Symbol | Meaning/Used for | Example |
|-------------------------------|---|---|
| Courier | Refers to keyboard key, system command, label, button, filename, window, or other computer component or output. | DATA directory contains... Click <code>C</code> lose button to... |
| <courier> | Serves as placeholder for variable text that the user will replace as appropriate to its context. | Use file name <entity>.cfg for... |
| [] | Refers user to external documentation listed in References section. | [ETSI 03.38] |
| <i>Italic</i> | Emphasises new word or term of significance. | Install procedure on a <i>SUN T1</i> . |
| % | Denotes a Unix regular-user prompt for C shell. | % ls |
| # | Denotes a Unix super-user prompt for any shell. | # ls |
| \$ | Denotes an OpenVMS Digital Command Language prompt. | \$ dir |
| \ (Unix) or - (OpenVMS) | Denotes line continuation; the character should be ignored as the user types the example, and Enter should only be pressed after the last line. | % grep searchforthis \ data/*.dat \$ search [.data]*.dat - searchforthis |
| - | Bridges two keystrokes that should be pressed simultaneously. | If <code>Ctrl-C</code> does not work, use <code>Ctrl-Alt- Del</code> . |
| ☐ | Denotes a “note”, a piece of text alongside the normal text requiring extra attention. | ☐ Note that the system is usually... |

1 Introduction

For the submission and reception of short messages (SMs), the SMSC can interface with (among others):

- GSM/GPRS/UMTS/TDMA/CDMA Mobile Telephones (PLMN),
- Value Added Services applications,
- Voice Messaging systems,
- Unified Communications systems.



Throughout this document, the External Machine will be referred to as 'SMT'. This can of course be any application system.

In order to allow any service provider to develop dedicated applications, an interface was developed to access the SMSC functions. This manual specifies that interface.

1.1 Interface Position

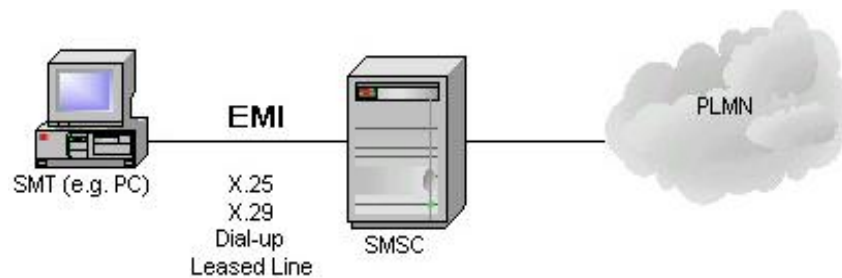


Figure 1-1: EMI External View

When viewed from the SMT side, the SMSC External Machine Interface (EMI) provides access to the SMSC functions:

- Submission of SMs,
- Reception of SMs,
- Submission of notifications not related to submitted SMs,
- Reception of notifications related or not related to submitted SMs,
- Operate on submitted SMs: Query, Delete and Modify.

The SMSC can be viewed as a black box: SMs are directed to the GSM mobile telephone of the recipient. The SMSC and the PLMN only function as relay mechanisms for those Messages. The only visible action of the SMSC apart from this is the provision of notifications: upon request, the SMSC will notify the originator of the SM regarding the status of the SM.

The protocol operations are 7-bit text based, in human readable format. The EMI can use the following lower level reliable and unreliable protocols as a carrier:

- TCP/IP v4

- X25 (X.121 Numbering Plan)
- X29 (X.121 Numbering Plan)
- ISDN (E.164 Numbering Plan)
- PSTN (E.164 Numbering Plan)

The set-up of the connection between the SMSC platform and the SMT depends on the carrier used. Once the connection is established, the EMI operations can be used. An SMT may establish multiple connections for fail over purposes or increased throughput. The SMSC operator may apply restrictions to the number of connections. The SMSC operator may require the SMT to authorize itself by starting with a session management operation with identification and password. An SMT may submit multiple messages without waiting for response to each message (windowing). The SMSC operator applies restrictions to the allowed window size.

Each side can send asynchronous operations, e.g., independent of each other. As an instance, the SMSC can deliver a Mobile Originated Message between receiving an operation from the SMT and sending the result operation to that response.

An SMSC operator may apply an inactivity timeout on the message transfer. The SMSC releases the connection after the timeout.

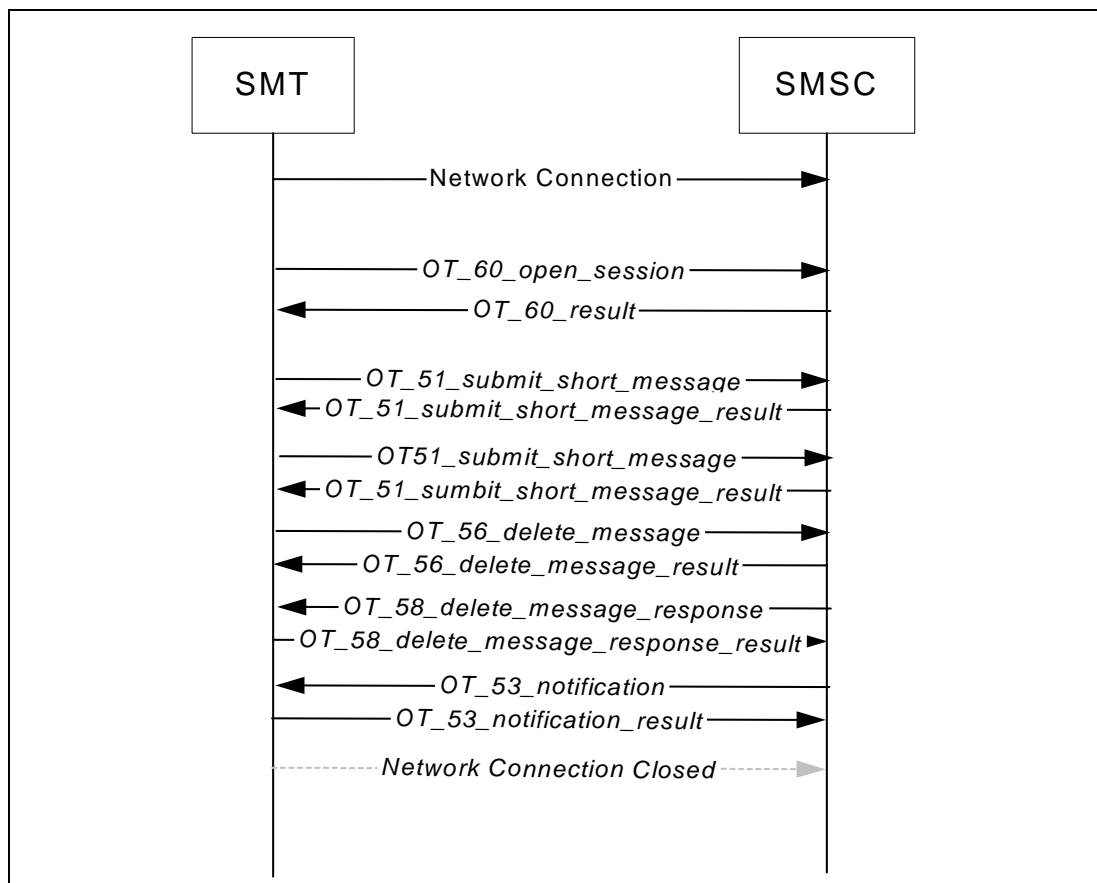


Figure 1-2: Protocol Flow Example

The SMT can be authenticated by the SMSC in the following ways:

- Based on the network provided address (Calling Line Identification)
- Based on SMT provided address and password registered on the SMSC

In this example, the SMT logs into the SMSC, using the operation type 60, subtype Open Session for authentication.

1.2 Interface History

The SMSC External Machine Interface (EMI) is based on an extended subset of the UCP protocol defined for the ERMES paging system in ETS 300 133-3. When referring to 'UCP' in the context of the SMSC (usually the EMI) the extended subset of the ERMES UCP is meant.

In the SMSC, the UCP protocol was chosen as the basis for the EMI because:

1. The first operators that used the SMSC required the UCP protocol to interact with external machines.
2. It allows service providers to use a single mechanism to interface with both ERMES based paging systems and the SMSC.
3. No re-invention of 'yet another' protocol had to take place.

In order to provide access to the more extensive set of SMS operations, it was necessary to extend the UCP definition with some additional, SMSC specific operations, such as 'SMS message transfer operation' and 'SMT alert operation'.



All new applications should only use the SMT alert operation, UCP5x and UCP6x operations. All other UCP operations are only referenced for existing applications and compatibility with previous SMSC releases.

2 EMI Operations Structure

In the ERMES/ UCP-based SMSC External Machine Interface (EMI) protocol, the operation structure is as follows:

```
stx <header> / <data> / <checksum> etx
```

```
stx = 02(hex)
```

```
etx = 03(hex)
```

Please note that in the examples `stx`, `etx` and `/`, each represent only one character. As a separator between header and data, between data and checksum, as well as between parameters, a `/` (2F(hex)) is used. In parameters that contain a list, the items are separated by a `,` (2C(hex)). Numeric characters (0...F) are encoded as in IRA. Alphanumeric characters are encoded as two numeric IRA characters; first the higher 3-bits (0...7), and then the lower 4-bits (0...F). The `<header>` consists of the following four mandatory fields:

Table 2-1: Fields Operation Header

| Parameter | Type | Description |
|-----------|-----------------|--|
| TRN | 2 Num. Char. | Transaction reference number, right justified with leading zero. Values 00-99. |
| LEN | 5 Num. Char. | Total number of IRA characters contained between <code>stx</code> and <code>etx</code> , right justified with leading zeros. |
| O/R | Char "O" or "R" | "O" indicates operation, "R" indicates result. |
| OT | 2 Num. Char. | Operation Type (see list in Chapter 3). |

Errors in the operation `<header>` are not recognised by the SMSC. The `<data>` fields depend on the Operation Type. For each Operation Type they are listed in the next chapters. The `<checksum>` is derived by the addition of all bytes of the header, data field separators and data fields (i.e., all characters after the `stx` character, up to and including the last `/` before the checksum field). The eight Least Significant Bits (LSB) of the result is then represented as two printable characters. The character containing four Most Significant Bits (MSB) (of those eight LSB) shall be transmitted first. For example, if the checksum is 3A(hex), the representation shall be the characters "3" (33(hex)) and "A" (41(hex)).

2.1 Character Sets

EMI provides text support via two character sets: GSM 7-bit alphabet [3GPP 23.038] and Unicode (16-bit UCS2) [UCS2]. GSM 7-bit alphabet is specific for GSM mobile stations and can be used for western-European languages. The GSM 7-bit alphabet largely overlaps with US-ASCII [ASCII]. One important difference, although there are more, is the value of the sign `@`. In US-ASCII, the character value is 40(hex); in GSM 7-bit alphabet, it is 00(hex). An SMSC operator might decide to provide an alternative character set for a specific language.

The Unicode character set allows texts in languages like Chinese, Thai and Hebrew, but occupies 2 bytes (16-bits) per character. A character mapping of GSM 7-bit and Unicode 16-bit is listed in A.2 GSM 7-Bit – Unicode Mapping. In addition to text character sets, EMI supports the transfer of the 8-bit binary data.

2.2 Examples

The following table presents examples of the operations and responses.

Table 2-2: Character Set Examples

| Description | UCP String |
|--|---|
| The SMT sends a message to the SMSC with text "hello" in the GSM 7-bit alphabet. Note that "hello" in ASCII has the same encoding. | stx49/00078/O/51/00316123 45678/55555//////////////// ///3//68656C6C6F//////// ///0Detx |
| The SMSC sends a positive acknowledgement to indicate the message has been accepted (and stored). In the acknowledgement, the 'system message' parameter is used to indicate the recipient address 0031612345678 and timestamp 281102085030. | stx49/00046/R/51/A//00316 12345678:281102085030/DFe tx |
| The next example is the "hello" text in Unicode UCS2 together with a notification request. | stx99/00098/O/51/00316123 45678/55555//1//7//////// ////4/80/00680065006C006 C006F/////////020108///F 0etx |
| Again, the SMSC sends a positive acknowledgement. | stx99/00046/R/51/A//00316 12345678:281102084420/E6e tx |
| The first delivery attempt is unsuccessful. The message is buffered, and the SMSC sends a buffered notification to the SMT. | stx00/00095/O/53/55555/06 12345678/////////////////2811 02084420/1/107/2811020844 21/3//20/////////////////12et x |
| The SMT sends a positive acknowledgement back. | stx00/00038/R/53/A//55555 :281102084442/46etx |

Other examples are given in the description of the specific EMI operations. Please Note that the stx and etx characters in these examples are skipped.

3 EMI Operations

The SMSC External Machine Interface (EMI) operations can be initiated either from the SMT or from the SMSC. Each command will lead to an action on the other side, which will respond with a positive or negative acknowledgement with the same TRN value. Each side maintains its own TRN values.

3.1 SMT Initiated Operations

The following table presents the SMT initiated operations that are available.

Table 3-1: SMT Initiated Operations

| Command ID | Command Name | Purpose |
|------------|----------------------|---|
| 31 | SMT Alert Operation | Alert the SMSC to start delivering buffered messages immediately. This allows you to retrieve messages submitted to you without waiting for the scheduled next delivery attempt. |
| 32 | (Reserved) | |
| 33 | (Reserved) | |
| 38 | (Reserved) | |
| 40 | (Reserved) | |
| 41 | (Reserved) | |
| 51 | Submit_short_message | Submit a new message to someone. |
| 54 | Modify_message | Modify the message parameters of a buffered message. |
| 55 | Inquiry_message | Verify if a message is still in the SMSC. |
| 56 | Delete_message | Delete a buffered message if it is still in the SMSC. |
| 59 | Submit_notification | Submit a new notification informing of the delivery status of a message <ul style="list-style-type: none"> Buffered: the first delivery attempt failed, the message scheduled for further attempts. Delivered: the recipient has received the message. Not delivered: the message could not be delivered; No more attempts are being made. |
| 60 | Session Management | Authenticate yourself after making the connection to the SMSC. |
| 61 | List Management | Manage your own mobile originated and mobile terminated black lists or white lists. |

The 'SMT alert operation' can be used by the application to alert the SMSC to send messages and notifications to the application. It can only be used when the application uses a connection that supports Calling Line Identification, such as X25.

3.2 SMSC Initiated Operations

The following table presents the SMSC initiated operations (used to deliver notifications or mobile originated short messages) that are available.

Table 3-2: SMSC Initiated Operations

| Command ID | Command Name | Purpose |
|------------|--------------------------|--|
| 34 | (Reserved) | |
| 36 | (Reserved) | |
| 42 | (Reserved) | |
| 43 | (Reserved) | |
| 52 | Deliver_short_message | The SMSC delivers a message that someone has sent to you. |
| 53 | Deliver_notification | <p>Informs you of the delivery status of a message</p> <ul style="list-style-type: none"> • Buffered: first delivery attempt failed, message scheduled for further attempts. • Delivered: the recipient has received the message. • Not delivered: message could not be delivered; No more attempts are being made. |
| 57 | Response_inquiry_message | Informs you of the outcome of the inquiry to a buffered message |
| 58 | Response_delete_message | Informs you of the outcome of the delete request for a buffered message |

3.3 Legacy SMT Initiated Operations



All new applications should only use the SMT alert operation, UCP5x and UCP6x operations. All other UCP operations are only referenced for existing applications and compatibility with previous SMSC releases.

The following table presents the Legacy SMT initiated operations that are available.

Table 3-3: Legacy SMT Initiated Operations

| Command ID | Command Name |
|------------|--|
| 01 | Call Input Operation |
| 02 | Multiple Address Call Input Operation |
| 03 | Call Input with Supplementary Services Operation |
| 30 | SMS Message Transfer Operation |

The definitions of operations '01', '02' and '03' are identical to the corresponding operations defined in [ETSI 03.00].

The 'Call input operation' is the normal means of submitting a short message. When the SMSC receives this command, it must send the message to the recipient address that is specified in the command.

The 'Multiple address call input operation' is used to address a number of recipients in one operation. The command contains a list of recipient addresses. The SMSC will send the same message to all addresses in this list.

The 'Call input with supplementary services operation' is used when a message is to be scheduled for deferred delivery.

The 'SMS message transfer operation' is used to submit a message when SMSC specific services are required, such as a notification request, a deferred delivery, or validity period.

3.4 Legacy SMSC Initiated Operations

SMSC initiated operations (used to deliver notifications or mobile originated short messages) are:

Table 3-4: Legacy SMSC Initiated Operations

| Command ID | Command Name |
|------------|----------------------|
| 01 | Call Input Operation |

The SMSC uses the 'Call input operation' to transfer notifications and mobile originated short messages (MO/SM) to the SMT. The initiative to do so lies either with the SMSC (notifications on messages submitted in the current session) or with the SMT (SMT has to issue an SMT alert command).

3.5 Flow Control

The SMSC can support two types of flow control. The first type of flow control is a 'stop-and-wait' protocol, i.e., during the handling of operations, no other operations shall be sent before the response is received. A command sent before the reception of the response will be discarded.

The second type of flow control that can be supported by the SMSC is 'windowing' for increased throughput. In this case, a maximum of n operations can be sent before a response is received. The transaction number of the command (field TRN) will be used to determine if there is a command in the current 'window'.

