H21 AT Command User Guide

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Contents

H21 AT Command User Manual Revision History			
Version	**Content**	**Author**	**Date**
1.0.0	Official Release	Cariel Huang	2008/04/18
1.0.1	Add “AT$QHK” command for HotKey feature.	Cariel Huang	2008/05/14
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1.0.13	1) Remove “AT$QSWUSB” commands 2) Add “AT$QGPRSANI” command for changing GRPS Anite GCF NV item (947).	Cariel Huang	2008/11/28
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1 Introduction

1.1 Introduction to Interface between TE and MS

In order to communicate each other between TE and MS, we must use AT commands. Figure 1.1 illustrates the interface. In section 2, we will divide the content into ten subsections. They are about SIM, list management, mobility management, supplementary service, short message, cell broadcast, base-band and the other service.

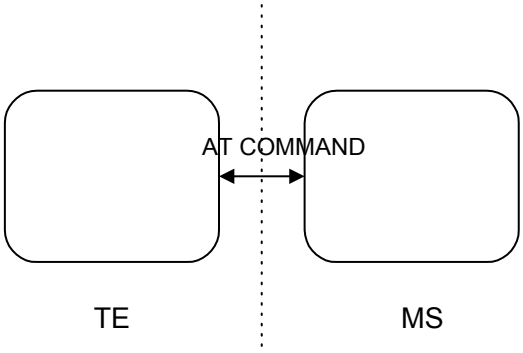


Figure 1.1

Explanation

ME	Mobile equipment
MS	Mobile station. Basically, a mobile station is mobile equipment with a SIM card.
TE	Terminal Equipment that is the same as the controller in this case.

Getting started

For testing AT commands, the MS can be connected to any computer environment, as long as it has a V.24/V.28 serial interface. The commands can be issued with, for example, HyperTerminal in Microsoft Windows or other emulator programs.

Syntax description

The section gives a brief description of the syntax used for the command set. The MS may echo characters received, depending on the setting of the command E. As a default, echo is enabled, and characters are echoed at the same rate, parity, and format as received.

The character defined by parameter S5 (default, BS, IRA 8) is interpreted as request from the TE to delete the previous character.

<CR>	Carriage return character, whose value is specified by command S3, default IRA 13.
<LF>	Line feed character, whose value is specified by command S4, default IRA 10.
<…>	The name enclosed in angle brackets is a syntactical element. The brackets do not appear in the command line.
[…]	Strings enclosed in square brackets are optional items (sub-parameters). The brackets do not appear in the command line.

Other characters, including '?','=', parentheses, etc, appear in commands and response as written.

AT command syntax

A command line is made up of three elements: the prefix, the body and the termination character. The command line prefix consists of the characters 'AT'.

MS supports a set of commands referred to as basic syntax commands, and a set of extended syntax commands, the latter prefixed with a plus sign (+).

Basic syntax command

The format of basic syntax commands, except for the command D, is as follows:

<name>[<value>]

Example: ATV1<CR> (set text form result codes)
<CR><LF>OK<CR><LF>(response)

Extended syntax command

+<name>[=<value>]

Example: AT+CMUT=0<CR>(the representation of signal strength)
<CR><LF>OK<CR><LF>(response)

Test command syntax

+<name>=?

Example: AT+CFUN=? <CR>(show supported CFUN values)

<CR><LF> +CFUN: (0-1,4-7),(0-1) <CR><LF>
<CR><LF>OK<CR><LF>

Read command syntax

+<name>?

Example: AT+CACM?<CR>(show current accumulated call meter value)
<CR><LF>+CACM: ”0”<CR><LF>(response)
<CR><LF>OK<CR><LF>

If the indicated name is not recognized, an Error code is issued.

AT response syntax

The default response is text mode that is shown below. See the command V for further details. The format of a response is as follows:

<CR><LF>[<response>]<CR><LF>

The <response> can be:

- Basic format result code, such as OK.
- Extended syntax result code, prefixed with a plus sign (+):

+<name>: <value>

The result codes are separate by commas if it’s included several values. The <value> followed by the colon is separated by a space. It is also possible that result codes have no value. Unlike basic format result codes, extended syntax result codes have no numeric equivalent, and are always issued in alphabetic form.

There are two types of result code responses:

Final result code

A final result code indicates to the TE that execution of the command is completed and another command may be issued.

If you typed an implemented AT command, you should get the result code OK.

If you typed an AT command that was not implemented, or which had the wrong parameter or syntax, you will get the result code ERROR or else, for example, +CME ERROR followed by an error code.

Unsolicited result code

Unsolicited result codes, such as RING, indicate the occurrence of an event not directly associated with a command being issued from TE.

1.2 Initial the Test Environment

Initial the HyperTerminal.

- Start HyperTerminal
- Name a new connection
- Select the connection port
- Initial the connection port with 115200 bps and none flow control

Initial the MS.

- Put the SIM card into ME and power on the ME.
- Start all of AT Commands with “AT+CFUN=1”
- Camp on the cell with “AT+COPS=0”

1.3 How to Handle SMS messages

This section gives examples of the AT commands for sending and receiving SMS (Short Messages Service) messages.

Whatever the destination of the SMS message, the message is always sent via a Service Center (SC). One of the SC’s jobs, among others, is to forward SMS messages to the destination, or save the SMS until the receiving MS becomes available in the GSM network. The message can be stored at the SC up to a maximum time period decided by the sender. Also the message is “time stamped” at the SC and its contents are interpreted according to choices made by the sender.

The conclusion of this is that an SMS message, along with other information decided upon by the sender, always contains 2 addresses. First the Service Center Address (SCA), and then the destination address. Also, other useful information is added at the SC.

Setting Service Center Address (SCA)

The service center address is usually stored on the SIM card, but it can be set manually by using the AT command AT+CSCA. Note that the SCA must be given in the international phone number format.

Format of an SMS message

It is important to realize that SMS messages could be sent in two modes: text mode and PDU mode, which is described in detail in the GSM specifications 3GPP 27.005, 3GPP 23.040 and 3GPP 23.038.

Because text mode is followed the format of input parameters, it is clear to execute the commands. We now focus on the introduction of PDU mode.
What is PDU mode? First a PDU is a Service Center Address (SCA) followed by a Transport Protocol Data Unit (TPDU). There are several formats of TPDU, but we now only use two forms here:

SMS-SUBMIT TPDU	Outgoing SMS messages “submitted” to the SM from the originating MS.
SMS-DELIVER TPDU	Incoming SMS messages “delivered” by the SC to final destination MS.

Therefore we have the following general format of an SMS message:

PDU=SCA+TPDU

The TPDU format is a hexadecimal encoded binary format, which means that 2 hexadecimal digits represent a byte or an octet. In general there is a header part of the TPDU, containing the control information, and the follows user data, which can be any type of information (default 7-bit GSM alphabet, 8-bit ISO 8859-1 alphabet or even 8-bit data).

Let’s start with some examples of PDU SMS messages using an SMS-SUBMIT type TPDU. For simplicity’s sake we will send a text message that reads “TEST”, using the default GSM 7-bit alphabet.

Here is the message written out in full:

0011000B916407861582F50000A704D4E2940A

Equivalently, we could write this as:

07916407058099F911000B916407861582F50000A704D4E2940A

These two have one difference, and that is how we have chosen to describe the SCA. In the first SMS we use:

00	This is a valid SCA with a length equal to zero. Therefore we are using the default SCA given by the SIM card, or as given by the AT command AT+CSCA.
07916407058099F9	Here is the SCA hex encoded binary. The first octet (07) is a length indicator, in this case there are 7 octets to follow. The second octet (91) tells us about the numbering plan and type of number of the coming address. In this case the 91 says that the address is in international phone number format. Then follows the actual service center address (6407058099F9). Every pair of digits is swap, that there is an odd number of digits in the phone number and therefore, a half byte of fill digits is required at the end (hence the hexadecimal F9). The exact meaning of all the octets and fields in the SCA address is described in detail in 3GPP 23.040.

Let's analyze the message by breaking it down into its component parts:

11	This octet contains many 1-bit and 2-bit fields that are described in detail in GSM 03.40. These include: - TP-MTI : message type indicator - TP-RD : more messages waiting indicator - TP-VPF : validity period format - TP-SRR : status report request flag - TP-UDHI : user data header indicator flag - TP-RP : reply path setting flag
00	This octet is only associated with the 8-bit field TP-MR and is basically a message reference number, which can be chosen by the user. Here we set the message reference number to zero (00HEX).
0B916407861582F5	This is the destination address (TP-DA). The format of the address field is given in detail in 3GPP 23.040. It is similar to the format of the SCA, but now it refers to the

	phone number of the receiving MS. The first octet (0B) is a phone number length indicator. In this case the phone number of the destination MS consists of 11 digits. The second octet (91) is the numbering plan and type of number of the coming address. The address is in international phone number format. Then follows the mobile number with every pair of digits in reverse order, and because we have an odd number of digits a half octet of fill bits are required (hence the F5HEX).
00	This is the protocol ID (TP-PID) which refers to a possible higher level protocol being used or indicates inter-working with certain types of telematic devices. This can usually be left set to zero.
00	This is the data coding scheme field (TP-DCS) that is described in detail in 3GPP 23.038. Basically this octet tells us what kind of user data is being sent. For instance, if we are using a 7-bit or 8-bit alphabet, or we are sending 8-bit data. It also informs the receiving MS about the class of the SMS message, which tells it how to handle and store the incoming SMS message.
A7	This is the validity period (TP-VP). The validity period is how long the SC will store the SMS, waiting for the receiving MS to come in contact with the GSM network. If the SMS is not received by the destination MS within this time, then the message will be discarded. 3GPP 23.040 describes this field in detail.
04	TP-UDL. This is the length of the user data. It is given in septets, if TP-DCS describes the message as using the default 7-bit GSM alphabet, or octets otherwise.
D4E2940A	Finally we come to the user data (TP-UD). This is 4-septets long, defined above in TP-DCS and TP-UDL. The message reads “TEST”. Note the one character is not represented by one octet, but by a septet (7-bits), and therefore it can be quite complicated to decipher a GSM text SMS by looking at the PDU. 3GPP specification 23.038 describes in detail how the 7-bit GSM alphabet works and how to convert from the hexadecimal to the characters. You may know that one

	can send 160 characters in an SMS message. This is only possible in 140 bytes using a 7-bit alphabet

Before we finish we should also take a look at the TPDU of SMS-DELIVER type. This is the PDU one would see when reading an SMS that has been sent to the module.

07916407058099F9040B916407861582F500009910702123040004D4E2940A

The TPDU breaks down as follows:

04	TP-MTI, TP-MMS, TP_SRI, TP-UDHI, TP-RP
0B916407861582f5	This is the originating address (TP-OA)
00	TP-PID
00	TP-DCS
99107021230400	This is the service center time stamp. Every pair of digits are reversed. This time stamp reads, in octets from left to right: the date 990107 (year, month, day), the time 123240 (hours, minutes, seconds). Finally the last octet is a reference for the difference in time between local time and GMT.
04	TP-UDL
D4E2940A	TP-UD

Sending SMS messages

The AT command to use is AT+CMGS. Notice that this is the length of the TPDU and not the PDU, so it does not include the SCA. The length of the message is 4 octets and the message reads “TEST”.

Example1:

A user would like to send a GSM 7 bit alphabet text “TEST” to number “0910123456”, he may use

AT+CMGS=17<CR>

>0011000A8190012143650000A704D4E2940A<CTRL-Z>

+CMGS:122 (depends on the MS)

OK

Reading SMS message from storage

To read SMS messages from storage, the AT commands AT+CMGL and AT+CMGR should be used.

Example1:

AT+CMGR=1
+CMGR: 1,,23
07916407058099F9040B916407950303F10000892122214014000 4D4E2940A
OK

Example2:

AT+CMGL=4 The 4 here means “all messages”.
+CMGL: 1,1,23
07916407058099F9040B916407950303F10000892122214014000 4D4E2940A
+CMGL: 2,1,26
07916407058099F9040B916407950303F10000892122216000000 841E190583411E91
+CMGL: 3,1,27
07916407058099F9040B916407950303F10000892122217064000 941E1905831E9149
OK

Deleting SMS messages

To delete an SMS message from the selected <mem1>, use the AT+CMGD command.

