

NOKIA

**Nokia Artuse SMS Center
Release SC5B CD3**

CIMD Interface Specification

Reference Documents

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Summary of changes

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made to previous issues.

Date	Issue	Summary of changes
April 1999	1c-0 en	Modifications concerning Y2K changes together with some minor modifications have been made.
August 1999	1-0 en	USSD Center related parameters and descriptions have been added.
November 1999	1-1 en	Made minor editorial changes.
March 2000	1-2 en	Additions for UC2.
May 2000	2-0 en	Document revised for release SC5B.
February 2001	3-0 en	Updated for release SC5B CD1. A new optional CIMD2 parameter, Alphanumeric Originating Address, added in the Submit Operation. Two new error codes added: <ul style="list-style-type: none">• 321 – Incorrect alpha originator address usage• 322 – Invalid data for alpha numeric originator Also some USSD Center related parameters added.
May 2001	3a-0 en	Minor errors, found in pilot phase, corrected.
July 2001	3b-0 en	Minor corrections.
November 2001	4-0 en	Updated for release SC5B CD2. Chapter 6 Windowing for applications added. Parameters 012 and 019 added. Error codes 104, 105, 106, 107 and 108 added.

Date	Issue	Summary of changes
January 2002	4a-0 en	Minor error corrections.
October 2002	5-0 en	<p>Updated for release SC5B CD3 pilot phase.</p> <p><i>Modified chapters:</i></p> <p>5.3 Submit message (03), where a note concerning Submit message responses in error situations has been added.</p> <p>5.7 Deliver message (20), where</p> <ul style="list-style-type: none"> - new parameter 069 'Service Center Address' has been added - information has been added that parameter 900 'Error code' is supported as response to deliver messages. <p>7.4.1 Status Error Code values for SMS Center connections, where a new status error code (12) has been added to Table 35.</p> <p>7.2 Parameters, where</p> <ul style="list-style-type: none"> - the descriptions of parameters <i>user data header</i> and <i>user data binary</i> have been updated - the max lengths of parameters <i>Subaddr</i>, <i>Window size</i> and <i>Status Report Request</i> have been updated. <p>8 Character conversion for user data, where</p> <ul style="list-style-type: none"> - new subchapter 8.2 Extension character conversion has been added with information on conversion of special characters - the conversion for e and E with acute accent has been corrected from e/E" to e/E' - symbol of the apostrophe has been corrected - symbols for 7, 8, 9 and colon have been corrected. - the coding of the Euro currency symbol has been added
December 2002	5a-0 en	<p>Updated for release SC5B CD3.</p> <p><i>Modified chapter:</i></p> <p>7.4.1 Status Error Code values for SMS Center connections, where new status error codes (112, 113, and 114) have been added to, and error code 12 has been removed from Table 35.</p>

1 About this document

This document describes the CIMD2 (Computer Interface to Message Distribution) protocol, an interface that transfers messages between the short message entity (SME) and the message centre (MC).

Note

This *Computer Interface to Message Distribution* (CIMD) document applies to both the Short Message Service Center (SMS Center) and the Unstructured Supplementary Services Center (USSD Center) and contains therefore parameters and descriptions related to them both.

1.1 Scope

The main chapters of this document are:

- *Overview*
Gives a short overview of the CIMD protocol.
- *CIMD operations*
Defines the operations between the SME and the MC.
- *CIMD protocol messages*
Describes the message format, message packet numbering, checksum, response messages and operation codes.
- *Operation details*
Specifies the parameters related to each operation.
- *CIMD parameters*
Describes the parameters, their maximum length in CIMD2 messages, their type, and their value range.

- *Character conversion for user data*
Explains the default character conversion for user data, and shows the conversion of the extension table's special characters.
- *Example sessions*
Gives example sessions for send-only SME, querying SME and receiving SME.

1.2 Audience

This document is intended for operator personnel involved in daily operations of the Nokia Artuse™ Short Message Service Center (SMS Center) and Unstructured Supplementary Service Data Center (USSD Center); and for application developers.

2

Overview

A short message entity (SME), commonly referred to as an application, is interconnected through the CIMD2 connection to a message centre (MC). The CIMD2 protocol is currently supported by two different types of message centres: the Short Message Service Center (SMS Center), and the Unstructured Supplementary Service Data Center (USSD Center). The main purpose of this interconnection is to transfer messages from the SMEs to the mobile stations (MS) and from the MSs to the SMEs. Other kind of information can also be conveyed over the interconnection, for example status reports from the GSM / GPRS network to the SMEs.

The system architecture discussed in this document thus consists of the SME and the MC, and the purpose of this document is to specify the interface between the two.

When a message has been submitted to the SMS Center using the CIMD2, the SMS Center uses its own retry policy to attempt to deliver the message. If the delivery fails, the message is stored in the SMS Center database until a delivery attempt succeeds. If a permanent error occurs, or the validity period of the message expires, the message is deleted.

When a message has been submitted to the USSD Center using CIMD2, the USSD Center immediately transfers the data to the mobile station (MS). If the delivery fails, the message is deleted and the status of the message is made available to the SME.

The computer interface is suitable for client applications that send and retrieve messages. The interface supports TCP/IP sockets, X.25 PAD and serial ports (modems). However, some message centres only support parts of the connectivity.

The user always identifies himself in a "login". A login ID does not have to be unique, but can be a commonly known name used in public services (like when using premium charge modem lines).

The CIMD2 operations are specified in Chapters 3 CIMD operations and 5 Operation details. Each CIMD2 operation carries a number of parameters with it, that is, data items specifying the subscriber, some facts about the operation itself, and so on.

Section CIMD protocol messages introduces the question of how to communicate between the SME and the MC, that is, the coding of information related to operations and parameters.

The parameters are specified in section CIMD parameters of this document.

Note

In some cases the operator may want to restrict the use of some parameters. These are configured by the operator in the interface profiles.

In this document, the operations and the parameters specified for each operation represent the maximum amount of information the SME or the MC may provide. It is very important to notice that in most cases it is not reasonable for the SME to send all the possible parameters.

3

CIMD operations

This section defines the operations between the SME and the MC. The parameters related to each operation are specified in Chapter 5 Operation details and the values of the parameters are specified in Chapter 7 CIMD parameters.

The operations are divided into operations originated by the SME, operations originated by the MC, and operations that can be originated by both the SME and the MC.

3.1 SME types

When defining the operations the different SMEs might use, three basic types of SMEs can be distinguished:

1. Send-only SMEs.
2. Querying SMEs.
3. Receiving SMEs.

A send-only SME can only submit messages to the MC. The short messages are destined to MSs or other SMEs. Status reports of sent messages must be requested by the SME explicitly.

A querying SME does not receive anything from the MC automatically, but merely queries if there is something to be retrieved. The application can retrieve messages coming from mobile stations, but only on demand. The SME is typically connected to the MC every now and then to submit a message and may at the same time also check if there is something to be received. An example of this kind of SME is a PC application with a modem connection to the MC. Status reports, if desired, must be requested by the SME explicitly. Note that, due to the nature of USSD, querying type of SMEs are not supported for USSD Center connections, as the USSD Center will not store messages nor status reports for later retrieval by the SME.

A receiving SME is always ready to receive messages if the MC has something to send to it (that is, messages or status reports). A receiving SME can automatically receive messages stored in the MC, when logging in to the MC. This allows fast two-way message exchange between the SME and MC.

When connected to an SMS Center, the receiving type SMEs can also be set up in such a way that messages stored in the SMS Center are not sent automatically when the SME logs in. In such a case, the SME receives new incoming messages, but it has to query for the old messages stored in the SMS Center. This is not supported by the USSD Center due to the nature of USSD.

The type of the SME must be specified before the SME may operate. The type, along with other information about the SME, is stored in the MC.

3.2 Operations from the SME to the MC

Table 1 lists operations from the SME to the MC.

Table 1. Operations from SME to MC

Operation	Definition
Login	This operation is used by all SMEs before any operations.
Logout	This operation is used by all SMEs to indicate the end of the session. The logout operation does not release the connection. Therefore, a disconnect must be explicitly performed after the logout.
Submit	This operation is used by the SME to send messages to MSs and/or other SMEs. In the submit operation, the SME can request transmission of status reports for the message.
Delivery request	This operation is used by the SME to retrieve messages.
Cancel	This operation is used by the SME to cancel messages it has sent.
Enquire message status	This operation is used by the SME to request a status report for a previously submitted message.
Set	This operation is used by the SME to change the values of those interface parameters that it is allowed to change.
Get	This operation is used by the SME to inquire the values of the interface parameters.

3.3 Operations from the MC to the SME

Table 2 lists operations from the SME to the MC.

Table 2. Operations from MC to SME

Operation	Definition
Deliver message	This operation is used by the MC for automatically delivering a message to the SME.
Deliver status report	This operation is used by the MC to send a status report describing the current status of a message sent by the SME.