The SMSC will discard a command if its transaction number is outside the current window (message n+1 in a window of n). The SMSC will give transaction numbers to the operations it sends as much as possible in a cyclic manner.

If the SMSC receives an invalid response on a command, the transaction number of that command can only be used again after the delivery operation has been cancelled due to a delivery time-out.



Windowing is only supported in combination with UCP5x series operations, and the windowing functionality has to be provisioned by the SMSC operator.

4 EMI Operations Syntax

This chapter shows the syntax of the data fields of the EMI operations. The order in which the operations are listed is:

1. General operations, used for normal SM transfer.
2. SMSC specific extensions, used to address SMS functions not foreseen in the UCP definition.

In the column marked 'Presence', "M" indicates that the field is Mandatory, "O" indicates that it is Optional, "C" indicates Conditional and "-" indicates Not Applicable.

4.1 Address Syntax

Most addresses used in the EMI-messages are formatted according to E.164 numbering plan. The following syntax rules are valid:

- In case the national prefix is used in the network, the following syntax is seen as valid addresses:

```
<trunk-prefix><trunk-code><telephone-nr>
```

```
<international-prefix><country-code><trunk-code><telephone-nr>
```

- In case the national prefix is not used in the network, the following syntax is seen as valid addresses (in these situations, a valid telephone number will be recognised by its length):

```
<international-prefix><country-code><telephone-nr>
```

```
<telephone-nr>
```

For TCP/IP addresses, every byte expressed in decimal form should be left zero so that they all have a length of three characters. The TCP/IP port number shall be concatenated to the IP address. All dots (".") in the address shall be omitted.

Example

IP address 192.87.25.9 with port number 5000 shall be filled in as 1920870250095000.

5 EMI Operations 50-Series

This chapter introduces the 50-series of operations. The following table defines these operations:

Table 5-1: EMI Operations 50-Series

| EMI Operation | Name | Initiated |
|---------------|--------------------------|-----------|
| 51 | Submit_short_message | SMT |
| 52 | Deliver_short_message | SMSC |
| 53 | Deliver_notification | SMSC |
| 54 | Modify_message | SMT |
| 55 | Inquiry_message | SMT |
| 56 | Delete_message | SMT |
| 57 | Response_inquiry_message | SMSC |
| 58 | Response_delete_message | SMSC |
| 59 | Submit_notification | SMT |

These messages have been introduced in order to provide more facilities to the SMSC users. If one of these operations is utilised during a session, it is assumed that the other (output) operations are supported as well. The SMSC initiated operations will always be those of the 50-series. Only in the cases mentioned in section 4.2, the SMSC will use the UCP01 operation.

5.1 Abstract Data Types

For a higher maintainability, a generic Abstract Data Type (ADT) is introduced for all operations described in this chapter. This means that all 50-series of EMI strings, including responses, shall contain all fields listed. In exception to this, depending on the value of 'MT', only one of the fields NMsg, AMsg or NB + TMsg shall be included. Fields not appropriate shall be left empty.

The following is a description of this generic ADT (where 'Num. string' indicates 'string of numeric char.'):

Table 5-2: Abstract Data Types 50-Series

| Member | Length | Type | Meaning |
|--------|--------|--------------|--|
| AdC | 16 | Num. String | Address Code Recipient for the SM OAdC 16 Num. String Address code originator. |
| | 22 | Char. String | If the OTOA field indicates alphanumeric OAdC. A 22-character string corresponds with a max. 11 character alphanumeric string. |

| Member | Length | Type | Meaning |
|--------|--------|---------------|--|
| AC | 16 | Num. String | Authentication Code Originator (min 4 char. max 16 char). |
| NRq | 1 | Num. Char. | Notification Request: 0 = NAdC not used 1 = NAdC used |
| NAdC | 16 | Num. String | Notification Address |
| NT | 1 | Num. Char. | Notification Type ¹ : Buffered Message Notification (BN) Delivery Notification (DN) Non-Delivery Notification (ND) 0 Default Value 1 = DN 2 = ND 3 = DN+ND 4 = BN 5 = BN+DN 6 = BN+ND 7 = All |
| NPID | 4 | 4 Num. Char. | Notification PID value: 0100 Mobile Station 0122 Fax Group 3 0131 X.400 0138 Menu over PSTN 0139 PC application over PSTN (E.164) 0339 PC application over X25 (X.121) 0439 PC application over ISDN (E.164) 0539 PC application over TCP/IP |
| LRq | 1 | 1 Num. Char. | Last Resort Address request: 0 = LRAd not used 1 = LRAd used |
| LRAd | 16 | Num. String | Last Resort Address |
| LPID | 4 | 4 Num. Char. | LRAd PID value: 0100 Mobile Station 0122 Fax Group 3 0131 X.400 0138 Menu over PSTN 0139 PC application over PSTN 0339 PC application over X.25 (X121) 0439 PC application over ISDN (E.164) 0539 PC application over TCP/IP |
| DD | 1 | 1 Num. Char. | Deferred Delivery requested: 0 = DDT not used 1 = DDT used |
| DDT | 10 | 10 Num. Char. | Deferred Delivery time in absolute timer format DDMMYYHHmm or in relative time format 0000mmmmmm. Relative time format specifies interval in minutes, after which message is delivered. |

¹) Compared to the GSM 03.39 specification the following differences can be noted:
EMI implementation : As mentioned above;
GSM Specification: 1=BN, 2=DN, 3=ND, 4=BN+DN, 5=BN+DN, 6=DN+ND, 7=all.

| Member | Length | Type | Meaning |
|------------|------------------|---------------|--|
| VP | 10 | 10 Num. Char. | Validity Period in absolute time format DDMMYYHHmm or in relative time format 0000mmmmmm. Relative time format specifies interval in minutes for which is message valid. |
| RPID | 4 | Num. String | Replace PID. Values according to TP-PID of [3GPP 23.040] ² : 0000-0255. Special values: 0064 (Type 0, user not alerted) 0065 ... 0071 (Replace Type 1-7) 0095 (Return Call Message) 0125 (ME Data download) 0126 (ME De-personalization) 0127 (SIM Data Download) |
| SCTS | 12 | Num. String | Service Centre Time Stamp (SCTS) in DDMMYYHHmss. For a SM this is the time stamp of the SM itself. For a Notification, this is the time stamp of the corresponding SM. |
| Dst | 1 | 1 Num. Char. | Delivery Status: 0 = Delivered 1 = Buffered (see Rsn) 2 = Not Delivered (see Rsn) |
| Rsn | 3 | 3 Num. Char. | Reason Code, value '000'...'255'. Code can be found in an SMSC configuration file witch can be changed by the operator. (See appendix A). |
| DSCTS | 12 | Num. String | Delivery Time Stamp in DDMMYYHHmss. Indicates the actual time of delivery of the short message. |
| MT | 1 | 1 Num. Char. | Message Type. Associated parameters depend on the value of MT. |
| MT=2: NMsg | 640 | Num. String | Numeric message |
| MT=3: AMsg | 640 | Char. String | Alphanumeric message encoded into IRA characters. |
| MT=4: NB | 4 | Num. Char. | No. of bits in Transparent Data (TD) message. |
| TMsg | 140 ³ | Char. String | TD message encoded into IRA characters. |
| MMS | 1 | 1 Num. Char. | More Messages to Send (to the same SME) |
| PR | 1 | 1 Char. | Priority Requested |
| DCs | 1 | 1 Num. Char. | Deprecated. Data Coding scheme: 0 = Default Alphabet 1 = User Defined Data ('8 bit') |
| MCLs | 1 | 1 Num. Char. | Message Class: 0 = Message class 0 1 = Message class 1 2 = Message class 2 3 = Message class 3 |

² The SMSC operator may apply limitations.

³ The length is 140 octets when the SMSC is used in a GSM environment and 160 octets when used in a TDMA/CDMA environment.

| Member | Length | Type | Meaning |
|--------|--------|--------------|--|
| RPI | 1 | 1 Num. Char. | Reply Path: 1 = Request 2 = Response |
| CPg | 1 | Num. String | (Reserved for Code Page) |
| RPLy | 1 | 1 Num. Char. | (Reserved for Reply type) |
| OTOA | 4 | 4 Num. Char. | Originator Type Of Address: 1139 OAdC is set to NPI telephone and TON international. 5039 OAdC contains an alphanumeric address. Leave OTOA empty for a numeric address in the OAdC. |
| HPLMN | 16 | Num. String | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | 400 | Num. String | Extra Services With the XSer field, one or more additional services can be specified. These services consist of IRA encoded data constructed in the following common format: TTLDD... TT: Represents two HEX characters defining the type of service. For a description of available services refer to section "XSer Extra Services Description" LL: Represents two HEX characters defining the number of octets present in the data field DD. (Note that the number of <i>HEX characters</i> in the data DD is twice the number of <i>octets</i>) DD...: Represents a stream of HEX characters defining the service specific data itself. If more than one additional service is to be specified in one message, this service information is concatenated without any separators, i.e., TT ₁ LL ₁ DD ₁ ...DD ₁ TT ₂ LL ₂ DD ₂ ...DD ₂ The above-mentioned construction is designed such that in the future additional service types can be added to the XSer field. |
| RES4 | x | Num. String | (Reserved for future use) |
| RES5 | x | Num. String | (Reserved for future use) |

x = Not specified yet

A generic ADT for the EMI response is defined as presented in the following tables.

For a positive response:

Table 5-3: Generic ADT for EMI Positive Response

| Member | Type |
|--------|--------------------------|
| ACK | Positive Acknowledgement |
| MVP | Modified Validity Period |
| SM | System Message |

For a negative response:

Table 5-4: Generic ADT for EMI Negative Response

| Member | Type |
|--------|--------------------------|
| NACK | Negative Acknowledgement |
| EC | Error Code |
| SM | System Message |

5.1.1 Application – Pass Alphanumeric OAdC

5.1.1.1 Encode Alphanumeric OAdC

This paragraph describes how an alphanumeric OAdC should be sent. This will be explained by using an example.

Suppose that the alphanumeric address is: [ALPHA@NUM](#)

In [3GPP 23.038] chapter “Default alphabet”, the 7-bit codes can be derived from the table.

These codes are:

| | | |
|---|---|----------|
| A | = | 100 0001 |
| L | = | 100 1100 |
| P | = | 101 0000 |
| H | = | 100 1000 |
| A | = | 100 0001 |
| @ | = | 000 0000 |
| N | = | 100 1110 |
| U | = | 101 0101 |
| M | = | 100 1101 |

The application packs the 7-bit characters in octets as defined in [3GPP 23.038] chapter “SMS Point-to-Point Packing”. The result is as follows:

| B7 | B6 | B5 | B4 | B3 | B2 | B1 | B0 | Result |
|----|----|----|----|----|----|----|----|--------|
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 41 |
| 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 26 |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 14 |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 19 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 04 |
| 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 38 |

This results in the following hexadecimal values:

0x41 0x26 0x14 0x19 0x04 0x38 0xAB 0x4D

The application should add the number of useful semi-octets within the alphanumeric address in front of these values, according to [3GPP 23.040]. The length should be added in

a byte (octet). In case of ALPHA@NUM, the number of useful semi-octets in the 7-bit encoded representation is 16 decimal (0x10 hexadecimal). This results in the following hexadecimal values:

0x10 0x41 0x26 0x14 0x19 0x04 0x38 0xAB 0x4D

Finally, this string should be converted to an ASCII string that can be used in the UCP message. Each nibble (4 bits) should be stored as ASCII character. The resulting ASCII string is:

10412614190438AB4D

This is the OAdC as it should be stored in a UCP message. The OTOA should be set to '5039' in the UCP message

Restrictions of the used IRA characters in an alphanumeric OAdC

There are no restrictions. All characters from the IRA alphabet can be used.

5.1.2 XSer Extra Services Description

The XSer field allows the specification of one or more additional services, all in the format TTLDD...DD, where TT field specifies the type of service, LL indicates the length of data and DD indicates zero or more data elements. The following subsections specify the supported service types.

It is possible to combine various Services in the XSer field. The order of the various Services in the XSer field is not important. However, each Type of Service should not occur more than once since each repeated occurrence would overwrite the previously set values.

5.1.3 XSer Type Of Service 00 – Not Used

This service type is reserved and should not be used.

5.1.4 XSer Type Of Service 01 – GSM UDH Information

With this service, type the *GSM User Data Header (UDH) information* can be specified. The data field DD of this service type contains the octets of the GSM UDH as specified in [3GPP 23.040]. (UDHL, IEIa, IEIDLa, IEDa, IEIb... IEIn, IEDLn, IEDn). Every UDH octet is encoded in two IRA hex characters, as usual in UCP. An example is given below.

The length of the *GSM UDH information*, related to the length of the Msg field content, is restricted to the maximum length of the GSM TP-UD field: 140 octets i.e. 160 septets. Depending on the MT field this is checked as follows:

- If MT = 2 or 3: The length of the UDH field (in octets), multiplied by 8/7, rounded up to the nearest integer value, plus the length of the NMsg/AMsg field (in octets) must not exceed 160 (septets).
- If MT = 4: The length of the UDH field (in octets) plus the length of the TMsg field (in octets) must not exceed 140 (octets).

There must be only one occurrence of *Type of service 01, GSM UDH information* in XSer.

5.1.4.1 Example Encoding of XSer Type Of Service 01 – GSM UDH Information

The GSM UDH information field consisting of the following two UDH information elements is to be encoded:

1. Concatenated short messages, concatenated short message reference number = 64, maximum number of short messages in the concatenated short message = 4, sequence number of the current short message = 2
2. Application Port Addressing 8 bit address, destination port = 240, originator port = 250

TTLDD... encoding in IRA characters: 010A0900034004020402F0FA

This same TTLDD... encoding annotated:

```
01 = TT, specifies XSer Type of service 01, GSM UDH information
0A = LL, specifies that DD part contains 10 octets
09 = DD, UDHL, Length of user data header = 9 octets
00 = DD, IEIa, Information-Element-Identifier a, Concatenated short
    messages
03 = DD, IEIDL a, Length of information element a = 3 octets
40 = DD, IEDa, Concatenated short message reference number = 64
04 = DD, IEDa, Max number of short messages in the concatenated
    message = 4
02 = DD, IEDa, Sequence number of the current short message = 2
04 = DD, IEIb, Information-Element-Identifier b, Application Port
    Addressing 8 bit
02 = DD, IEIDL b, Length of information element b = 2 octets
F0 = DD, IEDb, destination port = 240
FA = DD, IEDb, originator port = 250
```

5.1.5 XSer Type Of Service 02 – GSM DCS Information

The type of service always has a total length of 6 numeric characters. Therefore, the sequence TTLDD is set to:

TT = 02

LL=01

DD=00...FF

The meaning of the DCS values is explained in [3GPP 23.038].

Use the GSM DCS information field value 08 to send text in the Unicode character set [UCS2]. The MT field must be set to the value 4.

Use the GSM DCS information field to send 8-bit data coded short messages. The MT field must be set to the value 4. If the GSM DCS information field is not specified, MT=4 indicates an 8-bit coded short message and the MCLs (Message Class) must be specified.

Use the GSM DCS information field to send "Message Waiting Indication" updates to the mobile station.

Use the GSM DCS information field to send "Message Class Meaning". If the MCLs field is specified too, the GSM DCS information field overrules the MCLs field.

The use of the GSM DCS information field in the XSER field is limited to the UCP51, UCP52, UCP53 and UCP54 messages.

5.1.5.1 Example Encoding XSer Type Of Service 02 – GSM DCS Information:

020108, meaning that the DCS value 08 (0000 1000 binary) is used.

According to the [3GPP 23.038] specification, this means Unicode (UCS2).

5.1.6 XSer Types Of Service 03-0B – CDMA/TDMA Information Exchange

This section introduces 9 Types of Service that can be defined in the Extra Services (XSER) field. These services offer support for the information exchange to TDMA and CDMA mobile stations.

The XSER Types of Services are only applicable for UCP51 and UCP52 operations. Other operations do not support this extension.

The next table shows which information elements can be accessed or retrieved, using the UCP protocol operations. The first column is the Type of Service in the TTLDD sequence (some examples will follow). The second column describes the information element.

Table 5-5: Information Elements

| Type Of Service | Information Element | Mobile Network Technology |
|-----------------|-------------------------|---------------------------|
| 03 | Message Type | CDMA, TDMA |
| 04 | Message Reference | CDMA, TDMA |
| 05 | Privacy Indicator | CDMA, TDMA |
| 06 | Urgency Indicator | CDMA, TDMA |
| 07 | Acknowledgement Request | CDMA, TDMA |
| 08 | Message Updating | TDMA |
| 09 | Call Back Number | CDMA, TDMA |
| 0A | Response Code | CDMA, TDMA |
| 0B | Teleservice ID | CDMA, TDMA |

This section continues with a detailed description of these Types of Services. This section ends with an example showing the XSer field when some services are used simultaneously.