Example1:

AT+CMGD=1
OK

Memory management

Once both SM are full, then the module will receive no new messages and SMS messages will be buffered in the Service Center until the following happens:

- The validity period of the message expires. The validity period is set by TP-VP.
- A message is deleted by using AT+CMGD. An empty memory position becomes available and the module can receive a new message.

There are other ways to control the storage of SMS messages. In the TPDU field, TP-DCS, one can set the class of the SMS message. Basically the

different SMS classes are as follows:

Classless SMS	(TP-DCS=00hex). This is usually the type sent by a mobile telephone. They are stored in the available memory.
Class 0 SMS	(TP-DCS=F0hex). These are not stored anywhere, but are sent directly to the telephone display. Since there is no display one can forward the messages to the TE by means of the AT command setting AT+CNMI=3,2
Class 1 SMS	(TP-DCS=F1hex). These are directed specifically to ME if there is a memory storage available, otherwise it will be stored in SM.
Class 2 SMS	(TP-DCS=F2hex). These are directed specifically to SM.
Class 3 SMS	(TP-DCS=F3hex). These messages shall normally be transferred to the terminal equipment or application, if requested to do so, This is controlled by the AT command AT+CNMI

For a deeper explanation and more information regarding the different SMS classed and their use see the 3GPP specification 23.038.

2 Implemented AT commands for MS

2.1 Commands specified by GSM REC.27.07

2.1.1 General Commands

2.1.1.1 Request manufacturer identification +CGMI

Table: +CGMI parameter command syntax

Command	Possible response(s)
+CGMI	1) <manufacturer> 2) +CME ERROR: <err>

Description

Read handset or model's manufacturer's ID.

Defined values

<manufacturer>: total number of characters shall not exceed 2048.

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CGMI<CR>

<manufacturer>

2.1.1.2 Request model identification +CGMM

Table: +CGMM parameter command syntax

Command	Possible response(s)
+CGMM	1) <model> 2) +CME ERROR: <err>

Description

Read model information which determined by ME manufacturer.

Defined values

<model id>: string type

Informative examples

- Initial the HyperTerminal
- Initial the MS without SIM card
- AT Command

AT+CGMM <CR>

<model>

2.1.1.3 Request revision identification +CGMR

Table: +CGMR parameter command syntax

Command	Possible response(s)
+CGMR	1) <revision> 2) +CME ERROR: <err>

Description

Read revision of ME. It may include software and hardware revision.

Defined values

<revision >: information text

Informative examples

- Initial the HyperTerminal
- Initial the MS without SIM card
- AT Command

AT+CGMR<CR>

SW Ver: 0.04, SW Type: 1, HW Ver: 04, HW Type: 0, Build Date: Jul 29 2008, Build Time: 18:05:49

2.1.1.4 Request product serial number identification +CGSN

Table: +CGSN parameter command syntax

Command	Possible response(s)
+CGSN	1) <IMEI> OK 2) +CME ERROR: <err>

Description

Read serial number identification which determined by ME manufacturer.

Defined values

<sn >: total number of characters shall not exceed 2048 characters.

Informative examples

- Initial the HyperTerminal
- Initial the MS without SIM card
- AT Command

AT+CGSN<CR>

359095000360270

OK

2.1.1.5 Select TE character set +CSCS

Table: +CSCS parameter command syntax

Command	Possible response(s)
+CSCS=[<chset>]	1) OK 2) ERROR
+CSCS?	+CSCS: <chset>
+CSCS=?	+CSCS: (list of supported <chset>s)

Description

Set command informs TA of which character set “<chset>” is used by the TE. TA is then able to convert character strings correctly between TE and ME character sets.

When TA-TE interface is set to 8-bit operation and used TE alphabet is 7 bit, the highest bit shall be set to zero.

Read command returns the current setting and test command displays conversion schemes implemented in the TA.

Defined values

<chset>: string type

Command	Possible response(s)
“IRA” (default)	International reference alphabet
“GSM”	GSM default alphabet
“UCS2”	16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF. ; e.g. “004100620063” equals three 16-bit characters with decimal values 65,98 and 99.

Informative examples

- Initial the HyperTerminal
- Initial the MS without SIM card
- AT Command

(1)

AT+CSCS=? <CR>

+CSCS: ("IRA","GSM","UCS2")

OK

(2)

AT+CSCS= “GSM”

+CSCS: “GSM”

OK

AT+CSCS? <CR>

+CSCS: “GSM”

OK

(3)

AT+CSCS ="GSM"

OK

AT+ CPBR =1,10

+CPBR: 1,"0920933828",129,"Tina"

+CPBR: 2,"+886227998800",145,"Qisda"

+CPBR: 3,"123456789",129,"test"

+CPBR: 4,"876425",129,"qwe"

+CPBR: 5,"7514876543",129,"afe"

OK

AT+CSCS ="UCS2"

OK

AT+CPBR =1,10

+CPBR: 1,"0920933828",129,"00540069006E0061"
+CPBR: 2,"+886227998800",145,"00420065006E0051"
+CPBR: 3,"123456789",129,"0074006500730074"
+CPBR: 4,"876425",129,"007100770065"
+CPBR: 5,"7514876543",129,"006100660065"
OK

2.1.1.6 Request international mobile subscriber identity +CIMI

Table: +CIMI parameter command syntax

Command	Possible response(s)
+CIMI	1) <IMSI> OK 2) +CME ERROR:<err>

Description

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM that is attached to ME.

Defined values

<IMSI>: International Mobile Subscriber Identity (string without double quotes)

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+CIMI
466880100493652
OK

2.1.1.7 PCCA STD-101[17] select wireless network +WS46

Table: +WS46 parameter command syntax

Command	Possible response(s)
+WS46=[<n>]	OK
+WS46?	<n>
+WS46=?	+WS46: (list of supported <n>s)

Description

Read command shows current setting and test command displays side stacks implemented in the TA.

Defined values

<n>:12 GSM digital cellular

22 WCDMA digital cellular

25 WCDMA+GSM digital cellular

Informative example

- Initial the HyperTerminal
- Initial the MS without SIM card
- AT Command

```
AT+WS46=?
+WS46: (12,22,25)
OK

AT+WS46?
12
OK
```

2.1.2 Network service related commands

2.1.2.1 Subscriber number +CNUM

Table: +CNUM parameter command syntax

Command	Possible response(s)
+CNUM	1) [+CNUM: [<alpha1>],<number1>, <type1> […<CR><LF>+CNUM: [alphaX>],<numberX>, <typeX>]] OK 2) +CME ERROR:<err>

Description

Set command returns the MSISDN related to the subscriber (this information can be stored in the SIM or in the ME.) If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line (<CR><LF>).

Defined values

<number>: string type; phone number
<alpha>: string type; optional alphanumeric string associated with
<number>: used character set should be the one selected with command Select TE Character Set +CSCS.
<type>: integer value

129	National
145	International

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Power on MS but SIM is not ok

```
AT+CPIN?
+CME ERROR: 10
AT+CNUM
+CME ERROR: 10
```

(2) Power on MS and SIM is ok

```
AT+CPIN?
+CPIN: READY
OK

AT+CNUM
+CNUM: “ABC”,”0920123456”,129
OK
```

(3) Write record

```
AT+CPBS="ON"
OK
AT+CPBW=1,"0960530355",,"WM0"
OK
AT+CPBR=1
+CPBR: 1,"0960530355",129,"WM0"
OK
AT+CNUM
+CNUM: "WM0","0960530355",129
OK
```

2.1.2.2 Network registration +CREG

Table: +CREG parameter command syntax

Command	Possible response(s)
+CREG=[<n>]	+CME ERROR:<err>
+CREG?	1) +CREG: <n>,<stat> 2) +CME ERROR:<err>
+CREG=?	+CREG: (list of supported <n>s)

Description

Set command controls the presentation of an unsolicited result code code +CREG: <stat>when <n>=1.

Read command returns the status of result code presentation and an integer <state> which shows whether the network has currently indicated the registration of the ME.

Test command returns a list of supported <n>.

Defined values

<n>: integer value

0 <default>	Disable network registration unsolicited result code.
1	Enable network registration unsolicited result code +CREG: <stat>.

<state>: integer value

0	Not registered, ME is not currently searching a new operator to register to (NO SERVICE)
1	Registered, home network
2	Limiting Service: not registered but ME is currently searching a new operator to register to
3	Limiting Service: registration denied
4	Unknown
5	Registered, roaming

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Disable network registration unsolicited result code

AT+CREG=0

OK

(2) Enable network registration unsolicited result code

AT+CREG=1

OK

(3) Returns the status of current network registration.

AT+CREG?

+CREG: 1,1

OK

(4) Query all status:

AT+CREG=?

+CREG: (0-1)

OK

2.1.2.3 Operator selection +COPS

Table: +COPS parameter command syntax

Command	Possible response(s)

+COPS=[<mode>[,<format> [,<oper>[,< AcT>]]]]	+CME ERROR: <err>
+COPS?	1) +COPS: <mode>[,<format>,<oper>[, AcT>]] 2) +CME ERROR: <err>
+COPS=?	1) +COPS: [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric <oper>,numeric <oper>[, AcT>])s] [,,(list of supported <mode>s),(list of supported <format>s)] 2) +CME ERROR: <err>

Description

Set command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is done automatically by the MT or is forced by this command to operator <oper> (it shall be given in format <format>) to a certain access technology, indicated in <AcT>. If the selected operator is not available, no other operator shall be selected (except <mode>=4). If the selected access technology is not available, then the same operator shall be selected in other access technology. The selected operator name format shall apply to further read commands (+COPS?) also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, MT shall be unregistered until <mode>=0 or 1 is selected). Refer subclause 9.2 for possible <err> values. This command should be abortable when registration/deregistration attempt is made.

Read command returns the current mode, the currently selected operator and the current Access Technology. If no operator is selected, <format>, <oper> and < AcT> are omitted.

Test command returns a set of five parameters, each representing an operator present in the network. A set consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, numeric format representation of the operator and access technology. Any of the formats may be unavailable and should then be an empty field. The

list of operators shall be in order: home network, networks referenced in SIM or active application in the UICC (GSM or USIM) in the following order: HPLMN selector, User controlled PLMN selector, Operator controlled PLMN selector and PLMN selector (in the SIM or GSM application), and other networks.
It is recommended (although optional) that after the operator list TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list by two commas.

NOTE: The access technology selected parameters, <AcT>, should only be used in terminals capable to register to more than one access technology. Selection of <AcT> does not limit the capability to cell reselections, even though access technology is selected, the phone may still re-select a cell in other access technology.

