



EXTERNAL MACHINE INTERFACE (EMI) SPECIFICATION

version 3.1.2

Abstract

This document specifies the communication interface between the T-Mobile Czech Republic Short Message Service Centre and other computer systems and applications.

Disclaimer

The information in this document is subject to change without notice. T-Mobile Czech Republic assumes no responsibility for any errors that may appear in this document.

Further information:

T-Mobile Czech Republic a.s.
Londynska 730
120 00 Praha 2
Czech Republic
+420 603 603603
developers@t-mobile.cz
<http://www.t-mobile.cz>

Table of Contents

| | |
|---|-----------|
| PREFACE | 4 |
| 1. INTRODUCTION | 7 |
| 1.1 Position of interface | 7 |
| 1.2 Interface history | 8 |
| 1.3 References | 9 |
| 2. STRUCTURE OF EMI MESSAGES | 10 |
| 2.1 Examples | 11 |
| 3. EMI COMMANDS | 12 |
| 3.1 SMT initiated commands | 12 |
| 3.2 SMSC initiated commands | 13 |
| 3.3 Flow control | 13 |
| 4. EMI COMMANDS SYNTAX | 14 |
| 4.1 Address syntax | 14 |
| 4.2 Call input operation -01 | 14 |
| 4.2.1 Call input operation (positive result) | 15 |
| 4.2.2 Call input operation (negative result) | 16 |
| 4.3 Multiple address call input operation -02 | 17 |
| 4.3.1 Multiple address call input operation (positive result) | 18 |
| 4.3.2 Multiple address call input operation (negative result) | 18 |
| 4.4 Call input with supplementary services operation -03 | 19 |
| 4.4.1 Call input with supplementary services operation (positive result)..... | 21 |
| 4.4.2 Call input with supplementary services operation (negative result)..... | 21 |
| 4.5 MS message transfer operation -30 | 22 |
| 4.5.1 MS message transfer operation (positive result)..... | 24 |
| 4.5.2 MS message transfer operation (negative result)..... | 24 |
| 4.6 MT alert operation -31 | 25 |
| 4.6.1 MT alert operation (positive result)..... | 26 |
| 4.6.2 MT alert operation (negative result)..... | 26 |
| 5. 50-SERIES OF EMI MESSAGES | 28 |
| 5.1 Abstract Data Types | 28 |
| 5.1.1 How an application should pass an alphanumeric OAdC..... | 32 |
| How to encode the alphanumeric OAdC | 32 |
| Restrictions of the used IA5 characters in an alphanumeric OAdC | 32 |
| 5.1.2 Description Of XSer Extra Services | 33 |
| 5.1.2.0 XSer Type of service 00, Not Used..... | 33 |
| 5.1.2.1 XSer Type of service 01, GSM UDH information..... | 33 |
| Example encoding of XSer Type of service 01, GSM UDH information: | 33 |
| 5.1.2.2 XSer Type of service 02 – FF, Reserved..... | 33 |
| 5.2 Standard string | 34 |

| | |
|---|-----------|
| 5.3 Submit Short Message operation -51 | 35 |
| 5.3.1 Submit Short Message operation (positive result)..... | 36 |
| 5.3.2 Submit Short Message operation (negative result)..... | 37 |
| 5.4 Delivery Short Message operation -52 | 37 |
| 5.4.1 Delivery Short Message operation (positive result)..... | 39 |
| 5.4.2 Delivery Short Message operation (negative result)..... | 39 |
| 5.5 Delivery notification operation -53 | 40 |
| 5.5.1 Delivery Notification operation (positive result)..... | 41 |
| 5.5.2 Delivery Notification operation (negative result)..... | 42 |
| 5.6 Modify Short Message operation - 54 | 42 |
| 5.6.1 Modify Short Message operation (positive result)..... | 45 |
| 5.6.2 Modify Short Message operation (negative result)..... | 45 |
| 5.7 Inquiry message operation -55 | 46 |
| 5.7.1 Inquiry message operation (positive result)..... | 47 |
| 5.7.2 Inquiry message operation (negative result)..... | 47 |
| 5.8 Delete message operation -56 | 48 |
| 5.8.1 Delete message operation (positive result)..... | 49 |
| 5.8.2 Delete message operation (negative result)..... | 49 |
| 5.9 Response Inquiry message operation -57 | 50 |
| 5.9.1 Response inquiry message operation (positive result)..... | 51 |
| 5.9.2 Response inquiry message operation (negative result)..... | 52 |
| 5.10 Response delete message operation -58 | 52 |
| 5.10.1 Response delete message operation (positive result)..... | 53 |
| 5.10.2 Response delete message operation (negative result)..... | 54 |
| 6. 60-SERIES OF EMI MESSAGES | 54 |
| 6.1 Abstract Data Types | 54 |
| 6.2 Standard string | 56 |
| 6.3 Session management operation -60 | 56 |
| 6.3.1 Session management operation (positive result)..... | 57 |
| 6.3.2 Session management operation (negative result)..... | 58 |
| 6.4 Provisioning actions operation -61 | 58 |
| 6.4.1 Provisioning actions operation (positive result)..... | 59 |
| 6.4.2 Provisioning actions operation (negative result)..... | 60 |
| 7. ERROR CODES OVERVIEW | 61 |
| 7.1 Error codes | 61 |

PREFACE

This manual specifies the interface used between the SMSC System and other computer systems and applications. The interface is based on the ERMES UCP (Universal Computer Protocol) with some SMSC-specific extensions.