5.1.7 Type Of Service 03 – Message Type

This Service indicates the type of a message. It is only present in a delivery when the message involves an acknowledgement. It has exactly one data element (octet), which can have the following values:

Table 5-6: Message Type

| Value (Hex) | Meaning |
|-------------|--|
| 00 | Short Message (<i>Default</i>) |
| 01 | Delivery Acknowledgement Message Type (Read Receipt) |
| 02 | Manual Acknowledgement Message Type |
| 03-FF | <i>Reserved, do not use</i> |

The default value 00 may only be present for messages submitted via UCP. It shall not be set when delivering a message. If this Type of Service is absent from the XSer field, the default value indicating a normal short message is assumed.

An example of the Service 03 in the XSer field is the sequence **030102** (TTLDD), which means a *Manual Acknowledgement* message type.

5.1.8 Type Of Service 04 – Message Reference

The Message Reference is an identifier for a short message. The end user can use it as a handle to refer to an earlier submitted message. The data element is 2-octets long and represents a 16-bit integer number (for TDMA only the lower 13-bits may be used). The first data element in the sequence contains the most significant bits. If this Service is absent, the default value 0 is assumed.

Table 5-7: Message Reference

| Value (Hex) | Meaning |
|-------------|-----------------------------|
| 0000 - 1FFF | Message Reference |
| 2000 – FFFF | <i>Reserved, do not use</i> |

For example, the sequence **0402020A** (TLLDD) contains 522 as a short message identifier.

5.1.9 Type Of Service 05 – Privacy Indicator

This Type of Service indicates the privacy level of the short message. The size of the data element is 1-octet, which can have the following values:

Table 5-8: Privacy Indicator

| Value (Hex) | Meaning |
|-------------|-----------------------------------|
| 00 | Not Restricted (<i>Default</i>) |
| 01 | Restricted |
| 02 | Confidential |
| 03 | Secret |
| 04-FF | <i>Reserved, do not use</i> |

If the Privacy Indicator is not specified in the submitted message, the default value *Not Restricted* is assumed. The next example shows the XSer sequence (TLLDD) indicating a Privacy Level of *Secret*: **050103**.

5.1.10 Type of Service 06 – Urgency Indicator

This Type of Service indicates the priority of the short message to the end user. The size of this data element is 1-octet, which can have the following values:

Table 5-9: Urgency Indicator

| Value (Hex) | Meaning |
|-------------|-----------------------------|
| 00 | Bulk |
| 01 | Normal (<i>Default</i>) |
| 02 | Urgent |
| 03 | Very Urgent |
| 04-FF | <i>Reserved, do not use</i> |

When the Urgency Indicator has a value of 02 or 03, the SMSC shall attempt to deliver the message with priority. This can also be realized by setting the UCP field *Priority Requested*. However, both ways are independent and do not affect each other.

An example of the Service 06 is the sequence **060102** (TTLLDD), which means: Urgency Indicator set to *Urgent*.

5.1.11 Type Of Service 07 – Acknowledgement Request

This service indicates whether the sender of the short message requests an Acknowledgement. This Type of Service is absent in a delivery when no acknowledgement is requested. The size of the data element is 1-octet, which can have the following values:

Table 5-10: Acknowledgement Request

| Value (Hex) | Meaning |
|-------------|--|
| 00 | No Acknowledgement requested (<i>Default</i>) |
| 01 | Delivery Acknowledgement requested (read receipt) |
| 02 | Manual Acknowledgement requested |
| 03 | Both delivery and Manual Acknowledgement requested |
| 04-FF | <i>Reserved, do not use</i> |

An example of a valid XSer entry is **070101** (TTLLDD), which means that the field Acknowledgement Request is set to request a *Delivery Acknowledgement*.

5.1.12 Type of Service 08 – Message Updating

This Type of Service requests to replace a previously submitted message. It is only present when an update is requested. By default, a message is assumed a new message. The size of the data element is 1-octet, which can have the following values:

Table 5-11: Message Updating

| Value (Hex) | Meaning |
|-------------|-----------------------------|
| 00 | <i>New (Default)</i> |
| 01 | Replace in SMSC and SME |
| 02-FF | <i>Reserved, do not use</i> |

For example, **080101** (TTLLDD) is a valid XSer entry with the meaning: Message Updating set, replace the corresponding message in both the SMSC and the SME, if applicable.

5.1.13 Type of Service 09 – Call Back Number

This Service associates a Call Back Number information element with the short message. A Call Back Number information element consists of the call back number itself, Type of Number, Numbering Plan Identification, Presentation Indicator and Alpha Tag. See next table.

Table 5-12: Call Back Number

| Description | Abbreviation | Mandatory/Optional | Comment |
|---|--------------|--------------------|---|
| Call Back Number | CBN | Mandatory | |
| Call Back Type Of Number | CBN_TON | Optional | If not defined, TON is set to 'Unknown' as default. |
| Call Back Numbering Plan Identification | CBN_NPI | Optional | If not defined, NPI is set to 'ISDN/Telephony Numbering Plan' as default. |
| Call Back Number Presentation Indicator | CBNPI | Optional | If not defined zero is taken as default. |
| Call Back Number Alpha Tag | CBNAT | Optional | For future use. |

The Call Back Number Type of Service data part contains a (TTLDD...DD) on itself (the TTLDDs are nested). The next table presents the nested tag codes, which should be used within the Call Back Number Type of Service.

Table 5-13: Call Back Number Nested Tag Codes

| Abbreviation | Nested Tag Code | Length |
|--------------|-----------------|--|
| CBN | 01 | 1 to 16 octets. |
| CBN_TON | 02 | Optional, when defined always 1-octet of length. |
| CBN_NPI | 03 | Optional, when defined always 1-octet of length. |
| CBNPI | 04 | Optional, when defined always 1-octet of length. |
| CBNAT | 05 | Optional, length between 0 and 64 characters, IRA encoded. |

For each of the optional parameters, the default is taken when not defined. The Call Back Number Type of Service can be used to associate multiple⁴ Call Back Numbers information elements with the short message. To do this, define multiple 09 tags in the XSER field: for each Call Back Number information element, one tag. See the examples at the end of this section.

Each of the elements CBN, CBN_TON, CBN_NPI, CBNPI and CBNAT will now be described in details. The CBN consists of 1 to 16 digits IRA encoded. The CBN_TON and CBN_NPI elements are according to the TDMA specifications TIA/EIA-136-123-A.

The Call Back Number Presentation Indicator (CBNPI) controls the presentation and screening of the Call Back Number at the mobile station. The CBNPI is a bit field with the size of 1-octet. The bit field is arranged **b₇...b₀**; where **b₇** means, the most significant bit. Bits **b₇...b₄** are reserved and should always be set to zero. Bit 3 and 2 are the Provision bits. Bit 1 and 0 are the Presentation bits. The next tables show the different settings for the Provision and Presentation bits.

Table 5-14: Provision Bits

| Provision Bits (b ₃ ...b ₂) | Meaning |
|--|------------------------------|
| 00 | User provided, not screened. |

⁴ At this moment the SMSC accepts multiple definitions of Call Back Number information elements. However, only the first definition is really processed, others are ignored.

| Provision Bits (b ₃ ...b ₂) | Meaning |
|--|-------------------------------------|
| 01 | User provided, verified and passed. |
| 10 | User provided, verified and failed. |
| 11 | Network provided. |

Table 5-15: Presentation Bits

| Presentation Bits (b ₁ ...b ₀) | Meaning |
|---|------------------------------|
| 00 | Presentation Allowed |
| 01 | Presentation Restricted |
| 10 | Number not available |
| 11 | <i>Reserved, do not use.</i> |

When submitting a short message, the value of the screening part should be set to 00 in order to prevent rejection of the message. The default value for the Presentation Indicator is 00, *i.e.*, the presentation is set to *Presentation Allowed* and the screening is set to *User provided, not screened*.

The CBNAT⁵ is a string with a maximum length of 64 characters.

Consider the following example of the use of Type of Service 09 with a single Call Back Number:

Call back number 3456, default CBN_TON and CBN_NPI, CBNPI set to zero and CBNAT set to "Hello":

```
0910010433343536040100050B48656C6C6F
```

Consider the following example of the use of Type of service 09 with multiple Call Back Numbers:

First Call Back Number 3456, default CBN_TON and CBN_NPI, CBNPI set to zero and CBNAT set to "Hello World". Second Call Back Number 7777, default CBN_TON and CBN_NPI, CBNPI set to 01 and CBNAT not defined:

```
0910010433343536040100050B48656C6C6F0909010437373737040101
```

5.1.14 Type Of Service 0A – Response Code

The user may optionally set the Response Code in the Manual Acknowledgement Message. The meaning of the Response Code is specific for the Message Centre. The length of the data element is 1-octet.

Table 5-16: Response Code

| Value (Hex) | Description |
|-------------|---------------|
| 00 – 0F | Response Code |

⁵ At this moment the CBNAT string is accepted by the SMSC but not associated with the message. Instead an empty string is associated.

| Value (Hex) | Description |
|-------------|-----------------------------|
| 10 – FF | <i>Reserved, do not use</i> |

An example of a valid XSer entry is **0A010F** (TLLDD), which means: Response Code, code set to 0F (hex).

5.1.15 Type Of Service 0B – Teleservice Identifier

This Type of Service enables the user to select a specific Teleservice for the message. The size of the Teleservice Identifier field is 1-octet and the value of this field should be according to the table below:

Table 5-17: Teleservice Identifier

| Value (Hex) | Description |
|-------------|---|
| 00 | Cellular Messaging Teleservice (<i>Default</i>) |
| 01 – FF | <i>Reserved, do not use</i> |

At present, the only valid occurrence of the Teleservice Identifier is the sequence **0B0100**.

Example: using multiple Types of Service together in XSer

An example of combining various Services in the XSer field is the following sequence: **0301020601020402020A**. This sequence can be decomposed in three parts, namely **030102**, **060102** and **0402020A**. These three parts are the individual examples shown before for the Services Message Type (03), Urgency Indicator (06) and Message Reference (04). The explanations of the three parts can be found in the descriptions of the corresponding services.

5.1.16 XSer Type Of Service 0C – Billing Identifier

This type of service enables the SMT to send additional billing information to the SMSC [EMI-UCP-BILLID]. The Billing Identifier is only allowed in UCP51 and UCP54 messages sent by registered Large Accounts. All other UCP messages containing the Billing Identifier will be rejected.

The Billing Identifier data element is an alphanumeric field with a variable length of at least 0 and at most 20 characters. These characters need to be part of the Visible String character set as defined in *ITU-T*. Each character takes two hexadecimal positions. For information about the Billing Identifier Format see Billing Identifier Format in Appendix E below.

5.1.17 XSer Type Of Service 0D – Single Shot Indicator

This type of service indicates whether a short message is treated as Single Shot or not. Only Single Shot indications in UCP51 and UCP52 messages will be supported. The size of the data element is 1-octet, which can have the following values:

Table 5-18: Single Shot Identifier

| Value (Hex) | Description |
|-------------|--|
| 00 | Non-Single Shot Short Message (<i>Default</i>) |
| 01 | Single Shot Short Message |
| 02-FF | <i>Reserved, do not use</i> |

5.1.18 XSer Type Of Service 0E – Originator TON

This Type of Service enables the user to provide the type of number for the OAdC. The size of the Originator TON field is 1-octet and the value of this field should be according to the table below:

Table 5-19: Originator / Recipient TON

| Value (Hex) | Description |
|-------------|-----------------------------|
| 00 | TON Unknown |
| 01 | International Number |
| 02 | National Number |
| 03 | Network Specific Number |
| 04 | Short Number |
| 05 | Alphanumeric Number |
| 06 | Abbreviated Number |
| 07 -FF | <i>Reserved, do not use</i> |

5.1.19 XSer Type Of Service 0F – Originator NPI

This Type of Service enables the user to provide the NPI for the AdC. The size of the Originator NPI field is 1-octet and the value of this field should be according to the table below:

Table 5-20: Originator / Recipient NPI

| Value (Hex) | Description |
|-------------|---------------------------------|
| 00 | Unknown |
| 01 | Telephone numbering plan |
| 03 | Data numbering plan X25, X29 |
| 04 | Telex numbering plan - ISDN |
| 05 | Private numbering plan - TCP/IP |
| 06 -FF | <i>Reserved, do not use</i> |

5.1.20 XSer Type Of Service 10 – Recipient TON

This Type of Service enables the user to provide the type of number for the AdC. The size of the Recipient TON field is 1-octet and the value of this field should be according to Table 5-19: Originator / Recipient TON.

5.1.21 XSer Type Of Service 11 – Recipient NPI

This Type of Service enables the user to provide the NPI for the AdC. The size of the Recipient NPI field is 1-octet and the value of this field should be according to Table 5-20: Originator / Recipient NPI

5.1.22 XSer Type Of Service 12 – Message Original Submission Time

This Type of Service associates a Message Original Submission Time (MOST) information element with the short message. The MOST field consists of 12 numeric characters (octet string) in the following format: DDMMYYHHmmss (UCP Time Stamp format).

5.1.23 XSer Type Of Service 13 – Destination Network Type

This Type of Service enables the user to provide a network type associated with the destination address of a notification (operation 59 only). The size of the Destination Network Type field is 1-octet and the value of this field should correspond with the table below:

Table 5-21: Destination Network Type

| Value (Hex) | Description |
|--------------|-----------------------------|
| 00 | Unknown |
| 01 | GSM |
| 02 | TDMA |
| 03 | CDMA |
| 06 | iDEN |
| 04-05, 07-FF | <i>Reserved, do not use</i> |

5.1.24 XSer Types Of Service 14 – FF, Reserved

These types are reserved for future use and should not be used.

5.2 Standard String

The advantage of using the generic ADT for all new EMI operations is that one standard string can be used for all operations. The string is build according to the specifications in [ETSI 03.00] as follows:

```

stx <header> / <data> / <checksum> etx

stx = 02(hex)
etx = 03(hex)

```

The string header is build up in the same way as is done in UCP. The data field shall always contain **ALL fields** listed in the 5x series generic ADT. These fields are separated by “/”. If a member of the ADT is not used in a specific message type, its place in the data string is empty, but the field separators will be present (“//”).

For example, the data block for INQM (OAdC and AdC fields only) will look like:

```
..//55/O/012345/0324/////////.....
```

This format provides a high degree of flexibility as well as upwards compatibility to future EMI specifications. This does also apply for the responses. For example, the positive response message contains the MVP field. This field is only used for the SUBS message positive response; in all other cases this field is left empty. In the columns marked 'Presence' of the sections to follow, “M” indicates that the field is Mandatory, “O” indicates that the parameter is Optional and “-” indicates that the parameter will be empty.

5.3 Submit Short Message Operation -51

This operation is used to submit a short message to the SMSC. The operation can be used for short messages with an alphanumeric or a binary message text field. In the latter case, the MT parameter shall be set to "4".

Table 5-22: Submit Short Message Operation

| Member | Presence | Meaning |
|----------|----------|--|
| AdC | M | Address Code Recipient for the SM |
| OAdC | M | Address Code Originator |
| AC | O | Authentication Code Originator |
| NRq | O | Notification Request |
| NAdC | O | Notification Address |
| NT | O | Notification Type |
| NPID | O | Notification PID Value |
| LRq | O | Last Resort Address Request |
| LRAAd | O | Last Resort Address |
| LPID | O | LRAD PID Value |
| DD | O | Deferred Delivery Requested |
| DDT | O | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm |
| VP | O | Validity Period in DDMMYYHHmm or in 0000mmmmmm |
| RPID | O | Replace PID Value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmmss. |
| MT | M | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | O | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric Message encoded into IRA characters. |
| MT=4: NB | C | No. of bits in Transparent Data (TD) message. This field is M (Mandatory) if the TMsg field is used. |
| TMsg | O | TD Message encoded into IRA characters. |
| MMS | O | More Messages to Send (to the same SME). |
| PR | O | Priority Requested |
| DCs | - | Deprecated |
| MCLs | O | Message Class. Must be supplied when MT=4 and XSer "GSM DCS information" is not supplied. |

| Member | Presence | Meaning |
|--------|----------|---|
| RPI | O | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | O | Originator Type Of Address |
| HPLMN | - | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- If the AC field is used, it should contain at least 4 numeric characters in every message, which are not all equal to zero, otherwise it shall be rejected.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.
- If NRq is used, and NAdC and NPID are both used, then this address will be used as notification address.
- If NRq is used, and NAdC and NPID, or both are left empty, the notification is sent to the originator in the current session. The notification is deleted by the SMSC, if in this case:
 - The session is ended,
 - The originator is not known to the SMSC to have more than one address,
 - The originator is not a mobile user submitting messages via a UCP application (option 'Mobile Subscriber Access via Fixed Network')
 - The notification has not yet been delivered.
- If LRq is used, and LRAd and LPID are both used, then this address (user supplied) will be used as Last Resort address.
- If LRq is used, and LRAd, LPID, or both are left empty, then the Last Resort address is the current session. The short message is deleted by the SMSC, if in this case:
 - The session is ended,
 - The originator is not known to the SMSC to have more than one address,
 - The short message has not yet been delivered.
- If LRq is empty, the contents of LRAd and LPID are ignored.
- If DD is used, then DDT is mandatory.
- The priority message field PR can only be used if the originator is subscribed to this service.
- If RPID value 0127 (SIM Data Download) is used, MT must be 4 and either MCLs must be 2 or XSer "GSM DCS information" must be 0xF6 otherwise the message is rejected. RPID value 0127 (SIM Data Download) is only supported for registered Large Accounts. Last resort addressing and Reply path functionality is not applicable to this type of message. The contents of LRq and RPI are ignored.
- If the MCLs field is also specified, the GSM DCS information field in the XSER field overrules the MCLs field.