Defined values

<mode>: integer value

0	automatic (<oper> field is ignored)
1	manual (<oper> field shall be present, and <AcT> optionally)
2	deregister from network
3	set only <format> (for read command +COPS?), do not attempt registration/deregistration (<oper> and < AcT> fields are ignored); this value is not applicable in read command response
4	manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered

<format>: integer value

0 (default)	long format alphanumeric <oper>
1	short format alphanumeric <oper>
2	numeric <oper>

<oper>: string type; <format> indicates if the format is alphanumeric or numeric; long alphanumeric format can be upto 16 characters long and short format up to 8 characters (refer GSM MoU SE.13 [9]); numeric format is the GSM Location Area Identification number (refer TS 24.008 [8] subclause 10.5.1.3) which consists of a three BCD digit country code coded as in ITU-T

E.212 Annex A [10], plus a two BCD digit network code, which is administration specific; returned <oper> shall not be in BCD format, but in IRA characters converted from BCD; hence the number has structure: (country code digit 3)(country code digit 2)(country code digit 1)(network code digit 3)(network code digit 2)(network code digit 1)

<state>: integer value

0	unknown
1	available
2	current
3	forbidden

<AcT>: integer value

0	GSM only
2	WCDMA only

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) network connection

--GSM only

```
AT+COPS=0,,0
OK
AT+ WS46?
12
OK
```

--WCDMA only

```
AT+COPS=0,,2
OK
AT+ WS46?
22
OK
```

-- WCDMA and GSM

```
AT+COPS=0
OK
```

AT+ WS46?
25
OK

AT+COPS?
+COPS: 0,0,"Far EasTone Tele",2
OK

(2) List all available network and manual selection of network

AT+COPS=?
+COPS: (1,"Far EasTone Tele","Far EasT","46601",0),(2,"Far EasTone Tele","Far EasT","46601",2),(1,"KG Telecom","KGT","46688",0),(3,"Taiwan Cellular ","TWNGSM","46697",2),(3,"Chunghwa Telecom","Chunghwa","46692",2),(3,"","","46689",2),(3,"Chunghwa Telecom","Chunghwa","46692",0),(3,"Taiwan Cellular ","TWNGSM","46697",0),,(0,1,3,4),(0,1,2)
OK

AT+COPS=1,2,"46692",0
OK

2.1.2.4 Facility Lock AT+CLCK

Table: +CLCK parameter command syntax

Command	Possible response(s)
+CLCK=<fac>,<mode>[,<passwd>]	1) Right: OK **When <mode>=2 and command successful:** 2) Right: +CLCK: <status>[,<class>] 3) Wrong: +CME ERROR: <er>
+CLCK=?	1) +CLCK: (list of supported <fac>s) 2) +CME ERROR: <err>

Description

Execution command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for ‘not active’ case (<status>=0) should be returned only if service is not active for any

<class>. This command should be abortable when network facilities are set or interrogated.

Call barring facilities are based on GSM supplementary services. The interaction of these with other commands based on other GSM supplementary services is described in the GSM standard.

Test command returns facility values supported by the TA as compound value.

Defined Values

<fac>:

"AB"	All Barring services
"AC"	All incoming barring services
"AG"	All outgoing barring services
"AI"	BAIC (Barr All Incoming Calls)
"AO"	BAOC (Barr All Outgoing Calls)
"IR"	BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
"OI"	BOIC (Barr Outgoing International Calls)
"OX"	BOIC-exHC (Barr Outgoing International Calls except to Home Country)
"SC"	PIN enabled (<mode>=1) / disabled (<mode> = 0)
"PN"	Network personalization of the ME
"PU"	Network subset personalization of the ME
"PP"	Service provider personalization of the ME
"PC"	Corporate personalization of the ME
"PF"	Personalization on first inserted SIM

<mode>:

0	Unlock
1	Lock
2	Query status

<status>:

0	Not active
1	Active

<password>: string type, indicate PIN or network password

<class>: integer type, sum of integers each representing a class(default 7)

1	Voice
2	Data
4	Fax
8	Short message
16	Data circuit sync
32	Data circuit async
64	Dedicated packet access
128	Dedicated PAD access

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

```
AT+CLCK=?
+CLCK:
 ("AB","AC","AG","AI","AO","IR","OI","OX","SC","PN","PU","PP","PC","PF
 ")
OK
```

(1) Enable PIN with “1234”

```
AT+CLCK=”SC”,1,”1234”
OK
```

(2) Disable PIN

```
AT+CLCK=”SC”,0,”1234”
OK
```

(3) Query the PIN lock status

```
AT+CLCK=”SC”,2
+CLCK: 0
OK
```

(4) Activate all outgoing calls barring

```
AT+CLCK=”AO”,1,”1234”
OK
```

(5) Disable all outgoing calls barring

```
AT+CLCK=”AO”,0,”1234”
OK
```

2.1.2.5 Change password +CPWD

Table: +CPWD action command syntax

Command	Possible response(s)
+CPWD=<fac>, <oldpwd>, <newpwd>	+CME ERROR: <err>
+CPWD=?	1) +CPWD: list of supported (<fac>, <pwdlength>)s 2) +CME ERROR: <err>

Description

Action command sets a new password.

Defined values

<fac>:

"AB" All Barring services

"SC" PIN enabled (<mode>=1) / disabled (<mode> = 0)

"P2" SIM PIN2

<oldpwd>, <newpwd>: string type; <oldpwd> shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD and <newpwd> is the new password; maximum length of password can be determined with <pwdlength>

<pwdlength>: integer type maximum length of the password for the facility

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CPWD=?
+CPWD: ("AB",4),("SC",8),("P2",8)
OK
```

2.1.2.6 Call forwarding service +CCFC

Table: +CCFC parameter command syntax

Command	Possible response(s)

+CCFC =<reason>, <mode>[, <number>[, <type>[,<class>[,<subaddr>[, <satype>[, <time>]]]]]]	+CME ERROR: <err> When <mode> = 2 and command successful: +CCFC: <status>, <class1>[, <number>, <type>[,<subaddr>,<satype>[,<time>]]][<CR><LF>+CCFC: <status>, <class2>[, <number>, <type>[, <subaddr>, <satype>[, <time>]]] […]]
+CCFC=?	+CCFC: (list of supported <reason>s)

Description

This command allows control of the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

Defined values

<Reason>:

0	Unconditional
1	Mobil busy
2	No Reply
3	Not reachable
4	All call forwarding
5	All conditional call forwarding

<Mode>:

0	Disable
1	Enable
2	Query Status
3	Registration
4	Erasure

<Class x>: integer type, sum of bearer service code.

1	Voice (telephony)
2	Data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16,32,64 and 128)
4	Fax (facsimile services)
8	Short message service
16	Data circuit sync
32	Data circuit async

64	Dedicated packet access
128	Dedicated PAD access
255	All type

<number>: string type, forwarding phone number.
<type>: type of address octet in integer format; default 145 when dialing string includes international access code character “+”, otherwise 129

<subaddr>: string type subaddress of format specified by <satype>
<satype>: type of subaddress octet in integer format; default 128
<Time>: 1…30 when “no reply” is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20
<Status>:

0	Not active
1	Active

Informative examples

-Initial the HyperTerminal
-Initial the MS
-AT Command

1. Query status
AT+CCFC=0,2
Query the status of unconditional forwarding
+CCFC: 0,255
Interrogated result: not active, voice
OK

2. Registration
Before enable, disable, and erasure, you should register the SS service.
AT+CCFC=0,3,”0123456789”
Register unconditional forwarding to “0123456789” and activated the service.
OK
It doesn’t mean that the SS service is registered successfully. You should query the status to confirm the result.
AT+CCFC=0,2
+CCFC: 1,1," 0123456789",129,,,

OK

3. Deactivate
AT+CCFC=0,0
Disable unconditional forwarding.
OK

4. Activate
AT+CCFC=0,1
Enable unconditional forwarding.

5. Erasure
AT+CCFC=0,4
Erase registered unconditional forwarding data.
Note: After registering unconditional call forwarding, one can't register another reason's service.

2.1.2.7 Preferred PLMN list +CPOL

Table: +CPOL parameter command syntax

Command	Possible response(s)
+CPOL=[<index>][,<format>[,<oper>]]	+CME ERROR: <err>
+CPOL?	1) +CPOL: <index1>,<format>,<oper1> [<CR><LF>+CPOL:<index2>,<format>,<oper2> [...]] 2) +CME ERROR: <err>
+CPOL=?	1) +CPOL: (list of supported <index>s), (list of supported <format>s) 2) +CME ERROR: <err>

Description

This command is used to edit the PLMN selector with Access Technology lists in the SIM card or active application in the UICC(GSM or USIM).

Execute command writes an entry in the SIM/USIM list of preferred PLMNs,

previously selected by the command +CPLS. If no list has been previously selected, the User controlled PLMN selector with Access Technology, $EF_{OPLMNWACT}$, is the one accessed by default. If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed. The Access Technology selection parameters, Read command returns all used entries from the SIM/USIM list of preferred PLMNs, previously selected by the command +CPLS, with the Access Technologies for each PLMN in the list.

Note: It is recommend to add a preferred PLMN with numeric format. There is an internal list which store all PLMN's long name, short name and numeric name in the module. AT+COPN shows the list. The numeric information is the MCC and MNC of the PLMN. When using long/short format to add a preferred PLMN that does not exist in the internal list, the module will reject the command because the module is fail to get the MCC and MNC of the PLMN.

Test command returns the whole index range supported by the SIM.

Defined values

<indexn>: integer type; the order number of operator in the SIM/USIM preferred operator list

<format>

0	Long format alphanumeric<oper>
1	Short format alphanumeric<oper>
2	Numeric<oper>

<opern>: string type; <format> indicates if the format is alphanumeric or numeric

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CPOL=?
+CPOL: (1-16),(0-2)
OK
```

AT+CPOL?
+CPOL: 1,2,"46601"
+CPOL: 2,2,"46688"
OK

AT+CPOL=2
OK

AT+CPOL?
+CPOL: 1,2,"46601"
OK

2.1.2.8 Read operator names +COPN

. **Table: +COPN parameter command syntax**

Command	Possible response(s)
+COPN	1) +COPN: <numeric1>, <alpha1>[<CR><LF>+COPN: <numeric2>, <alpha2>[…]] 2) +CME ERROR: <err>

Description

Execute command returns the list of operator names from the ME. Each operator code<numericn> that has an alphanumeric equivalent <alphan> in the ME memory shall be returned.

Defined values

<numericn>: string type; operator in numeric format(see +COPS)
<alphan>: string type; operator in long alphanumeric format(see +COPS)

Informative example

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+COPN
+COPN: "00131","Test Network"
+COPN: "546559","Test Net 222"

+COPN: "56231","A1"
+COPN: "56263","A max."
……
OK

2.1.2.9 Time Zone Reporting + CTZR

Table : +CTZR parameter command syntax

Command	Possible response(s)
+CTZR=<onoff>	+CME ERROR: <err>
+CTZR?	1) +CTZR: <onoff> 2) +CME ERROR: <err>
+CTZR=?	1) +CTZR: (list of supported <onoff>s) 2) +CME ERROR: <err>

Description

This set command enables and disables the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed. If setting fails in an MT error, +CME ERROR: <err> is returned. Refer subclause 9.2 for <err> values.
Read command returns the current reporting settings in the MT.
Test command returns supported <onoff>-values.

Defined values

<onoff>: integer type value indicating:
0 – disable time zone change event reporting (default).
1 – Enable time zone change event reporting.

2.1.3 Mobile control and status commands

2.1.3.1 Phone activity status +CPAS

Table: +CPAS parameter command syntax

Command	Possible response(s)
+CPAS	1) +CPAS: <pas> 2) +CME ERROR: <err>
+CPAS=?	1) +CPAS: (list of supported <pas>s) 2) +CME ERROR: <err>

Description

Execution command returns the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone.

