Short Message Service Centre 4.0
EMI - UCP Interface

Specification

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Preface

Purpose

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.

The protocol that is described in this document has been implemented in an API built by CMG. Hereby, application programmers are able to build applications for communication with a Short Message Service Centre (SMSC) of CMG in order to send and receive short messages to/from mobile stations.

Audience

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

Organisation

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.

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.

Typographic conventions

In this document, the typographic conventions listed in

Table P-1 are used.

Table P-1: Typographic conventions

Typeface or Symbol	Meaning/Used for	Example
`Courier`	Refers to a keyboard key, system command, label, button, filename, window, or other computer component or output.	The directory `data` contains… Click the `Close` button to…
`<courier>`	Serves as a placeholder for variable text that the user will replace as appropriate to its context.	Use the file name `<entity>.cfg` for...
`[ ]`	Refers the user to external documentation listed in the References section.	[ETSI 03.38]
italic	Emphasises a new word or term of significance.	apply a *style* to the...
`$`	Denotes an OpenVMS Digital Command Language prompt.	`$ dir`

\ (Unix)
or
– (OpenVMS)
	Denotes line continuation; the character should be ignored as the user types the example, and `Enter` should only be pressed after the last line.	`% grep searchforthis \`
		`data/*.dat`
		
		`$ search [.data]*.dat -`
		`searchforthis`

-	Bridges two keystrokes that should be pressed simultaneously.	If `Ctrl-C` does not work, use `Ctrl-Alt-Del`.
⬚	Denotes a “note”, a piece of text alongside the normal text requiring extra attention.	⬚ Note that the system is usually...

This document contains the general specification of the external machine interface of CMG's SMSC. Since the available functions depend on the specific SMSC implementation of the Mobile Telecommunication Operator, please contact your local operator for the available implemented SMSC functions and features.

1 Introduction

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

- GSM/GPRS/UMTS/TDMA/CDMA Mobile Telephones (PLMN),
- Interactive Voice Response systems,
- Voice Messaging systems,
- a MENU application accessed from PC's through terminal emulation,
- Dedicated PC applications.

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

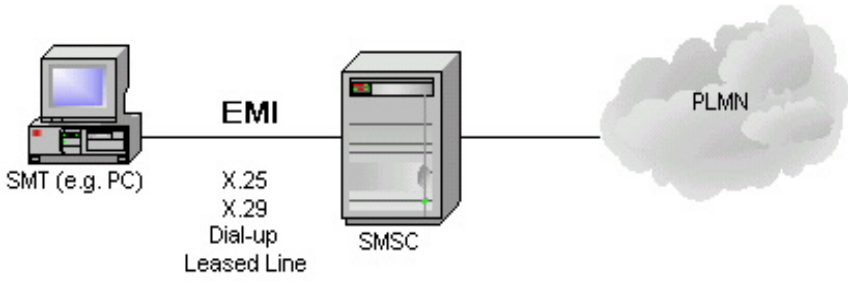

Figure 1-1: EMI External View

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'.

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

2 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 IRA. Alphanumeric characters are encoded as two numeric IRA characters, the higher 3 bits (0..7) first, the lower 4 bits (0..F) thereafter, according to the following 7 bit default alphabet table.

This section provides tables for all the alphabets to be supported by SMS. The default alphabet is mandatory. Additional alphabets are optional. Irrespective of support of an individual alphabet, a MS shall have the ability to store a short message coded in any alphabet on the SIM.

Table 2-1: 7-bit Default Alphabet Table

				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
B4	b3	b2	B1		0	1	2	3	4	5	6	7
0	0	0	0	0	@		SP	0	¡	P	¿	p
0	0	0	1	1	£	DC1	!	1	A	Q	a	q
0	0	1	0	2	$		"	2	B	R	b	r
0	0	1	1	3	¥		#	3	C	S	c	s
0	1	0	0	4	è		¤	4	D	T	d	t
0	1	0	1	5	é		%	5	E	U	e	u
0	1	1	0	6	ù		&	6	F	V	f	v
0	1	1	1	7	ì		'	7	G	W	g	w
1	0	0	0	8	ò		(	8	H	X	h	x
1	0	0	1	9	Ç	θ	)	9	I	Y	i	y
1	0	1	0	10	LF		*	:	J	Z	j	z
1	0	1	1	11	Ø	1)	+	;	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

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

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.

Table 2-2: 7-bit Default Alphabet Extension Table

				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
B4	b3	b2	B1		0	1	2	3	4	5	6	7
0	0	0	0	0					|			
0	0	0	1	1								
0	0	1	0	2								
0	0	1	1	3								
0	1	0	0	4		^						
0	1	0	1	5							2)	
0	1	1	0	6								
0	1	1	1	7								
1	0	0	0	8			{					
1	0	0	1	9			}					
1	0	1	0	10	3)							
1	0	1	1	11		1)						
1	1	0	0	12				[				
1	1	0	1	13				~				
1	1	1	0	14				]				
1	1	1	1	15			\					

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

1) This code value is reserved for the extension to another extension table. On receipt of this code, a receiving entity shall display a space until another extension table is defined.

2) This code represents the EURO currency symbol. The code value is that used for the character “e”. Therefore a receiving entity which is incapable of displaying the EURO currency symbol will display the character “e” instead.