- If the originator of the UCP51 message is not registered in the SMSC as being an LA and the Billing Identifier in the XSER field is used, then the UCP51 operation will be rejected with error code 04 "Operation not allowed".

Examples:

- Alphanumeric message 'Message 51' with validity period set and with notification request to a PC application over TCP/IP.

```
18/00113/O/51/012345/09876//1/1920870340125000/4/0539/////3012961212/////3//4D65737
3616765203531//////////CD
```

- TD message with deferred delivery set and notification request within the session for all types of notification

```
39/00099/O/51/0657467/078769//1//7//1/0545765/0122/1/0808971800/////4/32/F5AA34DE///
/1/////////65
```

5.3.1 Submit Short Message Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-23: Parameter Positive Result Data Field Submit Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive acknowledgement |
| MVP | String of Char. | O | Modified validity period |
| SM | String of Char. | O | System message |

The SM parameter contains the three fields presented in the following table.

Table 5-24: Short Message Parameter Field Submit Short Message Operation

| SM Parameter | Type | Description |
|--------------|-------------------------|--|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. |
| SEP | Char ":" | Separator |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmmss. |

Example:

- 00/00039/R/51/A//012234:090996101010/68

5.3.2 Submit Short Message Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-25: Parameter Negative Result Data Field Submit Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|--------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|----------------|
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/51/N/31//07

5.4 Delivery Short Message Operation -52

This operation (DELS) is used to deliver a short message. The operation is initiated by the SMSC and answered by the SMT.

Table 5-26: Delivery Short Message Operation

| Member | Presence | Meaning |
|----------|----------|--|
| AdC | M | Address Code Recipient for the SM |
| OAdC | M | Address Code Originator |
| AC | - | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity Period in DDMMYYHHmm or in 0000mmmmmm |
| RPID | O | Replace PID Value |
| SCTS | M | Service Centre Time Stamp in DDMMYYHHmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmss. |
| MT | M | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | O | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric message encoded into IRA characters. |
| MT=4: NB | C | No. of bits in Transparent Data (TD) message. This field is M (Mandatory) if the TMsg field is used. |
| TMsg | O | TD message encoded into IRA characters. |

| Member | Presence | Meaning |
|--------|----------|--|
| MMS | O | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | O | Deprecated; applications must ignore this field and retrieve message-coding information from XSer "GSM DCS information". |
| MCLs | O | Message Class |
| RPI | O | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- If the recipient of the UCP52 operation is registered in the SMSC as being an LA, the MSC ISDN address of the mobile originator is stored in the HPLMN field when the option HOMEPLMN_IN_UCP52 is active.
- If the recipient of the UCP52 operation is registered in the SMSC as being an LA, and the originator of the short message has made the message anonymous (Hide CLI), then the OAdC field contains the used SMSC address.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.
- Recipients of UCP52 operations with a UDH specified in the XSer field must be registered in the SMSC as LA's.
- If the MCLs field is also specified, the GSM DCS information field in the XSER overrules the MCLs field.
- If the Billing Identifier in the XSER field is used in a UCP52 operation, the short message will be rejected with error code 02 "Syntax error".

Example:

- Alphanumeric message 'Call you back later.' received from originator 07686745
00/00120/O/52/076523578/07686745//////////120396111055////3//43616C6C20796F752062
61636B206C617465722E///0//////////A3

5.4.1 Delivery Short Message Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-27: Parameter Positive Result Data Field Delivery Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | String of Char. | - | Modified Validity Period |

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|----------------|
| SM | String of Char. | O | System Message |

Example:

- 00/00039/R/52/A//076567:010196010101/6C

5.4.2 Delivery Short Message Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-28: Parameter Negative Result Data Field Delivery Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/52/N/01//05

5.5 Delivery Notification Operation -53

This operation (DELN) is used to indicate the (changed) status of a previously submitted short message to the SMSC. The operation is initiated by the SMSC.

Table 5-29: Delivery Notification Operation

| Member | Presence | Meaning |
|--------|----------|--|
| AdC | M | Address Code Recipient for the SM |
| OAdC | M | Address Code Originator |
| AC | - | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity Period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | O | Replace PID value; present when the original SM's delivery acknowledgement contains a PID value. |

| Member | Presence | Meaning |
|----------|----------|--|
| SCTS | M | Service Centre Time Stamp in DDMMYYHHmmss. This is the time stamp of the corresponding short message. |
| Dst | M | Delivery Status |
| Rsn | M | Reason Code |
| DSCTS | M | Delivery Time Stamp in DDMMYYHHmmss. Indicates the time of (non-) delivery of the corresponding short message, or the time of creation of this notification. |
| MT | M | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | - | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message |
| AMsg | O | Alphanumeric message encoded into IRA characters. |
| MT=4: NB | C | No. of bits in Transparent Data (TD) message This field is M (Mandatory) if the TMsg field is used. |
| TMsg | O | TD message encoded into IRA characters. |
| MMS | O | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | - | Message Class |
| RPI | - | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | - | Originator Type of Address |
| HPLMN | - | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- If the recipient of the UCP53 operation is registered in the SMSC as being an LA, and the originator of the short message has made the message anonymous (Hide CLI), then the OAdC field contains the used SMSC address.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.

Example:

- Notification 'Message for 315555, with identification 960109161057 has been buffered' received

```
00/00234/O/53/1299998/315555//////////090196161057/1/108/090196161105/3//4D657373
61676520666F7220333135353535352C2077697468206964656E74696669636174696F6E2
039363031303931363130353720686173206265656E206275666665726564//////////1F
```

5.5.1 Delivery Notification Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-30: Parameter Positive Result Data Field Delivery Notification Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | String of Char. | - | Modified Validity Period |
| SM | String of Char. | O | System Message |

Example:

- 00/00032/R/53/A//020296020202/F2

5.5.2 Delivery Notification Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-31: Parameter Negative Result Data Field Delivery Notification Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/53/N/02//07

5.6 Modify Short Message Operation - 54

The operation requires option 014 on the SMSC.

This operation is used to modify a previously submitted short message, which is still buffered in the SMSC. The originally submitted has to be a UCP51 operation. The AdC field in combination with the SCTS field identifies the message to be modified. Extra security is provided by an optional check on the OAdC and the AC field.

The message that is buffered in the SMSC will be identified by the modify operation as the message to be modified, in the following cases.

1. Calling Line Identification (CLI) Available

AdC, OAdC and SCTS should all match. If the AC field was used in the original submitted message, this must match as well. If the CLI address differs from the OAdC field, then the CLI address must match as well.

2. No Calling Line Identification Available

AdC, OAdC, AC and SCTS of the original message and the modify operation should all match and all be filled in.

Furthermore, if the original message was submitted via a port on the SMSC that is associated with a Virtual SMSC (VSMSC), then the modify operation has to be sent via the same VSMSC. If the message is not found in the SMSC, a negative acknowledge is returned.

The above implies that the recipient address, originator address, authentication code and timestamp of a previously submitted message cannot be changed.

All other fields can be changed. If a field is left empty in the modify operation, it will leave the related field in the original submitted short message unchanged. Below the effect is described in more detail.

1. Notifications

- If Nrq is empty, no changes are made. The contents of NAdC, NPID and NT are ignored.
- If Nrq is "0", the notification request is cancelled. The contents of NAdC, NPID and NT are ignored.
- If Nrq is "1", then NAdC and NPID must be both either left empty or both used, otherwise a negative acknowledge is returned.
- If Nrq is "1" and NAdC and NPID are left empty, the notification is sent to the originator in the current session. The notification is deleted by the SMSC, if in this case:
 - The originator is not known to the SMSC to have more than one address,
 - The originator is not a mobile user submitting messages via a UCP application (option 'Mobile Subscriber Access via Fixed Network'),
 - The notification has not been delivered.
- NT can only be used if NRq is set to "1", otherwise the contents of this field is ignored.

2. Last Resort

- If LRq is "1", then a Last Resort Address is requested. LRAd and LPID are mandatory, otherwise a negative acknowledge is returned.
- If LRq is empty, no changes are made. LRAd and LPID must be empty otherwise a negative acknowledge is returned.
- If LRq is "0", the Last Resort Address request is cancelled. The contents of LRAd and LPID are ignored.

3. Deferred Delivery Time

- DDT can only be set if the original message to be modified is already scheduled for deferred delivery, otherwise the contents of this field are ignored.

4. Validity Period

- VP should be larger than the current time (time when the UCP54 is received by the SMSC) and smaller than the maximum validity period of the SMSC, otherwise a negative acknowledge is returned.
- VP should be larger than the deferred delivery time (if used), otherwise a negative acknowledge is returned.

5. Replace PID

- If a RPID value (other than 0127 (SIM Data Download)) is used that is already in use by a buffered message for the same recipient, a negative acknowledge is returned.
- If RPID contains an invalid value, then a negative acknowledge is returned.
- If RPID value 0127 (SIM Data Download) is used: see section "Submit Short Message Operation -51".

6. Message Type

- If MT is set to “4” (binary message), then the fields NB and TMsg should be filled in. Either the field MCLs should be supplied or the XSer “GSM DCS information” should be supplied. Otherwise, a negative acknowledge is returned.

7. Reply Path

- The field RPI can only be set to “1” (reply path request) or left empty, otherwise a negative acknowledge is returned. Note that a reply request cannot be cancelled.

8. Billing Identifier

- If the Billing Identifier tag is not present in the XSer field, no changes are made to the Billing Identifier.
- If the Billing Identifier tag is present, but the length of the data part is zero, then the Billing Identifier is cleared (all bytes put to zero).
- If the Billing Identifier tag is present and the length of the data part is not zero, then the value of the Billing Identifier is changed.

Table 5-32: Modify Short Message Operation

| Member | Presence | Meaning |
|----------|----------|--|
| AdC | M | Address Code Recipient for the SM to be modified |
| OAdC | M | Address Code Originator of the SM to be modified |
| AC | O | Authentication Code Originator of the SM to be modified |
| NRq | O | Notification Request |
| NAdC | O | Notification Address Code |
| NT | O | Notification Type |
| NPID | O | Notification PID Value |
| LRq | O | Last Resort Request |
| LRAd | O | Last Resort Address |
| LPID | O | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | O | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | O | Validity Period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | O | Replace PID Value |
| SCTS | M | Service Centre Time Stamp that identifies the message in the SMSC that is to be modified, in DDMMYYHHmmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmmss. |
| MT | O | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | O | Numeric Message |

| Member | Presence | Meaning |
|----------|----------|--|
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric message encoded into IRA characters. |
| MT=4: NB | M | No. of bits in Transparent Data (TD) message. |
| TMsg | O | TD message encoded into IRA characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | O | Message Class. See section "Submit Short Message Operation -51". |
| RPI | O | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | O | Originator Type Of Address |
| HPLMN | - | Home PLMN Address; E.164 number of the originating MSC. |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- When the AC field is used, it should contain at least 4 numeric characters in every message, which are not all equal to zero, otherwise it shall be rejected.
- If a message is to be modified that was conditionally or unconditionally forwarded, a negative acknowledge is returned.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.
- A UCP 54 operation that requires modification of the message contents of a buffered message that contains a UDH is rejected by the SMSC.
- UCS2 as well as GSM Message Waiting Indications can be supplied in the GSM DCS information field in the UCP XSer field. Hereby, UCS2 messages can also be modified.
- If the GSM DCS information field is specified in the UCP XSer field, the UCP MCLs field is over-ruled and does not have to be supplied.
- If the stored message contains message content, the UCP54 message must have the same alphabet and compression or new message content must be supplied else the operation is rejected.
- GSM Message Waiting Indications can be modified only if no MT and NMsg, AMsg or TMsg is supplied and the alphabet and compression is the same as of the stored message.
- If the originator of the UCP51 message is not registered in the SMSC as being a Large Account (LA), and the Billing Identifier in the XSER field is used, then the UCP54 operation will be rejected with error code 04 "Operation not allowed".

Examples:

- Previously submitted message to recipient 012345 with timestamp 010197120501 is modified with a new (mobile) last resort address 0654321.

Table 5-36: Inquiry Message Operation

| Member | Presence | Meaning |
|----------|----------|---|
| AdC | M | Address Code Recipient for the SM |
| OAdC | M | Address Code Originator |
| AC | O | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | - | Replace PID Value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmss. |
| MT | - | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | - | Numeric message. |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | - | Alphanumeric message encoded into IRA characters. |
| MT=4: NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IRA characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | - | Message Class |
| RPI | - | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | O | Originator Type Of Address |
| HPLMN | - | Home PLMN Address; E.164 number of the originating MSC. |

| Member | Presence | Meaning |
|--------|----------|---------|
| XSer | - | |
| RES4 | - | |
| RES5 | - | |

- When the AC field is used, it should contain at least 4 numeric characters in every message, which are not all equal to zero, otherwise it shall be rejected.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.

Example:

- Inquiry message on recipient 0786483 from originator 0786875676
65/00066/O/55/0786483/0786875676////////////////////////////////////7B

5.7.1 Inquiry Message Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-37: Parameter Positive Result Data Field Inquiry Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | String of Char. | - | Modified Validity Period |
| SM | String of Char. | O | System Message |

Example:

- 00/00032/R/55/A//030395030303/F8

5.7.2 Inquiry Message Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-38: Parameter Negative Result Data Field Inquiry Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 09/00022/R/55/N/02//12

5.8 Response Inquiry Message Operation -57

This operation is initiated by the SMSC in response to an Inquiry message operation. If necessary, the SMSC will start a dial-back session.

Table 5-39: Response Inquiry Message Operation

| Member | Presence | Meaning |
|----------|----------|---|
| AdC | M | Address Code Recipient for this operation |
| OAdC | - | Address Code Originator |
| AC | - | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity Period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | - | Replace PID Value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmmss. |
| MT | M | Message Type. |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | - | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric Message encoded into IRA characters. It Contains the recipient address and the time stamps (format YYMMDDhhmmss) of the buffered short message(s), separated by spaces. Format: [TEXT1] <AdC> [TEXT2] {TIMESTAMP}. |
| MT=4: NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IRA characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | - | Message Class |
| RPI | - | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |

| Member | Presence | Meaning |
|--------|----------|---|
| OTOA | - | Originator Type Of Address |
| HPLMN | - | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | - | |
| RES4 | - | |
| RES5 | - | |

- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.

Example:

- There are no messages for 0666666 waiting to be send

```
17/00098/O/57/55555/3//44657374696E6174696F6E3A2030363636363620/1//
//37
```

5.8.1 Response Inquiry Message Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-40: Parameter Positive Result Data Field Response Inquiry Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | String of Char. | - | Modified Validity Period |
| SM | String of Char. | O | System Message |

Example:

- 00/00020/R/57/A//9A

5.8.2 Response Inquiry Message Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-41: Parameter Negative Result Data Field Response Inquiry Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 47/00022/R/57/N/02//16

5.9 Delete Message Operation -56

This operation is initiated by the SMT to delete one or more buffered short messages.

Table 5-42: Delete Message Operation

| Member | Presence | Meaning |
|----------|----------|---|
| AdC | M | Address Code Recipient for the SM |
| OAdC | M | Address Code Originator |
| AC | O | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity Period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | - | Replace PID Value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmss. |
| MT | M | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | - | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric message encoded into IRA characters. Contains the time stamps (format YYMMDDhhmss) of the buffered short message(s), separated by spaces. Format: TIMESTAMP {TIMESTAMP}. |
| MT=4: NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IRA characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | - | Message Class |
| RPI | - | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | O | Originator Type Of Address |

| Member | Presence | Meaning |
|--------|----------|---|
| HPLMN | - | Home PLMN Address; E.164 number of the originating MSC. |
| XSer | - | |
| RES4 | - | |
| RES5 | - | |

- When the AC field is used, it should contain at least 4 numeric characters in every message that are not all equal to zero, otherwise it shall be rejected.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.

Example:

- Delete messages with timestamps '960901113944 960808122222' for recipient 0546546 from originator 08456556

```
12/00115/O/56/0546546/08456556//////////3//39363039303131313339343420393630383038313232323232//////////2A
```

5.9.1 Delete Message Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-43: Parameter Positive Result Data Field Delete Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | String of Char. | - | Modified Validity Period |
| SM | String of Char. | O | System Message |

Example:

- 10/00032/R/56/A//040497161604/07

5.9.2 Delete Message Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-44: Parameter Negative Result Data Field Delete Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/56/N/01//09

5.10 Response Delete Message Operation -58

This operation is initiated by the SMSC to indicate which short messages have been deleted successfully.

Table 5-45: Response Delete Message Operation

| Member | Presence | Meaning |
|----------|----------|---|
| AdC | M | Address Code Recipient for this operation |
| OAdC | - | Address Code Originator |
| AC | - | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm. |
| VP | - | Validity Period in DDMMYYHHmm or in 0000mmmmmm. |
| RPID | - | Replace PID Value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmss. |
| Dst | - | Delivery Status |
| Rsn | - | Reason Code |
| DSCTS | - | Delivery Time Stamp in DDMMYYHHmss. |
| MT | M | Message Type. |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | - | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric message encoded into IRA characters. Contains the recipient address and the time stamps (format YYMMDDhhmmss) of the deleted short message(s), separated by spaces. Format: [TEXT3] <AdC> [TEXT4] (TIMESTAMP) [TEXT5]. |
| MT=4: NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IRA characters. |
| MMS | O | More Messages to Send (to the same SME) |
| PR | - | (Reserved for Priority Requested) |
| DCs | - | Deprecated |
| MCLs | - | Message Class |

Example:

- 00/00027/R/58/N/02/07567/1A

5.11 Submit Notification Operation -59

This operation is used to submit a notification to the SMSC. The notification indicates status of a short message but is handled without any relation to the original short message. The notification can contain an alphanumeric or a binary text field. In the latter case, the MT parameter shall be set to "4".