Defined values

<pas>

0	Ready
3	Ringing
4	Call in progress

Informative example

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CPAS=?
+CPAS: (0,3,4)
OK

AT+CPAS
+CPAS: 0
OK

AT+CPAS
RING

+CLIP: "0934398899",128,,,,0
+CPAS: 3
OK
```

2.1.3.2 Set phone functionality +CFUN

Table: +CFUN parameter command syntax

Command	Possible response(s)
+CFUN=[<fun>[,<rst>]]	+CME ERROR: <err>
+CFUN?	1) +CFUN: <fun> 2) +CME ERROR: <err>
+CFUN=?	1) +CFUN: (list of supported <fun>s),(list of supported <rst>s)

	2) +CME ERROR: <err>

Description

Set command selects the level of functionality <fun> in the ME. Level “full functionality” is where the highest level of power is drawn. “Minimum functionality” is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufactured, ME resetting with <rst> parameter may be utilized.

Defined values

<fun>

0	Minimum functionality
1	Full functionality
4	Disable phone both transmit and receive RF circuits
5	Factory Test Mode
6	Reset UE
7	Offline mode

<rst>

0: do not reset the ME before setting it to <fun> power level.

1: reset the MT before setting it to <fun> power level

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

```
AT+CFUN=?
+CFUN: (0-1,4-7),(0-1)
OK

AT+CFUN?
+CFUN: 0
OK
AT+CFUN=1
OK

AT+CFUN=4
OK
```

(SIM not inserted)
AT+CFUN?
+CFUN: 0
OK

AT+CFUN=1
ERROR
AT+CFUN?
+CFUN: 1
OK

2.1.3.3 Enter PIN +CPIN

Table: +CPIN parameter command syntax

Command	Possible response(s)
+CPIN=<pin>[, <newpin>]	+CME ERROR: <err>
+CPIN?	1) +CPIN: <code> 2) +CME ERROR: <err>

Description

Set command sends to the MS a password that is necessary before it can be operated only SIM PIN. If no PIN request is pending, no action is taken. If SIM is useless or SIM is not inserted, an error message +CME ERROR, is returned to the TE.

Read command returns an alphanumeric string indicating whether some password is required or not.

Defined values

<pin>, <newpin>:string type values

<code>: values reserved by the present document

READY	ME is not pending for any password
SIM PIN	ME is waiting SIM PIN to be given
SIM PIN2	ME is waiting SIM PIN2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PIN2 authentication

	failure (i.e. +CME ERROR: 17); if PIN2 is not entered right after the failure, it is recommended that ME does not block it operation)
SIM PUK	ME is waiting SIM PUK to be given
SIM PUK2	ME is waiting SIM PUK2 to be given (this <code> is recommended to be returned only when the last executed command resulted in PUK2 authentication failure (i.e. +CME ERROR: 18); if PUK2 and new PIN2are not entered right after the failure, it is recommended that ME does not block it operation)

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Power on (1) (CHV1 is disabled, SIM is ready)

AT+CPIN?

+CPIN: READY

(2) Power on (1) (SIM not inserted)

AT+CMEE=2

OK

AT+CPIN?

+CME ERROR: SIM not inserted

2.1.3.4 Signal quality +CSQ

Table: +CSQ parameter command syntax

Command	Possible response(s)
+CSQ	1) +CSQ: <rssi>,<ber> 2) +CME ERROR:<err>
+CSQ=?	+CSQ: (list of supported <rssi>s), (list of supported <ber>s)

Description

1. Execution command returns received signal strength indication <rssi> and channel bit error rate <ber> from the MS.
2. Test command returns values supported by the MS as compound values. Only support continuous unsolicited response.

Defined values

<rssi>:

0	-113dBm or less
1	-111dBm
2…30	-109dBm ~ -53dBm
31	-51dBm or greater
99	Not known or not detectable

<ber>:

99	Unknown or not detectable

Informative examples

-Initial the HyperTerminal

-Initial the MS

-AT Command

AT+CSQ=?

+CSQ: (2-31,99), (99)

OK

AT+CSQ

+CSQ: 31, 99

OK

2.1.3.5 Restricted SIM access +CRSM

Table: +CRSM action command syntax

Command	Possible response(s)
+CRSM=<command>[,<fileid> [,<P1>,<P2>,<P3>[,<data>]]]	1)+CRSM:<sw1>,<sw2>[,<response>] 2) +CME ERROR: <err>
+CRSM=?	OK

Description

By using this command instead of Generic SIM Access +CSIM TE application has easier but more limited access to the SIM database. Set command transmits to the ME the SIM <command> and its required parameters. ME

handles internally all SIM-ME interface locking and file selection routines. As response to the command, ME sends the actual SIM information parameters and response data. ME error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

Coordination of command requests to SIM and the ones issued by GSM/UMTS application inside the ME is implementation dependent. However the TE should be aware of the precedence of the GSM/UMTS application commands to the TE commands.

Defined values

<command> (command passed on by the ME to the SIM):

176	READ BINARY
178	READ RECORD
192	GET RESPONSE
214	UPDATE BINARY
220	UPDATE RECORD
242	STATUS

all other values are reserved

NOTE 1: The ME internally executes all commands necessary for selecting the desired file, before performing the actual command.

<fileid>: integer type; this is the identifier of a elementary data file on SIM. Mandatory for every command except STATUS

NOTE 2: The range of valid file identifiers depends on the actual SIM and is defined in GSM 51.011 [28]. Optional files may not be present at all.

<P1>, <P2>, <P3>: integer type; parameters passed on by the ME to the SIM. These parameters are mandatory for every command, except GET RESPONSE and STATUS. The values are described in GSM 51.011 [28]

<data>: information which shall be written to the SIM (hexadecimal character format; refer +CSCS)

<sw1>, <sw2>: integer type; information from the SIM about the execution of the actual command. These parameters are delivered to the TE in both cases, on successful or failed execution of the command

<response>: response of a successful completion of the command previously issued (hexadecimal character format; refer +CSCS). STATUS and GET RESPONSE return data, which gives information about the current elementary datafield. This information includes the type of file and its size (refer GSM 51.011 [28]). After READ BINARY or READ RECORD command the requested data will be returned. <response> is not returned after a successful UPDATE BINARY or UPDATE RECORD command

Informative example

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CRSM=192,12258,0,0,255
+CRSM: 103,15
OK

/* Get SIM Card Identification number (ICCID) */
AT+CRSM=176,12258,0,0,10
+CRSM: 144,0,98889612040053576639
OK
```

And then the ICCID is 89886921400035756693.

2.1.4 Commands related with phonebook service

2.1.4.1 Select phonebook memory storage +CPBS

Table: +CPBS parameter command syntax

Command	Possible response(s)
+CPBS=<storage>	+CME ERROR: <err>
+CPBS?	1) +CPBS: <storage>[,<used>,<total>] 2) +CME ERROR: <err>

+CPBS=?	+CPBS: (list of supported <storage>s)

Description

1. Set command selects phonebook memory storage <storage> which is used by other phonebook commands. If settings fails in an MS error, +CME ERROR: <err> is returned.

2. Read command returns currently selected memory, this used entry numbers and the entire entry numbers in the selected storage.

3. Test command returns supported storages as compound value.

Defined values

<storage>:string type

“SM”	Abbreviated dialing numbers
“DC”	MTdialled calls list (+CPBW may not be applicable for this storage)
“FD”	SIM fix dialing-phonebook
“MC”	Last missed number
“ME”	ME number
“RC”	Last received umbers
“EN”	SIM/USIM (or ME) emergency number(+CPBW is not be applicable for this storage)
“ON”	Own number

<used>: the used entry numbers within the selected storage.
<total>: the all entry numbers within the selected storage.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set command

```
AT+CPBS=”FD”,”XXXX”    (XXXX->PIN 2 )
OK
AT+CPBS?
+CPBS: "FD",2,3
OK
```

(2) Read command

AT+CBPS?

+CPBS: "SM",17,100

OK

(3) Test command

AT+CPBS=?

+CPBS: ("SM","DC","FD","MC","ME","RC","EN","ON")

OK

2.1.4.2 Read phonebook entries +CPBR

Table: +CPBR parameter command syntax

Command	Possible response(s)
+CPBR=<index1>[,<index2>]	1) [+CPBR: <index1>,<number>,<type>,<text>[[..]<CR> <LF>+CPBR: <index2>,<number>,<type>,<text>]] 2) +CME ERROR:<err>
+CPBR=?	1) +CPBR: (list of supported <index>s), [<nlength>], [<tlength>] 2) +CME ERROR:<err>

Description

1. Execution command returns phonebook entries in location number range <index1>..<index2> from the current phonebook memory storage selected with +CPBS. If <index2> is left out, only location <index1> is returned. Entry fields returned are location number <indexn>, phone number stored there <number>(of format <type>) and text <text> associated with the number. If all queried locations are empty (but available), no information text lines may be returned and +CME ERROR: <err> can be returned. If list setting fails in an ME error, +CME ERROR: <err> is returned.

2. If it is possible to show Chinese name in phone book, character set (+CSCS) has better to set “UCS2” first.

Defined values

<index1>,<index2>: integer type value in the range of location numbers of phonebook memory.

<number>: string type indicating the phone number of format <type>

<type>: integer value indicating type of address octet in integer format.

<text>: string type ;character set specified by command select TE character Set +CSCS

<nlength>: integer value indicating the maximum length of field <number>

<tlength>: integer value indicating the maximum length of field <text>

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Read the phonebook from index1 to index2 and neglect the blank record.

```
AT+CPBS=”SM”
OK
AT+CPBR=1,5
+CPBR:1,”27998800”,129,”David”
+CPBR:3,”27998800”,129,”JENNY”
+CPBR:5,”27998800”,129,”Davis”
OK
```

(2) Chinese name may appear in phone book (SM).

```
AT+CSCS=”UCS2”
OK
AT+CPBR=61,70
+CPBR: 61,"0920960846",129,"004D00410047"
+CPBR: 62,"0928844716",129,"54335FB7660E"
+CPBR: 63,"0928836001",129,"92809234"
+CPBR: 70,"0935657249",129,"0053002D0042004C00410043004B"
OK
```

(3) Read the phonebook of item index1

```
AT+CPBR=5
+CPBR: 5,”27998800”,129,”Davis”
OK
```

2.1.4.3 Find phonebook entries +CPBF

Table: +CPBF parameter command syntax

Command	Possible response(s)
+CPBF=<findtext>	1) [+CPBF:<index1>,<number>,<type>,<text>] 2) +CME ERROR: <err>
+CPBF=?	1) +CPBF: [<nlength>],[<tlength>] 2) +CME ERROR:<err>

Description

1. Execution command returns the phonebook entries (from the current phonebook memory storage selected with +CPBS which alphanumeric fields starting with the giving string <findtext>. Entry fields returned are location number <indexn>, phone number stored there <number> (of format <type>) and text <text> associated with the number. If listing fails in an ME error, +CME ERROR: <err> is returned.

2. Test command returns the maximum lengths of <number> and <text> fields. In case of SIM storage, the lengths may not be available.

3. The AT+CPBF="" command can be used to display all phonebook entries sorted in alphabetical order.

(1) This command is only available for the "SM" and "ME" phonebook.

(2) It is possible to use this command with UCS2 strings. If a wrong UCS2 format is entered, the string is considered as an ASCII string.

Defined values

<index1>: integer type value in the range of location numbers of phonebook memory.

<number>: string type indicating the phone number of format <type>

<type>: integer value indicating type of address octet in integer format.

<text>,<findtext>: string type ;character set specified by command select TE character Set +CSCS

<nlength>: integer value indicating the maximum length of field <number>

<tlength>: integer value indicating the maximum length of field <text>

Informative examples

- Initial the HyperTerminal
- Initial the MS

- AT Command

AT+CPBS=”SM”

OK

;;; List all phonebook entries start with “DA”

AT+CPBF=”DA”

+CPBF: 1,”27998800”,129,”DAVID”

+CPBF: 5,”123456”,129,”dad”

+CPBF: 8,”222222”,129,”Davis”

+CPBF: 10,”99999”,129,”dAllen”

OK

2.1.4.4 Write phonebook entry +CPBW

Table: +CPBW parameter command syntax

Command	Possible response(s)
+CPBW=[<index>][,<number>[,<type>[,<text>]]]	+CME ERROR:<err>
+CPBW=?	1) +CPBW: (list of supported <index>s),[<nlength>],(list of supported <type>s),[<tlength>] 2) +CME ERROR: <err>

Description

Set command writes phonebook entry in location number <index>of phonebook memory <storage> excluding “DC”, “LD”, “MC” and “RC”. Entry fields written are phone number <number>(in the format <type>) and text <text> associated with the number. If <index> is left out, but <number> is given, entry is written to the first free location in the phonebook (the implementation of this feature is manufacturer specific.) If the fields except for <index> are omitted, phonebook storage entry will be deleted. If writing fails in an ME error, +CME ERROR:<err> is returned.

Defined values

<index>: integer type values in the range of location numbers of phonebook memory

<number>: string type; phone number

<type>: type of address octet in integer format

<text>,<findtext>: string type ;character set specified by command select TE character Set +CSCS

<nlength>: integer value indicating the maximum length of field <number>

<tlength>: integer value indicating the maximum length of field <text>

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) AND, given <index>

(*PC will check if FDN is disabled in advance)

AT+CSCS?