3.4 Common operations

Table 3 lists common operations.

Table 3. Common operations

Operation	Definition
Alive	This operation can be used by both entities to check whether the link is alive.

3.5 Operations supported by different types of SMEs and MCs

Table 4 lists operations supported by different types of SMEs and MCs.

Table 4. Operations supported by different types of SMEs and MCs

Message centre SME type Operation	SMS Center			USSD Center	
	Send-only	Querying	Receiving	Send-only	Receiving
Login	+	+	+	+	+
Logout	+	+	+	+	+
Submit	+	+	+	+	+
Enquire message status	+	+	+	*	*
Delivery request	-	+	+	-	*

Table 4. Operations supported by different types of SMEs and MCs

Message centre	SMS Center			USSD Center	
Cancel	+	+	+	*	*
Deliver message	-	+	+	-	+
Deliver status report	-	-	+	-	+
Set parameters	+	+	+	+	+
Get parameters	+	+	+	+	+
Alive	+	+	+	+	+

+ supported
 - not supported
 * supported but not useful

4 CIMD protocol messages

4.1 Message format

Each message, operation, or response consists of a header, data, and trailer part of the message, see Figure 1.

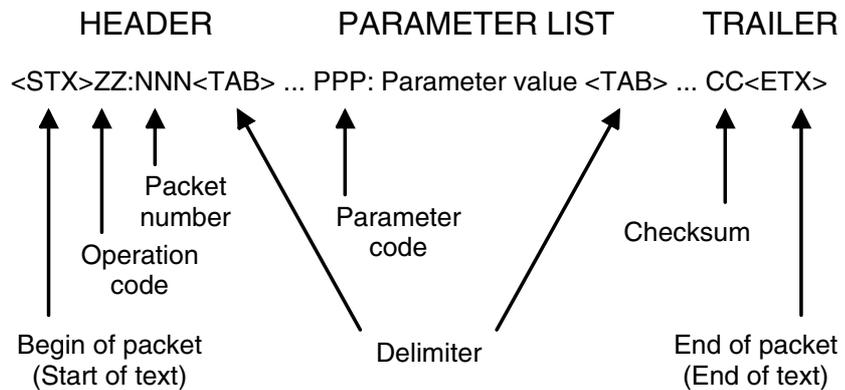


Figure 1. CIMD protocol message format

Note

Any data transmitted between packets can be ignored. This data can originate from modems, terminal drivers and so on.

The coding of the message parts are explained in the following.

Header

The header has the following format:

```
<stx>ZZ:NNN<tab>
```

where <stx> is the start-of-text indicator, which consists of a single byte containing the decimal value 2.

The field ZZ defines the operation code and consists of two bytes containing the ASCII characters of the digits 0 to 9, which range from 48 to 57.

The field NNN represents the message packet number, which consists of 3 bytes containing the ASCII characters of the digits 0 to 9, which range from 48 to 57.

The ZZ and NNN fields are separated by one byte containing the ASCII code of a colon, which is 58. The header is terminated by one byte containing the ASCII code of <tab>, which is 9.

An example of the decimal values for each byte of a header is given below:

2 48 49 58 48 48 49 9

In the notation used in the rest of this document, the header looks as follows:

<stx>01:001<tab>

Data

The data fields consist of a list of parameters each terminated by the <tab>

character. Each parameter field has the following format:

PPP:value of the parm<tab>

where PPP indicates the parameter type and consists of 3 bytes containing the ASCII values of the digits 0 to 9 (values 48 to 57). After the single byte containing the ASCII value for the colon (58) the value of the parameter is coded with a variable number of bytes. The parameter is terminated by a single byte containing the ASCII value for tab (9).

The coding of the parameter value is dependent on the type of the parameter and is explained in Chapter 7 CIMD parameters.

All parameters consist of the ASCII equivalents of digits or the characters of the alphabet. The parameter for the user data (033), however, can also consist of other characters, which will enable the use of all characters in the default GSM character set. The reserved characters 0x00 (NUL) 0x02 (STX), 0x03 (ETX), 0x09 (TAB) are not allowed in any parameter.

The parameters allowed in a packet depend on the operation and sometimes the user profile. The order of parameters is free, and many parameters may be omitted.

Examples of the decimal values of the bytes for a few parameters are listed below, together with the notation used in this document.

Example 1. Password parameter (11)

```
48 49 49 58 83 101 51 114 83 116 9
011:SeCrEt<tab>
```

Example 2. Userdata parameter (33)

```
48 51 51 58 104 105 32 116 104 101 114
101 32 33 9
033:hi there !<tab>
```

Trailer

The format of the trailer of a packet is as follows:

```
CC<etx>
```

where CC consists of two bytes containing the checksum of the packet, and <etx> is a single byte containing the end-of-text character, which has the value 3.

The use of the CC field is optional, in which case the trailer merely consists of the single <etx> byte.

An example of the decimal values of the bytes in a trailer is given below, together with the notation used in this document.

Example 3. Decimal values of the bytes in a trailer

```
51 65 3
3A<etx>
```

All parts combined give the following typical message:

```
<stx>ZZ:NNN<tab>PPP:parameter1<tab>QQQ:parm2<tab><etx>
```

When real values for ZZ, NNN and so on are used, you get the message:

```
<stx>01:001<tab>010:wwwstat<tab>011:wwwstat<tab><etx>
```

or:

```
<stx>03:011<tab>021:123456789<tab>033:hi there<tab><etx>
```

4.2 Message packet numbering

All CIMD2 messages are assigned a packet number. This packet number is used for detecting duplicate packets or missing packets. The number is assigned according to the following rules:

- Operations from the SME to the MC are assigned an odd packet number, starting from one. Subsequent packet numbers are incremented by two. After reaching 255, the number wraps back to one again. Using the coding described before the three-character NNN field (see Example 3), the message packet numbering for a list of SME-originated packets is as follows: 001, 003, 005, ... 253, 255, 001, 003, ...
- Operations from the MC to the SME are assigned an even packet number starting from zero. Subsequent packet numbers are incremented by two. After reaching 254, the number wraps back to zero again. This means that the message packet numbering for MC-originated packets is as follows: 000, 002, 004,252 , 254, 000, 002, 004,
- All response messages are assigned the same packet number as the request. Thus, the responses from the SME to the MC have even numbers and the responses from the MC to the SME have odd numbers.

4.3 Checksum

The checksum is an optional field, but when it is used you can calculate it according to the following procedure:



To calculate the checksum

1. At the beginning of the message, set the checksum to 0.
2. Retrieve the first byte of the message.
3. Add the value of the byte to the checksum.
4. Truncate the checksum so that it contains only the least significant byte.
5. If available, retrieve the next byte from the message and repeat step 3. The process stops when the <etx> field is found 2 bytes further in the message.

Example 4. Checksum calculation using C language

```
int GetChecksum( char *pstx,
char *petx )
/*****/
/* pstx points to the in the message */
/* petx points to the in the message */
/*****/
{
int checksum = 0;
char *p = pstx;
```

```
while (petx - p >= 2 ){
checksum+= *p;
checksum&= 0xFF;
p++;
}
return( checksum );
}
```

Example 4 shows that all characters from the first character to the last character before the checksum characters are included in the sum. Thus, <stx> is the first character in the checksum calculation and the last <tab> before the checksum is the last character. The checksum characters and the <ETX> are not included in the calculation.

The following line indicates the characters included in the checksum calculation:

```
<stx>ZZ:NNN<TAB>PPP:value1<tab>QQQ:val2<tab>
```

The coding of the checksum value into the two bytes of field CC is done as follows. The most significant 4 bits of the checksum are coded in the first byte and the least significant 4 bits are coded into the second byte of the checksum field CC. The ASCII representation of the digits `0" to `9" and `A" to `F" are used for coding the hexadecimal value of the four bits into the message.

For example, if the checksum is 58 (decimal) which is 0x3A (hexadecimal), the most significant 4 bits give us the value 3, and the ASCII representation `3" has the value 51 (decimal) or 0x33 (hex). The second value gets the value `A" which is 65.

The use of the checksum is optional for the SME. The MC will always include a checksum to the packets it sends to the SME.

4.4 Response messages

The interaction between an SME and the MC involves the sending of request messages, to which the other party responds with response messages. Depending on the situation, the response message can be one of the following:

- Positive response message
- Negative response message
- Nack message
- General error response message.

4.4.1 Positive response message

After processing the request message, the SME or MC sends back a positive response message. The operation code of the response packet is fixed to be 50 more than the operation code of the request packet. The packet number is the same as the request message.

A positive response message informs the initiator of the operation that the request message was received correctly and the operation was performed successfully.

In some exceptional cases (for example, cancel message), the response message assures only that the request message was received correctly and the operation will be performed, but the result of the operation is not available.