Table 5-48: Submit Notification Operation

| Member | Presence | Meaning |
|----------|----------|--|
| AdC | M | Address Code Recipient of the notification |
| OAdC | M | Address Code Originator |
| AC | O | Authentication Code Originator |
| NRq | - | Notification Request |
| NAdC | - | Notification Address |
| NT | - | Notification Type |
| NPID | - | Notification PID Value |
| LRq | - | Last Resort Address Request |
| LRAAd | - | Last Resort Address |
| LPID | - | LRAD PID Value |
| DD | - | Deferred Delivery Requested |
| DDT | - | Deferred Delivery Time in DDMMYYHHmm or in 0000mmmmmm |
| VP | O | Validity Period in DDMMYYHHmm or in 0000mmmmmm |
| RPID | - | Replace PID Value |
| SCTS | M | Service Centre Time Stamp in DDMMYYHHmss. |
| Dst | M | Delivery Status |
| Rsn | M | Reason Code |
| DSCTS | M | Delivery Time Stamp in DDMMYYHHmss. |
| MT | M | Message Type |
| MT=2: NB | - | No. of bits in Transparent Data (TD) message. |
| NMsg | O | Numeric Message |
| MT=3: NB | - | No. of bits in Transparent Data (TD) message. |
| AMsg | O | Alphanumeric Message encoded into IRA characters. |
| MT=4: NB | C | No. of bits in Transparent Data (TD) message. This field is M (Mandatory) if the TMsg field is used. |
| TMsg | O | TD Message encoded into IRA characters. |
| MMS | - | More Messages to Send (to the same SME). |
| PR | - | Priority Requested |

| Member | Presence | Meaning |
|--------|----------|--|
| DCs | - | Deprecated |
| MCLs | O | Message Class. It must be supplied when MT=4 and XSer "GSM DCS information" is not supplied. |
| RPI | - | Reply Path |
| CPg | - | (Reserved for Code Page) |
| RPLy | - | (Reserved for Reply type) |
| OTOA | O | Originator Type Of Address |
| HPLMN | - | Home PLMN Address. E.164 number of the originating MSC. |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- If the AC field is used, it should contain at least 4 numeric characters in every message, which are not all equal to zero, otherwise it shall be rejected.
- Notifications cannot be segmented, the maximum length of AMsg represents 160 characters and NMsg is 160 digits.
- If the MCLs field is also specified, the GSM DCS information field in the XSER field overrules the MCLs field.
- The XSer Type Of Service 04 – Message Reference is mandatory for Submit Notification Operation.
- The XSer Type Of Service 13 – Destination Network Type is mandatory for Submit Notification Operation in case of a multimode SMSC.

Example:

- A Submit Notification 'Message 59' with Destination Network set to GSM. The notification indicates a message delivery failure due to a temporary reason.

```
00/00107/O/59/00123456789/9876//////////010109230000/1/001/010109230130/3//////////04
020012130101///43
```

5.11.1 Submit Notification Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 5-49: Parameter Positive Result Data Field Submit Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive acknowledgement |
| MVP | String of Char. | O | Modified validity period |
| SM | String of Char. | O | System message |

The SM parameter contains the three fields presented in the following table.

Table 5-50: SM Parameter Field of Submit Notification Operation

| SM Parameter | Type | Description |
|--------------|-------------------------|--|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. |
| SEP | Char ":" | Separator |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmmss. |

Example:

- 00/00039/R/59/A//012234:090996101010/70

5.11.2 Submit Notification Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 5-51: Parameter Negative Result Data Field Submit Short Message Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/59/N/31//0F

6 EMI Operations 60-Series

This chapter introduces the 60-series of operations. The 60-series are used in combination with registered SMTs. The following table defines these operations:

Table 6-1: 60-Series of EMI Messages

| EMI Operation | Name | Initiated |
|---------------|--------------------|-----------|
| 60 | Session Management | SMT |
| 61 | List Management | SMT |

6.1 Abstract Data Types

For a higher maintainability, a generic Abstract Data Type (ADT) is introduced for all operations described in this chapter. This means that all 60-series of EMI strings, including responses, shall contain all fields listed, fields not appropriate shall be left empty.

The following table is a description of this generic ADT (where 'Num. string' indicates 'string of numeric char.'):

Table 6-2: Abstract Data Types 60-Series

| Member | Length | Type | Meaning |
|--------|--------|-----------------------------|--|
| OAdC | 16 | Num. String or Char. String | Address code originator |
| OTON | 1 | Num. Char. | Originator Type of Number |
| ONPI | 1 | Num. Char. | Originator Numbering Plan Id |
| STYP | 1 | Num. Char. | Subtype of operation |
| PWD | 16 | Char. String | Current password encoded into IRA characters |
| NPWD | 16 | Char. String | New password encoded into IRA characters |
| VERS | 4 | Num. String | Version number |
| LAdC | 16 | Num. String | Address for VSMSC list operation |
| LTON | 1 | Char. String | Type of Number list address |
| LNPI | 1 | Char. String | Numbering Plan Id list address |
| OPID | 2 | Num. String | Originator Protocol Identifier |
| RES1 | x | Num. String | (Reserved for future use) |

The following tables present a generic ADT for the EMI response.

For a positive response:

Table 6-3: Generic ADT for EMI Positive Response

| EMI Operation | Type |
|---------------|--------------------------|
| ACK | Positive Acknowledgement |
| SM | System Message |

For a negative response:

Table 6-4: Generic ADT for EMI Negative Response

| EMI Operation | Type |
|---------------|--------------------------|
| NAck | Negative Acknowledgement |
| EC | Error Code |
| SM | System Message |

6.2 Standard String

The advantage of using the generic ADT for all new EMI operations is, that one standard string can be used for all operations. The string is build according to the specifications in [ETSI 03.00] as follows:

```
stx <header> / <data> / <checksum> etx
```

- o stx = 02(hex)
- o etx = 03(hex)

The string header is build up in the same way as is done in UCP.

The data field shall always contain **ALL fields** listed in the 6x series generic ADT. These fields are separated by "/". If a member of the ADT is not used in a specific message type, its place in the data string is empty, but the field separators will be present ("/").

This format provides a high degree of flexibility as well as upwards compatibility to future EMI specifications.

In the columns marked 'Presence' of the sections to follow, "M" indicates that the field is Mandatory, "O" indicates that the parameter is Optional and "-" indicates that the parameter shall be empty.

6.3 Session Management Operation -60

This operation provides the facility to open a session, and to modify the submit and provisioning passwords.

Table 6-5: Session Management Operation

| Member | Presence | Meaning |
|--------|----------|---|
| OAdC | M | Any valid X.121, E.164, TCP/IP or abbreviated address or System ID, excluding prefixes. |

| Member | Presence | Meaning |
|--------|----------|--|
| OTON | O | Originator Type of Number: 1 = International number (starts with the country code) 2 = National number (default value if omitted) 6 = Abbreviated number (registered LA identification) |
| ONPI | O | Originator Numbering Plan Id: 1 = E.164 address (default value if omitted) 3 = X121 address 5 = SMSC specific: Private (TCP/IP address/abbreviated number) |
| STYP | M | Subtype of operation: 1 = open session 2 = reserved 3 = change password 4 = open provisioning session 5 = reserved 6 = change provisioning password |
| PWD | M | Current password encoded into IRA characters. |
| NPWD | O | New password encoded into IRA characters. |
| VERS | M | Version number '0100'. |
| LAdC | - | Address for VSMSC list operation. |
| LTON | - | Type of Number list address. |
| LNPI | - | Numbering Plan Id list address. |
| OPID | O | Originator Protocol Identifier: 00 = Mobile station 39 = PC application |
| RES1 | - | |

- OAdC may contain abbreviated Short Number (LA ID) or alphanumeric LA System ID.
- For System ID, OTON=5 and ONPI is ignored. Any alphanumeric string up to 15 characters long can be entered to OAdC.
- If ISDN is used as access method to the SMSC, then the ONPI field should remain empty.
- In case STYP=4 or STYP=6 (provisioning), the physical address from which the connection is set up (CLI-address) is **not checked**. That is, the connection may be set up from any address.
- The session setup is refused by the SMSC when:
 - The physical address is to be screened **and** STYP=1 or STYP=3 **and** the CLI-address (connect address) is not registered in the SMSC,
 - OAdC contains alphanumeric SYSTEM_ID and OTON is different from 5,
 - OAdC contains abbreviated Short Number and OTON=5,
 - OAdC contains an address or abbreviated Short Number or SYSTEM_ID that is not a registered LA,
 - The supplied password does not match.

Example:

- 02/00059/O/60/07656765/2/1/1/50617373776F7264//0100/////61

6.3.1 Session Management Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 6-6: Parameter Positive Result Data Field Session Management Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

Example:

- 00/00019/R/60/A//6D

6.3.2 Session Management Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 6-7: Parameter Negative Result Data Field Session Management Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/60/N/01//04

6.4 Provisioning Actions Operation -61

With this operation, items can be verified, added or removed from the mobile originated and mobile terminated lists.

Table 6-8: Provisioning Actions Operation

| Member | Presence | Meaning |
|--------|----------|--|
| OAdC | M | Any valid X.121, E.164, TCP/IP or abbreviated address or SYSTEM_ID, excluding prefixes. |
| OTON | O | Originator Type of Number: 1 = International number (starts with the country code) 2 = National number (default value if omitted) 6 = Abbreviated number (Short Number alias) |
| ONPI | O | Originator Numbering Plan Id: 1 = E.164 address (default value if omitted) 3 = X121 address 5 = SMSC specific: Private (TCP/IP address/abbreviated number address) |

| Member | Presence | Meaning |
|--------|----------|---|
| STYP | M | Subtype of operation: 1 = Add item to MO list 2 = Remove item from MO list 3 = Verify item MO list 4 = Add item to MT list 5 = Remove item from MT list 6 = Verify item MT list |
| PWD | - | Current password encoded into IRA characters. |
| NPWD | - | New password encoded into IRA characters. |
| VERS | M | Version number '0100'. |
| LAdC | M | Address to be 'filled in', 'removed from' or 'checked in' a VSMSC list, containing a valid X.121, E.164 or TCP/IP address excluding prefixes. |
| LTON | O | Type of Number list address: 1 = International number (starts with the country code) 2 = National number (default value if omitted) |
| LNPI | O | Numbering Plan Id list address: 1 = E.164 address (default value if omitted) 3 = X121 address 5 = TCP/IP address |
| RES1 | - | |
| RES2 | - | |

Example:

- 00/00058/O/61/04568768///2///0100/1920870340094000//5///06



For UCP 61 operation, the same rules related to OAdC, combination of an abbreviated address and SYSTEM_ID with OTON apply as for the UCP 60 operation.

6.4.1 Provisioning Actions Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 6-9: Parameter Positive Result Data Field Provisioning Actions Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

Example:

- 00/00019/R/61/A//6E

6.4.2 Provisioning Actions Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 6-10: Parameter Negative Result Data Field Provisioning Actions Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

Example:

- 00/00022/R/61/N/02//06 SMT Alert Operation

6.5 SMT Alert Operation -31

This operation can be used by an SMT to alert the SC to start delivering pending messages. The following table shows the parameters in the operation data field:

Table 6-11: Parameter Operation Data Field SMT Alert Operation

| Parameter | Type | Presence | Description |
|-----------|----------------------|----------|--|
| AdC | String of Num. Char. | M | Address code for the SMT, maximum length is 16 digits. |
| PID | 4 Num. Char. | M | SMT PID value: 0100 Mobile Station 0122 Fax Group 3 0131 X.400 0138 Menu over PSTN 0139 PC Application via PSTN 0339 PC Application via X.25 0439 PC Application via ISDN 0539 PC Application via TCP/IP 0639 PC Application via abbreviated number |



PID value 0639 can only be used to alert for the own (originator) address and if the abbreviated number is the OAdC of the corresponding 60 operation 'open session'.

Example:

- Alert requested on PSTN number 0234765439845

02/00035/O/31/0234765439845/0139/A0

6.5.1 SMT Alert Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 6-12: Parameter Positive Result Data Field SMT Alert Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

If used, the positive SMT Alert Operation result text SM parameter will contain the number of messages waiting in the SC destined for the subscriber the alert was generated for. The number consists of four digits and contains leading zeros. When the number of messages

waiting in the SC is more than 9,999, the number 9999 will be returned as the number of messages waiting. In case the alert address is a Multiple Address LA, the number of messages waiting is always returned as '0000', independent of the actual number of waiting messages.

Example:

- 04/00024/R/31/A/0003/5D

6.5.2 SMT Alert Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 6-13: Parameter Negative Result Data Field SMT Alert Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

The following error codes can be returned in the operation negative result:

| | |
|----|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 04 | Operation not allowed (at this point in time) |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |
| 24 | Message too long |
| 26 | Message type not valid for the pager type |

Example:

- 7 00/00022/R/31/N/06//07

7 Legacy Operations Syntax

7.1 Call Input Operation -01

This operation can be used by the SMT to submit a message to the SMSC. This operation is also used by the SMSC to deliver short messages and notifications to an SMT user in the following cases:

- The SMSC operator provides the UCP behaviour of previous SMSC releases, i.e., the UCP01 operation is used to deliver a mobile originated short message (MO-SM), when the MO-SM functionality does not require the UCP50 series operations, or the UCP01 is used to deliver a notification to the SMT because of an SMT initiated UCP30 operation.
- The SMSC operator provides the default UCP behaviour of the current SMSC release. I.e., a UCP01 is used for a MO-SM or notification for a UCP30 operation, when a UCP50 series operation is negatively acknowledged by the application with Error Code 03 (Operation not supported on system) and the functionality of the UCP01 operation is sufficient to do the requested operation.

The following table shows the parameters in the operation data field:

Table 7-1: Parameters Operation Data Field Call Input Operation

| Parameter | Type | Presence | Description |
|------------|----------------------|----------|--|
| AdC | String of Num. Char. | M | Address code recipient, maximum length is 16 digits. |
| OAdC | String of Num. Char. | O | Address code originator, maximum length is 16 digits. |
| AC | String of Char. | O | Authentication code originator. |
| MT | 1 Num. Char. | M | Message type. Associated parameters depend on the value of the message type. |
| MT=2: NMsg | String of Num. Char. | O | Numeric message, maximum length is 160 digits. |
| MT=3: AMsg | String of Char. | O | Alphanumeric message encoded into IRA characters, maximum length is representing 640 characters. |

- The AC parameter is discarded if present.
- If the option 'Long Message' is not enabled on the SMSC, the maximum length of AMsg represents 160 characters.

Examples:

- Alphanumeric message 'Short Message'

```
00/00070/O/01/01234567890/09876543210//3/53686F7274204D657373616765/D9
```

- Numeric message '716436383334'

```
00/00041/O/01/0888444///2/716436383334/C5
```

7.1.1 Call Input Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 7-2: Parameter Positive Result Data Field Call Input Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

The SM parameter contains the following three fields.

Table 7-3: Short Message Parameter Field Call Input Operation

| Parameter | Type | Presence | Description |
|-----------|-------------------------|--|-------------|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. | |
| SEP | Char ":" | Separator | |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmms. | |

When the SMSC initiates this operation, the contents of the SM parameter will be discarded.

Example:

- 06/00043/R/01/A/01234567890:090196103258/4E

7.1.2 Call Input Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 7-4: Parameter Negative Result Data Field Call Input Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

The following error codes can be returned in the operation negative result:

| | |
|----|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 03 | Operation not supported by system |
| 04 | Operation not allowed (at this point in time) |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |
| 24 | Message too long |
| 23 | Message type not supported by system |
| 26 | Message type not valid for the pager type |

Example:

- 12/00022/R/01/N/02//03

7.2 Multiple Address Call Input Operation -02

This message can be used by the SMT to submit a message to the SMSC. With this operation, a list of recipients of the message may be specified, thus reducing the traffic between the SMSC and the SMT.

The following table shows the parameters in the operation data field.