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

Intended Audience

All persons involved in the design and implementation of applications on external computer systems that have to interact with the SMSC.

Document Structure

This document is structured as follows:

- Chapter 1 contains the introduction to the EMI. It describes the position of the EMI between the SMSC components and the external machines.
- Chapter 2 shows the structure of EMI messages and provides examples of valid exchanges of commands between the SMSC and the applications.
- Chapter 3 defines the EMI operations, and describes briefly the actions that are expected from the SMSC and the Application upon reception of the commands (these are further detailed in the respective design documents).
- Chapter 4 shows the syntax of EMI command messages.
- Chapter 5 shows the syntax of the 50-series of EMI command messages.
- Chapter 6 shows the syntax of the 60-series of EMI command messages.
- Chapter 7 summarises the error codes for the EMI operations.

General Note on External Machine Interface specification

The External Machine Interface specification specifies the features that can be used in the EMI operations. However, many of the features can only be used when the operator of the SMSC has bought the corresponding licenses. Also many features are subject to provisioning by the SMSC operator, i.e. did the operator grant you the rights to use these features in the EMI operations.

Abbreviations

Abbreviations used in this document

| Abbreviation | Meaning |
|--------------|--|
| EMI | External Machine Interface |
| ERMES | European Radio Messaging System |
| ETS | European Technical Standard |
| FAX | Facsimile |
| GSM | Global System for Mobile communication |
| IVR | Interactive Voice Response |
| 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 |
| SMH | Short Message Handler |
| SMS | Short Message Service |
| SMSC | Short Message Service Centre |
| SMT | Short Message Terminal |
| UCP | Universal Computer Protocol |
| UDH | User Data Header |
| VMS | Voice Mail System |

Changes with respect to 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 Large Account support:
- 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) Large Account 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 OTON to 5 (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 Large Accounts 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 which are not equal to all zero's, 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.)

Changes with respect to 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.

Changes with respect to EMI specification 3.1.1

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

1. INTRODUCTION

For submission and reception of Short Messages the Short Message Service Centre can interface with (among others):

- GSM Mobile Telephones (PLMN),
- Interactive Voice Response systems,
- Voice Messaging systems,
- a MENU application accessed from PC's through terminal emulation,
- dedicated PC applications.

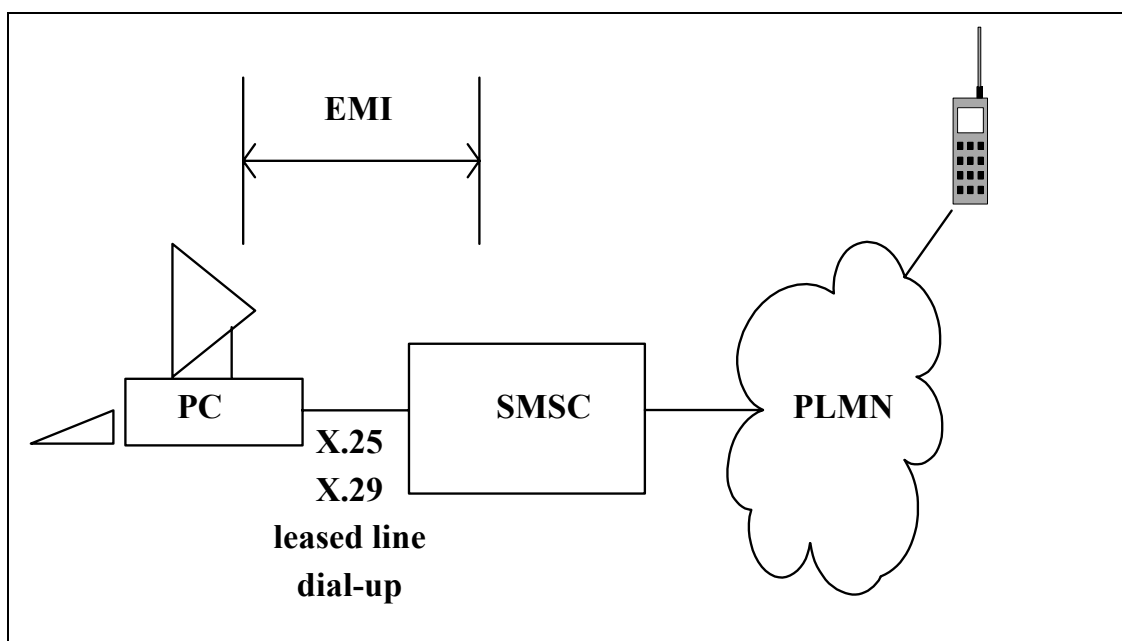
NOTE

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 SMSC functions. This manual specifies that interface.