4.4.2 Negative response message

If the request contains invalid parameters or cannot be performed, a negative response message is sent back to the initiator of the operation. Positive and negative responses have the same operation code and packet number, but the negative response message has an error code and optionally an error text parameter. The usage of error texts is set in the interface profile.

A negative response message informs the initiator of the operation that the request message was received correctly, but the operation could not be performed successfully.

4.4.3 Nack message

A nack message is a special case that performs either of the following actions:

1. It can be used to trigger a retransmission of the request message in case the checksum calculated by the receiver does not match the checksum found in the packet.
2. It can be used to indicate that the packet number used is not the expected number. The packet number of the nack message always contains the expected packet number.

Note

The MC will never change the packet number because of the nack message. The MC always assumes that the packet number confusion should be corrected by the SME.

4.4.4 General error response message

This response message is used if an unknown operation has been received by the MC. It indicates the correct reception of a request with a correct checksum and packet number, but an illegal operation code (for example operation code 7).

4.5 Operation codes

All available operations are listed in the following tables, showing both the request and the response operation code.

Table 5. Operation codes (SM request — MC response)

SM request →	← MC response
login response (01)	login response (51)
logout response (02)	logout response (52)
submit message response (03)	submit message response (53)
enquire message status response (04)	enquire message status response (54)
delivery request response (05)	delivery request response (55)
cancel message response (06)	cancel message response (56)
set message response (08)	set response (58)
get message response (09)	get response (59)
alive response (40)	alive response (90)
	general error response (98)
	nack (99)

Table 6. Operation codes (SME response — MC request)

SME response →	← MC request
deliver message (70)	deliver message (20)
deliver status report (73)	deliver status report (23)
alive (90)	alive (40)
nack (99)	

5

Operation details

Table 7 lists the symbols used in this chapter. Some parameters are only meaningful if used when communicating with a certain type of MC, and therefore, also MC dependencies are listed.

Table 7. Parameter symbols

Symbol	Meaning
M	Mandatory parameter
O	Optional
X	Not supported (operation fails unless special ignore instructions are configured on the CIMD2 server side)
-	Ignored (can be used, but silently ignored)

If no specific columns for SMS Center and USSD Center are given, the behaviour is the same for both MCs.

5.1 Login (01)

A login operation must always be done before any other operation. The MC selects the interface profile based on the user identity given in the login operation.

Table 8. Login parameters

Number	Login parameters	Presence
010	User identity	M
011	Password	M
012	Subaddr	O
019	Window size	O

Positive response for login contains no parameters.

Table 9. Negative response parameters for login

Number	Negative response parameters
900	Error code
901	Error text (optional)

Negative response may follow if the user is already logged in or the User identity or Password or Subaddr is incorrect. It can also follow if the window size exceeds allowed limits for login.

5.2 Logout (02)

The logout operation closes the session, but not the connection. This allows an SME connected via a modem to login again without having to re-establish the modem connection to the MC. In most cases, the SME can close the connection without performing an explicit logout.

The logout operation does not need any parameters.

Positive response for logout contains no parameters.

Table 10. Negative response parameters for logout

Number	Negative response parameters
900	Error code
901	Error text (optional)

5.3 Submit message (03)

Submit in its simplest mode just passes the message text and destination address to the MC, which takes care of delivery. There are, however, also some special features that may be requested with the submit operation, for example first delivery time, or message to many recipients.

When the SME wants to submit a message, it builds the message text and places it into the parameter user data in the submit operation. The text is sent with other necessary parameters to the MC. The MC then sends the message to the MS or another SME.

The submitted message can be identified afterwards by using a time stamp generated by the MC (returned in a submit response) and the destination address.

Table 11. Submit parameters

Number	Submit parameters:	SMS Center Presence	USSD Center Presence
021	Destination address (multi)	M	M
023	Originating address	O	O
027	Alphanumeric originating address	O	X
030	Data coding scheme	O	O
032	User data header (bin)	O	O
033	User data *	O	O
034	User data binary *	O	O
041	Transport type	X	O
042	Message type	X	O
044	More Messages to Send	O	O
045	Operation Timer	X	O
046	Dialogue ID	X	O
047	USSD Phase	X	O
048	Service Code	X	O
050	Validity period relative **	O	O
051	Validity period absolute **	O	O
052	Protocol identifier	O	O
053	First delivery time relative ***	O	O
054	First delivery time absolute ***	O	O
055	Reply path	O	O
056	Status report request	O	O
058	Cancel enabled	O	O
064	Tariff class	O	O
065	Service description	O	O
067	Priority	O	O

- * either user data (033) or user data binary (034) field
- ** either relative or absolute validity period
- *** either integer or absolute first delivery time

For using the user data parameters (032, 033, and 034), refer to the parameter description in Chapter 7 CIMD parameters.

If an originating address is given in the submit message, it is regarded as a sub-address and it is appended to the end of the address that is set in the interface profile.

Table 12. Positive response parameters for submit

Number	Positive response parameters
021	Destination address
060	Service centre time stamp

Table 13. Negative response parameters for submit

Number	Negative response parameters
021	Destination address *
900	Error code
901	Error text (optional)

- * The destination address(es) is included only if the MC could interpret the address in the request correctly.

Note

A submit to multiple destinations is responded to with a single submit response message. This submit response contains an element, formed of a destination address and a time stamp (positive response) or of a destination address and an error code (negative response) for each destination address in the submit message.

Example 5. Submit operation to multiple destinations

```
Submit Request --->
<STX>03:007<TAB>021:11111<TAB>021:22222<TAB>021:333<TAB>033:UserData<TAB><ETX>
<-- Submit Response
<STX>53:007<TAB>021:11111<TAB>060:971107131212<TAB>
```

```
>021:22222<TAB>060:971107131212<TAB>021:333<TAB>  
>900:300<TAB><ETX>
```

Note

As the CIMD interface allows the parameters to be in any order, note that the decoding ends right after the first erroneous parameter is received. So the addresses are returned only if the error occurs after the address parameters. See examples below.

Example 6. Addresses are returned even if there is an erroneous parameter

In the following case, the 056 (that is, SR request) is wrongly set (too big value). Despite that, all addresses (021) are returned before an error code (900:310).

Submit:

```
03:005 021:123 021:12345 021:1234567890 033:hi there  
056:321
```

Submit response:

```
53:005 021:123 021:12345 021:1234567890 900:310 D6
```

Example 7. Addresses are not returned because of an erroneous parameter

In the following case, the 056 (that is, SR request) is wrongly set (too big value). Because the second address (021:456) comes after the erroneous parameter, it is never decoded, thus it is not added to the response at all.

Submit:

```
03:007 021:123 033:hello 056:333 021:456
```

Submit response:

```
53:007 021:123 900:310 20
```

Likewise, if the erroneous parameter happens to be before the first address, none of the addresses will be returned.

5.4 Enquire message status (04)

This operation is used to request a status report for a previously submitted message.

An enquire message status operation can be performed independently of the status report request parameter used in the submit message operation. However, a returned status code usually indicates that the status is unknown, because the SMS Center will not keep track of statuses unless requested at submission time for performance reasons.

No multiple enquiries are allowed in one enquire message status message packet, so SMEs have to request each status report separately.

Note that, because of the nature of USSD, a USSD Center connection will always return a negative response packet.

Table 14. Enquire message status parameters

Number	Enquire message status parameters	Presence
021	Destination address	M
060	Service centre time stamp	M

The information in the enquire message status response is the same as in the message status delivery.

Table 15. Positive response parameters for enquire message status

Number	Negative response parameters
021	Destination address
060	Service centre time stamp
061	Status code
062	Status error code (optional)
063	Discharge time

Table 16. Negative response parameters for enquire message status

Number	Negative response parameters
900	Error code
901	Error text (optional)

Example 8. Enquire message status

```

Enquire Message Status --->
<STX>04:003<TAB>021:DestAddr<TAB>060:ServiceCentreTimeStamp<TAB>cs<ETX>
<--- Positive response
<STX>54:003<TAB>021:DestAddr<TAB>060:ServiceCentreTimeStamp<TAB>061:StatusCode<TAB>
063:DischargeTime<TAB>cs<ETX>
<--- Negative response
<STX>54:003<TAB>900:ErrorCode<TAB>checksum<ETX>
    
```

5.5 Delivery request (05)

This operation is used by the client (SME) to retrieve a message sent to the client. The usage of this operation depends on the type of message centre and type of SME.

This operation is not functional in USSD Center connections. For the message count request, it returns an error code; for the other modes it returns the basic positive response packet without any following deliver message operation.

For the SMS Center, the usage depends on the SME type.

The querying type of SME must always poll for messages using this delivery request operation.

For the receiving type of SME, this operation is optional as normally messages are delivered immediately to the SME using the deliver message operation (020). This operation can still be useful for querying the count of messages waiting for the SME.