Table 7-5: Parameters Operation Data Field Multiple Address Call Input Operation

| Parameter | Type | Presence | Description |
|------------|----------------------|----------|---|
| NPL | String of Num. Char | M | Number of parameters in the following RAd:s list. |
| RAd:s | String of Num. Char. | M | List of parameters: Each parameter consists of AdC Address code recipient; maximum length is 16 digits with optional legitimisation code for all calls. |
| OAdC | String of Num. Char. | O | Address code originator, maximum length is 16 digits. |
| AC | String of Char. | O | Authentication code originator. |
| MT | 1 Num. Char. | M | Message type. Associated parameters depend on the value of the message type. |
| MT=2: NMsg | String of Num. Char. | O | Numeric message, maximum length is 160 digits. |
| MT=3: AMsg | String of Char. | O | Alphanumeric message encoded into IRA characters, maximum length is representing 640 characters. |

- Currently, the SMSC does not support the Multiple Call Input Operation for LA's in combination with throughput regulation.
- The SMSC does not support the Multiple Call Input Operation for Multiple Address LA's.
- The NPL parameter must range from 1 to 20, thus limiting the length of the RAd:s list to 20. An IW also contains the DEST_MAX parameter. The NPL must also have a value less than or equal to this parameter.
- The RAd:s is a list of NPL RAd fields. A RAd field contains an address and optionally a legitimisation code. If the legitimisation code is present, it is separated from the address by a comma ",". If the legitimisation code is not present, the comma may be omitted. If present, the legitimisation code is discarded by the IW.
- If the option 'Long Message' is not enabled on the SMSC, the maximum length of AMsg represents 160 characters.
- The AC parameter is discarded if present.

Examples:

- Alphanumeric message 'SMSC' to 3 subscribers

05/00059/O/02/3/01111/02222/03333/0123456789//3/534D5343/52

- Numeric message '563444' to 5 subscribers

17/00069/O/02/5/01111/02222/03333/04444/05555/0123456789//2/563444/44

7.2.1 Multiple Address Call Input Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 7-6: Parameter Positive Result Data Field Multiple Address Call Input Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

The SM field contains the following three fields:

Table 7-7: Short Message Parameter Field Multiple Address Call Input Operation

| SM Parameter | Type | Description |
|--------------|-------------------------|--|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. |
| SEP | Char ":" | Separator |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmss. |

Since the operation allows a maximum of 20 addresses to be provided, the positive result may also contain a maximum of 20 addresses: time-stamp combinations.

In case of invalid and valid addresses, the invalid ones can be recognised by the absence of the timestamp field. If all addresses are invalid, a negative result is returned.

Example

- 82/00059/R/02/A/0654321:090196113940,065432:090196113940/86

7.2.2 Multiple Address Call Input Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 7-8: Parameter Negative Result Data Field Multiple Address Call Input Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

The following error codes can be returned in the operation negative result:

| | |
|----|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 04 | Operation not allowed (at this point in time) |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |

| | |
|----|---|
| 23 | Message type not supported by system |
| 24 | Message too long |
| 26 | Message type not valid for the pager type |

Example:

- 47/00022/R/02/N/01//0B

7.3 Call Input with Supplementary Services Operation -03

This operation can be used by the SMT to submit a short message to the SMSC. The following table shows the parameters in the operation data field.

Table 7-9: Parameter Operation Data Field Call Input with Services Operation

| Parameter | Type | Presence | Description |
|------------|----------------------|----------|--|
| RAd | String of Num. Char. | M | AdC Address code recipient, maximum length is 16 digits, combined with optional legitimisation code for all calls. |
| OAdC | String of Num. Char. | O | Address code originator, maximum length is 16 digits. |
| AC | String of Char. | O | Authentication code originator. |
| NPL | String of Num. Char. | M | Number of parameters in the following GA:s list. Must be "0". |
| GA:s | String of Char. | O | List of additional GA:s requested by the calling party. Not present because NPL = 0. |
| RP | Char "1" | O | Repetition requested. Must be left empty. |
| PR | Char "1" or Char "3" | O | Priority request 1 or 3. Must be left empty. |
| LPR | String of Num. Char. | O | Legitimation code for priority requested. Must be left empty. |
| UR | Char "1" | O | Urgent message indicator request. Must be left empty. |
| LUR | String of Num. Char. | O | Legitimation code for urgent message. Must be left empty. |
| RC | Char "1" | O | Reverse charging request. Must be left empty. |
| LRC | String of Num. Char. | O | Legitimation code for reverse charging. Must be left empty. |
| DD | Char. "1" | O | Deferred delivery request. |
| DDT | 10 Num. Char. | O | Deferred delivery time DDMMYYHHmm or in 0000mmmmmm. |
| MT | 1 Num. Char. | M | Message type. Associated parameters depend on the value of the message type. |
| MT=2: NMsg | String of Num. Char. | O | Numeric message, maximum length is 160 digits. |
| MT=3: AMsg | String of char. | O | Alphanumeric message encoded into IRA characters, maximum length is representing 640 characters. |

- The RAd field contains an address and optionally a legitimisation code. If the legitimisation code is present, it is separated from the address by a comma ",". If the legitimisation code is not present, the comma may be omitted. If present, the legitimisation code is discarded by the IW.

- The NPL must be equal to zero. If the NPL contains anything else than zero, a negative response with "GA not valid" (09) must be sent to the message sender. Since NPL must be equal to zero, the GA:s list may not be used.
- The RP parameter may not be set. If the RP parameter is set, a negative response with "Repetition not allowed" (10) must be sent to the message sender.
- The PR parameter may not be set. If the PR parameter is set, a negative response with "Priority call not allowed" (12) must be sent to the message sender.
- The LPR parameter may not be set. If the LPR parameter is set, a negative response with "Priority call not allowed" (12) must be sent to the message sender.
- The UR parameter may not be set. If the UR parameter is set, a negative response with "Urgent message not allowed" (14) must be sent to the message sender.
- The LUR parameter may not be set. If the LUR parameter is set, a negative response with "Urgent message not allowed" (14) must be sent to the message sender.
- The RC parameter may not be set. If the RC parameter is set, a negative response with "Reverse charging not allowed" (16) must be sent to the message sender.
- The LRC parameter may not be set. If the LRC parameter is set, a negative response with "Reverse charging not allowed" (16) must be sent to the message sender.
- If the option 'Long Message' is not enabled on the SMSC, the maximum length of AMsg represents 160 characters.
- The AC parameter is discarded if present.

Examples:

- Alphanumeric message 'CMG'

15/00058/O/03/01234568/0756663/2435/0/////////3/434D47/1B

- Numeric message '89123334' with deferred delivery

22/00067/O/03/01234568/0756663//0/////////1/0602961500/2/89123334/CF

7.3.1 Call Input with Supplementary Services Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 7-10: Parameter Positive Result Data Field Call Input with Services Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| SM | String of Char. | O | System Message |

The SM parameter contains the following three fields:

Table 7-11: Short Message Parameter Field Call Input with Services Operation

| SM Parameter | Type | Description |
|--------------|-------------------------|--|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. |
| SEP | Char. ":" | Separator |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmmss. |

Example:

- 01/00038/R/03/A/066666:090296103355/4F

7.3.2 Call Input with Supplementary Services Operation (Negative Result)

The following table shows the parameters in the negative result data field:

Table 7-12: Parameter Negative Result Data Field Call Input with Services Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

The following error codes can be returned in the operation negative result:

| | |
|----|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 03 | Operation not supported by system |
| 04 | Operation not allowed (at this point in time) |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |
| 09 | GA not valid |
| 10 | Repetition not allowed |
| 11 | Legitimation code for repetition, failure |
| 12 | Priority call not allowed |
| 13 | Legitimation code for priority call, failure |
| 14 | Urgent message not allowed |
| 15 | Legitimation code for urgent message, failure |
| 16 | Reverse charging not allowed |
| 17 | Legitimation code for reverse charging, failure |
| 18 | Deferred delivery not allowed |
| 21 | Standard text not valid |
| 22 | Time period not valid |
| 23 | Message type not supported by system |
| 24 | Message too long |
| 26 | Message type not valid for the pager type |

Example:

01/00022/R/03/N/22//05

7.4 MS Message Transfer Operation -30

This operation can be used by the SMT to submit a message to the SMSC. With this operation, short message specific services can be requested. The following table shows the parameters in the operation data field:

Table 7-13: Parameter Operation Data Field MS Message Transfer Operation

| Parameter | Type | Presence | Description |
|-----------|----------------------|----------|--|
| AdC | String of Num. Char. | M | Address code recipient, maximum length is 16 digits. |
| OAdC | String of Num. Char. | O | Address code originator, maximum length is 16 digits. |
| AC | String of Char. | O | Authentication code originator. |
| NRq | Char. "1" | O | Notification requested. |
| NAd | String of Num. Char. | O | Notification address. |
| NPID | 4 Num. Char. | O | Notification PID value: 0100 Mobile Station 0122 Fax Group 3 0131 X.400 0138 Menu over PSTN 0139 PC Application over PSTN 0339 PC Application over X25 0439 PC Application over ISDN 0539 PC Application over TCP/IP |
| DD | Char. "1" | O | Deferred Delivery Request |
| DDT | 10 Num. Char. | O | Deferred Delivery Time DDMMYYHHmm or in 0000mmmmmm. |
| VP | 10 Num. Char. | O | Validity Period DDMMYYHHmm or in 0000mmmmmm. |
| AMsg | String of Char. | O | Alphanumeric message encoded into IRA characters, maximum length representing 640 characters. |

- The AC parameter is discarded if present.
- If NRq is used, then NAd and NPID must be either empty or both used.
- If NRq is used and NAdC and NPID are left empty, then the notification is sent to the originator in the current session. The notification is deleted by the SMSC, if in this case:
 - The session is ended,
 - The originator is not known to the SMSC to have more than one address,
 - The notification has not yet been delivered.
- If the option 'Long Message' is not supported on the SMSC, the maximum length of AMsg represents 160 characters.

Examples:

- Alphanumeric message 'EMI specification' with notification requested to a PC application over PSTN

```
56/00089/O/30/0123456/0568243//1/0296877842/0139////454D4920737065636966696361746966F6E/D4
```

- Alphanumeric message 'Message OK' with deferred delivery and validity period set

```
44/00077/O/30/0673845336/////1/1003961344/1203961200/4D657373616765204F4B/27
```

7.4.1 MS Message Transfer Operation (Positive Result)

The following table shows the parameters in the positive result data field.

Table 7-14: Parameter Positive Result Data Field MS Message Transfer Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| ACK | Char. "A" | M | Positive Acknowledgement |
| MVP | 10 Num. Char. | O | Modified Validity Period |
| SM | String of Char. | O | System Message |

The SM parameter contains the following three fields:

Table 7-15: Short Message Parameter Field MS Message Transfer

| SM Parameter | Type | Description |
|--------------|-------------------------|--|
| AdC | String of Num. Char. | Address code recipient, maximum length is 16 digits. |
| SEP | Char ":" | Separator |
| SCTS | String of 12 Num. Char. | Service Centre time-stamp DDMMYYHHmss. |

Example:

- 10/00039/R/30/A//067345:070295121212/6F

7.4.2 MS Message Transfer Operation (Negative Result)

The following table shows the parameters in the negative result data field.

Table 7-16: Parameter Negative Result Data Field MS Message Transfer Operation

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char. "N" | M | Negative Acknowledgement |
| EC | 2 Num. Char. | M | Error Code |
| SM | String of Char. | O | System Message |

The following error codes can be returned in the operation negative result:

| | |
|----|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 04 | Operation not allowed (at this point in time) |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |
| 22 | Time period not valid |
| 24 | Message too long |
| 26 | Message type not valid for the pager type |

Example:

- 11/00022/R/30/N/24//08

Appendix A. Error Codes

Error codes, which can be returned in the operations negative result, are listed in [ETSI 03.00], paragraph 9.2.6. For all the operations defined in the ERMES recommendation that are not implemented in the SMSC, the EMI returns the error code 03 ("Operation not supported by system").

A.1 Error Codes

Table A-17: Error Codes

| Error Code | Message |
|------------|---|
| 01 | Checksum error |
| 02 | Syntax error |
| 03 | Operation not supported by system |
| 04 | Operation not allowed |
| 05 | Call barring active |
| 06 | AdC invalid |
| 07 | Authentication failure |
| 08 | Legitimation code for all calls, failure |
| 09 | GA not valid |
| 10 | Repetition not allowed |
| 11 | Legitimation code for repetition, failure |
| 12 | Priority call not allowed |
| 13 | Legitimation code for priority call, failure |
| 14 | Urgent message not allowed |
| 15 | Legitimation code for urgent message, failure |
| 16 | Reverse charging not allowed |
| 17 | Legitimation code for rev. charging, failure |
| 18 | Deferred delivery not allowed |
| 19 | New AC not valid |
| 20 | New legitimation code not valid |
| 21 | Standard text not valid |
| 22 | Time period not valid |
| 23 | Message type not supported by system |
| 24 | Message too long |
| 25 | Requested standard text not valid |
| 26 | Message type not valid for the pager type |

| Error Code | Message |
|------------|---|
| 27 | Message not found in SMSC |
| 30 | Subscriber hang-up |
| 31 | Fax group not supported |
| 32 | Fax message type not supported |
| 33 | Address already in list (60 series) |
| 34 | Address not in list (60 series) |
| 35 | List full, cannot add address to list (60 series) |
| 36 | RPID already in use |
| 37 | Delivery in progress |
| 38 | Message forwarded |

The following table summarises some special occurrences of error codes.

Table A-18: Error Code – Special Occurrences

| Error Code | Meaning |
|------------|---|
| 02 | Error in the NPID parameter (SMS Message transfer) or in the PID parameter (SMT Alert). |
| 04 | Any internal error (e.g., no resources), often of temporary nature. If the RAd:s (number of addresses) parameter contained more addresses than the specified maximum, the System Message parameter will contain "too many addresses". |
| 05 | One of the addresses is on the blacklist. |
| 07 | Authentication failure (PWD parameter in 60-series) |
| 19 | New AC not valid (NPWD parameter in 60-series) |

Appendix B. Notification Error Messages/ Reason Codes

Table B-19: Notification Error Messages/ Reason Codes

| Error Message/ Reason Code | Meaning |
|----------------------------|---------------------------------|
| 000 | Unknown subscriber |
| 001 | Service temporary not available |
| 002 | Service temporary not available |
| 003 | Service temporary not available |
| 004 | Service temporary not available |
| 005 | Service temporary not available |
| 006 | Service temporary not available |
| 007 | Service temporary not available |
| 008 | Service temporary not available |
| 009 | Illegal error code |
| 010 | Network time-out |
| 100 | Facility not supported |
| 101 | Unknown subscriber |
| 102 | Facility not provided |
| 103 | Call barred |
| 104 | Operation barred |
| 105 | SC congestion |
| 106 | Facility not supported |
| 107 | Absent subscriber |
| 108 | Delivery fail |
| 109 | Sc congestion |
| 110 | Protocol error |
| 111 | MS not equipped |
| 112 | Unknown SC |
| 113 | SC congestion |
| 114 | Illegal MS |
| 115 | MS not a subscriber |
| 116 | Error in MS |
| 117 | SMS lower layer not provisioned |

| Error Message/ Reason Code | Meaning |
|----------------------------|-----------------------------------|
| 118 | System fail |
| 119 | PLMN system failure |
| 120 | HLR system failure |
| 121 | VLR system failure |
| 122 | Previous VLR system failure |
| 123 | Controlling MSC system failure |
| 124 | VMSC system failure |
| 125 | EIR system failure |
| 126 | System failure |
| 127 | Unexpected data value |
| 200 | Error in address service centre |
| 201 | Invalid absolute Validity Period |
| 202 | Short message exceeds maximum |
| 203 | Unable to Unpack GSM message |
| 204 | Unable to convert to IRA ALPHABET |
| 205 | Invalid validity period format |
| 206 | Invalid destination address |
| 207 | Duplicate message submit |
| 208 | Invalid message type indicator |

Appendix C. GSM 7-Bit Alphabet Tables

The GSM 7-bit alphabet [3GPP 23.038] consists of 2 tables listed below: a default table and an extended table.

Table C-20: 7-Bit Default Alphabet Table

| | | | | B7 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|----|----|----|----|----|----|----|----|---|---|---|---|---|
| | | | | B6 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| | | | | B5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| B4 | B3 | B2 | B1 | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 0 | 0 | 0 | @ | Δ | SP | 0 | i | P | ı | p |
| 0 | 0 | 0 | 1 | 1 | £ | _ | ! | 1 | A | Q | a | q |
| 0 | 0 | 1 | 0 | 2 | \$ | Φ | " | 2 | B | R | b | r |
| 0 | 0 | 1 | 1 | 3 | ¥ | Γ | # | 3 | C | S | c | s |
| 0 | 1 | 0 | 0 | 4 | è | Λ | α | 4 | D | T | d | t |
| 0 | 1 | 0 | 1 | 5 | é | Ω | % | 5 | E | U | e | u |
| 0 | 1 | 1 | 0 | 6 | ù | Π | & | 6 | F | V | f | v |
| 0 | 1 | 1 | 1 | 7 | ì | Ψ | ' | 7 | G | W | g | w |
| 1 | 0 | 0 | 0 | 8 | ò | Σ | (| 8 | H | X | h | x |
| 1 | 0 | 0 | 1 | 9 | Ç | θ |) | 9 | I | Y | i | y |
| 1 | 0 | 1 | 0 | 10 | LF | E | * | : | J | Z | j | z |
| 1 | 0 | 1 | 1 | 11 | Ø | l) | + | ; | K | Ä | k | ä |
| 1 | 1 | 0 | 0 | 12 | ø | Æ | , | < | L | Ö | l | ö |
| 1 | 1 | 0 | 1 | 13 | CR | æ | - | = | M | Ñ | m | ñ |
| 1 | 1 | 1 | 0 | 14 | Å | ß | . | > | N | Ü | n | ü |
| 1 | 1 | 1 | 1 | 15 | å | É | / | ? | O | š | o | à |

- 1) This code is an escape to an extension of the 7-bit default alphabet table. A receiving entity, which does not understand the meaning of this escape mechanism, shall display it as a space character.