+CSCS: “IRA”

AT+CPBW=1,”27998800”, 129,”DAVID”

OK

(2) AND but <index> is left out

(*PC will check if FDN is disabled in advance)

AT+CPBW=,”27998800”, 129,”DAVID”

OK

(3) Deleting entry

AT+CPBW=1

OK

2.1.4.5 Report Mobile Equipment error +CMEE

Table: +CMEE parameter command syntax

Command	Possible response(s)
+CMEE=<n	OK
+CMEE?	+CMEE: <n>
+CMEE=?	+CMEE: (list of supported <n>s)

Description

Set command disables or enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the ME. When enable, ME related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. ERROR is returned normally when error is

related to syntax, invalid parameters, or TA functionality. See Section 0 for more information.

Defined values

<n>

0 Disable +CME ERROR: <err> result code and use ERROR instead

1 Enable +CME ERROR: <err> result code and use numeric <err> values.

2 Enable +CME ERROR: <err> result code and use verbose <err> values.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+CMEE=?
+CMEE: (0,1,2)
OK

AT+CMEE?
+CMEE: 0
OK

AT+CMEE=1
OK
AT+CMEE?
+CMEE: 1
O K

2.1.5 Commands from TIA IS-101

2.1.5.1 Select mode +FCLASS

Table: +FCLASS parameter command syntax

Command	Return
+FCLASS=<n>	OK
+FCLASS?	<n>
+FCLASS=?	(list of supported <n>s)

Description

This command puts the TA into a particular mode of operation (data, fax, voice etc.). This causes the TA to process information in a manner suitable for that type of information (rather than for other types of information).

Defined values

The values and meanings of parameter <n> are specified in the following table.

<n> Mode

0 data

1 fax class 2 (ITU-T T.32 [12] and TIA-592)

Voice mode is of particular interest here, and has an additional result code +VCON. Specifically, +VCON indicates that the TA is entering the voice command mode and there is a voice connection to at least one audio input or output. This presupposes that some mechanism has previously initiated a connection to that audio I/O.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+FCLASS=?
+FCLASS: (0-1)
OK

AT+FCLASS?
  0
OK

AT+FCLASS=1
OK

AT+FCLASS?
1
OK
```

2.2 Commands related to short message service

SMS Text Mode & PDU Mode

Parameter Definitions

The following parameters are used in the subsequent clauses which describe all commands.

Message Storage Parameters

<index> integer type (1-256); value in the range of location numbers supported by the associated memory

<mem1> string type; memory from which messages are read, and deleted; defined value:
"BM" broadcast message storage
"ME" ME message storage
"MT" any of the storages associated with ME
"SM" (U)SIM message storage
"SR" status report storage

<mem2> string type; memory to which writing and sending operations are made; refer <mem1> for defined values

<mem3> string type; memory to which received SMs are preferred to be stored (unless forwarded directly to TE; refer command New Message Indications +CNMI); refer <mem1> for defined values

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:
0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMS)
3 "STO SENT" stored sent message (only applicable toSMS)
4 "ALL" all messages (only applicable to +CMGL command)

Message Data Parameters

<alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; used character set should be the one selected with command Select TE Character Set +CSCS

<da> 3GPP TS 23.40 TP-Destination-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer command +CSCS in 3GPP TS 27.07); type of address given by <toda>

<data> In the case of SMS: 3GPP TS 23.040 TP-User-Data in text mode responses; format:

- if <dcs> indicates that 3GPP TS 23.038 default alphabet is used and <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set:
  - if TE character set other than "HEX" (refer +CSCS) : ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
  - if TE character set is "HEX": ME/TA converts each 7-bit character of GSM alphabet into two IRA character long hexadecimal number (e.g. character Π(GSM 23) is presented as 17 (IRA 49 and 55))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<dcs> depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0)

<dt> GSM 03.40 TP-Discharge-Time in time-string format: “yy/MM/dd,hh:mm:ss±zz”, where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone. E.g. 6th of May 1994, 22:10:00 GMT+2 hours equals to “94/05/06,22:10:00+08”

<fo> depending on the command or result code: first octet of 3GPP 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format

<length> Integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> in characters; or in PDU mode (+CMGF=0), the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the

length)

<mr> 3GPP TS 23.040 TP-Message-Reference in integer format

<oa> 3GPP TS 23.040 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tooa>

<pdu> In the case of SMS: 3GPP TS24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65))

<pid> 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0)

0x00 plain text
0x21 telex
0x22 group 3 telefax
0x23 group 4 telefax
0x24 voice telephone
0x25 ERMES
0x26 National paging system
0x32 Internet Electronic Mail

<ra> 3GPP TS 23.040 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tora>

<sca> 3GPP TS 24.011 RP SC address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer +CSCS); type of address given by <tosca>

<scts> 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)

<sn> 3GPP TS 23.041CBM Serial Number in integer format

<st> 3GPP 23.040 TP-Status in integer format

<toda> 3GPP 24.011 TP-Destination-Address Type-of-Address octet in integer format (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129)

<tooa>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<tosca>	3GPP 24.011 RP SC address Type-of-Address octet in integer format (default refer <toda>)
<tora>	3GPP 24.011 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)
<vp>	depending on SMS-SUBMIT <fo> setting: 3GPP 23.040 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>), or if $(EVPF)$ is supported, in enhanced format (hexadecimal coded string with double quotes)
(text&PDU)	Commands available on both text and PDU mode
(text)	Commands available on only text mode
(PDU)	Commands available on only PDU mode

2.2.1 General Configuration Commands

2.2.1.1 Select Message Service +CSMS

Table: +CSMS parameter command syntax (text & PDU)

Command	Possible response(s)
+CSMS=<service>	1) +CSMS: <mt>,<mo>,<bm> 2) +CMS ERROR: <err>
+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm>
+CSMS=?	+CSMS: (list of supported <service>s)

Description

Set command selects messaging service <service>. It returns the types of messages supported by the ME: <mt> for mobile terminated messages, <mo> for mobile originated messages and <bm> for broadcast type messages. If chosen service is not supported by the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of <err> values.

Also read command returns supported message types along the current service setting. Test command returns a list of all services supported by the TA.

Defined values

<service>:

0	GSM 03.40 and 03.41
1	GSM 03.40 and 03.41(the requirement of <service> setting 1 is mentioned under corresponding command descriptions.)

<mt>, <mo>, <bm>:

0	type not supported
1	type supported

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set Message Service

AT+CSMS=0

+CSMS:1,1,1

OK

(2) Show Message Service

AT+CSMS?

+CSMS:0,1,1,1

OK

2.2.1.2 Preferred Message Storage +CPMS

Table: +CPMS parameter command syntax

Command	Possible response(s)
+CPMS=<mem1>[,<mem2>][,<mem3>]	1) +CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> 2) +CMS ERROR: <err>
+CPMS?	1) +CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> 2) +CMS ERROR: <err>
+CPMS=?	+CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s)

Description

Set command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc. If chosen storage is not appropriate for the ME (but is supported by the TA), final result code +CMS ERROR: <err> shall be returned. See chapter Message Service Failure Result Code for a list of possible <err> values.

Test command returns lists of memory storages supported by the TA.

<**mem1**>: Memory used to list, read and delete messages. It can be:
“SM”: SMS message storage in SIM (default)

<**mem2**>: Memory used to write and send messages
“SM”: SMS message storage in SIM (default).

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CPMS= "SM","SM","SM"
+CPMS: 3,15,3,15,3,15
OK

AT+CPMS?
+CPMS: "SM",3,15,"SM",3,15,"SM",3,15
OK
```

2.2.1.3 Message Format +CMGF

Table: +CMGF parameter command syntax (text & PDU)

Command	Possible response(s)
+CMGF=[<mode>]	+CMS ERROR: <err>
+CMGF?	+CMGF: <mode>
+CMGF=?	+CMGF: (list of supported <mode>s)

Description

Set command tells the TA, which input and output format of messages to use. <mode> indicates the format of messages used with send, list, read and write commands and unsolicited result codes resulting from received messages.

Mode can be either PDU mode (entire TP data units used) or text mode (headers and body of the messages given as separate parameters). Text mode uses the value of parameter <chset> specified by command Select TE Character Set +CSCS to inform the character set to be used in the message body in the TA-TE interface.

Test command returns supported modes as a compound value.

Defined values

<mode>:

0	PDU mode (default)
1	text mode

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set Text Mode

```
AT+CMGF=1
OK

AT+CMGF?
+CMGF: 1
OK
```

(2) Set PDU mode (default)

```
AT+CMGF?
+CMGF: 0
OK
```

2.2.2 Message Configuration Commands

2.2.2.1 Service Centre Address +CSCA

Table: +CSCA parameter command syntax (text & PDU)

Command	Possible response(s)
+CSCA = <sca>[,<tosca>]	1) OK 2) ERROR

+CSCA?	+CSCA: <sca>,<tosca>

Description

Set command updates the SMSC address, through which mobile originated SMs are transmitted. In text mode, setting is used by send and write commands. In PDU mode, setting is used by the same commands, but only when the length of the SMSC address coded into <pdu> parameter equals zero.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set SC address

AT+CSCA=”+886935874443”,145

OK

(2) Read SC address

AT+CSCA?

+CSCA: “+886935874443”,145

OK

2.2.2.2 Set Text Mode Parameters +CSMP

Table: +CSMP parameter command syntax (text)

Command	Possible response(s)
+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]	OK
+CSMP?	+CSMP: <fo>,<vp>,<pid>, <dcs>

Description

Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>.

NOTE: When storing a SMS-DELIVER from the TE to the preferred memory storage in text mode (refer command Write Message to Memory +CMGW),

<vp> field can be used for <scts>.

Defined values

<fo>: integer type

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0

Bit 4, Bit 3 TP-VPF

0 0 TP-VP field not present

1 0 TP-VP field present – relative format

0 1 TP-VP field present – enhanced format (not supported)

1 1 TP-VP field present – absolute format

Bit 2 TP-RD (Reserved)

Bit 1, Bit 0 TP-MTI

0 1 SMS-SUBMIT (in the direction MS to SC)

<vp>: integer type

0 to 143	(vp + 1) * 5 minutes
144 to 167	12 hours + ((vp – 143) * 30 minutes)
168 to 196	(vp – 166) * 1 day
197 to 255	(vp – 192) * 1 week

<pid>: integer type

Please see 03.40 TP-Protocol-Identifier (TP-PID) description. Default 0.

<dcs>: integer type

0x00	Default alphabet (default)
0x04	8 bit data
0x08	UCS2 (16bit)

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set parameter for saving/sending short message (<vp> field is relative format, <vp> = 2 days, <pid> = 0, <dcs>=0)

AT+CSMP=17,168,0,0

OK

(2) Set parameter for 8bit message and keeps other parameter unchanged

AT+CSMP=,,,4

OK

2.2.2.3 Show Text Mode Parameters +CSDH

Table: +CSDH parameter command syntax (text)

Command	Possible response(s)
+CSDH=<show>	1) OK 2) ERROR
+CSDH?	+CSDH: <show>
+CSDH=?	+CSDH: (list of supported <show>s)

Description

Set command controls whether detailed header information is shown in text mode result codes.

Defined values

<show>:

0 do not show header values defined in commands +CSCA and +CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, +CMGL, +CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in +CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <cdata>

1 show the values in result codes

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set command

AT+CSDH=1

OK

(2) Read command

AT+CSDH?

+CSDH: 1

OK

(3) Test command

AT+CSDH=?

+CSDH: (0,1)

OK

2.2.2.4 Select Cell Broadcast Message Types +CSCB

Table: +CSCB parameter command syntax (text & PDU)

Command	Possible response(s)
+CSCB = [<mode>[, <mids>[,<dcss>]]]	1) OK 2) ERROR
+CSCB?	+CSCB: <mode>,<mids>,<dcss>
+CSCB=?	+CSCB: (list of supported <mode>s)

Description

Set command selects which types of CBMs are to be received by the ME.

Test command returns supported modes as a compound value.