This operation cannot be used by send-only applications.

If the response to the delivery request with mode 1 or 2 is positive, one or more deliver short message operations will follow until all the messages are delivered.

Table 17. Delivery request

Number	Delivery request	Presence
068	Mode	O

Mode can have one of the following values (default value = 1):

- 0 - Number of messages waiting. The response contains the number of messages waiting to be retrieved, no actual messages are transferred after this request.
- 1 - Deliver one message. The oldest message is delivered.
- 2 - Deliver all messages (receiving SMEs only!). All messages are delivered.

Table 18. Positive response parameters for delivery request

Number	Positive response parameters
066	Number of messages waiting*

* Positive response contains the parameter only if the mode parameter in the request was used with value zero.

Table 19. Negative response parameters for delivery request

Number	Negative response parameters
900	Error code
901	Error text (optional)

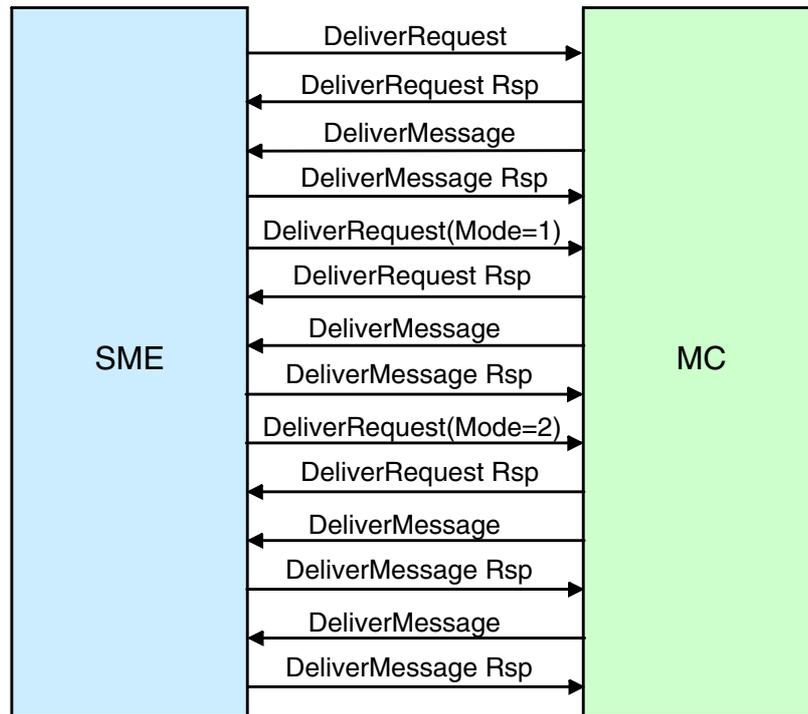


Figure 2. Flow of delivery request operations

Example 9. A querying application using the delivery request for retrieving messages

```

Delivery Request ----->
<STX>05:007<TAB><ETX>
<--- Positive response
<STX>55:007<TAB><checksum><ETX>

<----- Deliver message
<STX>20:002<TAB>021:DestAddr<TAB>060:ServiceCentreTimeStamp
<TAB>023:OrigAddr<TAB>033:Data<TAB><checksum><TX>

Deliver message response ----->
<STX>70:002<TAB><ETX>

Delivery Request ----->
<STX>05:009<TAB><ETX>

<--- Positive response
<STX>55:009<TAB><checksum><ETX>

<----- Deliver message<STX>20:004<TAB>021:DestAddr<TAB>060:ServiceCentreTimeStamp
<TAB>023:OrigAddr<TAB>033:Data<TAB><checksum><ETX>
    
```

```
Deliver message response ----->
<STX>70:004<TAB>chksum<ETX>
```

Example 10. A querying or receiving application asks for the number of messages waiting

```
Delivery Request (mode=0) --->
<STX>05:011<TAB>068:0<TAB><ETX>
<--- Positive response
<STX>55:011<TAB>066:26<TAB><chksum><ETX>
```

5.6 Cancel message (06)

This operation is used to cancel a message sent earlier by the subscriber. The operation is only useful when communicating with an SMS Center; the USSD Center will accept, but ignore this operation.

It is possible to cancel more than one message with one operation.

If the message has already been delivered to its destination, it cannot be cancelled.

Cancelling may be disabled in the submit operation. Disabling is useful, for example, in cases where there are such messages to a certain destination that should not be cancelled, but the cancellation is made according to the destination address.

Table 20. Cancel message parameters

Number	Delivery request	Presence
060	Service centre time stamp	O
021	Destination address	O
059	Cancel mode	M

The mode parameter can have three different values:

- 0 - Cancel all messages with the same destination address. This is only valid for MT messages.
- 1 - Cancel all sent messages. This is only valid for MT messages.
- 2 - Cancel a message where the destination address and the time stamp match with a short message submitted earlier.

In mode 0, the destination address is mandatory. In mode 1, only the cancel mode parameter is needed, and in mode 2, all three parameters are mandatory.

Positive response for cancel message does not contain any parameters.

Table 21. Negative response parameters for cancel message operation

Number	Negative response parameters
900	Error code
901	Error text (optional)

A cancel message response is positive even if the message cannot be cancelled. A positive response only means that the cancel request was received correctly by the MC. Status reports can be used to find out about the actual success of the cancel message operation.

5.7 Deliver message (20)

This operation is used by the MC to deliver a message to an SME. Only receiving-type SMEs will get this message.

Table 22. Deliver message parameters

Number	Deliver message parameters:	SMS Center Presence	USSD Center Presence
021	Destination address	M	M
023	Originator address	M	M
060	Service centre time stamp	M	M
032	User data header *	O	O
033	User data *	O	O
034	User data binary *	O	O
052	Protocol identifier	O	O
030	Data coding scheme	O	O
041	Transport type	X	O
042	Message type	X	O
046	Dialogue ID	X	O
047	USSD Phase	X	O
048	Service Code	X	O

Table 22. Deliver message parameters (Continued)

Number	Deliver message parameters:	SMS Center Presence	USSD Center Presence
026	Originated IMSI	O	X
028	Originated Visited MSC address	O	O
069	Service Center Address	O	X

The User data header parameter is present only if the message contains a user data header. Either the user data (033) or user data binary (034) is used, depending on the value of the data coding scheme (030).

If the data coding scheme indicates that the data is using the default GSM character set, the common user data parameter is used. For UCS2 or other binary data, the user data binary (034) parameter is used.

Other optional parameters are normally present, unless suppressed via the user interface profile.

Response for a deliver message does not need to contain any parameters, but parameter 900 (error code) is supported. If the parameter's value is > 0, this causes ASE to retry message delivery after a certain time period. Value 0 means OK, and the effect is the same as leaving out the parameter.

Table 23. Negative response parameter for delivery message

Number	Negative response parameters
900	Error code

5.8 Deliver status report (23)

This operation is used by the MC to send a status report describing the delivery status of a previously submitted message. The generation of status reports for a particular message is requested in the submit operation.

The delivery of status reports to the SME depends also on the type of SME. Querying SMEs, connecting to an SMS Center, always have to request the delivery of a status report using the enquire message status operation (04). Receiving SMEs will receive the status report whenever it is available.

After a successful delivery of the status report, the status report will be removed from the MC if it describes the final status of the message.

The information in the deliver status report message is the same as in the enquire message status response.

The optional Status Error code parameter in USSD Center connections is normally present, unless suppressed via the server configuration.

Table 24. Deliver status report parameters

Number	Deliver status report parameters:	SMS Center Presence	USSD Center Presence
021	Destination address	M	M
046	Dialogue ID	X	O
060	Service centre time stamp	M	M
061	Status code	M	M
062	Status Error code	O	O
063	Discharge time	M	M

Response for deliver status report does not contain any parameters.

Example 11. Deliver status report

```
<--- Deliver Status Report
<STX>23:012<TAB>021:destAddr<TAB>060:scts
<TAB>061:statusCode<TAB>063:dis_time<TAB><chksum><ETX>
Response --->
<STX>73:012<TAB><chksum><ETX>
```

5.9 Set (08)

This operation is used by the SME to change those parameters of the interface profile that it is allowed to change.

At the moment, only the password can be changed by SMEs.

Table 25. Set parameters

Number	Set parameters
011	Password

Positive response for set does not contain any parameters.

Table 26. Negative response parameters for set

Number	Negative response parameters
900	Error code
901	Error text (optional)

Example 12. Set

```
Set (password) --->
<STX>08:011<TAB>011:myNewpasWord<TAB><checksum><ETX>
<--- Response
<STX>58:011<TAB><checksum><ETX>
```

5.10 Get (09)

This operation is used by the SME to retrieve specific parameters from the MC.