3) This code is defined as a Page Break character. Any mobile which does not understand the 7 bit default alphabet table extension mechanism will treat this character as Line Feed.

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

Table 2-3: Fields Message Header

Parameter	Type	Description
TRN	2 num. char.	Transaction reference number, right justified with leading zero.
LEN	5 num. char.	Total number of IRA 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:

Table 3-1: SMT Initiated Operations

Command ID	Command Name
01	Call input operation
02	Multiple address call input operation
03	Call input with supplementary services operation
30	SMS message transfer operation
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:

Table 3-2: SMSC Initiated Operations

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 (message n+1 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.

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, “O” indicates that it is Optional, “C” indicates Conditional and “-” indicates Not Applicable.

4.1 Address syntax

Most addresses used in the EMI-messages are formatted according to E.164 addresses. 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>

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

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

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

<telephone-nr>
```

For TCP/IP addresses every byte expressed in decimal form should be left zero 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 table shows the parameters in the operation data field:

Table 4-1: Parameters Operation Data Field Call Input Operation

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

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

Examples:

- Alphanumeric message ‘Short Message’

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

- Numeric message ‘716436383334'

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

4.2.1 Call input operation (positive result)

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

Table 4-2: Parameter Positive Result Data Field Call Input Operation

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

The SM parameter contains the following three fields:

Table 4-3: Short Message Parameter Field Call Input Operation

SM Parameter	Type	Description
AdC	String of num. char.	Address code recipient, maximum length is 16 digits.
SEP	char ":"	Separator
SCTS	String of 12 num. char.	Service Centre time-stamp 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 table shows the parameters in the negative result data field:

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

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

01	Checksum error
02	Syntax error
03	Operation not supported by system
04	Operation not allowed (at this point in time)
05	Call barring active
06	AdC invalid
07	Authentication failure
08	Legitimisation 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 table shows the parameters in the operation data field:

Table 4-5: Parameters Operation Data Field Multiple Address Call Input Operation

Parameter	Type	Presence	Description
NPL	String of num. char	M	Number of parameters in the following RAd:s list
RAd:s	String of num. char.	M	List of parameters: Each parameter consists of AdC Address code recipient, maximum length is 16 digits with optional legitimisation code for all calls.
OAdC	String of num. char.	O	Address code originator, maximum length is 16 digits.
AC	String of char	O	Authentication code originator.
MT	1 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 IRA 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 SMSC does not support the Multiple call input operation for Multiple Address Large Accounts.
- 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 table shows the parameters in the positive result data field:

Table 4-6: Parameter Positive Result Data Field Multiple Address Call Input Operation

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

The SM field contains the following three fields:

Table 4-7: Short Message Parameter Field Multiple Address Call Input Operation

SM Parameter	Type	Description
AdC	String of num. char.	Address code recipient, maximum length is 16 digits.
SEP	char ":"	Separator
SCTS	String of 12 num. char.	Service Centre time-stamp 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 table shows the parameters in the negative result data field:

Table 4-8: Parameter Negative Result Data Field Multiple Address Call Input Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

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

01 Checksum error

02 Syntax error

04	Operation not allowed (at this point in time)
05	Call barring active
06	AdC invalid
07	Authentication failure
08	Legitimisation 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 table shows the parameters in the operation data field:

Table 4-9: Parameter Operation Data Field Call Input with Services Operation

Parameter	Type	Presence	Description
RAd	String of num. char.	M	AdC Address code recipient, maximum length is 16 digits, combined with optional legitimisation code for all calls.
OAdC	String of num. char.	O	Address code originator, maximum length is 16 digits.
AC	String of char.	O	Authentication code originator.
NPL	String of num. char.	M	Number of parameters in the following GA:s list. Must be “0”.
GA:s	String of char.	O	List of additional GA:s requested by the calling party. Not present because NPL = 0.
RP	Char “1”	O	Repetition requested. Must be left empty.
PR	Char “1” or char “3”	O	Priority request 1 or 3. Must be left empty.
LPR	String of num. char.	O	Legitimisation 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	Legitimisation 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	Legitimisation code for reverse charging. Must be left empty.
DD	Char “1”	O	Deferred delivery request.
DDT	10 num. char.	O	Deferred delivery time DDMMYYHHmm.

Parameter	Type	Presence	Description
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 IRA characters, maximum length is representing 640 characters.

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

Examples:

- Alphanumeric message ‘CMG’

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

- Numeric message ‘89123334' with deferred delivery

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

4.4.1 Call input with supplementary services operation (positive result

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

Table 4-10: Parameter Positive Result Data Field Call Input with Services Operation

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

The SM parameter contains the following three fields:

Table 4-11: Short Message Parameter Field Call Input with Services Operation

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

Example:

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

4.4.2 Call input with supplementary services operation (negative result)

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

Table 4-12: Parameter Negative Result Data Field Call Input with Services Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

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

01	Checksum error
02	Syntax error
03	Operation not supported by system
04	Operation not allowed (at this point in time)
05	Call barring active
06	AdC invalid
07	Authentication failure
08	Legitimisation code for all calls, failure
09	GA not valid
10	Repetition not allowed

11	Legitimisation code for repetition, failure
12	Priority call not allowed
13	Legitimisation code for priority call, failure
14	Urgent message not allowed
15	Legitimisation code for urgent message, failure
16	Reverse charging not allowed
17	Legitimisation 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 table shows the parameters in the operation data field:

Table 4-13: Parameter Operation Data Field MS Message Transfer Operation

Parameter	Type	Presence	Description
AdC	String of num. char.	M	Address code recipient, maximum length is 16 digits.
OAdC	String of num. char.	O	Address code originator, maximum length is 16 digits.
AC	String of char.	O	Authentication code originator.
NRq	Char “1”	O	Notification requested.
NAd	String of num. char.	O	Notification address.
NPID	4 num. char.	O	Notification PID value:
			0100 Mobile Station
			0122 Fax Group 3
			0131 X.400
			0138 Menu over PSTN
			0139 PC appl. over PSTN
			0339 PC appl. over X.25
			0439 PC appl. over ISDN
			0539 PC appl. over TCP/IP

Parameter	Type	Presence	Description
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 IRA 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 delivered then 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////454D492073706563696669636174696F6E/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 table shows the parameters in the positive result data field:

Table 4-14: Parameter Positive Result Data Field MS Message Transfer Operation

Parameter	Type	Presence	Description
ACK	Char "A"	M	Positive acknowledgement
MVP	10 num. char.	O	Modified validity period
SM	String of char.	O	System message

The SM parameter contains the following three fields:

Table 4-15: Short Message Parameter Field MS Message Transfer

SM Parameter	Type	Description

AdC	String of num. char.	Address code recipient, maximum length is 16 digits.
SEP	char ":"	Separator
SCTS	String of 12 num. char.	Service Centre time-stamp DDMMYYhhmmss

Example:

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

4.5.2 MS message transfer operation (negative result)

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

Table 4-16: Parameter Negative Result Data Field MS Message Transfer Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

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

01	Checksum error
02	Syntax error
04	Operation not allowed (at this point in time)
05	Call barring active
06	AdC invalid
07	Authentication failure
08	Legitimisation 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 table shows the parameters in the operation data field:

Table 4-17: Parameter Operation Data Field MT Alert Operation

Parameter	Type	Presence	Description

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

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 table shows the parameters in the positive result data field:

Table 4-18: Parameter Positive Result Data Field MT Alert Operation

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 zeros. 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. In case the alert address is a Multiple Address Large Account, the number of messages waiting is always returned as ‘0000’, independent of the actual number of waiting messages.

Example:

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

4.6.2 MT alert operation (negative result)

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

Table 4-19: Parameter Negative Result Data Field MT Alert Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

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

01	Checksum error
02	Syntax error
04	Operation not allowed (at this point in time)
05	Call barring active
06	AdC invalid
07	Authentication failure
08	Legitimisation 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 table defines these operations:

Table 5-1: 50-Series of 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.'):

Table 5-2: Abstract Data Types 50-Series

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

Member	Length	Type	Meaning
AC	16	Num. string	Authentication code originator (min 4 char., max 16 char)
NRq	1	Num. char.	Notification Request 0 = NAdC not used 1 = NAdC used
NAdC	16	Num. string	Notification Address
NT	1	Num. char.	Notification Type[1]: Buffered message notification (BN), Delivery Notification (DN), Non-delivery notification (ND), 0 default value, 1 = DN, 2 = ND, 3 = DN+ND, 4 = BN, 5 = BN+DN, 6 = BN+ND, 7 = all.
NPID	4	4 num. char.	Notification PID value: 0100 Mobile Station 0122 Fax Group 3 0131 X.400 0138 Menu over PSTN 0139 PC 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

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

Member	Length	Type	Meaning
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[2] value 0000…0071, 0095, 0127(SIM Data Download), 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:			Numeric message.
NMsg	640	Num. string	
MT=3:			
AMsg	640	Char. string	Alphanumeric message encoded into IRA characters.

[2]) RPID will be filled with the content of the TP-PID as specified in the GSM 03.40 specification.

Member	Length	Type	Meaning
MT=4:			
NB	4	Num. char.	No. of bits in Transparent Data (TD) message.
TMsg	140[3]	Char. string	TD message encoded into IRA characters.
MMS	1	1 num. char.	More Messages to Send (to the same SME)
PR	1	1 char.	Priority Requested
DCs	1	1 num. char.	Deprecated. Data Coding scheme:
			0 = default alphabet
			1 = user defined data ('8 bit')
MCLs	1	1 num. char.	Message Class:
			0 = message class 0
			1 = message class 1
			2 = message class 2
			3 = message class 3
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

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

Member	Length	Type	Meaning
XSer	400	Num. string	Extra Services With the XSer field one or more additional services can be specified. These services consist of IRA encoded data constructed in the following common format: TTLLDD… TT: represents two HEX characters defining the type of service. For a description of available services refer to section “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. $TT_1LL_1DD_1…DD_1TT_2LL_2DD_2..DD_2$ 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:

Table 5-3: Generic ADT for EMI Positive Response

Member	Type
ACK	Positive acknowledgement
MVP	Modified Validity Period
SM	System Message

For a negative response:

Table 5-4: Generic ADT for EMI Negative Response

Member	Type
NAcK	Negative acknowledgement
EC	Error code
SM	System Message

5.1.1 How an application should pass an alphanumeric OadC

5.1.1.1 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 (IRA) should first be coded into 7 bits, according to

ETSI's 3.38, by the application.

In GSM 03.38 chapter “Default alphabet” the 7-bit codes can be derived from the table.

These codes are:

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

The 7 bits characters are packed in octets as defined in chapter ”SMS Point-to-Point Packing”. The result is:

b7	B6	b5	b4	b3	b2	b1	b0	Result
0	**1**	**0**	**0**	**0**	**0**	**0**	**1**	41
0	**0**	1	0	0	1	1	0	26
0	0	0	**1**	**0**	**1**	**0**	**0**	14
0	**0**	**0**	**1**	1	0	0	1	19
0	0	0	0	0	**1**	**0**	**0**	04
0	**0**	**1**	**1**	**1**	**0**	0	0	38
1	0	1	0	1	0	1	**1**	AB
0	**1**	**0**	**0**	**1**	**1**	**0**	**1**	4D

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 IRA characters in an alphanumeric OAdC

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

5.1.2 Description Of XSer Extra Services

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

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

5.1.2.1 XSer Type of service 00, Not Used

This service type is reserved and should not be used.

5.1.2.2 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 IRA hex characters, as usual in UCP. An example is given below.

The length of the *GSM UDH information,* related to the length of the Msg field content, is restricted to the maximum length of the GSM TP-UD field: 140 octets 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:

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

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

TTLLDD.. encoding in IRA characters: 010A0900034004020402F0FA

This same TTLLDD... 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
```