1.1 Position of interface

Figure 1-1: EMI: External view



When viewed from the SMT/PC side, the EMI provides access to the SMSC functions:

- Submission of Short Messages
- Reception of Short Messages
- Reception of Notifications

The SMSC can be viewed as a Black Box: Short Messages 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.

EMI can use the following lower level protocols as a carrier:

- X.25 (X.121)
- X.29
- PSTN (E.164)
- ISDN (E.164)
- TCP/IP
- other on request

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.

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, almost always 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 to use the UCP protocol to interact with external machines.
2. it allows service providers to use a single mechanism to interface to 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 commands, it was necessary to extend the UCP definition with some additional, SMSC specific commands, such as 'SMS message transfer operation' and 'SMT alert operation'

NOTE

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.

1.3 References

1. ETSI ETS 300 133-3 Paging Systems (PS); European Radio Messaging System (ERMES) Part 3: Network aspects; Section 9: I5 interface.
2. ETSI GSM 03.38 Version 4.0.1; Alphabets and language-specific information; European digital cellular telecommunications system (Phase 2).

2. STRUCTURE OF EMI MESSAGES

In the ERMES/UCP-based EMI protocol, the message structure is as follows:

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

o stx = 02(hex)

o etx = 03(hex)

Note that in the examples 'stx', 'etx' and '/' each represent only one character.

As 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 IA5. Alphanumeric characters are encoded as two numeric IA5 characters, the higher 3 bits (0..7) first, the lower 4 bits (0..F) thereafter, according to the following table.

| Character set for alphanumeric paging | | | | 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 | £ | DC1 | ! | 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 | ^ | ▯ | 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 | Ξ | * | : | J | Z | j | z |
| 1 | 0 | 1 | 1 | 11 | Ø | ESC | + | ; | 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 | § | o | à |

This table is the default setting for computer interworking. Operators might select to change this mapping to accommodate other national characters. Character coding above '7F'(hex) can be filled as well.

The <header> consists of the following 4 mandatory fields:

| Parameter | Type | Description |
|-----------|-----------------|---|
| TRN | 2 num. char. | Transaction reference number, right justified with leading zero. |
| LEN | 5 num. char. | Total number of IA5 characters contained between stx and etx, 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 message <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 8 Least Significant Bits (LSB) of the result is then represented as two printable characters. The character containing 4 Most Significant Bits (MSB) (of those 8 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 Examples

Below you will find examples of the SMS message transfer operation and responses. The message sent is "hello":

```
stx01/00045/O/30/66677789///1/////68656C6C6F/CEetx
stx01/00041/R/30/A//66677789:180594141236/F3etx
```

```
stx01/00052/O/30/66677789///1/558/0138/////68656C6C6F/3Aetx
stx01/00041/R/30/A//66677789:180594141430/EFetx
```

In the acknowledgement, the 'system message' parameter is used to indicate the recipient address and timestamp. Note that the 'Authentication Code' parameter is not used. The Notification requested in the first example will be sent to the originator of the short message, only as long as this session exists.

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

3. EMI COMMANDS

EMI commands can be initiated either from the SMT, or from the SMSC. Each command will lead to an action on the other side. The other side will respond with a positive or negative acknowledgement.

3.1 SMT initiated commands

The following SMT initiated operations are available:

| 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 |
| 31 | SMT alert operation |
| 32 | (reserved) |
| 33 | (reserved) |
| 38 | (reserved) |
| 40 | (reserved) |
| 41 | (reserved) |
| 5x | 50-series, see chapter 5, 7 |
| 6x | 60-series, see chapter 6, 7 |

The definitions of operations '01', '02' and '03' are identical to the corresponding operations defined in [1].

The 'Call input operation' is the normal means of submitting a Short Message. The SMSC must, when it receives this command, 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 notification request, deferred delivery, or validity period.

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 X.25.

3.2 SMSC initiated commands

SMSC initiated operations (used to deliver Notifications or Mobile Originated Short Messages) are:

| Command id | Command Name |
|------------|-----------------------------|
| 01 | Call input operation |
| 34 | (reserved) |
| 36 | (reserved) |
| 42 | (reserved) |
| 43 | (reserved) |
| 5x | 50-series, see chapter 5, 7 |

The SMSC uses the 'Call input operation' to transfer Notifications and Mobile Originated Short Messages to the Short Message Terminal (SMT). The initiative to do so lies either with the SMSC (Notifications on messages submitted in the current session) or with the SMT (the SMT has to issue an SMT alert command).