In the get operation, the parameter 500 is used in all get operations and the value of the parameter 500 is the number of the parameter (or information) the SME is requesting.

Table 27. Get parameters

Number	Get parameters
011	Password

Currently the only supported value for get parameters is 501, which returns the time of the MC.

Table 28. Positive response parameters for get

Number	Positive response parameters
501	Time of the MC

Positive response contains the value parameter (or information) requested and the real value of that parameter.

Negative response will follow if the parameter value is not available.

Table 29. Negative response parameters for get

Number	Negative response parameters
900	Error code
901	Error text (optional)

Example 13. Get

```
Get (system time) --->
<STX>09:009<TAB>500:501<TAB><checksum><ETX>
<----- response
<STX>59:009<TAB>501:990814154512<TAB><checksum><ETX>
```

5.11 Alive (40)

This operation can be used by both the SME and the MC to check whether the link between the SME and the MC is still alive. The receiving entity sends an acknowledgement back to the originator if the alive operation is received correctly.

The alive operation does not need any parameters.

Positive response for alive does not contain any parameters.

Example 14. SME-originated Alive request

```
Alive request ----->
<STX>40:009<TAB><Chksum><ETX>
<----- response
<STX>90:009<TAB><Chksum><ETX>
```

An example of an MC originated Alive request

```
<----- Alive request
<STX>40:022<TAB><Chksum><ETX>
```

```
Response ----->
<STX>90:022<TAB><Chksum><ETX>
```

5.12 Additional operations

This section lists the additional response packages used in certain error situations as described in the previous chapter.

5.12.1 General error response (98)

This operation is used by the MC to respond to illegal, unexpected, or unsupported operations sent by the SME.

Table 30. Operation parameters

Number	Operation parameters
900	Error code
901	Error text (optional)

Example 15. General error response

```
Request  <---->
<STX>07:007<TAB><checksum><ETX>
<---- response
<STX>98:007<TAB>900:ErrorCode<TAB><checksum><ETX>
```

5.12.2 Nack (99)

The nack operation is used to reject an operation due to an incorrect checksum or an incorrect sequence number. The nack operation causes retransmission of the message. The packet sequence number in a nack message is always the expected sequence number.

There are no operation parameters.

Example 16. Corrupted message retransmission

```
SME sends <----->
<STX>03:007<TAB>021:daddr<TAB>033:data<TAB>3A<ETX>
MC Receives
<STX>03:007<TAB>021:daddr<TAB>033:XXXX<TAB>3A<ETX>

<----- response with the nack
<STX>99:007<TAB><checksum><ETX>

SME retransmits <----->
<STX>03:007<TAB>021:daddr<TAB>033:data<TAB>3A<ETX>
```

```
<----- MC response
<STX>53:007<TAB>021:daddr<TAB>060:scts<TAB><CS><ETX>
```

Example 17. Wrong packet number

```
SME sends unexpected packet number ----->
<STX>03:001<TAB>021:daddr<TAB>033:Data<TAB><CS><ETX>
<----- MC responds with nack
<STX>99:009<TAB><CS><ETX>

SME recovers ---->
<STX>03:009<TAB>021:daddr<TAB>033:Data<TAB><CS><ETX>

<----- MC responds
<STX>53:009<TAB>021:daddr<TAB>060:60:scts<TAB><CS><ETX>
```

The MC expects a packet number 007, but the client sends something else. After the Nack the client recovers and the normal operation continues.

6

Windowing for applications

The windowing for applications feature enables the CIMD2 applications to initiate more than one operation before receiving responses. The feature also activates multiple SM and SR deliveries from the application server engine (ASE) to the application, which application can acknowledge preferably in the received order.

This feature is reasonable to use, for example, when the application connects to the ASE through a slow link. Then the application is able to speed up the transactions by submitting more than one SM before waiting for submit responses.

6.1 Windowing scenarios

In the following, some scenarios between the application and the ASE are presented.

Submitting more than one SM from application

Suppose X is the window size allowed for the considered application. The application is allowed to submit up to X SMs to the ASE before it waits for the responses. The ASE ignores any SMs submitted with a sequence number outside the window range and a nack (negative acknowledge) is returned. So there is no retransmission of responses once windowing is enabled. This behaviour is enabled only when the application logs in with parameter 019. The application is forced to use the sequence numbers in strict increasing order.

If an application submits with a window size 3, and if 007 is the current sequence number for submit, the following scenario is possible, see Table 31.

Table 31. Windowing scenario 1

ASE	Direction	Application
	<----	007:<submit>
007:<submit response>	---->	
	<----	005:<submit>
--- Ignore (NACK) ---		
	<----	011:<submit>
--- Ignore (NACK) ---		
	<----	009:<submit>
	<----	011:<submit>
	<----	013:<submit>
009:<submit response>	---->	
011:<submit response>	---->	
013:<submit response>	---->	

ASE delivers more than one SM/SR to application

If an application has logged in with a window size of X, and the ASE has accepted it, the ASE is entitled to deliver up to X SMs or SRs to the application before waiting for the response from the application. This is valid only if the application is configured as auto deliver. If the delivery is not acknowledged during the delivery timeout period, then the ASE retransmits the packet. The application can acknowledge the delivery packets it has received in any order, but the preferred way is to acknowledge them in the order they are received.

If the ASE is retrieving messages from the message router, then the ASE uses only a window size of 1. The scenario can be explained with an application which has a window size of 3, see Table 32.

Table 32. Windowing scenario 2

ASE	Direction	Application
000:<SM delivery>	---->	
002:<SM delivery>	---->	
004:<SM delivery>	---->	
	<----	000:<SM ack>
006:<SM delivery>	---->	
	<----	002:<SM ack>
	<----	006:<SM ack>
...		
...		
Time out for 004 – retransmit	---->	
004:<SM delivery>	<----	004:<SM ack>

6.2 Restrictions

The CIMD2 windowing does not distinguish between different operations initiated by the application. This means that an application can have X outstanding operations (submit, message count request, cancel and so on) if it has been granted a window size of X.

All the windowing features are enabled if the application logs with parameter 019. If not, then submit and delivery behaviour is the same as in the previous version of CIMD. But an application can use windowing only after it has received a login response from the ASE.

For polling applications, it is recommended not to use a window size higher than 1. This is because more than one poll-request simultaneously for a short message can cause duplicate deliveries.

7 CIMD parameters

7.1 Parameter types

The parameter type selects the allowed values of characters in the CIMD2 messages.

Integer (int)

Integer is the most common type of parameter. The allowed values are the ASCII representation of the digits 0 to 9. This means that only decimal values from 48 to 57 are allowed.

Example 18. Integer

```
064:3<tab>050:167<tab>030:0<tab>055:1<tab>056:63
```

Address (addr)

The Address parameter type is used for passing GSM addresses to and from the MC. This field can contain digits like the integer field, but also some extra characters. What characters are actually accepted depends on the configuration of the address conversion done in the MC. The ASCII representations of the following characters are currently allowed: '-', '+'. This means that besides the values 48 to 57 (digits 0 to 9) also the values 45 ('-') and 43 ('+') are allowed.

Example 19. Address

```
021:+35812345678<tab>023:13131
```

Hexadecimal (hex)

The Hexadecimal parameter type is used for passing binary data to and from the MC. This field can contain the ASCII representation of the digits 0 to 9 and the ASCII representation of the characters 'A' to 'F' and 'a' to 'f'. This means that the following decimal values are allowed: 48 to 57 (0 to 9); 65 to 70 ('A' to 'F') and 97 to 102 ('a' to 'f') in the CIMD2 parameters of this type.

Example 20. Sending six bytes of binary data

```
034:0500032a0301<tab>
```

User data (ud)

The User data parameter type is used to exchange user data between the MC and an SME. The SME can use most of the printable ASCII character set, and can combine them to select the characters of the default GSM character set. The exact configuration of this conversion is selected by the user profile. The default character conversion table 37 is shown in chapter 8.1 Default character conversion.

The following example shows the first few characters of the default GSM character set that can be entered using the default character conversion over an 8-bit wide link using a system with the ISO-Latin character set.

Example 21. Default character conversion over 8-bit wide link

```
033:@f$¥èéùìðÇ
```

which is from the iso latin1 character set.
48,51,51,58,64,163,36,165,232,233,249,236,242,199

For a 7-bit link, only values under 128 can be used. Example 20 shows how to enter the same data as before (see previous example) from a system with a different character set.

Example 22. Default character conversion over 7-bit link

```
033:_a0_L-$_Y-_e`_e"_u`_i`_o`_C,
```

String (str)

The String parameter type is used to exchange general printable characters from the ASCII character table. Parameters of this type can have the decimal values from 32 (space) to 126 ('~').

Example 23. String

```
010:MyUserId<tab>011:my()<pass;+\wo%=rd<tab>
```

7.2 Parameters

The parameters marked with (*) are not usable when used over a USSD Center connection. The parameters marked with (#) are not usable when used over an SMS Center connection.