If <mids> or <dcss> set empty string, there is no action on <mids> or <dcss>.

Defined values

<mode>:

0 message types specified in <mids> and <dcss> are accepted

1 message types specified in <mids> and <dcss> are not accepted

<mids>: string type; all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. “0,1,5,320-478,922”

<dcss>: string type; all different possible combination of CBM data coding schemes (refer <dcs>) (default is empty string); e.g. “0-3,5”

Note: Supported values for parameter <mids> and <dcss>: maximum of 20 ranges could be declared for each parameter.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) read message types

AT+CSCB?

+CBCB: 0,”1,4,10”,”2,3”

OK

(2) set message types

Note: the number of <mids> and <dcss> depends on services scope of the service provider.

(a) set <mids>,<dcss> in the command to be accepted . And the number of <mids>, <dcss> are in the supported range.

AT+CSCB=0,”1,4,5”,”3,4”

+CMS ERROR: 302

OK

AT+CSCB?

+CSCB: 0,"0,221,1,30,200,3084,22,300,4,40,223,2,20,5","3,4"

OK

(b) <mids> or <dcss> setting are out of the supported range

AT+CSCB=0,”65536”,”7,8”

+CMS ERROR: 302

AT+CSCB?

+CSCB: 0,"0,221,1,30,200,3084,22,300,4,40,223,2,20,5","7,8"

OK

Note: The values are set step by step, so, the values behind the supported range are discarded with a +CMS error.

(c) set <mids> or <dcss> in the command to be unaccepted.

AT+CSCB=1,”2-5”,”8”

OK

AT+CSCB?

+CSCB: 1,"0,221,1,30,200,3084,22,300,4,40,223,2,20,5","8"

OK

2.2.3 Message Receiving and Reading Commands

2.2.3.1 New Message Indications to TE +CNMI

Table: +CNMI parameter command syntax (text & PDU)

Command	Possible response(s)
+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	1) OK 2) +CMS ERROR: <err>
+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>, <bfr>
+CNMI=?	+CNMI: (list of supported <mode>s), (list of supported <mt>s), (list of supported <bm>s), (list of supported <ds>s), (list of supported <bfr>s)

Description

Set command selects the procedure, how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON.

<mode> controls the processing of unsolicited result codes specified within this command, <mt> sets the result code indication routing for SMS-DELIVERs, <bm> for CBMs and <ds> for SMS-STATUS-REPORTs. <bfr> defines the handling method for buffered result codes when <mode> 1, 2 or 3 is enabled. If ME does not support requested item (although TA does), final result code +CMS ERROR: <err> is returned.

Test command gives the settings supported by the TA as compound values. NOTE: Command Select Message Service +CSMS should be used to detect ME support of mobile terminated SMs and CBMs, and to define whether a message routed directly to TE should be acknowledged or not.

Defined values

<mode>

0	Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new receiver indications.
1	Discard indication and reject new received message unsolicited result code when TA-TE link is reserved (e.g.

in on-line data mode). Otherwise forward them directly to the TE.

2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.

<mt>

0 No SMS-DELIVER (message to ME) indications are routed to the TE. Default.

1 SMS-DELIVER is stored in ME. Indication of the memory location is routed to the TE by using the unsolicited result code:
+CMTI: <mem>, <index>

2 class 0, class 1 and class 3 SMS-DELIVERs are routed directly to the TE using unsolicited result code:

+CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled)

or

+CMT: <oa>, <alpha>],<scts>,<tooa>,<fo>,<pid>,<dcs>, <sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled; about parameters in italics, refer command +CSDH)

class 0 message and messages in the message waiting indication group (discard message), may be copied to TE, In this case , ME shall send the acknowledgement to the network.
Class2 message and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1

<bm>

0 No CBM indications are routed to the TE. Default

2 CBM is routed directly to the TE by using the unsolicited result code:

+CBM: <length><CR><LF><pdu> (PDU mode enabled)

or

+CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)

refer to 03.41, Content of message is limited to 82 bytes and total pages are no more than 15.

<ds>

0	No SMS-STATUS-REPORTs are routed to the TE
1	SMS-STATUS-REPORTs are routed to the TE using unsolicited result code: +CDS: <length><CR><LF><pdu> (PDU mode enabled) or +CDS: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

<bfr>

0	TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1…3 is entered (OK response shall be given before flushing the codes)
1	TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1..3 is entered.

Informative examples

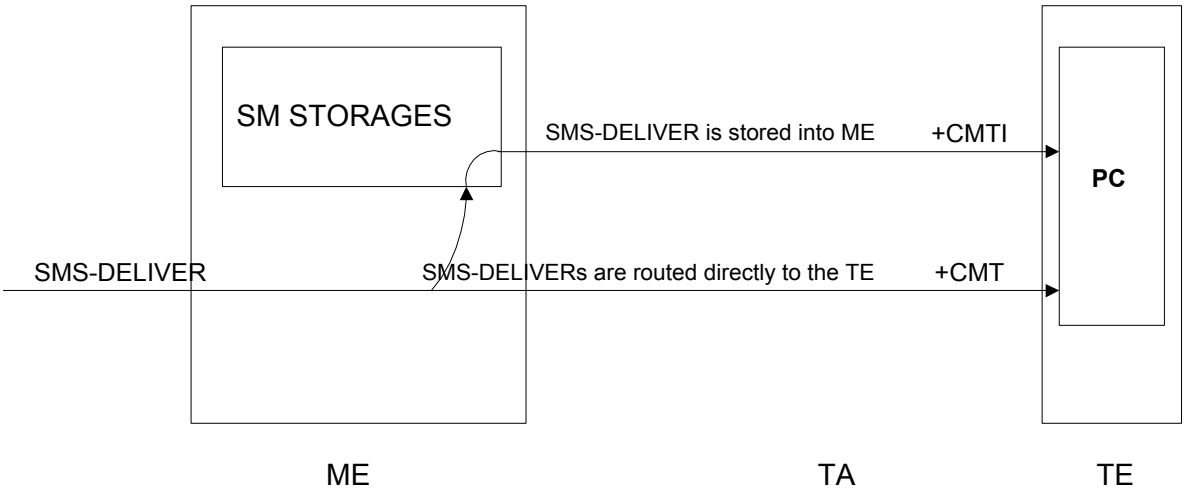
- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CNMI=?
+CNMI: (0-2),(0-3),(0,2),(0,1),(0,1)
OK

AT+CNMI?
+CNMI: 0,0,0,0,0
OK
```

AT+CNMI =0,0,0,0,0
OK
AT+CNMI?
+CNMI: 0,0,0,0,0
OK

AT+CNMI =1,3,2,1,1
OK
AT+CNMI?
+CNMI: 1,3,2,1,1
OK



Message receiving procedures

2.2.3.2 List Messages +CMGL

Table: +CMGL Action Command Syntax (text)

Command	Possible response(s)
+CMGL[=<stat>]	**1) if text mode (+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:** +CMGL: <index>,<stat>,<oa/da>,[<alpha>], [<scts>][,<tooa/toda>,<length>]<CR><LF><dat a>[<CR><LF> +CMGL: <index>,<stat>,<da/oa>,[<alpha>], [<scts>][,<tooa/toda>,<length>]<CR><LF><dat

	a>[...]] **2) otherwise:** +CMS ERROR: <err>

Description

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

NOTE: If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.

Defined values

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMS)
3 "STO SENT" stored sent message (only applicable toSMS)
4 "ALL" all messages (only applicable to +CMGL command)

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CMGF=1
OK
AT+CMGL="ALL"
+CMGL: 2,"STO UNSENT","0921214863",,,129,4
TEST
OK
AT+CMGL=”STO UNSENT”
+CMGL: 2,"STO UNSENT","0921214863",,,129,4
```

TEST
OK

2.2.3.3 Read Message +CMGR

Table: +CMGR Action Command Syntax (text)

Command	Possible response(s)
+CMGR=<index>[,<State>]	**1) if text mode (+CMGF=1), command successful and SMS-DELIVER:** +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> **2) if text mode (+CMGF=1), command successful and SMS-SUBMIT:** +CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> **3) If reading fails:** +CMS ERROR: <err>

Description

Execution command returns message with location value <index> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR:<err> is returned.

<State>: If <State> equal to 1, MS will not change the reading state of the message. If <State> equal to 0, MS will change the reading state of the message.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) read the message

AT+CMGR=0;+CMGR=1;+CMGR=2
+CMGR: 2,,26

07918896834348221 1B602812500008F13683A1DAE7BBDEEF7BB4B5C
76C75DE3771B

+CMGR: 2,,26
07918896834348221 1B602812500008F13683A1DAE7BBDEEF7BB4B5C
76C75DE3771B

+CMGR: 2,,36
07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5B
ADFEF2E71D91D778DDF6D90
3A4C0601

(2) reading fail

AT+CMGR=3
ERROR

2.2.3.4 NEW Message Acknowledgement to ME/TA +CNMA

Table: +CNMA Action Command Syntax

Command	Possible response(s)
If text mode (+CMGF=1): +CNMA	+ CMS ERROR: <err>
+CNMA=?	

Description

Execution command confirms correct reception of a new message (SMS=DELIVER or SMS-STATUS-REPORT) which is routed directly to the TE (refer command +CNMI tables 2 and 4). This acknowledgement command (causing ME to send RP-ACK to the network) shall be used when +CSMS parameter <service> equals 1. TA shall not send another +CMT or +CDS result code to TE before previous one is acknowledged.

If ME does not get acknowledgement within required time (network timeout), ME should send RP-ERROR to the network. ME/TA shall automatically disable routing to TE setting both <mt> and <ds> values of +CNMI to zero.

If command is executed, but no acknowledge is excepted, or some other ME related error occurs, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values.

NOTE: In case that a directly routed message must be buffered in ME/TA (possible when +CNMI parameter <mode> equals 0 or 2) or AT interpreter remains too long in a state where result codes cannot be sent to TE (e.g. user is entering a message using +CMGS), acknowledgement (RP-ACK) must be sent to the network without +CNMA command from TE. Later, when buffered result codes are flushed to TE, TE must send +CNMA acknowledgement for each result code. In this way, ME/TA can determine if message should be placed in non-volatile memory and routing to TE disabled(+CNMA not received). Refer command +CNMI for more details how to use <mode> parameter reliably.

Informative examples
None Support

2.2.4 Message Sending and Writing Commands

2.2.4.1 Send Message +CMGS

Table: +CMGS Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMGS=<da>[,<toda>]<CR> *text is entered* <ctrl-Z/ESC>	**1) if text mode (+CMGF=1) and sending successful:** +CMGS: <mr>[,<scts>] **2) if sending fails:** +CMS ERROR: <err>

Description
Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Value can be used to identify message upon unsolicited delivery status report result code.