3.3 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 commands, no other commands shall be sent before the a response is received. Any command that is 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'. In this case a maximum of n commands can be sent before a response is received. The transaction number of the command (field TRN) will be used to determine if a command is in the current 'window'.

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

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

NOTE

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

4. EMI COMMANDS SYNTAX

This chapter shows the syntax of the data fields of the EMI commands. For the syntax of the complete messages, please refer to Chapter 2, Structure of EMI messages. For each command also the format of the positive and negative responses is given, including the possible error codes. For convenience, all error codes are summarised in Chapter 7, 7.1, Error Codes Overview. The order in which the commands are listed is:

1. general commands, 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, and 'O' indicates that it is Optional.

4.1 Address syntax

For all addresses used in the EMI-messages the following syntax rules are valid:

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

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

<int-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):

<int-prefix><country-code><telephone-nr>

<telephone-nr>

For TCP/IP addresses every byte expressed in decimal form should be left zero padded so that they all have a length of 3 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.

4.2 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 a 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 as a result of a 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 list shows the parameters in the operation data field:

| 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 IA5 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

4.2.1 Call input operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

| 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 |

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

Example:

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

4.2.2 Call input operation (negative result)

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

| 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

4.3 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 list shows the parameters in the operation data field:

| 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 numeric 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 IA5 characters, maximum length is representing 640 characters. |

- The SMSC does currently not support the Multiple call input operation for Large Accounts in combination with throughput regulation.
- 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

4.3.1 Multiple address call input operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

| 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 |

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

If some of the addresses are invalid, and some are valid, the invalid addresses 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

4.3.2 Multiple address call input operation (negative result)

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

| Parameter | Type | Presence | Description |
|-----------|------|----------|-------------|
|-----------|------|----------|-------------|

| | | | |
|------|-----------------|---|--------------------------|
| NACK | Char "N" | M | Negative acknowledgement |
| EC | 2 numeric 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

4.4 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 list shows the parameters in the operation data field:

| Parameter | Type | Presence | Description |
|-----------|----------------------|----------|--|
| RAAd | String of num. char. | M | AdC Address code recipient, maximum length is 16 digits, combined with optional legitimation 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. |
| MT | 1 numeric 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 IA5 characters, maximum length is representing 640 characters. |

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

4.4.1 Call input with supplementary services operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

| 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 |

Example:

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

4.4.2 Call input with supplementary services operation (negative result)

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

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char "N" | M | Negative acknowledgement |
| EC | 2 numeric 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

4.5 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 list shows the parameters in the operation data field:

| 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 appl. over PSTN 0339 PC appl. over X.25 0439 PC appl. over ISDN 0539 PC appl. over TCP/IP |
| DD | Char '1' | O | Deferred delivery request. |
| DDT | 10 num. char. | O | Deferred delivery time DDMMYYHHmm. |
| VP | 10 num. char. | O | Validity period DDMMYYHHmm. |

| | | | |
|------|-----------------|---|---|
| AMsg | String of char. | O | Alphanumeric message encoded into IA5 characters, maximum length representing 640 characters. |
|------|-----------------|---|---|

- The AC parameter is discarded if present.
- If NRq is used, then NAd and NPID must be both 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. If, in this case :
 - * the session is ended,
 - * and the originator is not known to the SMSC to have more than one address,
 - * and the notification has not yet been deliveredthen the notification is deleted by the SMSC.
- 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////454D4920737065636966669636174696F6E/D4
- Alphanumeric message 'Message OK' with deferred delivery and validity period set
44/00077/O/30/0673845336/////1/1003961344/1203961200/4D657373616765204F4B/27

4.5.1 MS message transfer operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

| 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 DDMMHHhhmmss |

Example:

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

4.5.2 MS message transfer operation (negative result)

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

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char "N" | M | Negative acknowledgement |
| EC | 2 numeric 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

4.6 MT alert operation -31

This operation can be used by a SMT to alert the SC. The following list shows the parameters in the operation data field:

| 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 appl. via PSTN 0339 PC appl. via X.25 0439 PC appl. via ISDN 0539 PC appl. via TCP/IP 0639.....PC appl. via abbreviated number |

Note:

- PID value 0639 can only be used to alert for the own (originator) address and if the abbreviated number is known to the SMSC to be related with multiple physical addresses.

Example:

- Alert requested on PSTN number 0234765439845
02/00035/O/31/0234765439845/0139/A0

4.6.1 MT alert operation (positive result)

The following list shows the parameters in the positive result data field:

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

The positive SMT alert operation result text SM parameter must 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 zero's. When the number of messages waiting in the SC is more than 9,999, then 9999 will be returned as the number of messages waiting.