Table 33. Parameters

Name	ID	Max Length	Type	Values	Description
User Identity	010	32	String	-	Identity used to login. Max. 32 characters. Leading or trailing spaces are not allowed.
Password	011	32	String	-	Password used to login. Max. 32 characters. Leading or trailing spaces are not allowed.
Subaddr	012	3	Integer	0 - 9	Defines a unique index for application instance. This is useful for correct delivery of SRs when multiple instances of the same application are connected.
Window size	019	3	Integer	1 - 128	Defines the window size used by the application for submitting messages.
Destination Address	021	20	Address	-	Destination address in the GSM network. The prefix "+" indicates address type 145 which means international address.
Originating Address	023	20	Address	-	Originating address. This value is appended to the prefix in the ASE subscriber database. The total length can be 20 characters at the most.
Originating IMSI (*)	026	20	Address	-	Originating International Mobile Subscriber Identity number.
Alphanumeric Originating Address	027	11	String	-	Originating address in alphanumeric format. This parameter is a string of maximum 11 chars, where each character byte can have the following values: 32-126 inclusive, BUT NOT ALLOWED: 36,64,93,95,96,125, that is, included are a few punctuation marks, space, a-z, A-Z and 0-9.
Originated Visited MSC address	028	20	Address	-	The ISDN number of the serving MSC network element of the originating subscriber.

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Data Coding Scheme	030	3	Integer	0 - 255	As defined in GSM 03.38.
User Data Header	032	280 - 320	Hexa-decimal	-	<p>This is an optional part of the user data of the message transferred. The maximum length of the header is 140 bytes.</p> <p>The maximum length of the user data header is reduced by the length of user data or user data binary.</p> <p>140 bytes result in a coded length of 280 characters. For the user data for an USSD Center connection, the maximum size is 160 bytes, giving a coded length of 320 bytes.</p>
User Data	033	480 - 546	User Data	-	<p>This parameter can be used to transfer the user data of the short message using the default character set. Special 3-character sequences can be used to select, for example, some Greek characters. The maximum length of the User Data in the message itself can be 160 septets at the most. This corresponds to 140 octets or bytes.</p> <p>For a USSD Center connection, this maximum is 160 octets giving 182 septets.</p>
User Data Binary	034	280-320	Hexa-decimal	-	<p>This field can be used to transfer the user data of the short message. As it uses the simple hexadecimal coding, any bit pattern can be sent to another SME. By selecting an appropriate value for the data coding scheme (030) binary data or UCS2 user data can be transferred.</p> <p>The maximum length of the user data binary is 140 bytes. This maximum length is reduced by the length of user data header.</p>
Transport Type (#)	041	1	Integer	0 or 1	<p>This field indicates what type of transport the message uses:</p> <p>0 - SMS</p> <p>1 - USSD</p>

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Message Type (#)	042	1	Integer	1 - 6	This USSD Center-specific field defines the type of USSD message: 1 - USSD Process Request 2 - USSD Request 3 - USSD Notify 4 - USSD Ack 5 - USSD Release 6 - USSD Process Request Ack
More messages to send	044	1	Integer	0 or 1	This parameter indicates if there will be more messages to the same destination immediately after this message. This will allow faster delivery of many messages to the same destination. Values: 0 No subsequent messages 1 More messages will follow
Operation Timer (#)	045	3	Integer	0 - 600	This parameter controls the timeout for the USSD dialogue. The value is in seconds; the value 0 indicates to use the default of the USSD Center.
Dialogue Id (#)	046	5	Integer	-1 - 99999	USSD Center kernel's dialogue ID. Values: -1 Value is not known and it is not included in the CIMD packets.
USSD Phase (#)	047	2	Integer	0, 10 or 20	USSD Phase of the mobile station. Values: 0 - Unknown 10 - Phase 1 20 - Phase 2
Service Code (#)	048	3	Integer	0 - 255	USSD Service Code (from GSM 02.90).
Validity Period Relative (*)	050	3	Integer	-1 - 255	The length of the validity period of the message, counted from the time the message is received by the MC. The value is converted to a time period according to the GSM 03.40 specification. This parameter can not be combined with the Validity Period Absolute (051).

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Validity Period Absolute (*)	051	12	Integer	-	The absolute termination time of the validity period of the message; value consists of year, month, day, hour, minute, second in the format "yyymmddhhmmss" This parameter can not be combined with the validity period relative (050).
Protocol Identifier (*)	052	3	Integer	0 - 255	The Protocol Identifier (PID) can be used to control GSM phase 2 features, such as "replace message". Setting the PID to 65 (decimal) sets the message type to "Replace Message Type 1", adding 1..6 gives the replace message types 2 to 7, as defined in GSM 03.40. This parameter can also select the routing to applications instead of GSM mobile stations, as defined in the MC routing table.
First Delivery Time Relative (*)	053	max. 3	Integer	-1 - 255	This parameter selects the time period waited before the first delivery attempt of the message will be made. The value is converted like the validity period relative.
First Delivery Time Absolute (*)	054	12	Integer	-	Time for the first delivery attempt of the message. Representation in format "yyymmddhhmmss".
Reply Path (*)	055	1	Integer	0 or 1	This parameter selects whether the reply path feature is enabled (1) or not (0).

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Status Report Request	056	3	Integer	See Description.	<p>Defines in what cases the status report shall be returned. Value of the parameter is the sum of the cases where automatic status report shall be produced. For example, value 62 means that status report is created for all events except temporary error.</p> <p>Possible flags for SMS Center connections:</p> <ul style="list-style-type: none"> 1 - temporary error 2 - validity period expired 4 - delivery failed 8 - delivery successful 16 - message cancelled 32 - message deleted by the operator 64 - first temporary result <p>Resulting in SRR values from 0 - 127.</p> <p>Possible flags for USSD Center connections:</p> <ul style="list-style-type: none"> 4 - delivery failed 8 - delivery successful <p>Resulting in the SRR values: 0,4,8,12. Setting other flags has currently no effect.</p>
Cancel Enabled (*)	058	1	Integer	0 or 1	This parameter selects whether the submitted message can later be cancelled (1) or not (0).
Cancel Mode(*)	059	1	Integer	0, 1 or 2	<p>Cancel mode:</p> <ul style="list-style-type: none"> 0 - Cancel all messages with the same destination address. 1 - Cancel all sent messages. 2 - Cancel a message where the destination address and the time stamp match with a message submitted earlier.
Service Centre Time Stamp	060	12	Integer	-	<p>Time of message arrival at the Service Centre.</p> <p>In the SMS Center connection the format is "yymmddhhmms".</p> <p>In USSD Center connections the format is "mmdhhmsshh" - hundreds of seconds are included instead of the years.</p>

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Status Code	061	2	Integer	See Description.	Status of the message delivery. Passed to the SME in the inquire message status response and deliver status report messages. Value as follows in SMS Center connections: 0 - no status available 1 - in process 2 - validity period expired 3 - delivery failed 4 - delivery successful 5 - no response 6 - last no response 7 - message cancelled 8 - message deleted 9 - message deleted by cancel Value as follows in USSD Center connections: 3 - delivery failed 4 - delivery successful
Status Error Code	062	3	Integer	0 - 999	Detailed error code of the message delivery status. The values are listed in Section 7.4 Status Error Code values.
Discharge Time	063	12	Integer	-	Time of the last delivery attempt in format "yyymmddhhmmss".
Tariff Class	064	2	Integer	0 - 99	Defines the tariff class of the message.
Service Description	065	2	Integer	0 - 99	Defines the service description of the message, which can be used for billing.
Message Count (*)	066	3	Integer	0 - 999	Number of messages waiting to be retrieved.
Priority(*)	067	1	Integer	1 - 9	Priority of the message. Lower value means higher priority.
Delivery Request Mode(*)	068	1	Integer	0, 1 or 2	Selects the Mode in the Delivery Request operation
Service Center Address	069	20	Address	-	The ISDN number of an SMS Center element

Table 33. Parameters (Continued)

Name	ID	Max Length	Type	Values	Description
Get parameter	500	3	Integer	501 - 999	The value is the parameter number or information item that the SME wants to retrieve. Currently only the value 501 is supported.
MC Time	501	12	Integer	-	The local time of the MC in the format "yymmddhhmmss" for year, month, day, hours, minutes and seconds.
Error Code	900	3	Integer	0 - 999	The identifier of the error. The error codes are listed in 7.3 Error codes.
Error Text	901	64	String	-	Text describing the error. These merely help so that the client application developer does not have to look up the coded error.

7.3 Error codes

Table 34 lists the values of the parameter error code (900) together with the error texts.