This function is only applicable when the SMSC is operating in a GSM environment. For TDMA this function has no meaning and is therefore ignored.

5.1.2.3 XSer Type of service 02, GSM DCS information

The type of service always has a total length of 6 numeric characters. So the sequence TTLLDD is set to:

TT = 02

LL=01

DD=00..FF.

The meaning of the DCS values are explained in GSM 03.38.

Use the GSM DCS information field to send UCS2 coded short messages. The MT field must be set to the value 4.

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

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

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

The use of the GSM DCS information field in the XSER field is limited to the UCP 51 and UCP 52 messages.

Note: this function is only applicable when the SMSC is operating in a GSM environment. For TDMA this function has no meaning and is therefore ignored.

Example encoding of XSer Type of service 02, GSM DCS information:

020100, meaning that the DCS value 00 (0000 0000 binary) is used.

According to the GSM03.38 specification, this means 7-bit default alphabet, no compression, no message class meaning.

5.1.2.4 XSer Types of Service 03-0B, TDMA information exchange

This section introduces 9 Types of Service that can be defined in the XSer (Extra Services) field. These services offer support for the information exchange to Time Division Multiple Access (TDMA) networks (see reference [3]).

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

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

Table 5-5: Information Elements

Type of Service (hex)	Information Element
03	Message Type
04	Message Reference
05	Privacy Indicator
06	Urgency Indicator
07	Acknowledgement Request
08	Message Updating
09	Call Back Number
0A	Response Code
0B	Teleservice ID

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

Important: these functions are only applicable for a SMSC operating in a TDMA environment. When the SMSC is operating in a GSM environment these functions are ignored.

Type of Service 03: Message Type

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

Table 5-6: Message Type

Value (hex)	Meaning
00	Short Message *(Default)*
01	Delivery Acknowledgement message type
02	Manual Acknowledgement message type
03-FF	*Reserved, do not use*

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

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

Type of Service 04: Message Reference

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

Table 5-7: Message Reference

Value (hex)	Meaning
0000 - 1FFF	Message Reference
2000 - FFFF	*Reserved, do not use*

For example, the sequence **0402020A** (TTLLDD) contains 522 as a Short Message identifier.

Type of Service 05: Privacy indicator

This Type of Service indicates the privacy level of the Short Message. The size of the data element is one octet, which can have the following values:

Table 5-8: Privacy Indicator

Value (hex)	Meaning
00	Not Restricted *(Default)*
01	Restricted
02	Confidential
03	Secret
04-FF	*Reserved, do not use*

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

Type of Service 06: Urgency Indicator

This Type of Service indicates the priority of the Short Message to the end user. The size of this data element is one octet, which can have the following values:

Table 5-9: Urgency Indicator

Value (hex)	Meaning
00	Bulk
01	Normal *(Default)*
02	Urgent
03	Very Urgent
04-FF	*Reserved, do not use*

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

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

Type of Service 07: Acknowledgement Request

This service indicates whether or not the sender of the Short Message requests an Acknowledgement. This Type of Service is absent in a delivery when no acknowledgement is requested. The size of the data element is one octet, which can have the following values:

Table 5-10: Acknowledgement Request

Value (hex)	Meaning
00	No Acknowledgement requested *(Default)*
01	Delivery Acknowledgement requested
02	Manual Acknowledgement requested
03	Both delivery and Manual Acknowledgement requested
04-FF	*Reserved, do not use*

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

Type of Service 08: Message Updating

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

Table 5-11: Message Updating

Value (hex)	Meaning
00	New *(Default)*
01	Replace in SMSC and SME
02-FF	*Reserved, do not use*

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

Type of Service 09: Call Back Number

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

Table 5-12: Call Back Number

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

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

Table 5-13: Call Back Number Nested Tag Codes

Abbreviation	Nested Tag Code	Length
CBN	01	1 to 16 octets.
CBN_TON	02	Optional, when defined always one octet of length.