Example:

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

4.6.2 MT alert operation (negative result)

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

| Parameter | Type | Presence | Description |
|-----------|-----------------|----------|--------------------------|
| NACK | Char "N" | M | Negative acknowledgement |
| EC | 2 numeric 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:

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

5. 50-SERIES OF EMI MESSAGES

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

| EMI operation | Name | initiated by |
|---------------|--------------------------|--------------|
| 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 |

These messages have been introduced in order to provide more facilities to the SMSC users. If a user has used one of these operations 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 that are 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.'):

| Member | Length | Type | Meaning |
|--------|--------|-------------|--|
| AdC | 16 | Num. string | Address code recipient for the SM |
| OAdC | 16 | Num. string | Address code originator |
| | 24 | Char string | If the OTOA field indicates alphanumeric OAdC. |
| 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: 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 appl. over PSTN (E.164) 0339 PC appl. over X.25 (X.121) 0439 PC appl. over ISDN (E.164) 0539 PC appl. 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 appl. over PSTN 0339 PC appl. over X.25 (X121) 0439 PC appl. over ISDN (E.164) 0539 PC appl. 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 DDMMYYHHmm |
| VP | 10 | 10 num. char. | Validity period in DDMMYYHHmm |
| RPID | 4 | Num. string | Replace PID, value 0000, 0071, 0095, 0127, 0192...0255. |
| SCTS | 12 | Num. string | Service Centre Time Stamp in DDMMYYHHmmss. For a Short Message this is the time stamp of the Short Message itself. For a Notification this is the time stamp of the corresponding Short Message. |
| 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 DDMMYYHHmmss. 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 IA5 characters. |
| MT=4: | | | |
| NB | 4 | Num. char. | No. of bits in Transparent Data (TD) message. |
| TMsg | 140 | Char. string | TD message encoded into IA5 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. | 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 |
| 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 The OadC is set to NPI telephone and TON international. 5039 The OAdC contains an alphanumeric address (see OAdC and below). Leave OTOA empty for a numeric address in the OAdC. |
| HPLMN | 16 | Num. string | Home PLMN Address |
| XSer | 400 | Num. string | Extra Services With the XSer field one or more additional services can be specified. These services consist of IA5 encoded data constructed in the following common format: TTLLDD... where TT represents two HEX characters defining the type of service. For a description of available services refer to section “ |

5.1.2 Description Of XSer Extra Services"

- LL represents two HEX characters defining the number of octets present in the data field DD. (Note that the number of *HEX characters* in the data DD is twice the number of *octets*)
- 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.

TT₁LL₁DD₁...DD₁TT₂LL₂DD₂..DD₂

The above 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 follows:

- For a positive response:

| Member | Type |
|--------|--------------------------|
| AcK | Positive acknowledgement |
| MVP | Modified Validity Period |
| SM | System Message |

- For a negative response:

| Member | Type |
|--------|--------------------------|
| NAcK | Negative acknowledgement |
| EC | Error code |
| SM | System Message |

5.1.1 How an application should pass an alphanumeric OAdC

How to encode the alphanumeric OAdC

This paragraph describes how an alphanumeric OAdC should be sent, this will be done using an example.

Suppose that the alphanumeric address is: ALPHA@NUM

The hexadecimal values of this string are:

0x41 0x4C 0x50 0x48 0x41 0x00 0x4E 0x55 0x4D

This alphanumeric address (IA5) should first be coded into 7 bits, according to *ETSI's 3.38*, by the application. 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 *ETSI's 3.40*. 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 IA5 characters in an alphanumeric OAdC

There are no restrictions. All characters from the IA5 alphabet can be used.

5.1.2 Description Of XSer Extra Services

The XSer field allows to specify one or more additional services, all in the format TTLDD...DD, where TT field specifies the type of service. The following subsections specify the supported service types.

5.1.2.0 XSer Type of service 00, Not Used

This service type is not used.

5.1.2.1 XSer Type of service 01, GSM UDH information

With this service type *GSM User Data Header information* can be specified. The data field DD of this service type contains the octets of the GSM User Data Header as specified in GSM 03.40. (UDHL, IEIa, IEIDLa, IEDa, IEIb, ..., IEIn, IEDLn, IEDn). Every UDH octet is encoded in two IA5 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 c.q. 160 septets.

Depending on the MT field this is checked as follows:

- If MT = 2 or 3 then: 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 then: 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.