- entered text (3GPP TS 23.040 TP-Data-Unit) is sent to address <da> and all current settings (refer Set Text Mode Parameters +CSMP and Service Centre Address +CSCA) are used to construct the actual PDU in ME/TA
- the DCD signal shall be in ON state while text is entered
- the echoing of entered characters back from the TA is controlled by V.25ter echo command E
- the entered text should be formatted as follows:
- if <dcs> (set with +CSMP) indicates that 3GPP TS 23.038 default alphabet is used and <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is not set:
- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in 3GPP TS 27.007):ME/TA converts the entered text into GSM alphabet according to rules of Annex A; backspace can be used to delete last character and carriage returns can be used
- if TE character set is "HEX": the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts to 7-bit characters of GSM alphabet (e.g. 17 (IRA 49 and 55) will be converted to character ψ (GSM 23))
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used or <fo> indicates that 3GPP TS 23.040 TP-User-Data-Header-Indication is set: the entered text should consist of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octet (e.g. two characters 2A (IRA 50 and 65) will be converted to an octet with integer value 42)
- sending can be cancelled by giving <ESC> character (IRA 27)
- <ctrl-Z> (IRA 26) must be used to indicate the ending of the message body

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CMGF=1
OK
```

AT+CMGS=?
OK
OK
AT+CMGS="0921214863"
> TEST
+CMGS: 230
OK
OK

2.2.4.2 Send Message from Storage +CMSS

Table: +CMSS Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMSS=<index>[,<da>[,<toda>]]	**1) If text mode (+CMGF=1) and sending successful:** +CMSS: <mr> **2) if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

Defined values

<index>: integer type
<da>: string type
<toda>: integer type

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+CMGF=1
OK

AT+CMGW="0921214863"
> TEST1
+CMGW: 11
OK
AT+CMSS=11
+CMSS: 234
OK

2.2.4.3 Write Message to Memory +CMGW

Table: +CMGW Action Command Syntax (text)

Command	Possible response(s)
if text mode (+CMGF=1): +CMGW[=<da>[,<toda>[,<stat>]]]<CR> *text is entered* <ctrl-Z/ESC>	**1) If saving successful:** +CMGW: <index> **2) If saving fails:** +CMS ERROR: <err>

Description

Execution command stores message (SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to "stored unsent". The entering of text is done similarly as specified in command Send Message +CMGS.

Defined values

<stat>

2 Stored unsent

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Writing SM in GSM

We try to send “TEST” to number “0921214863”

AT+CMGF=1
OK
AT+CSCS=”GSM”
OK
AT+CSMP=17,168,0,0

OK
AT+CMGW=”0921214863”,129,”STO UNSENT”<CR>
>TEST<ctrl-z>
+CMGW:12
OK

2.2.4.4 Delete Message +CMGD

Table: +CMGD Action Command Syntax (text & PDU)

Command	Possible response(s)
+CMGD=<index>	1) OK 2) +CMS ERROR: <err>

Description

Execution command deletes message from preferred message storage <mem1> location <index>.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

Delete Message number 7
AT+CMGD=7 (delete message)
OK

2.2.4.5 Send Command +CMGC

Table: +CMGC Action Command Syntax (Text mode)

Command	Possible response(s)
If text mode (+CMGF=1) +CMGC=<fo>, <ct>[,<pid>[,<mn>[,<da>[, <toda>]]]]<CR> > Text is entered<ctrl-z/ESC>	1) If text mode (+CMGF=1) and sending successful: +CMGC: <mr>[,<scts>] 2) if sending fails: +CMS ERROR: <err>

Description

Execution command sends a command message from a TE to the network

(SMS-COMMAND). The entering of text is done similarly as specified in command Send Message +CMGS, but the format is fixed to be a sequence of two IRA character long hexadecimal numbers which ME/TA converts into 8-bit octets.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+COPS?
+COPS: 0,2,"46601",0
OK
AT+CSCA?
+CSCA: "0931000099",129
OK
AT+CSCA="0931000099",129
OK
AT+CMGF=1
OK

AT+CMGC=,,,,"0928930064"
> abcdef
+CMGC: 45
OK
```

2.2.5 PDU Mode

2.2.5.1 List Message +CMGL

Table: +CMGL Action Command Syntax (PDU)

Command	Possible response(s)

+CMGL[=<stat>]	1) if PDU mode (+CMGF=0) and command successful: +CMGL: <index>,<stat>,[<alpha>], <length><CR><LF><pdu>[<CR><LF>+CMGL: <index>,<stat>,[<alpha>], <length><CR><LF><pdu>[...]] 2) otherwise: +CMS ERROR: <err>
+CMGL=?	+CMGL: (list of supported <stat>s)

Description

Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If listing fails, final result code +CMS ERROR: <err> is returned.

Test command shall give a list of all status values supported by the TA.

Defined values

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMS)
3 "STO SENT" stored sent message (only applicable toSMS)
4 "ALL" all messages (only applicable to +CMGL command)

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1)

AT+CMGL=?
+CMGL: (0,1,2,3,4)
OK

(2)

AT+CMGF=0
AT+CMGL=2
+CMGL: 1,2,,8
07918896834348221100008000004A800
+CMGL: 2,2,,36
07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5B
ADFEF2E71D91D778DDF6D903A4C0601
+CMGL: 3,2,,8
07918896834348221100008000004A800
+CMGL: 4,2,,35
07918896834348225 1BA02812500008F1D0A0A030606010A030C040208
93D567BA421D26ABE98A7B5B1D06
+CMGL: 5,2,,9
07918896834348221100008000004A801E1
+CMGL: 6,2,,9
07918896834348221100008000004A801E4
OK

2.2.5.2 Read Message +CMGR

Table: +CMGR Action Command Syntax (PDU)

Command	Possible response(s)
+CMGR=<index>	1) if PDU mode (+CMGF=0) and command successful: +CMGR:<stat>,[<alpha>],<length><CR><LF> <pdu> 2) otherwise: +CMS ERROR: <err>

Description

Execution command returns message with location value <index> from preferred message storage <mem1> to the TE. Status of the message and entire message data unit <pdu> is returned. If status of the message is 'received unread', status in the storage changes to 'received read'. If reading fails, final result code +CMS ERROR: <err> is returned.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1)AT+CMGR=?

OK

AT+CMGR?

OK

(2)AT+CMGF=0

OK

AT+CMGR=2

+CMGR: 2,,36

07918896834348225 1B702812200008F1E040D021800A0E974B8EEF5B
ADFEF2E71D91D778DDF6D90
3A4C0601

OK

AT+CMGR=4

+CMGR: 2,,35

07918896834348225 1BA02812500008F1D0A0A030606010A030C040208
93D567BA421D26ABE98A7B
5B1D06

OK

AT+CMGR=3

+CMGR: 2,,8

07918896834348221 10000800004A800

OK

2.2.5.3 Send Message +CMGS

Table: +CMGS Action Command Syntax (PDU)

Command	Possible response(s)
if PDU mode (+CMGF=0): +CMGS=<length><CR> *PDU is given*<ctrl-Z/ESC>	**1) if PDU mode (+CMGF=0) and sending successful:** +CMGS: <mr>[,<ackpdu>] **2) if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message from a TE to the network (SMS-SUBMIT). Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be abortable.

- <length> must indicate the number of octets coded in the TP layer data unit to be given (i.e. SMSC address octets are excluded)
- the PDU shall be hexadecimal format (similarly as specified for <pdu>) and given in one line; ME/TA converts this coding into the actual octets of PDU
- when the length octet of the SMSC address (given in the PDU) equals zero, the SMSC address set with command Service Centre Address +CSCA is used; in this case the SMSC Type-of-Address octet shall not be present in the PDU, i.e. TPDU starts right after SMSC length octet
- sending can be cancelled by giving <ESC> character (IRA 27)
- <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+CMGS=?

OK

OK

2.2.5.4 Send Message from Storage +CMSS

Table: +CMSS Action Command Syntax (PDU)

Command	Possible response(s)
if text mode (+CMGF=0): +CMSS=<index>[,<da>[,<toda>]]	**1) If PDU mode (+CMGF=0) and sending successful:** +CMSS: <mr> **2) if sending fails:** +CMS ERROR: <err>