Table C-21: 7-Bit Default Alphabet Extension Table

| | | | | | B7 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
|-----------|-----------|-----------|-----------|----|-----------|----|----|---|---|---|----|---|---|
| | | | | | B6 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| | | | | | B5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| B4 | B3 | B2 | B1 | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 0 | 0 | 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | 1 | 1 | | | | | | | | | |
| 0 | 0 | 1 | 0 | 2 | | | | | | | | | |
| 0 | 0 | 1 | 1 | 3 | | | | | | | | | |
| 0 | 1 | 0 | 0 | 4 | | ^ | | | | | | | |
| 0 | 1 | 0 | 1 | 5 | | | | | | | 2) | | |
| 0 | 1 | 1 | 0 | 6 | | | | | | | | | |
| 0 | 1 | 1 | 1 | 7 | | | | | | | | | |
| 1 | 0 | 0 | 0 | 8 | | | | { | | | | | |
| 1 | 0 | 0 | 1 | 9 | | | | } | | | | | |
| 1 | 0 | 1 | 0 | 10 | | 3) | | | | | | | |
| 1 | 0 | 1 | 1 | 11 | | | 1) | | | | | | |
| 1 | 1 | 0 | 0 | 12 | | | | | [| | | | |
| 1 | 1 | 0 | 1 | 13 | | | | | ~ | | | | |
| 1 | 1 | 1 | 0 | 14 | | | | |] | | | | |
| 1 | 1 | 1 | 1 | 15 | | | | \ | | | | | |

In the event that an MS receives a code where a symbol is not represented in the above table, the MS shall display the character shown in the main default 7-bit alphabet table.

- 1) This code value is reserved for the extension to another extension table. On receipt of this code, a receiving entity shall display a space until another extension table is defined.
- 2) This code represents the EURO currency symbol. The code value is that used for the character “e”. Therefore, a receiving entity, which is incapable of displaying the EURO currency symbol, will display the character “e” instead.
- 3) This code is defined as a Page Break character. Any mobile which does not understand the 7-bit default alphabet table extension mechanism will treat this character as Line Feed.

A.2 GSM 7-Bit – Unicode Mapping

Table C-22: GSM 7-bit to Unicode Mapping

| GSM 7-Bit Alphabet Character Code (Sequence) | Unicode 16-Bit Character Code | Character Name |
|--|-------------------------------|---|
| 0x00 | 0x0040 | COMMERCIAL AT |
| 0x01 | 0x00A3 | POUND SIGN |
| 0x02 | 0x0024 | DOLLAR SIGN |
| 0x03 | 0x00A5 | YEN SIGN |
| 0x04 | 0x00E8 | LATIN SMALL LETTER E WITH GRAVE |
| 0x05 | 0x00E9 | LATIN SMALL LETTER E WITH ACUTE |
| 0x06 | 0x00F9 | LATIN SMALL LETTER U WITH GRAVE |
| 0x07 | 0x00EC | LATIN SMALL LETTER I WITH GRAVE |
| 0x08 | 0x00F2 | LATIN SMALL LETTER O WITH GRAVE |
| 0x09 | 0x00C7 | LATIN CAPITAL LETTER C WITH CEDILLA |
| 0x0A | 0x000A | LINE FEED |
| 0x0B | 0x00D8 | LATIN CAPITAL LETTER O WITH STROKE |
| 0x0C | 0x00F8 | LATIN SMALL LETTER O WITH STROKE |
| 0x0D | 0x000D | CARRIAGE RETURN |
| 0x0E | 0x00C5 | LATIN CAPITAL LETTER A WITH RING ABOVE |
| 0x0F | 0x00E5 | LATIN SMALL LETTER A WITH RING ABOVE |
| 0x10 | 0x0394 | GREEK CAPITAL LETTER DELTA |
| 0x11 | 0x005F | LOW LINE |
| 0x12 | 0x03A6 | GREEK CAPITAL LETTER PHI |
| 0x13 | 0x0393 | GREEK CAPITAL LETTER GAMMA |
| 0x14 | 0x039B | GREEK CAPITAL LETTER LAMDA |
| 0x15 | 0x03A9 | GREEK CAPITAL LETTER OMEGA |
| 0x16 | 0x03A0 | GREEK CAPITAL LETTER PI |
| 0x17 | 0x03A8 | GREEK CAPITAL LETTER PSI |
| 0x18 | 0x03A3 | GREEK CAPITAL LETTER SIGMA |
| 0x19 | 0x0398 | GREEK CAPITAL LETTER THETA |
| 0x1A | 0x039E | GREEK CAPITAL LETTER XI |
| 0x1B | 0x00A0 | ESCAPE TO EXTENSION TABLE or displayed as non-breaking space. |
| 0x1B0A | 0x000C | FORM FEED |
| 0x1B14 | 0x005E | CIRCUMFLEX ACCENT |
| 0x1B28 | 0x007B | LEFT CURLY BRACKET |
| 0x1B29 | 0x007D | RIGHT CURLY BRACKET |

| GSM 7-Bit Alphabet Character Code (Sequence) | Unicode 16-Bit Character Code | Character Name |
|---|--|-----------------------------------|
| 0x1B2F | 0x005C | REVERSE SOLIDUS |
| 0x1B3C | 0x005B | LEFT SQUARE BRACKET |
| 0x1B3D | 0x007E | TILDE |
| 0x1B3E | 0x005D | RIGHT SQUARE BRACKET |
| 0x1B40 | 0x007C | VERTICAL LINE |
| 0x1B65 | 0x20AC | EURO SIGN |
| 0x1C | 0x00C6 | LATIN CAPITAL LETTER AE |
| 0x1D | 0x00E6 | LATIN SMALL LETTER AE |
| 0x1E | 0x00DF | LATIN SMALL LETTER SHARP S |
| 0x1F | 0x00C9 | LATIN CAPITAL LETTER E WITH ACUTE |
| 0x20 | 0x0020 | SPACE |
| 0x21 | 0x0021 | EXCLAMATION MARK |
| 0x22 | 0x0022 | QUOTATION MARK |
| 0x23 | 0x0023 | NUMBER SIGN |
| 0x24 | 0x00A4 | CURRENCY SIGN |
| 0x25 | 0x0025 | PERCENT SIGN |
| 0x26 | 0x0026 | AMPERSAND |
| 0x27 | 0x0027 | APOSTROPHE |
| 0x28 | 0x0028 | LEFT PARENTHESIS |
| 0x29 | 0x0029 | RIGHT PARENTHESIS |
| 0x2A | 0x002A | ASTERISK |
| 0x2B | 0x002B | PLUS SIGN |
| 0x2C | 0x002C | COMMA |
| 0x2D | 0x002D | HYPHEN-MINUS |
| 0x2E | 0x002E | FULL STOP |
| 0x2F | 0x002F | SOLIDUS |
| 0x30 | 0x0030 | DIGIT ZERO |
| 0x31 | 0x0031 | DIGIT ONE |
| 0x32 | 0x0032 | DIGIT TWO |
| 0x33 | 0x0033 | DIGIT THREE |
| 0x34 | 0x0034 | DIGIT FOUR |
| 0x35 | 0x0035 | DIGIT FIVE |
| 0x36 | 0x0036 | DIGIT SIX |
| 0x37 | 0x0037 | DIGIT SEVEN |
| 0x38 | 0x0038 | DIGIT EIGHT |

| GSM 7-Bit Alphabet Character Code (Sequence) | Unicode 16-Bit Character Code | Character Name |
|---|--------------------------------------|---------------------------------------|
| 0x39 | 0x0039 | DIGIT NINE |
| 0x3A | 0x003A | COLON |
| 0x3B | 0x003B | SEMICOLON |
| 0x3C | 0x003C | LESS-THAN SIGN |
| 0x3D | 0x003D | EQUALS SIGN |
| 0x3E | 0x003E | GREATER-THAN SIGN |
| 0x3F | 0x003F | QUESTION MARK |
| 0x40 | 0x00A1 | INVERTED EXCLAMATION MARK |
| 0x41 | 0x0041 | LATIN CAPITAL LETTER A |
| 0x42 | 0x0042 | LATIN CAPITAL LETTER B |
| 0x43 | 0x0043 | LATIN CAPITAL LETTER C |
| 0x44 | 0x0044 | LATIN CAPITAL LETTER D |
| 0x45 | 0x0045 | LATIN CAPITAL LETTER E |
| 0x46 | 0x0046 | LATIN CAPITAL LETTER F |
| 0x47 | 0x0047 | LATIN CAPITAL LETTER G |
| 0x48 | 0x0048 | LATIN CAPITAL LETTER H |
| 0x49 | 0x0049 | LATIN CAPITAL LETTER I |
| 0x4A | 0x004A | LATIN CAPITAL LETTER J |
| 0x4B | 0x004B | LATIN CAPITAL LETTER K |
| 0x4C | 0x004C | LATIN CAPITAL LETTER L |
| 0x4D | 0x004D | LATIN CAPITAL LETTER M |
| 0x4E | 0x004E | LATIN CAPITAL LETTER N |
| 0x4F | 0x004F | LATIN CAPITAL LETTER O |
| 0x50 | 0x0050 | LATIN CAPITAL LETTER P |
| 0x51 | 0x0051 | LATIN CAPITAL LETTER Q |
| 0x52 | 0x0052 | LATIN CAPITAL LETTER R |
| 0x53 | 0x0053 | LATIN CAPITAL LETTER S |
| 0x54 | 0x0054 | LATIN CAPITAL LETTER T |
| 0x55 | 0x0055 | LATIN CAPITAL LETTER U |
| 0x56 | 0x0056 | LATIN CAPITAL LETTER V |
| 0x57 | 0x0057 | LATIN CAPITAL LETTER W |
| 0x58 | 0x0058 | LATIN CAPITAL LETTER X |
| 0x59 | 0x0059 | LATIN CAPITAL LETTER Y |
| 0x5A | 0x005A | LATIN CAPITAL LETTER Z |
| 0x5B | 0x00C4 | LATIN CAPITAL LETTER A WITH DIAERESIS |

| GSM 7-Bit Alphabet Character Code (Sequence) | Unicode 16-Bit Character Code | Character Name |
|--|-------------------------------|---------------------------------------|
| 0x5C | 0x00D6 | LATIN CAPITAL LETTER O WITH DIAERESIS |
| 0x5D | 0x00D1 | LATIN CAPITAL LETTER N WITH TILDE |
| 0x5E | 0x00DC | LATIN CAPITAL LETTER U WITH DIAERESIS |
| 0x5F | 0x00A7 | SECTION SIGN |
| 0x60 | 0x00BF | INVERTED QUESTION MARK |
| 0x61 | 0x0061 | LATIN SMALL LETTER A |
| 0x62 | 0x0062 | LATIN SMALL LETTER B |
| 0x63 | 0x0063 | LATIN SMALL LETTER C |
| 0x64 | 0x0064 | LATIN SMALL LETTER D |
| 0x65 | 0x0065 | LATIN SMALL LETTER E |
| 0x66 | 0x0066 | LATIN SMALL LETTER F |
| 0x67 | 0x0067 | LATIN SMALL LETTER G |
| 0x68 | 0x0068 | LATIN SMALL LETTER H |
| 0x69 | 0x0069 | LATIN SMALL LETTER I |
| 0x6A | 0x006A | LATIN SMALL LETTER J |
| 0x6B | 0x006B | LATIN SMALL LETTER K |
| 0x6C | 0x006C | LATIN SMALL LETTER L |
| 0x6D | 0x006D | LATIN SMALL LETTER M |
| 0x6E | 0x006E | LATIN SMALL LETTER N |
| 0x6F | 0x006F | LATIN SMALL LETTER O |
| 0x70 | 0x0070 | LATIN SMALL LETTER P |
| 0x71 | 0x0071 | LATIN SMALL LETTER Q |
| 0x72 | 0x0072 | LATIN SMALL LETTER R |
| 0x73 | 0x0073 | LATIN SMALL LETTER S |
| 0x74 | 0x0074 | LATIN SMALL LETTER T |
| 0x75 | 0x0075 | LATIN SMALL LETTER U |
| 0x76 | 0x0076 | LATIN SMALL LETTER V |
| 0x77 | 0x0077 | LATIN SMALL LETTER W |
| 0x78 | 0x0078 | LATIN SMALL LETTER X |
| 0x79 | 0x0079 | LATIN SMALL LETTER Y |
| 0x7A | 0x007A | LATIN SMALL LETTER Z |
| 0x7B | 0x00E4 | LATIN SMALL LETTER A WITH DIAERESIS |
| 0x7C | 0x00F6 | LATIN SMALL LETTER O WITH DIAERESIS |
| 0x7D | 0x00F1 | LATIN SMALL LETTER N WITH TILDE |
| 0x7E | 0x00FC | LATIN SMALL LETTER U WITH DIAERESIS |

| GSM 7-Bit Alphabet Character Code (Sequence) | Unicode 16-Bit Character Code | Character Name |
|--|-------------------------------|---------------------------------|
| 0x7F | 0x00E0 | LATIN SMALL LETTER A WITH GRAVE |

Appendix D. Protocol Sequence Example

Here is an example of a protocol sequence with various operation types:

1. SMT opens a session with the SMSC
2. SMT sends a message to mobile station, which is turned off
3. SMT inquires the SMSC for buffered message
4. SMT deletes the buffered message
5. SMT attempts to delete the deleted message again

In the example, the SMT uses “55555” as the originator address and the international number “0031612345678” for the mobile station address.

Table D-23: Protocol Sequence Example

| UCP String | Description |
|--|---|
| 00/00056/O/60/55555/6/5/1/7069657465723132//0100/////A | SMT opens session with address 55555 and password pieter12 |
| 00/00019/R/60/A//6D | SMSC accepts session |
| 00/00077/O/51/0031612345678/55555/////4//////////3//74657374//////////97 | SMT submits SMS with originator address 55555 to mobile station 0031612345678 |
| 00/00046/R/51/A//0031612345678:271102171649/DD | SMSC sends positive acknowledgement with message identification: 0031612345678:271102171649 |
| 00/00067/O/55/0031612345678/55555//////////88 | SMT sends inquire operation with originator address 55555 for recipient 0031612345678 |
| 00/00020/R/55/A//98 | SMSC sends positive acknowledgement |
| 00/00159/O/57/55555//////////3//44657374696E6174696F6E3A2030363132333435363738206964656E74696669636174696F6E3A20303231313237313731363439//////////E3 | SMSC sends inquire response to SMT with text: Destination: 0612345678 identification: 021127171649 |
| 00/00038/R/57/A//55555:271102171738/4E | SMT sends positive acknowledgement to SMSC |
| 00/00092/O/56/0031612345678/55555//////////3//303231313237313731363439//////////87 | SMT send delete operation with originator address 55555 for recipient 0031612345678 with in the text the timestamp 021127171649. |
| 00/00020/R/56/A//99 | SMSC sends positive acknowledgement to SMT |
| 01/00193/O/58/55555//////////3//44657374696E6174696F6E2030363132333435363738206964656E74696669636174696F6E3A2030323131323731373136343920686173206265656E2064656C657465642E//////////FD | SMSC send delete response to SMT with text: Destination 0612345678 identification: 021127171649 has been deleted. |
| 01/00038/R/58/A//55555:271102171824/4C | SMT sends positive response to SMSC |
| 00/00092/O/56/0031612345678/55555//////////3//303231313237313731363439//////////8 | SMT sends again the delete operation with originator address 55555 for recipient 0031612345678 with in the text the timestamp 021127140558. |
| 00/00020/R/56/A//99 | SMSC sends positive acknowledgement to SMT |

| UCP String | Description |
|--|---|
| 02/00167/O/58/55555/#####/3//446573746 96E6174696F6E203036313233343536373820 6964656E74696669636174696F6E3A2068617 3206265656E2064656C657465642E#####D 0 | SMSC sends delete response to SMT with text: Destination 0612345678 identification: has been deleted. The omission of the timestamp indicates that the message is not stored in the SMSC. |
| 02/00044/R/58/A//55555:271102171857/71 | SMT sends positive response to SMSC |

Appendix E. Billing Identifier Format

A.3 Billing Identifier Format

The Billing Identifier field is defined as a variable string of visible characters with an SMSC restricted maximum length of 20 characters. An SMSC provides this string towards the billing system for rating and charging.

In this limited space, a number of information elements are needed to provide effective charging details to the billing system. The majority of the information is financial, hence contains digits. Specifying numeric values in hexadecimal format makes the most efficient use of available space.

Furthermore, to provide applications with only the minimum amount of information to be provided, a flexible mechanism is available to select only the relevant information elements and leave out the unwanted information elements.

In addition, several formats are predefined to support the charging needs of most applications.

Currency information is not provided in ISO 4217 Currency Abbreviation format, but left to the operator as this saves space and most operators only support a single currency or temporarily support two currencies in a transition period.