Example encoding of XSer Type of service 01, GSM UDH information:

A GSM UDH 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 IA5 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, IEIDLa, 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, IEIDLb, Length of information element b = 2 octets
F0 = DD, IEDb, destination port = 240
FA = DD, IEDb, originator port = 250

```

5.1.2.2 XSer Type of service 02 – FF, Reserved

These types are reserved for future use.

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 [1] 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 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 shall 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'.

| 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 | M | Last Resort Address |
| LPID | M | LRAD PID value |
| DD | O | Deferred Delivery requested |
| DDT | O | Deferred delivery time in DDMMYYHHmm |
| VP | O | Validity period in DDMMYYHHmm |
| RPID | O | Replace PID value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmms. |
| Dst | - | Delivery status |
| Rsn | - | Reason code |
| DSCTS | - | Delivery time stamp in DDMMYYHHmms. |
| 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 IA5 characters. |
| MT=4: | | |
| NB | M | No. of bits in Transparent Data (TD) message. |
| TMsg | M | TD message encoded into IA5 characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | O | Priority Requested |
| DCs | O | Obsolete, value will be discarded |
| MCLs | O | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | O | Reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | O | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |

| | | |
|------|---|----------------|
| 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 or NPID or both are left empty, then the notification is sent to the originator in the current session. If in this case :
 - * the session is ended,
 - * the originator is not known to the SMSC to have more than one address,
 - * and the notification has not yet been delivered,
 then the notification is deleted by the SMSC.
- If LRq is used, and LRAAd and LPID are both used, then this address (user supplied) will be used as Last Resort address.
- If LRq is used, and LRAAd or LPID or both are left empty, then the Last Resort address is the current session. If in this case:
 - * the session is ended,
 - * the originator is not known to the SMSC to have more than one address,
 - * and the short message has not yet been delivered,
 then the short message is deleted by the SMSC.
- If LRq is empty, the contents of LRAAd 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 is used, MT must be 4 and MCLs must be 2 otherwise the message is rejected. RPID value 0127 is only supported for SMSC Large Accounts. Last resort addressing and Reply path functionality is not applicable to this type of message. The contents of LRq and RPI is ignored.

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//4D657373616765203531//////////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 list shows the parameters in the positive result data field:

| 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 following three fields:

| 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 list shows the parameters in the negative result data field:

| 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/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.

| 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 |
| VP | O | Validity period in DDMMYYHHmm |
| RPID | O | Replace PID value |
| SCTS | M | 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 IA5 characters. |
| MT=4: | | |
| NB | M | No. of bits in Transparent Data (TD) message. |
| TMsg | M | TD message encoded into IA5 characters. |
| MMS | O | More Messages to Send (to the same SME) |
| PR | - | (reserved for Priority Requested) |
| DCs | O | Data Coding scheme, See GSM 03.38. Shall be set to 1 when MT = 4, discarded or 0 otherwise. |
| MCLs | O | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | O | Reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |
| XSer | O | Extra Services |
| RES4 | - | |
| RES5 | - | |

- If the recipient of the UCP52 operation is registered in the SMSC as being a Large Account, the Home PLMN 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 a Large Account and the originator of the Short Message has anonymised the message (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 Large Accounts.

Example:

- Alphanumeric message 'Call you back later.' received from originator 07686745
00/00120/O/52/076523578/07686745//////////120396111055////3//43616C6C20796F7520626
1636B206C617465722E//0//////////A3

5.4.1 Delivery Short Message operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

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

5.4.2 Delivery Short Message operation (negative result)

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

| 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.

| 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 |
| VP | - | Validity period in DDMMYYHHmm |
| RPID | - | Replace PID value |
| 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 IA5 characters. |

| | | | |
|-------|---|--|---|
| MT=4: | | | |
| NB | - | | No. of bits in Transparent Data (TD) message. |
| TMsg | - | | TD message encoded into IA5 characters. |
| MMS | O | | More Messages to Send (to the same SME) |
| PR | - | | (reserved for Priority Requested) |
| DCs | - | | Data Coding scheme, See GSM 03.38. Shall be set to 1 when MT = 4, discarded or 0 otherwise. |
| MCLs | - | | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | - | | Reply Path |
| CPg | - | | (reserved for Code Page) |
| RPLy | - | | (reserved for Reply type) |
| OTOA | - | | Originator Type of Address |
| HPLMN | O | | Home PLMN Address |
| XSer | - | | |
| RES4 | - | | |
| RES5 | - | | |

- If the recipient of the UCP53 operation is registered in the SMSC as being a Large Account and the originator of the Short Message has anonymised the message (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 3155555, with identification 960109161057 has been buffered' received
00/00234/O/53/1299998/3155555//////////090196161057/1/108/090196161105/3//4D657373
61676520666F7220333135353535352C2077697468206964656E74696669636174696F
6E2039363031303931363130353720686173206265656E206275666665726564//////////
1F

5.5.1 Delivery Notification operation (positive result)

The following list shows the parameters in the positive result data field:

| 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 list shows the parameters in the negative result data field:

| 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

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 left empty or both used, otherwise a negative acknowledge is returned.
 - If Nrq is '1' and NAdC and NPID are left empty, then the notification is sent to the originator in the current session, if in this case:
 - * the session is ended,
 - * the originator is not known to the SMSC to have more than one address,
 - * and the notification has not been delivered,
 then the notification is deleted by the SMSC.
 - 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 is 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) 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 is used , MT must be 4 and MCLs must be 2 otherwise the message is rejected. RPID value 0127 is only supported for SMSC 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.
 6. Message type
 - If MT is set to '4' (binary message), then the fields NB and TMsg should be filled in, the field MCLs 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 can not be cancelled.

| 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 | (New) Notification Request |
| NAdC | O | (New) Notification Address Code |
| NT | O | (New) Notification Type |
| NPID | O | (New) Notification PID value |

| | | |
|-------|---|--|
| LRq | O | (New) Last Resort request |
| LRAd | O | (New) Last Resort Address |
| LPID | O | (New) LRAD PID value |
| DD | - | Deferred Delivery requested |
| DDT | O | (New) Deferred delivery time in DDMMYYHHmm |
| VP | O | (New) validity period in DDMMYYHHmm |
| RPID | O | (New) 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 | (New) Message Type. |
| MT=2: | | |
| NB | - | (New) No. of bits in Transparent Data (TD) message. |
| NMsg | O | (New) Numeric message. |
| MT=3: | | |
| NB | - | (New) No. of bits in Transparent Data (TD) message. |
| AMsg | O | (New) Alphanumeric message encoded into IA5 characters. |
| MT=4: | | |
| NB | M | (New) No. of bits in Transparent Data (TD) message. |
| TMsg | M | (New) TD message encoded into IA5 characters. |
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (reserved for Priority Requested) |
| DCs | O | Obsolete, value is discarded |
| MCLs | O | (New) Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | O | (New) reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |
| XSer | - | |
| RES4 | - | |
| RES5 | - | |

Note:

- 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 tried 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.

Examples:

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

00/00087/O/54/012345/011111111111111111111111/0654321/0100////010197120501////3//////////4C

5.6.1 Modify Short Message operation (positive result)

The following list shows the parameters in the positive result data field:

| 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 following three fields:

| 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/54/A//012345:020197120005/65

5.6.2 Modify Short Message operation (negative result)

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

| 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/54/N/04//0A

5.7 Inquiry message operation -55

This operation is initiated by the SMT towards the SMSC to inquire about the status of a buffered message. As a result the SMSC can initiate a Response 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 |
| LRAAd | - | Last Resort Address |
| LPID | - | LRAD PID value |
| DD | - | Deferred Delivery requested |
| DDT | - | Deferred delivery time in DDMMYYHHmm |
| VP | - | Validity period in DDMMYYHHmm |
| RPID | - | Replace PID value |
| SCTS | - | Service Centre Time Stamp in DDMMYYHHmmss. |
| Dst | - | Delivery status |
| Rsn | - | Reason code |
| DSCTS | - | Delivery time stamp in DDMMYYHHmmss. |
| 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 IA5 characters. |
| MT=4: | | |
| NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IA5 characters. |

| | | |
|-------|---|---|
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (reserved for Priority Requested) |
| DCs | - | Data Coding scheme, See GSM 03.38. Shall be set to 1 when MT = 4, discarded or 0 otherwise. |
| MCLs | - | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | - | Reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |
| 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 list shows the parameters in the positive result data field:

| 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 list shows the parameters in the negative result data field:

| 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 Delete message operation -56

This operation is initiated by the SMT to delete one or more buffered Short Messages.

| 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 |
| LRAAd | - | Last Resort Address |
| LPID | - | LRAD PID value |
| DD | - | Deferred Delivery requested |
| DDT | - | Deferred delivery time in DDMMYYHHmm |
| VP | - | Validity period in DDMMYYHHmm |
| 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 IA5 characters. Contains the time stamps (format YYMMDDhhmmss) of the buffered Short Message(s), separated by spaces. Format: <code>TIMESTAMP {TIMESTAMP}</code> |
| MT=4: | | |
| NB | - | No. of bits in Transparent Data (TD) message. |
| TMsg | - | TD message encoded into IA5 characters. |

| | | |
|-------|---|---|
| MMS | - | More Messages to Send (to the same SME) |
| PR | - | (reserved for Priority Requested) |
| DCs | - | Data Coding scheme, See GSM 03.38. Shall be set to 1 when MT = 4, discarded or 0 otherwise. |
| MCLs | - | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | - | Reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |
| 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:

- Delete messages with timestamps '960901113944 960808122222' for recipient 0546546 from originator 08456556
12/00115/O/56/0546546/08456556//////////3//39363039303131313339343420393630383038313232323232//////////2A

5.8.1 Delete message operation (positive result)

The following list shows the parameters in the positive result data field:

| 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

5.8.2 Delete message operation (negative result)

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

| 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

5.9 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.

| Member | Presence | Meaning |
|--------|----------|--|
| AdC | M | Address code recipient for the SM |
| 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 |
| VP | - | Validity period in DDMMYYHHmm |