CBN_NPI	03	Optional, when defined always one octet of length.
CBNPI	04	Optional, when defined always one octet of length.
CBNAT	05	Optional, length between 0 and 64 characters, IRA encoded.

For each of the optional parameters the default is taken when not defined. The Call Back Number Type of Service can be used to associate multiple[4] Call Back Numbers information elements with the Short Message. To do this, define multiple 09 tags in the XSER field: for each Call Back Number information element, one tag. See the examples at the end of this section.

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

The Call Back Number Presentation Indicator (CBNPI) controls the presentation and screening of the Call Back Number at the mobile station. The CBNPI is a bit field with the size of one octet. The bit field is arranged $\mathbf{b_7..b_0}$, where $\mathbf{b_7}$ means most significant bit. Bits b7..b4 are reserved and should always be set to zero. Bit 3 and 2 are the Provision bits. Bit 1 and 0 are the Presentation bits. The next tables show the different settings for the Provision and Presentation bits.

Table 5-14: Provision Bits

Provision bits ($b_3..b_2$)	Meaning
00	User provided, not screened
01	User provided, verified and passed
10	User provided, verified and failed
11	Network provided

Table 5-15: Presentation Bits

Presentation bits ($b_1..b_0$)	Meaning
00	Presentation Allowed
01	Presentation Restricted
10	Number not available
11	*Reserved, do not use.*

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

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

The CBNAT[5] is a string with a maximum length of 64 characters.

Examples of the use of Type of Service 09 Call Back Number. First example defines call back number 3456, default CBN_TON and CBN_NPI, CBNPI set to zero and CBNAT set to "Hello"

0910010433343536040100050B48656C6C6F

Example of multiple Call Back Number definitions. Two definitions are made, first call back number 3456, default CBN_TON and CBN_NPI, CBNPI set to zero and CBNAT set to "Hello World". Second call back number 7777, default CBN_TON and CBN_NPI, CBNPI set to 01 and CBNAT not defined.

0910010433343536040100050B48656C6C6F0909010437373737040101

Type of Service 0A: Response Code

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

Table 5-16: Response Code

Value (hex)	Description
00 – 0F	Response Code
10 – FF	*Reserved, do not use*

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

Type of Service 0B: Teleservice Identifier

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

Table 5-17: Teleservice Identifier

Value (hex)	Description
00	Cellular Messaging Teleservice *(Default)*
01 - FF	*Reserved, do not use*

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

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

Example: using multiple Types of Service together in XSer

An example of combining various Services in the XSer field is the following sequence: **03010206010204020 20A.** This sequence can be decomposed in three parts, namely **030102**, **060102** and **0402020A**. These three parts are the individual examples shown before for the Services Message Type (03), Urgency Indicator (06) and Message Reference (04). The explanations of the three parts can be found in the descriptions of the corresponding services.

5.1.2.5 XSer Type of service 0C: Billing Identifier

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

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

5.1.2.6 XSer Type of service 0D: Single Shot indicator

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

Table 5-18: Single Shot Identifier

Value (hex)	Description
00	non-Single Shot short message (*Default*)
01	Single Shot short message
02-FF	*Reserved, do not use*

5.1.2.7 XSer Types of service 0E – FF, Reserved

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

5.2 Standard string

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

Table 5-19: Submit Short Message Operation

Member	Presence	Meaning
AdC	M	Address code recipient for the SM
OAdC	M	Address code originator
AC	O	Authentication code originator
NRq	O	Notification Request
NAdC	O	Notification Address
NT	O	Notification Type
NPID	O	Notification PID value
LRq	O	Last Resort Address request
LRAd	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 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.

Member	Presence	Meaning
NMsg	O	Numeric message.
MT=3:		
NB	-	No. of bits in Transparent Data (TD) message.
AMsg	O	Alphanumeric message encoded into IRA characters.
MT=4:		
NB	C	No. of bits in Transparent Data (TD) message. This field is M (Mandatory) if the TMsg field is used.
TMsg	O	TD message encoded into IRA characters.
MMS	O	More Messages to Send (to the same SME)
PR	O	Priority Requested
DCs	-	Deprecated
MCLs	O	Message Class. Shall be supplied when MT=4 and Xser "GSM DCS information" is not supplied.
RPI	O	Reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)
OTOA	O	Originator Type Of Address
HPLMN	-	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 LRAd and LPID are both used, then this address (user supplied) will be used as Last Resort address.
- If LRq is used, and LRAd 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 LRAd and LPID are ignored.
- If DD is used, then DDT is mandatory.
- The priority message field PR can only be used if the originator is subscribed to this service.
- If RPID value 0127 (SIM Data Download) is used, MT must be 4 and either MCLs must be 2 or Xser “GSM DCS information” must be 0xF6 otherwise the message is rejected. RPID value 0127 (SIM Data Download) is only supported for 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.
- If the MCLs field is also specified, the GSM DCS information field in the XSER field overrules the MCLs field.
- If the originator of the UCP51 message is not registered in the SMSC as being a Large Account and the Billing Identifier in the XSER field is used, then the UCP51 operation will be rejected with error code 04 "Operation not allowed".