Table 34. Parameter error codes and error texts

Error code	Error text
0	No error
1	Unexpected operation
2	Syntax error
3	Unsupported parameter error
4	Connection to MC lost
5	No response from MC
6	General system error
7	Cannot find information
8	Parameter formatting error
9	Requested operation failed
LOGIN error codes:	

Table 34. Parameter error codes and error texts (Continued)

Error code	Error text
100	Invalid login
101	Incorrect access type
102	Too many users with this login ID
103	Login refused by MC
104	Invalid window size
105	Windowing disabled
106	Virtual SMS Center-based barring
107	Invalid subaddr
108	Alias account, login refused
SUBMIT MESSAGE error codes:	
300	Incorrect destination address
301	Incorrect number of destination addresses
302	Syntax error in user data parameter
303	Incorrect bin/head/normal user data parameter combination
304	Incorrect dcs parameter usage
305	Incorrect validity period parameters usage
306	Incorrect originator address usage
307	Incorrect PID parameter usage
308	Incorrect first delivery parameter usage
309	Incorrect reply path usage
310	Incorrect status report request parameter usage
311	Incorrect cancel enabled parameter usage
312	Incorrect priority parameter usage
313	Incorrect tariff class parameter usage
314	Incorrect service description parameter usage
315	Incorrect transport type parameter usage
316	Incorrect message type parameter usage
318	Incorrect MMs parameter usage
319	Incorrect operation timer parameter usage
320	Incorrect dialogue ID parameter usage

Table 34. Parameter error codes and error texts (Continued)

Error code	Error text
321	Incorrect alpha originator address usage
322	Invalid data for alpha numeric originator
ENQUIRE MESSAGE STATUS error codes:	
400	Incorrect address parameter usage
401	Incorrect scts parameter usage
DELIVERY REQUEST error codes:	
500	Incorrect scts parameter usage
501	Incorrect mode parameter usage
502	Incorrect parameter combination
CANCEL MESSAGE error codes:	
600	Incorrect scts parameter usage
601	Incorrect address parameter usage
602	Incorrect mode parameter usage
603	Incorrect parameter combination
SET error codes:	
800	Changing password failed
801	Changing password not allowed
GET error codes:	
900	Unsupported item requested

7.4 Status Error Code values

7.4.1 Status Error Code values for SMS Center connections

Table 35 lists the values and meanings of the parameter Status Error Code (062) for SMS Center connections.

Table 35. Status Error Code parameter for SMS Center connections

Value	Meaning
0	No error
1	Unknown subscriber
9	Illegal subscriber
11	Teleservice not provisioned
13	Call barred
15	CUG reject
19	No SMS support in MS
20	Error in MS
21	Facility not supported
22	Memory capacity exceeded
29	Absent subscriber
30	MS busy for MT SMS
36	Network/Protocol failure
44	Illegal equipment
60	No paging response
61	GMSC congestion
63	HLR timeout
64	MSC/SGSN_timeout
70	SMRSE/TCP error
72	MT congestion
75	GPRS suspended
80	No paging response via MSC
81	IMSI detached
82	Roaming restriction
83	Deregistered in HLR for GSM
84	Purged for GSM
85	No paging response via SGSN
86	GPRS detached
87	Deregistered in HLR for GPRS

Table 35. Status Error Code parameter for SMS Center connections

Value	Meaning
88	The MS purged for GPRS
89	Unidentified subscriber via MSC
90	Unidentified subscriber via SGSN
112	Originator missing credit on prepaid account
113	Destination missing credit on prepaid account
114	Error in prepaid system

7.4.2 Status Error Code values for USSD Center connections

Table 36 lists the values and meaning of the parameter Status Error Code (062) for USSD Center connections.

Table 36. Status Error Code parameter for USSD Center connections

Value	Meaning
0	No error
750	Release, call barred
751	Release, system failure
752	Release, data missing
753	Release, unexpected data value
754	Release, absent subscriber
755	Release, illegal subscriber
756	Release, illegal equipment
757	Release, unknown alphabet
758	Release, USSD busy
759	Release, operation timer expired
760	Release, unexpected primitive
761	Release, wait timer expired
762	Release, data error
763	Release, too long USSD data
764	Release, unknown MS address

Table 36. Status Error Code parameter for USSD Center connections

Value	Meaning
765	Release, network congestion
766	Release, internal congestion
767	Release, no network connection
768	Release, USSD not supported

8 Character conversion for user data

8.1 Default character conversion

Table 37 shows the default character conversion for user data.

The three columns on the left show the value, symbol, and name of the character of the 7-bit default GSM character set as defined in the *GSM 3.38*.

The fourth column shows the possible character of the ISO-Latin character set and in brackets the decimal value. Computers using another character table can also send the value from this column, even though it will look like a different character on their system. The fifth column shows the combination of ISO-Latin characters which results in the intended GSM character. The characters used in this column also match the corresponding characters of the common ASCII table.

Table 37. Default character conversion for user data

GSM character			Iso-Latin	Special combination
0	@	COMMERCIAL AT	@ (64)	_Oa
1	£	POUNDS STERLING		_L-
2	\$	DOLLAR SIGN	\$ (36)	
3	¥	YEN		_Y-
4	è	e WITH GRAVE ACCENT		_e`
5	é	e WITH ACUTE ACCENT		_e'
6	ù	u WITH GRAVE ACCENT		_u`
7	ì	i WITH GRAVE ACCENT		_i`
8	ò	o WITH GRAVE ACCENT		_o`
9	Ç	C WITH CEDILLA		_C,
10		LINE FEED	(10)	

Table 37. Default character conversion for user data (Continued)

GSM character			Iso-Latin	Special combination
11	Ø	O WITH SLASH		_O/
12	ø	o WITH SLASH		_o/
13		CARRIAGE RETURN	(13)	
14	Å	A WITH RING	] (93)	_A*
15	å	a WITH RING	} (125)	_a*
16	Δ	GREEK ALPHABET DELTA		_gd
17	_	UNDERSCORE		_--
18	Φ	GREEK ALPHABET PHI		_gf
19	Γ	GREEK ALPHABET GAMMA		_gg
20	Λ	GREEK ALPHABET LAMBDA		_gl
21	Ω	GREEK ALPHABET OMEGA		_go
22	Π	GREEK ALPHABET PI		_gp
23	Ψ	GREEK ALPHABET PSI		_gi
24	Σ	GREEK ALPHABET SIGMA		_gs
25	Θ	GREEK ALPHABET THETA		_gt
26	Ξ	GREEK ALPHABET XI		_gx
27		RESERVED		_XX
28	Æ	AE DIPHTHONG		_AE
29	æ	ae DIPHTHONG		_ae
30	ß	GERMAN DOUBLE-S		_ss
31	É	E WITH ACUTE ACCENT		_E'
32		SPACE	(32)	
33	!	EXCLAMATION MARK	! (33)	
34	"	QUOTATION MARK	" (34)	_qq
35	#	NUMBER SIGN	# (35)	
36	¤	CURRENCY SYMBOL		_ox
37	%	PERCENT SIGN	% (37)	
38	&	AMPERSAND	& (38)	
39	'	APOSTROPHE	' (39)	

Table 37. Default character conversion for user data (Continued)

GSM character			Iso-Latin	Special combination
40	(	LEFT PARENTHESIS	((40)	
41	)	RIGHT PARENTHESIS	) (41)	
42	*	ASTERISK	* (42)	
43	+	PLUS SIGN	+ (43)	
44	,	COMMA	, (44)	
45	-	HYPHEN	- (45)	
46	.	FULL STOP (PERIOD)	. (46)	
47	/	SOLIDUS (SLASH)	/ (47)	
48	0	DIGIT ZERO	0 (48)	
49	1	DIGIT ONE	1 (49)	
50	2	DIGIT TWO	2 (50)	
51	3	DIGIT THREE	3 (51)	
52	4	DIGIT FOUR	4 (52)	
53	5	DIGIT FIVE	5 (53)	
54	6	DIGIT SIX	6 (54)	
55	7	DIGIT SEVEN	7 (55)	
56	8	DIGIT EIGHT	8 (56)	
57	9	DIGIT NINE	9 (57)	
58	:	COLON	: (58)	
59	;	SEMICOLON	; (59)	
60	<	LESS-THAN SIGN	< (60)	
61	=	EQUALS SIGN	= (61)	
62	>	GREATER-THAN SIGN	> (62)	
63	?	QUESTION MARK	? (63)	
64	¡	INVERTED !		_!!
65	A	CAPITAL LETTER A	A (65)	
66	B	CAPITAL LETTER B	B (66)	
67	C	CAPITAL LETTER C	C (67)	
68	D	CAPITAL LETTER D	D (68)	

Table 37. Default character conversion for user data (Continued)