| 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 IA5 characters. 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 IA5 characters. |
| MMS | O | More Messages to Send (to the same SME) |
| PR | - | (reserved for Priority Requested) |
| DCs | - | Data Coding scheme, See GSM 03.38. Shall be set to 1 when MT = 4, discarded or 0 otherwise. |
| MCLs | - | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | - | Reply Path |
| CPg | - | (reserved for Code Page) |
| RPLy | - | (reserved for Reply type) |
| OTOA | - | Originator Type Of Address |
| HPLMN | O | Home PLMN Address |
| 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 06666666 waiting to be send
17/00098/O/57/55555//////////3//44657374696E6174696F6E3A203036363636363620/1///
/////////37

5.9.1 Response inquiry message operation (positive result)

The following list shows the parameters in the positive result data field:

| 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

5.9.2 Response inquiry message operation (negative result)

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

| 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

5.10 Response delete message operation -58

This operation is initiated by the SMSC to indicate which Short Messages have been deleted successfully.

| Member | Presence | Meaning |
|--------|----------|--|
| AdC | M | Address code recipient for the SM |
| 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 |
| VP | - | Validity period in DDMMYYHHmm |
| 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 IA5 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 IA5 characters. |
| MMS | O | | More Messages to Send (to the same SME) |
| PR | - | | (reserved for Priority Requested) |
| DCs | - | | Data Coding scheme, See GSM 03.38. Shall be set to 1 when |
| MT = 4, discarded or 0 otherwise. | | | |
| MCLs | - | | Message class. See GSM 03.38. Shall be supplied when MT=4. |
| RPI | - | | Reply Path |
| CPg | - | | (reserved for Code Page) |
| RPLy | - | | (reserved for Reply type) |
| OTOA | - | | Originator Type Of Address |
| HPLMN | O | | Home PLMN Address |
| 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:

- Message for 0666666 with timestamp 960110091043 has been deleted
22/00188/O/58/55555/3//44657374696E6174696F6E20303636363636362069646
56E74696669636174696F6E3A2039363031313030393130343320686173206265656E2
064656C657465642E/1/FF

5.10.1 Response delete message operation (positive result)

The following list shows the parameters in the positive result data field:

| 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:

- 00/00029/R/58/A//064564565/7D

5.10.2 Response delete message operation (negative result)

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

| 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:

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

6. 60-SERIES OF EMI MESSAGES

This chapter introduces the 60-series of operations. The 60-series are used in combination with the Large Account Database option. The following defines these operations:

| EMI operation | Name | initiated by |
|---------------|--------------------|--------------|
| 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 is a description of this generic ADT (where 'Num. string' indicates 'string of numeric char.'):

| Member | Length | Type | Meaning |
|--------|--------|--------------|--|
| OAdC | 16 | Num. 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 IA5 characters |
| NPWD | 16 | Char. string | New password encoded into IA5 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) |

A generic ADT for the EMI response is defined as follows:

For a positive response:

| Member | Type |
|--------|--------------------------|
| Ack | Positive acknowledgement |
| SM | System Message |

For a negative response:

| Member | 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 [1] 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.

| Member | Presence | Meaning |
|--------|----------|--|
| OAdC | M | Any valid X.121, E164, TCP/IP or abbreviated address, 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 = Private (TCP/IP address/abbreviated number address) |

| | | |
|------|---|---|
| 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 IA5 characters |
| NPWD | O | New password encoded into IA5 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 | - | |

- 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) then 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 Large Account Database defines a check on the physical address for a particular Large Account **and** STYP=1 or STYP=3 **and** the CLI-address (connect address) is not an address in the Large Account Database.
 - * the OAdC contains an address or abbreviated short number that is not in the Large Account Database.
 - * 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 list shows the parameters in the positive result data field:

| 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 list shows the parameters in the negative result data field:

| 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.

| Member | Presence | Meaning |
|--------|----------|---|
| OAdC | M | Any valid X.121, E164, TCP/IP or abbreviated address, 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 = Private (TCP/IP address/abbreviated number address) |
| 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 IA5 characters |
| NPWD | - | New password encoded into IA5 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

6.4.1 Provisioning actions operation (positive result)

The following list shows the parameters in the positive result data field:

| 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 list shows the parameters in the negative result data field:

| 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

7. ERROR CODES OVERVIEW

Error codes which can be returned in the operations negative result are listed in [1] paragraph 9.2.6. All operations defined in the ERMES recommendation which are not implemented in the SMSC, EMI returns with error code 03 ("Operation not supported by system").

7.1 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 |
| 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:

| 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 A ERROR MESSAGES AND REASON CODES IN NOTIFICATIONS

| 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 |
| 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 IA5 ALPHABET |
| 205 | Invalid validity period format |
| 206 | Invalid destination address |
| 207 | Duplicate message submit |

208 Invalid message type indicator