Examples:

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

18/00113/O/51/012345/09876//1/1920870340125000/4/0539//////3012961212//////3//4D6573
73616765203531/////////////CD

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

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

5.3.1 Submit Short Message operation (positive result)

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

Table 5-20: Parameter Positive Result Data Field Submit Short Message Operation

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

The SM parameter contains the following three fields:

Table 5-21: Short Message Parameter Field Submit Short Message Operation

SM Parameter	Type	Description

AdC	String of num. char.	Address code recipient, maximum length is 16 digits.
SEP	char ":"	Separator
SCTS	String of 12 num. char.	Service Centre time-stamp DDMMYYhhmmss

Example:

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

5.3.2 Submit Short Message operation (negative result)

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

Table 5-22: Parameter Negative Result Data Field Submit Short Message Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.4 Delivery Short Message operation -52

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

Table 5-23: Delivery Short Message Operation

Member	Presence	Meaning
AdC	M	Address code recipient for the SM
OAdC	M	Address code originator
AC	-	Authentication code originator
NRq	-	Notification Request
NAdC	-	Notification Address
NT	-	Notification Type
NPID	-	Notification PID value
LRq	-	Last Resort Address request
LRAd	-	Last Resort Address
LPID	-	LRAD PID value
DD	-	Deferred Delivery requested

Member	Presence	Meaning
DDT	-	Deferred delivery time in DDMMYYHHmm
VP	-	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 IRA characters.
MT=4:		
NB	C	No. of bits in Transparent Data (TD) message. This field is M (Mandatory) if the TMsg field is used.
TMsg	O	TD message encoded into IRA characters.
MMS	O	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	O	Deprecated. Applications must ignore this field and retrieve message coding information from Xser “GSM DCS information”.
MCLs	O	Message Class
RPI	O	Reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)
OTOA	-	Originator Type Of Address
HPLMN	O	Home PLMN Address
XSer	O	Extra Services.
RES4	-	
RES5	-	

- If the recipient of the UCP52 operation is registered in the SMSC as being a Large Account, the MSC ISDN address of the mobile originator is stored in the HPLMN field when the option HOMEPLMN_IN_UCP52 is active.

- If the recipient of the UCP52 operation is registered in the SMSC as being 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.
- If the MCLs field is also specified, the GSM DCS information field in the XSER overrules the MCLs field.
- If the Billing Identifier in the XSER field is used in a UCP52 operation, the short message will be rejected with error code 02 "Syntax error".

Example:

- Alphanumeric message ‘Call you back later.’ received from originator 07686745

00/00120/O/52/076523578/07686745/////////////120396111055////3//43616C6C20796F752062
61636B206C617465722E///0/////////A3

5.4.1 Delivery Short Message operation (positive result)

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

Table 5-24: Parameter Positive Result Data Field Delivery Short Message Operation

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

Example:

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

5.4.2 Delivery Short Message operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.5 Delivery notification operation -53

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

Table 5-26: Delivery Notification Operation

Member	Presence	Meaning
AdC	M	Address code recipient for the SM
OAdC	M	Address code originator
AC	-	Authentication code originator
NRq	-	Notification Request
NAdC	-	Notification Address
NT	-	Notification Type
NPID	-	Notification PID value
LRq	-	Last Resort Address request
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 IRA characters.
MT=4:		
NB	-	No. of bits in Transparent Data (TD) message
TMsg	-	TD message encoded into IRA characters.
MMS	O	More Messages to Send (to the same SME)

Member	Presence	Meaning
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	-	Message Class
RPI	-	Reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)
OTOA	-	Originator Type of Address
HPLMN	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//4D65737
361676520666F722033313535353535 2C2077697468206964656E74696669636174696F6
E203936303130393136313035372068617320626565 6E20627566666572656 4/////////////1F

5.5.1 Delivery Notification operation (positive result)

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

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

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

Example:

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

5.5.2 Delivery Notification operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.6 Modify Short Message operation - 54

The operation requires option 014 on the SMSC.

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

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

1. Calling Line Identification (CLI) available: AdC, OAdC and SCTS should all match. If the AC field was used in the original submitted message, this must match as well. If the CLI address differs from the OAdC field, then the CLI address must match as well.
2. No Calling Line Identification available: AdC, OAdC, AC and SCTS of the original message and the modify operation should all match and all be filled in.

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

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

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

1. Notifications.
   - If Nrq is empty, no changes are made. The contents of NAdC, NPID and NT are ignored.
   - If Nrq is “0”, the notification request is cancelled. The contents of NAdC, NPID and NT are ignored.
   - If Nrq is “1”, then NAdC and NPID must be both 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 (SIM Data Download)) is used that is already in use by a buffered message for the same recipient, a negative acknowledge is returned.
- If RPID contains an invalid value, then a negative acknowledge is returned.
- If RPID value 0127 (SIM Data Download) is used : see section ”Submit Short Message operation -51”.