GSM character			Iso-Latin	Special combination
69	E	CAPITAL LETTER E	E (69)	
70	F	CAPITAL LETTER F	F (70)	
71	G	CAPITAL LETTER G	G (71)	
72	H	CAPITAL LETTER H	H (72)	
73	I	CAPITAL LETTER I	I (73)	
74	J	CAPITAL LETTER J	J (74)	
75	K	CAPITAL LETTER K	K (75)	
76	L	CAPITAL LETTER L	L (76)	
77	M	CAPITAL LETTER M	M (77)	
78	N	CAPITAL LETTER N	N (78)	
79	O	CAPITAL LETTER O	O (79)	
80	P	CAPITAL LETTER P	P (80)	
81	Q	CAPITAL LETTER Q	Q (81)	
82	R	CAPITAL LETTER R	R (82)	
83	S	CAPITAL LETTER S	S (83)	
84	T	CAPITAL LETTER T	T (84)	
85	U	CAPITAL LETTER U	U (85)	
86	V	CAPITAL LETTER V	V (86)	
87	W	CAPITAL LETTER W	W (87)	
88	X	CAPITAL LETTER X	X (88)	
89	Y	CAPITAL LETTER Y	Y (89)	
90	Z	CAPITAL LETTER Z	Z (90)	
91	Ä	A WITH DIERESIS	[(91)	_A"
92	Ö	O WITH DIERESIS	\ (92)	_O"
93	Ñ	N WITH TILDE		_N~
94	Ü	U WITH DIERESIS	^ (94)	_U"
95	§	SECTION MARK		_so
96	¿	INVERTED ?		_??
97	a	SMALL LETTER a	a (97)	

Table 37. Default character conversion for user data (Continued)

GSM character			Iso-Latin	Special combination
98	b	SMALL LETTER b	b (98)	
99	c	SMALL LETTER c	c (99)	
100	d	SMALL LETTER d	d (100)	
101	e	SMALL LETTER e	e (101)	
102	f	SMALL LETTER f	f (102)	
103	g	SMALL LETTER g	g (103)	
104	h	SMALL LETTER h	h (104)	
105	i	SMALL LETTER i	i (105)	
106	j	SMALL LETTER j	j (106)	
107	k	SMALL LETTER k	k (107)	
108	l	SMALL LETTER l	l (108)	
109	m	SMALL LETTER m	m (109)	
110	n	SMALL LETTER n	n (110)	
111	o	SMALL LETTER o	o (111)	
112	p	SMALL LETTER p	p (112)	
113	q	SMALL LETTER q	q (113)	
114	r	SMALL LETTER r	r (114)	
115	s	SMALL LETTER s	s (115)	
116	t	SMALL LETTER t	t (116)	
117	u	SMALL LETTER u	u (117)	
118	v	SMALL LETTER v	v (118)	
119	w	SMALL LETTER w	w (119)	
120	x	SMALL LETTER x	x (120)	
121	y	SMALL LETTER y	y (121)	
122	z	SMALL LETTER z	z (122)	
123	ä	a WITH DIERESIS	{ (123)	_a"
124	ö	o WITH DIERESIS	l (124)	_o"

Table 37. Default character conversion for user data (Continued)

GSM character			Iso-Latin	Special combination
125	ñ	n WITH TILDE		_n~
126	ü	u WITH DIERESIS	~ (126)	_u"
127	à	a WITH GRAVE ACCENT		_a`

8.2 Extension character conversion

Table 38 shows how the characters of the extension table defined in ETSI specification *GSM 3.38* are converted in short message user data.

In the CIMD user data parameter, the special combination character `_XX` (named Reserved) is reserved as an escape to an extension of the GSM 7-bit default alphabet table. If a receiving mobile station does not understand the meaning of this escape mechanism, it should display it as a space character.

When defining the CIMD Reserved escape character (i.e. `_XX`) and the second CIMD character, type them immediately after each other (no space between them) in the CIMD user data parameter.

Table 38. Extension character conversion for user data

Symbol	Character name	CIMD special combination	Combination's name
|	Vertical bar	_XX_!!	Reserved, Inverted !
^	Caret	_XX_gl	Reserved, Greek Alphabet Lambda
€	Euro symbol *	_XXe	Reserved, Small Letter e
{	Opening brace	_XX(	Reserved, Left Parenthesis
}	Closing brace	_XX)	Reserved, right Parenthesis
	Page break	_XXascii(10)	Reserved, Line Feed ascii(10)
[	Opening bracket	_XX<	Reserved, Less Than Sign

Table 38. Extension character conversion for user data (Continued)

Symbol	Character name	CIMD special combination	Combination's name
]	Closing bracket	_XX>	Reserved, Greater Than Sign
~	Tilde	_XX=	Reserved, Equals Sign
\	Backslash	_XX/	Reserved, Slash

*The euro symbol is defined in the 7-bit default alphabet extension table in the ETSI specification *GSM 3.38*. The code value is the one used for character 'e' in the 7-bit default GSM character set. Therefore a receiving entity which is incapable of displaying the euro currency symbol will display the character 'e' instead.

The euro symbol is displayed correctly only on mobile terminals that support it.

9 Example sessions

9.1 Example session for a send-only SME

The example session given here contains the operations login, submit message, and logout.

Note

In the submit operation example, only parameters destination address, validity period and user data are given by the SME. Note also that packets are split at special characters like <TAB> for printing purposes only.

```
SME <--> SMSC
Connect <-->
Greeting <--
Login -->
<STX>01:001<TAB>010:MyUserId<TAB>011:MySecretPassWorD<TAB><CS><ETX>
Login response <--
<STX>51:001<TAB><CS><ETX>

Submit -->
<STX>03:003<TAB>021:1234567890<TAB>050:167<TAB>033:Hi
there !<TAB> <CS><ETX>

Submit response (positive) <--
<STX>53:003<TAB>021:1234567890<TAB>060:971111131245<TAB><CS><ETX>

Submit -->
<STX>03:005<TAB>050:167<TAB>033:Hi
there ! How are you doing ?<TAB><CS><ETX>

Submit response (negative) //destination was missing!! <--
<STX>53:005<TAB>900:301<TAB><CS><ETX>

Enquiry message status-->
<STX>04:007<TAB> 060:971111131245<TAB>021:1234567890<TAB><CS><ETX>

Enquiry message status response <--
<STX>54:007<TAB>021:1234567890<TAB>060:971111131245<TAB>061:0<TAB>
>063:971111131245<TAB><CS><ETX>
```

Disconnect <-->

9.2 Example session for querying SME

```
SME <--> SMSC
Connect <-->
Greeting <--
Login -->
<STX>01:001<TAB>010:MyUserId<TAB>011:MySecretPassWOrD<TAB><CS><ETX>
Login response <--
<STX>51:001<TAB><CS><ETX>

Submit -->
<STX>03:003<TAB>021:1234567890<TAB>050:167<TAB>033:Hi
there !<TAB><CS><ETX>

Submit response (positive) <--
<STX>53:003<TAB>021:1234567890<TAB>060:971111131245<TAB><CS><ETX>

Delivery Request Message -->
<STX>05:005<TAB>068:1<TAB><CS><ETX>

Delivery Request Response (positive) <--
<STX>55:005<TAB><CS><ETX>

Deliver Message <--
<STX>20:000<TAB>021:1234567890<TAB>023:987654321<TAB>060:971111121245 033:Call
me.<TAB><CS><ETX>

Deliver Message Response -->
<STX>70:000<TAB><CS><ETX>

Disconnect <-->
```

9.3 Example session for receiving SME

```
SME <-->
MC
Connect <-->
Greeting <--
Login -->
<STX>01:001<TAB>010:MyUserId<TAB>011:MySecretPassWOrD<TAB><CS><ETX>
Login response <--
<STX>51:001<TAB><CS><ETX>

Submit -->
<STX>03:003<TAB>021:1234567890<TAB>050:167<TAB>033:Hi
there!<TAB><CS><ETX>

Deliver Message //delivery before submit response
received <--
<STX>20:000<TAB>021:9876<TAB>023:1234567890<TAB>060:971111080045<TAB->033:Call
me!<TAB>052:0<TAB>030:0<TAB><CS><ETX>

Deliver Message Response -->
<STX>70:000<TAB><CS><ETX>

Submit response (positive) <--
<STX>53:003<TAB>021:1234567890<TAB>060:971111131245<TAB><CS><ETX>
```

Deliver Message <--

<STX>20:002<TAB>021:98765<TAB>023:1234567890<TAB>060:971111121245<TAB>033:Why
dont you call me<TAB>052:0 030:0<TAB><CS><ETX>

Deliver Message Response -->

<STX>70:002<TAB><CS><ETX>

Deliver StatusReport <--

<STX>23:005<TAB>021:1234567890<TAB>060:971111131245<TAB>061:3<TAB>063:971111131354<
TAB><CS><ETX>

Deliver StatusReport Response -->

<STX>73:005<TAB><CS><ETX>

Disconnect <-->