The following are the information elements that compose the Billing Identifier field.

| | |
|----------|----------------------------------|
| C.C. | Command Code |
| C.D.I. | Currency Decimal Indicator |
| C.V. | Currency Value |
| B.M. | Bit Mask |
| C.I. | Currency Indicator |
| S.N. | Sequence Number |
| S.T. | Service Type |
| S.C. | Service Class |
| A.B.A.L. | Alternate Billing Address Length |
| A.B.A. | Alternate Billing Address |
| A.S.L. | Alphanumeric String Length |
| A.S. | Alphanumeric String |

Table E-24: C.C. – Command Code

| | |
|--------------------|--|
| Description | Unique Identifier to Identify the format of the DD element |
| Length | 2 |
| Type | Hex |

| | |
|----------------|---|
| Range | 00 to 0F Standardised values 10 to 1F Vendor specific 20 to FF Reserved |
| | Values outside the 00 to FF range indicate billing identifier strings that are vendor specific. |
| Example | 01 indicates Billing format 1 (decimal). 0A indicates Billing format 10 (decimal). |

Table E-2: C.D.I. – Currency Decimal Indicator

| | |
|--------------------|--|
| Description | Specifies the position of the decimal point in the Currency Value field. |
| Length | 1 |
| Type | Numeric |
| Range | 0 to 5. Numbering starts from the right. |
| Example | If Currency Value = 543 (decimal) and Currency Decimal Indicator = 2, then the amount is 5.43. |

Table E-3: C.V. – Currency Value

| | |
|--------------------|--|
| Description | This field contains the amount to be billed from the subscriber as follows: Currency value * 10 ^ - Currency Decimal Indicator This representation avoids unwanted rounding off. |
| Length | 4 |
| Type | Hex |
| Range | 0000 to FFFF |
| Example | If Currency Value = 50 (decimal) and Currency Decimal Indicator = 2, then the amount is 0.50. |

Table E-4: B.M. – Bit-Mask

| | |
|--------------------|---|
| Description | This field is a toggle Bit Mask that indicates on a bit level functionality to be enabled or disabled. |
| Length | 2 |
| Type | Hex, (to be decoded into Binary). The Lowest Significant Bit (LSB) starts with number 0. Bits are numbered increasing from right to left. |
| Range | 00 to FF (00000000 to 11111111) Bit 0 with value 0 indicates Subscriber A Number billed. Bit 0 with value 1 indicates Subscriber B Number billed. Bit 1 with value 0 indicates Currency Indicator field disabled. Bit 1 with value 1 indicates Currency Indicator field enabled. Bit 2 with value 0 indicates Sequence Number field disabled. Bit 2 with value 1 indicates Sequence Number field enabled. Bit 3 with value 0 indicates Service Type field disabled. Bit 3 with value 1 indicates Service Type field enabled. Bit 4 with value 0 indicates Service Class field disabled. Bit 4 with value 1 indicates Service Class field enabled. Bit 5 with value 0 indicates Alternate Billing Address fields are disabled. Bit 5 with value 1 indicates Alternate Billing Address fields are enabled. Bit 0 is thereby overruled. Bits 6 and 7 (Reserved with default value 0). The sender must set them to 0; the receiver must ignore them. Note: Where Bit 1, 2, 3, 4 or 5 is disabled the relevant field must not be included in the DD field. |

| | |
|----------------|--|
| Example | <p>0A (hex)</p> <p>00001010 (binary)</p> <p>Indicates:</p> <p>Subscriber A-Number billed. Currency Indicator field enabled. Sequence Number field disabled. Service Type field enabled. Service Class field disabled. Alternate Billing Address field disabled.</p> |
|----------------|--|

Table E-5: C.I. – Currency Indicator

| | |
|--------------------|--|
| Description | This field contains the currency to be billed from the subscriber. |
| Length | 1 |
| Type | Hex |
| Range | 0 to F |
| Example | <p>0 indicates currency 0 in the (prepaid) billing system to be used.</p> <p>5 indicate currency 5 in the (prepaid) billing system to be used.</p> |

Table E-6: S.N. – Sequence Number

| | |
|--------------------|--|
| Description | This field contains a sequence value used by the (prepaid) billing system to detect duplicate transactions within a short time interval from the same sender. After every unique message submission, the sender should increment the sequence number by 1. |
| Length | 4 |
| Type | Hex |
| Range | 0000 to FFFF |
| Example | <p>0089</p> <p>Note: if the maximum value is reached (FFFF), the value 0000 should be next used.</p> |

Table E-7: S.T. – Service Type

| | |
|--------------------|--|
| Description | This field defines the type of service the subscriber is being billed for. |
| Length | 2 |
| Type | Hex |
| Range | 00 to FF (hex). |
| Example | "05" indicates that the message sent to the subscriber was service type 5. Definition of these service types is at the discretion of the operator. |

Table E-8: S.C. – Service Class

| | |
|--------------------|---|
| Description | This field defines the class of service the subscriber is being billed for. |
| Length | 2 |
| Type | Hex |
| Range | 00 to FF (hex). |

| | |
|----------------|---|
| Example | "3F" indicates the message sent to the subscriber was service class 3F. Definition of these service classes is at the discretion of the operator. |
|----------------|---|

Table E-8: A.B.A.L. – Alternate Billing Address Length

| | |
|--------------------|---|
| Description | This field defines the length of an Alternate Billing Address. |
| Length | 1 |
| Type | Hex |
| Range | 0 to F |
| Example | "5" indicates that the Alternate billing address is 5 digits in length. |

Table E-9: A.B.A. – Alternate Billing Address

| | |
|--------------------|---|
| Description | This field is the billing address to be used for the charged party instead of the subscriber address. This allows charging numeric address if the application uses an alphanumeric string as originator address, which most billing entities are unable to process. |
| Length | Variable based on Alternate Billing Address Length |
| Type | Numeric |
| Range | Any digit |
| Example | 5000 |

Table E-10: A.S.L. – Alphanumeric String Length

| | |
|--------------------|--|
| Description | This field defines the number of characters in the Alphanumeric String being passed to the (prepaid) billing system. |
| Length | 1 character |
| Type | Hex |
| Range | 0 to F |
| Example | "5" indicates 5 characters in length. |

Table E-11: A.S. – Alphanumeric String

| | |
|--------------------|---|
| Description | This field is the Alphanumeric String being passed to the (prepaid) billing system. |
| Length | Variable based on Alphanumeric String Length |
| Type | Alphanumeric |
| Range | Any visible IRA character. Character codes 20 to 7E (hex) |
| Example | "Ring tone / U2" |

A.4 Defined Billing Formats

Command Code 01



Fields between [] are mandatory and may not be modified.

| Field Name | [Value] / Range | Size Characters | Mandatory / Optional | Description |
|------------|-----------------|------------------------------|----------------------|----------------------------------|
| C.C. | [01] | 2 | M | Command Code |
| C.D.I. | 0-5 | 1 | M | Currency Decimal Indicator |
| C.V. | 0000-FFFF | 4 | M | Currency Value |
| B.M. | 00-FF | 2 | M | Bit-Mask |
| C.I. | 0-F | 1 | O | Currency Indicator |
| S.N. | 0000-FFFF | 4 | O | Sequence Number |
| S.T. | 00-FF | 2 | O | Service Type |
| S.C. | 00-FF | 2 | O | Service Class |
| A.B.A.L. | 0-F | 1 | O | Alternate Billing Address Length |
| A.B.A. | Any digit | Variable (Max 10 characters) | O | Alternate Billing Address |
| A.S.L. | 0-F | 1 | M | Alphanumeric String Length |
| A.S. | Any char | Variable (Max 10 characters) | O | Alphanumeric String |

Example 1:

If the (prepaid) billing system receives the following string "01212340A1023CNN", it should be interpreted as follows:

| C.C. | C.D.I. | C.V. | B.M. | C.I. | S.N. | S.T. | S.C. | A.B.A.L. | A.B.A. | A.S.L. | A.S. |
|------|--------|------|------|------|------|------|------|----------|--------|--------|------|
| 01 | 2 | 1234 | 0A | 1 | - | 02 | - | - | - | 3 | CNN |

The above-mentioned example can be decoded to mean:

| | |
|---------------------------------------|-------------------------|
| Command code | 01 |
| Currency Decimal Indicator | 2 |
| Currency Value | 1234 (Hex) = 4660 (Dec) |
| Adjusted Currency Value due to C.D.I. | 46.60 |
| Bit-Mask | 0A |

- Subscriber A-Number billed
- Currency Indicator field enabled
- Sequence Number field disabled
- Service Type field enabled
- Service Class field disabled
- Alternate Billing Address disabled

| | |
|----------------------------|-----|
| Currency Indicator | 1 |
| Service Type | 02 |
| Alphanumeric String Length | 3 |
| Alphanumeric String | CNN |

Example 2:

If the (prepaid) billing system receives the following string "01212342A1025500000", it should be interpreted as follows:

| C.C. | C.D.I. | C.V. | B.M. | C.I. | S.N. | S.T. | S.C. | A.B.A.L. | A.B.A. | A.S.L. | A.S. |
|------|--------|------|------|------|------|------|------|----------|--------|--------|------|
| 01 | 2 | 1234 | 2A | 1 | - | 02 | - | 5 | 50000 | 0 | - |

The above-mentioned example can be decoded to mean:

```

Command code                01
Currency Decimal Indicator  2
Currency Value              1234 (Hex) = 4660 (Dec)
Adjusted Currency Value due to C.D.I.  46.60
Bit-Mask                    2A
  
```

- Subscriber A-Number billed
- Currency Indicator field enabled
- Sequence Number field disabled
- Service Type field enabled
- Service Class field disabled
- Alternate Billing Address enabled

```

Currency Indicator          1
Service Type               02
Alternate Billing Address Length  5
Alternate Billing Address    50000
Alphanumeric String Length  0
Alphanumeric String        ""
  
```

Command Code 02



Fields between [] are mandatory and may not be modified.

| Field Name | [Value] / Range | Size Characters | Mandatory / Optional | Description |
|------------|-----------------|------------------------------|----------------------|----------------------------|
| C.C. | [02] | 2 | M | Command Code |
| C.D.I. | 0-5 | 1 | M | Currency Decimal Indicator |
| C.V. | 0000-FFFF | 4 | M | Currency Value |
| A.S.L. | 0-F | 1 | M | Alphanumeric String Length |
| A.S. | Any character | Variable (Max 15 characters) | O | Alphanumeric String |

Example 1:

If the (prepaid) billing system receives the following string "02312347Message", it should be interpreted as follows:

| C.C. | C.D.I. | C.V. | A.S.L. | A.S. |
|------|--------|------|--------|---------|
| 02 | 3 | 1234 | 7 | Message |

The above-mentioned example can be decoded to mean:

```

Command code                02
Currency Decimal Indicator  3
Currency Value              1234 (Hex) = 4660 (Dec)
Adjusted Currency Value due to C.D.I.  4.660
Alphanumeric String Length  7
Alphanumeric String        Message
  
```

Appendix F. Changes – Previous Versions

A.5 Changes – EMI Specification 2.4

- New UCP 54 (Modify Short Message) operation.
- The field PR in the UCP51 is no longer reserved. In the UCP51 the field is optional and can be used to request priority.
- Multiple Address LA support: sliding window and session management operations.
- In the UCP60 (Session management), the field RES1 has been renamed to OPID. This is an optional field in the UCP60. The OPID is used for GSM subscriber via fixed access.
- A (Multiple Address) LA can now use its Short Number in a UCP60 to login. The Short Number should be passed in the OAdC, OTON should be set to 6 (abbreviated) and ONPI to 5 (SC specific: Private).
- The remark “AC parameter is discarded if present” in the description of UCP51 has been removed.
- The UCP02 (Multiple address call input) is currently not supported for LA’s in combination with throughput regulation. A remark has been added in the description of UCP02.
- When the AC field (Authentication code originator) is used, the AC shall contain at least 4 numeric characters in every message that are not equal to all zeros, otherwise it will be rejected. A remark has been added in the description of the following UCP operations: 30, 51, 55 and 56.
- In the description of UCP56 (Delete message) the field MMS was listed as an optional parameter. However this field has no meaning in the UCP56 operation. Therefore, the description now states that this field should be left empty.
- In paragraph ‘4.1 Address syntax’ the following line has been removed:
- <+><country-code><telephone_nr> (This format may only be used on Mobile Stations.)

A.6 Changes – EMI Specification 3.1.0

- The RES3 (reserved field) is now used for extra services (XSer field) in UCP 51 and 52 operations. This patch allows the UCP application to specify a User Data Header. The functionality is an add-on (patch) to the SMSC 3.1 Release.

A.7 Changes – EMI Specification 3.1.1

- Clarification on the format of the XSer field and the format of the XSer service type “GSM UDH information”.

A.8 Changes – EMI Specification 3.1.2

- The XSer service type “GSM DCS information” is introduced. Its aim is to give more control to the user applications to send and receive GSM DCS values. It provides support for “7-bit alphabet”, “8-bit data”, “UCS2 alphabet”, “Message Waiting Indications” and “Message Class Meaning”.
- The UCP 50 series field “DCs” has been deprecated.

- Applications are advised to use the XSer service type “GSM DCS information” as a replacement for the UCP 50 series field MCLs.
- The 50 series RPID field range has been corrected to include 0000...0071.
- Added an example of encoding an alphanumeric address.
- The TMsg field in the UCP51 and UCP52 messages is changed from M (Mandatory) to O (Optional).
- Statement that the address fields are encoded according to E.164.

A.9 Changes – EMI Specification 3.1.4

- The XSer service types 03 - 0B have been introduced in order to support the functionality of TDMA within the UCP51 and UCP52 messages.
- The length of the TMsg field in the UCP51 and UCP52 messages for MT=4 has been extended from 140 to 160 octets to support 160 byte binary data for TDMA.
- The number-of-messages-waiting field in the response of a SMT alert message (UCP31) has been specified as always being ‘0000’ for a Multiple Address LA.
- The “GSM DCS information” field can be specified in the modified message (UCP54) XSer field.

A.10 Changes – EMI Specification 3.5

- The XSer service type 0C has been introduced to support the Billing Identifier in UCP51 and UCP54 messages.
- The XSer service type 0D has been introduced to support Single Shot indication.
- Support for the EURO sign / GSM default alphabet extension table.

A.11 Changes – EMI Specification 4.0

- The MT=4, Tmsg, RPID and Xser fields has been added in the UCP53 message to support transfer of data returned by the mobile station.
- The Oadc field has been removed from the UCP57 operation. This correction aligns the operation with UCP58.
- Valid values of RPID field have been extended to align with [3GPP 23.040] and operator configurable permissions and restrictions.

A.12 Changes – EMI Specification 4.6 Document Version 4.7

Added to the Xser fields: Originator and Recipient TON and NPI.

A.13 Changes – EMI Specification 4.6 Document Version 5.2

Added relative time format for VP and DDT fields.

A.14 Changes – EMI Specification 4.6 Document Version 5.3

Added to the Xser fields: Message Original Submission Time.

A.15 Changes – EMI Specification 4.7 Document Version 1.0

Added to the Xser fields: Destination Network Type.

New UCP 59 (Submit Notification) operation.

Abbreviations

| | |
|-------|--|
| CDMA | Code Division Multiple Access |
| CLI | Calling Line Identifier |
| DCS | Data Coding Scheme |
| EMI | External Machine Interface |
| ERMES | European Radio Messaging System |
| ETS | European Technical Standard |
| FAX | Facsimile |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile communication |
| IA5 | International Alphabet 5 |
| IRA | International Reference Alphabet [ITU T.50] (formerly IA5) |
| LA | Large account. An SMT registered on the SMSC. |
| MS | Mobile Station |
| O&M | Operations and Maintenance |
| PC | Personal Computer |
| PLMN | Public Land Mobile Network |
| PSTN | Public Switched Telephone Network |
| SM | Short Message |
| SME | Short Message Entity |
| SMS | Short Message Service |
| SMSC | Short Message Service Centre |
| SMT | Short Message Terminal |
| TDMA | Time Division Multiple Access |
| UCP | Universal Computer Protocol |
| UDH | User Data Header |
| UMTS | Universal Mobile Telecommunications System |
| VMS | Voice Mail System |

References

- [ETSI 03.00] ETSI ETS 300 133-3 Paging Systems (PS); European Radio Messaging System (ERMES) Part 3: Network aspects; Section 9: I5 interface.
- [3GPP 23.038] 3GPP TS 23.038 Alphabets and language-specific information.
- [3GPP 23.040] 3GPP TS 23.040 Technical realisation of the Short Message Service (SMS) [GSM]
- [ITU-T] X.680: ITU-T Recommendation X.680 Information Technology - Abstract Syntax Notation One (ASN.1): Specification of Basic Notation.
- [TIA/EIA-136-710c] TIA/EIA-136-710c, Short Message Service - Cellular Messaging Teleservice [TDMA].
- [TIA/EIA-637-B] TIA/EIA-637-B, Short Message Service for Spread Spectrum Systems [CDMA].
- [EMI-UCP-BILLID] EMI-UCP Billing Identifier Format Specification, version 1.22, May 2004

Version History

| Version | Status | Date | Details of Changes | Author(s) | Approver(s) |
|---------|--------|------------------|--------------------|---------------|-------------------|
| 0.1 | DRAFT | December 2011 | Initial version | | |
| 1.0 | ISSUED | 15 February 2011 | TW review | Jana Gilarova | Dalimil Hrabovsky |

Document derived from Template Version 6.0 Generic Document Template – Standard (APL_DOC_GENERIC_TEMPLATE_STANDARD.dot).