6. Message type

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

7. Reply path

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

8. Billing Identifier

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

Table 5-29: Modify Short Message Operation

Member	Presence	Meaning
AdC	M	Address code recipient for the SM to be modified

Member	Presence	Meaning
OAdC	M	Address code originator of the SM to be modified
AC	O	Authentication code originator of the SM to be modified
NRq	O	Notification Request
NAdC	O	Notification Address Code
NT	O	Notification Type
NPID	O	Notification PID value
LRq	O	Last Resort request
LRAd	O	Last Resort Address
LPID	O	LRAD PID value
DD	-	Deferred Delivery requested
DDT	O	Deferred delivery time in DDMMYYHHmm
VP	O	validity period in DDMMYYHHmm
RPID	O	Replace PID value
SCTS	M	Service Centre Time Stamp that identifies the message in the SMSC that is to be modified, in DDMMYYHHmmss.
Dst	-	Delivery status
Rsn	-	Reason code
DSCTS	-	Delivery time stamp in DDMMYYHHmmss.
MT	O	Message Type.
MT=2:		
NB	-	No. of bits in Transparent Data (TD) message.
NMsg	O	Numeric message.
MT=3:		
NB	-	No. of bits in Transparent Data (TD) message.
AMsg	O	Alphanumeric message encoded into IRA characters.
MT=4:		
NB	M	No. of bits in Transparent Data (TD) message.
TMsg	O	TD message encoded into IRA characters.
MMS	-	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	O	Message Class. See section “Submit Short Message operation -51”.
RPI	O	reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)

Member	Presence	Meaning
OTOA	-	Originator Type Of Address
HPLMN	O	Home PLMN Address
XSer	O	Extra Services
RES4	-	
RES5	-	

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

Examples:

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

00/00087/O/54/012345/0111111//////1/0654321/0100/////010197120501////3/////////////4C

5.6.1 Modify Short Message operation (positive result)

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

Table 5-30: Parameter Positive Result Data Field Modify Short Message Operation

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

The SM parameter contains the following three fields:

Table 5-31: Short Message Parameter Field Modify Short Message Operation

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

Example:

- 00/00039/R/54/A//012345:020197120005/65

5.6.2 Modify Short Message operation (negative result)

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

Table 5-32: Parameter Negative Result Data Field Modify Short Message Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

- 00/00022/R/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.

Table 5-33: 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

Member	Presence	Meaning
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	-	Message Type.
MT=2:		
NB	-	No. of bits in Transparent Data (TD) message.
NMsg	-	Numeric message.
MT=3:		
NB	-	No. of bits in Transparent Data (TD) message.
AMsg	-	Alphanumeric message encoded into IRA characters.
MT=4:		
NB	-	No. of bits in Transparent Data (TD) message.
TMsg	-	TD message encoded into IRA characters.
MMS	-	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	-	Message Class
RPI	-	Reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)
OTOA	-	Originator Type Of Address
HPLMN	O	Home PLMN Address
XSer	-	
RES4	-	

Member	Presence	Meaning
RES5	-	

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

Example:

- Inquiry message on recipient 0786483 from originator 0786875676

65/00066/O/55/0786483/0786875676////////////////////////////////7B

5.7.1 Inquiry message operation (positive result)

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

Table 5-34: Parameter Positive Result Data Field Inquiry Message Operation

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

Example:

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

5.7.2 Inquiry message operation (negative result)

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

Table 5-35: Parameter Negative Result Data Field Inquiry Message Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.8 Delete message operation -56

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

Table 5-36: Delete Message Operation

Member	Presence	Meaning
AdC	M	Address code recipient for the SM
OAdC	M	Address code originator
AC	O	Authentication code originator
NRq	-	Notification Request
NAdC	-	Notification Address
NT	-	Notification Type
NPID	-	Notification PID value
LRq	-	Last Resort Address request
LRAd	-	Last Resort Address
LPID	-	LRAD PID value
DD	-	Deferred Delivery requested
DDT	-	Deferred delivery time in DDMMYYHHmm
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 IRA characters. Contains the time stamps (format YYMMDDhhmmss) of the buffered Short Message(s), separated by spaces. Format: TIMESTAMP {TIMESTAMP}
MT=4:		
NB	-	No. of bits in Transparent Data (TD) message.
TMsg	-	TD message encoded into IRA characters.
MMS	-	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	-	Message Class

Member	Presence	Meaning
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 table shows the parameters in the positive result data field:

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

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

Example:

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

5.8.2 Delete message operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement

EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.9 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.

Table 5-39: 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
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.

Member	Presence	Meaning
AMsg	O	Alphanumeric message encoded into IRA 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 IRA characters.
MMS	-	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	-	Message Class
RPI	-	Reply Path
CPg	-	(reserved for Code Page)
RPLy	-	(reserved for Reply type)
OTOA	-	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 0666666 waiting to be send

17/00098/O/57/55555/////////////////3//44657374696E6174696F6E3A203036363636363620/1/
//////////37

5.9.1 Response inquiry message operation (positive result)

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

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

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

Example:

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

5.9.2 Response inquiry message operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

5.10 Response delete message operation -58

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

Table 5-42: Response Delete Message Operation

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

Member	Presence	Meaning
Rsn	-	Reason code
DSCTS	-	Delivery time stamp in DDMMYYHHmmss.
MT	M	Message Type.
MT=2:		
NB	-	No. of bits in Transparent Data (TD) message.
NMsg	-	Numeric message.
MT=3:		
NB	-	No. of bits in Transparent Data (TD) message.
AMsg	O	Alphanumeric message encoded into IRA characters. Contains the recipient address and the time stamps (format YYMMDDhhmmss) of the deleted Short Message(s), separated by spaces. Format: [TEXT3] <AdC> [TEXT4] {TIMESTAMP} [TEXT5]
MT=4:		
NB	-	No. of bits in Transparent Data (TD) message.
TMsg	-	TD message encoded into IRA characters.
MMS	O	More Messages to Send (to the same SME)
PR	-	(reserved for Priority Requested)
DCs	-	Deprecated
MCLs	-	Message Class
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//44657374696E6174696F6E2030363636363636206964656E74696669636174696F6E3A2039363031313030393130343320686173206265656E2064656C657465642E/1//////////FF

5.10.1 Response delete message operation (positive result)

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

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

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

Example:

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

5.10.2 Response delete message operation (negative result)

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

Table 5-44: Parameter Negative Result Data Field Response Inquiry Operation

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

- 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 table defines these operations:

Table 6-1: 60-Series of EMI Messages

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

Table 6-2: Abstract Data Types 60-Series

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

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

For a positive response:

Table 6-3: Generic ADT for EMI Positive Response

Member	Type
ACK	Positive acknowledgement
SM	System Message

For a negative response:

Table 6-4: Generic ADT for EMI 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.

Table 6-5: Session Management Operation

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 IRA characters
NPWD	O	New password encoded into IRA characters
VERS	M	Version number '0100'
LAdC	-	Address for VSMSC list operation
LTON	-	Type of Number list address
LNPI	-	Numbering Plan Id list address
OPID	O	Originator Protocol Identifier: 00 = Mobile station 39 = PC application
RES1	-	

- 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 table shows the parameters in the positive result data field:

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

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

Example:

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

6.3.2 Session management operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

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

6.4 Provisioning actions operation -61

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

Table 6-8: Provisioning Actions Operation

Member	Presence	Meaning
OAdC	M	Any valid X.121, 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)

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

Example:

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

6.4.1 Provisioning actions operation (positive result)

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

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

Parameter	Type	Presence	Description
ACK	Char "A"	M	Positive acknowledgement

SM	String of char.	O	System message

Example:

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

6.4.2 Provisioning actions operation (negative result)

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

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

Parameter	Type	Presence	Description
NACK	Char "N"	M	Negative acknowledgement
EC	2 num. char.	M	Error code
SM	String of char.	O	System message

Example:

- 00/00022/R/61/N/02//06

7 Error Codes Overview

Error codes, which can be returned in the operations negative result, are listed in [1] paragraph 9.2.6. For 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

Table 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	Legitimisation code for all calls, failure
09	GA not valid
10	Repetition not allowed
11	Legitimisation code for repetition, failure
12	Priority call not allowed
13	Legitimisation code for priority call, failure
14	Urgent message not allowed
15	Legitimisation code for urgent message, failure
16	Reverse charging not allowed
17	Legitimisation code for rev. charging, failure
18	Deferred delivery not allowed
19	New AC not valid
20	New legitimisation code not valid
21	Standard text not valid
22	Time period not valid
23	Message type not supported by system

Error Code	Message
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:

Table 7-2: 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. Changes with respect to previous versions

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 ONPI 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. Therefor 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”.

Changes with respect to EMI specification 3.1.2

- The XSer service type “GSM DCS information” is introduced. Its intention is to give more control to the user applications to send and receive GSM DCS values. It provides

support for “7-bit alphabet”, “8-bit data”, “UCS2 alphabet”, “Message Waiting Indications” and “Message Class Meaning”.

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

Changes with respect to EMI specification 3.1.4

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

Changes with respect to EMI specification 3.5

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

Appendix B. Error Messages and Reason Codes in Notifications

Table B-3: 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

Reason Code	Meaning
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 IRA ALPHABET
205	Invalid validity period format
206	Invalid destination address
207	Duplicate message submit
208	Invalid message type indicator

Abbreviations

CDMA	Code Division Multiple Access
CLI	Calling Line Identifier
DCS	Data Coding Scheme
EMI	External Machine Interface
ERMES	European Radio Messaging System
ETS	European Technical Standard
FAX	Facsimile
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
IA5	International Alphabet 5
IRA	International Reference Alphabet [ITU T.50] (formerly IA5)
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
TDMA	Time Division Multiple Access
UCP	Universal Computer Protocol
UDH	User Data Header
UMTS	Universal Mobile Telecommunications System
VMS	Voice Mail System

References

[ETSI 03.00]	ETSI ETS 300 133-3 Paging Systems (PS); European Radio Messaging System (ERMES) Part 3: Network aspects; Section 9: I5 interface.
[ETSI GSM 03.40]	ETSI GSM 03.38 Version 7.1.0; Alphabets and language-specific information; European digital cellular telecommunications system (Phase 2+).
[ETSI GSM 03.40]	ETSI GSM 03.40 Version 7.1.0; Technical realisation of the Short Message Service (SMS) Pont-To-Point; European digital cellular telecommunications system (Phase 2+).
[ITU-T]	ITU-T Recommendation X.208, Open Systems Interconnection Model and Notation, Specification of Abstract Syntax Notation One (ASN.1).
[TIA/EIA-136-710a]	TIA/EIA-136-710a, Short Message Service - Cellular Messaging Teleservice, 20 November 1998.

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