Description

Execution command sends message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT). If new recipient address <da> is given for SMS-SUBMIT, it shall be used instead of the one stored with the message. Reference value <mr> is returned to the TE on successful message delivery. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. This command should be aborted.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+CMSS=8
+CMSS: 3
OK
```

2.2.5.5 Write Message to Memory +CMGW

Table: +CMGW Action Command Syntax (PDU)

Command	Possible response(s)
If PDU mode (+CMGF=0): +CMGW[=<length>[,<stat>]<CR> *PDU is given* <ctrl-Z/ESC>	1) +CMGW: <index> 2) +CMS ERROR: <err>

Description

Execution command stores a message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>. Memory location <index> of the stored message is returned. By default message status will be set to 'stored unsent', but parameter <stat> allows also other status values to be given. The entering of PDU is done similarly as specified in command Send Message +CMGS. If writing fails, final result code +CMS ERROR: <err> is returned.

Note: SMS-COMMANDs and SMS-STATUS-REPORTs cannot be stored in text mode.

Informative Examples

Reopen

2.2.5.6 Send Command +CMGC

Table: +CMGC Action Command Syntax

Command	Possible response(s)
If PDU mode (+CMGF=0) +CMGC=<length><CR> > PDU is fiven<ctrl-z/ ESC>	1) If PDU mode (+CMGF=0) and sending successful: +CMGC: <mr>[,<ackpdu>] 2) if sending fails: +CMS ERROR: <err>

Description

Execution command sends a command message from a TE to the network (SMS-COMMAND). The entering of PDU is done similarly as specified in command Send Message +CMGS. Message reference value <mr> is returned to the TE on successful message delivery. Optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned. Values can be used to identify message upon unsolicited delivery status report result code. If sending fails in a network or an ME error, final result code +CMS ERROR: <err> is returned. See chapter Message Service Failure Result Code for a list of <err> values. This command should be abortable.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+CMGF=0
OK
AT+CMGL=4
+CMGL: 1,1,,24
07918896630000090 40C9188960635305500007021102263022305F4F29C1E03
+CMGL: 11,3,,19
0681901300009911 2A0A8190253011500108F06ED72FB2DCF03
+CMGL: 14,3,,19
0681901300009931 2E0A8190823900460000FF06351B2E379301
OK

AT+CMGC=19
> 06819013000099312E0A819082390046000FF06351B2E379301
+CMGC: 48
OK

2.3 Commands specified by ITU-T Rec. V25ter as by GSM Rec. 07.07

2.3.1 Generic TA control commands

2.3.1.1 Repeating a command line (A/)

Description

If the prefix "A/" or "a/" is received (IA5 4/1, 2/15 or 6/1, 2/15), the DCE shall immediately execute once again the body of the preceding command line. No editing is possible, and no termination character is necessary. A command line may be repeated multiple times through this mechanism, if desired.
Responses to the repeated command line shall be issued using the parity and format of the original command line, and the rate of the "A/". If "A/" is received before any command line has been executed, the preceding command line is assumed to have been empty (that results in an OK result code).

Information examples

2.3.1.2 Reset to default configuration (Z)

Table: Syntax (Z)

Command	Possible response(s)
Z	1) OK 2) ERROR

Description

This command instructs the DCE to set all parameters to their factory defaults as specified by the manufacturer. This may include taking into consideration the settings of hardware configuration switches or non-volatile parameter storage (if implemented). If the DCE is connected to the line, it is disconnected from the line, terminating any call in progress.

All of the functions of the command shall be completed before the DCE issues the result code. The DTE should not include additional commands on the same command line after the Z command because such commands may be ignored.

NOTE – Because this command may take into consideration the settings of switches and non-volatile parameter storage, it does not necessarily return the DCE to a "known state". In particular, the DCE may, as a result of execution of this command, be placed in a state in which it appears to not respond to DTE commands, or respond in a completely different format than was being used prior to execution of the command.

Result codes

OK If<value> is recognized.

ERROR If<value> is not recognized or supported.

An OK result code for this command is issued using the same rate, parity, and format as the DTE command line containing the command, but using the new values for parameters that affect the format of result codes (e.g. Q, V, S3, S4).

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

ATZ

OK

ATZ0

OK

2.3.1.3 Set to factory-defined configuration (&F)

Table: Syntax (&F)

Command	Possible response(s)
&F	1) OK 2) ERROR

Description

This command instructs the DCE to set all parameters to default values specified by the manufacturer, which may take into consideration hardware configuration switches and other manufacturer-defined criteria.

Defined values

0 set parameters to factory defaults.

(other) Reserved for manufacturer proprietary use.

Result codes

OK if value is valid.

ERROR if value is not recognized or not supported.

An OK result code for this command is issued using the same rate, parity, and format as the DTE command line containing the command, but using the factory-defined values for other parameters that affect the format of result codes (e.g. Q, V, S3, S4) and dependent upon other commands that may follow on the same command line.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT&F
OK
AT&F0
OK
AT&F1
ERROR
AT&F2
EXT: I
ERROR

2.3.1.4 Request identification information (I)

Table: Syntax (I)

Command	Possible response(s)
I	1) <manufacturer1> OK

	2) ERROR

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, followed by a final result code. <value> may optionally be used to select from among multiple types of identifying information, specified by the manufacturer.

NOTE – The responses to this command may not be reliably used to determine the DCE manufacturer, revision level, feature set, or other information, and should not be relied upon for software operation. In particular, expecting a specific numeric response to an I0 command to indicate which other features and commands are implemented in a DCE dooms software to certain failure, since there are widespread differences in manufacturer implementation among devices that may, coincidentally, respond with identical values to this command. Software implementers should use I commands with extreme caution, since the amount of data returned by particular implementations may vary widely from a few bytes to several thousand bytes or more, and should be prepared to encounter ERROR responses if the value is not recognized.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1)ATI

<manufacturer1>

OK

(2)ATI0

<manufacturer1>

OK

(3)ATI1

<manufacturer2>

OK

(4)ATI2

ERROR

2.3.1.5 Request manufacturer identification (+GMI)

Table: Syntax (+GMI)

Command	Possible response(s)
+GMI	<manufacturer> OK

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the manufacturer. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired (e.g. address, telephone number for customer service, etc.).

The total number of characters. Including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence “0 <CR>” (3/0,0/13)or “OK<CR>” (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK In all cases.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+GMI=?
OK
AT+GMI?
ERROR
AT+GMI
<manufacturer>
OK

2.3.1.6 Request model identification (+GMM)

Table: Syntax (+GMM)

Command	Possible response(s)
+GMM	<model> OK

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the specific model of device. Typically, the text will consist of a single line containing the name of the product, but manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence “0 <CR>” (3/0,0/13)or “OK<CR>” (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK in all cases

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+GMM

<model>

OK

2.3.1.7 Request revision identification (+GMR)

Table: Syntax (+GMR)

Command	Possible response(s)
+GMR	<information> OK

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the version, revision level or date, or other pertinent information of the device. Typically, the text will consist of a single line containing the version of the product, but manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence “0 <CR>” (3/0,0/13)or “OK<CR>” (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK in all cases

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+GMR

SW Ver: 0.04, SW Type: 1, HW Ver: 04, HW Type: 0, Build Date: Jul 29 2008, Build Time: 18:05:49

OK

2.3.1.8 Request product serial number identification (+GSN)

Table: Syntax (+GSN)

Command	Possible response(s)
+GSN	<serial number> OK

Description

This command causes the DCE to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the DCE to identify the individual device. Typically, the text will consist of a single line containing a manufacturer determined alpha-numeric string, but

manufacturers may choose to provide any information desired.

The total number of characters, including line terminators, in the information text returned in response to this command shall not exceed 2048 characters. Note that the information text shall not contain the sequence “0 <CR>” (3/0,0/13)or “OK<CR>” (4/15,4/11,0/13), so that DTE can avoid false detection of the this information text.

Result codes

OK in all cases

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+GSN

<serial number>

OK

2.3.1.9 Request complete capabilities list (+GCAP)

Table: Syntax (+GCAP)

Command	Possible response(s)
+GCAP	<capabilities> OK

Description

This extended-format command causes the DCE to transmit one or more lines of information text in a specific format. The content is a list additional capabilities command +<name>s, which is intended to permit the user of the DCE to identify the overall capabilities of the DCE.

In particular, if the DCE implements a particular DCE control standard that uses Extended Syntax Commands, and if that DCE control standard includes command(s) that indicate general capabilities, the +<name>(s) of the those commands shall be reported to the DCE in response to a +GCAP command. See table.

Table V.25ter-Examples of required +GCAP responses

+GCAP response	DCE control standard	Description
+FCLASS	T.class1, +F Or T.class2, +F	Class1 Facsimile DCE Control Class2 Facsimile DCE Control
+MS	+M commands	Modulation Control: +MS and +MR commands
+MV18S	+MV18 commands	V.18 Modulation Control: +MV18S and +MV18R
+ES	+E commands	Error Control: +ES, +EB, +ER, +EFCS, +ETBM
+DS	+D commands	Data Compression: +DS and +DR

For example, a data modem that supported all capabilities described in this Recommendation may report:

+GCAP: +MS, +ES, +DS, +MV18S

If that example DCE implemented other commands, they shall also be included. If that DCE implemented stubs (e.g. +FCLASS=0 only), it may report +FCLASS as part of its +GCAP response.

The response is not specifically limited as to number of lines of text. Note that the information text shall not contain the sequence “0 <CR>” (3/0,0/13)or “OK<CR>” (4/15,4/11,0/13), so that DTE can avoid false detection of the end of the this information text.

It is not necessary for a DTE to inquire of the +GCAP where the application is specific to a technology, such as facsimile where the +FCLASS command would be sufficient to determine capabilities.

Informative Examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+GCAP
+GCAP:+FCLASS
OK

2.3.1.10 Command line termination character (S3)

Table: Syntax (S3)

Command	Possible response(s)
S3=<values>	1) OK 2) ERROR
S3?	<values>

Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE from the DTE to terminate an incoming command line. It is also generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S4 parameter (see the description of the V parameter for usage).

The previous value of S3 is used to determine the command line termination character for entry of the command line containing the S3 setting command. However, the result code issued shall use the value of S3 as set during the processing of the command line. For example, if S3 was previously set to 13 and the command line “ATS3=30” is issued, the command line shall be terminated with a CR character (IA5 0/13), but the result code issued will use the character with the ordinal value 30 (IA5 2/14) in place of the CR.

Defined values

0 to 127 Set command line termination character to this value. Mandatory default setting

13 Carriage return character (CR, IA5 0/13).

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

ATS3?
013
OK

ATS3=13
OK

2.3.1.11 Response formatting character (S4)

Table: Syntax (S4)

Command	Possible response(s)
S4=<values>	1) OK 2) ERROR
S4?	<values>

Description

This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter (see the description of the V parameter for usage).

If the value of S4 is changed in a command line, the result code issued in response to that command line will use the new value of S4.

Defined values

0 to **127** Set response formatting character to this value.

Recommended default setting

10 Line feed character (LF, IA5 0/10).

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

ATS4?
010
OK

ATS4=10
OK

2.3.1.12 Command line editing character (S5)

Table: Syntax (S5)

Command	Possible response(s)
S5=<values>	1) OK 2) ERROR
S5?	<values>

Description

This S-parameter represents the decimal IA5 value of the character recognized by the DCE as a request to delete from the command line the immediately preceding character (see 5.2.2).

Defined values

0 to **127** Set command line editing character to this value.

Recommended default setting

8 Backspace character (BS, IA5 0/8).

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
ATS5?
008
OK

ATS5=8
OK
```

2.3.1.13 Command echo (E)

Table: Syntax (E)

Command	Possible response(s)
E<value>	OK

Description

The setting of this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command

state.

Defined values

0 DCE does not echo characters during command state and online command state.

1 DCE echoes characters during command state and online command state.

Recommended default setting

1 DCE echoes characters during command state and online command state.

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

ATE1
OK
<Display the response on the HyperTerminal>
ATE0
OK
[command]
OK

2.3.1.14 Result code suppression (Q)

Table: Syntax (Q)

Command	Possible response(s)
Q<value>	1) <value> = 0 OK 2) <value> = 1 [none] 3) ERROR

Description

The setting of this parameter determines whether or not the DCE transmits result codes to the DTE. When result codes are being suppressed, no portion of any intermediate, final, or unsolicited result code – header, result text, line

terminator, or trailer – is transmitted. Information text transmitted in response to commands is not affected by the setting of this parameter.

Defined values

0 DCE transmits result codes.

1 Result codes are suppressed and not transmitted.

Recommended default setting

0 DCE transmits result codes.

Result codes

OK If value is 0.

(none) If value is 1 (because result codes are suppressed).

ERROR For unsupported values (if previous value was Q0).

(none) For unsupported values (if previous value was Q1)

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

ATQ1
[none]
AT+CFUN?
+CFUN: 1
[none]

ATQ0
OK
AT+CFUN?
+CFUN: 1
OK

2.3.1.15 DCE response format (V)

Table: Syntax (V)

Command	Possible response(s)
V<value>	1) If value is 0 0

	2) If value is 1 OK 3) Unsupported values (if previous value was V0) 4 4) Unsupported values (if previous value was V1) ERROR

Description

The setting of this parameter determines the contents of the header and trailer transmitted with result codes and information responses. It also determines whether result codes are transmitted in a numeric form or an alphabetic (or "verbose") form. The text portion of information responses is not affected by this setting.

Table 3 shows the effect of the setting of this parameter on the format of information text and result codes. All references to cr mean "the character with the ordinal value specified in parameter S3"; all references to lf likewise mean "the character with the ordinal value specified in parameter S4". See Table 3.

Table 3/V.25 ter – Effect of V parameter on response formats

	V0	V1
Information responses	<text><cr><lf>	<cr><lf> <text><cr><lf>
Result codes	<numeric code><cr>	<cr><lf> <verbose code><cr><lf>

Defined values

0 DCE transmits limited headers and trailers and numeric text.

1 DCE transmits full headers and trailers and verbose response text.

Recommended default setting

1 DCE transmits full headers and trailers and verbose response text.

Result codes

0	If value is 0 (because numeric response text is being used).
OK	If value is 1.
4	For unsupported values (if previous value was V0).
ERROR	For unsupported values (if previous value was V1).

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1)AT+CFUN? -> +CFUN: 1

0

ATV? -> V: 0

0

(2)ATV?

V: 1

OK

AT+CFUN?

+CFUN: 1

OK

2.3.1.16 Circuit 109 (Received line signal detector) behavior (&C)

Table: Syntax (&C)

Command	Possible response(s)
&C<value>	OK

Description

This parameter determines how the state of circuit 109 relates to the detection of received line signal from the distant end. Changing the parameter will take effect immediately in both the command and online command states.

In &C1 mode of operation, circuit 109 is not turned off until all data previously received from the remote DCE is delivered to the local DTE. However, such buffered data shall be discarded and circuit 109 turned off if the DTE turns off circuit 108 (if &D1 or &D2 is set).

Defined values

0 The DCE always presents the ON condition on circuit 109.

1 Circuit 109 changes in accordance with the underlying DCE, which may include functions other than the physical layer functions (e.g.Recommendations V.42, V.110, V.120 and V.13).

Recommended default setting

1 Circuit 109 changes in accordance with the underlying DCE, which may include functions other than the physical layer functions (e.g. Recommendations V.42, V.110, V.120 and V.13).

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT&C1
OK
AT&C0
OK

2.3.1.17 Circuit 108 (Data terminal ready) behavior (&D)

Table: Syntax (&D)

Command	Possible response(s)
&D<value>	1) OK 2) ERROR

Description

This parameter determines how the DCE responds when circuit 108/2 is changed from the ON to the OFF condition during online data state.

Defined values

0 DCE ignores circuit 108/2.

1 Upon an on-to-off transition of circuit 108/2, the DCE enters online command state and issues an OK result code; the call remains connected.

2 Upon an on-to-off transition of circuit 108/2, the DCE instructs the underlying DCE to perform an orderly cleardown of the call. The

disposition of any data in the DCE pending transmission to the remote DCE is controlled by the ETBM parameter (see 6.5.6) if implemented; otherwise, this data is sent before the call is cleared, unless the remote DCE clears the call first (in which case pending data is discarded). The DCE disconnects from the line. Automatic answer is disabled while circuit 108/2 remains off.

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT&D?
&D: 0
OK

AT&D1
OK

AT&D?
&D: 1
OK

AT&D2
ERROR

2.3.1.18 Fixed DTE rate (+IPR)

Table: Syntax (+IPR)

Command	Possible response(s)
+IPR?	+IPR: <values> OK
+IPR=?	+IPR: (list of supported autodetectable rate values)[,(list of fixed-only rate values)] OK

Description

This numeric extended-format parameter specifies the data rate at which the DCE will accept commands, in addition to 1200 bit/s or 9600 bit/s (as required

in 4.3). It may be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE. Specifying a value of 0 disables the function and allows operation only at rates automatically detectable by the DCE. The specified rate takes effect following the issuance of any result code(s) associated with the current command line.

The rate specified does not apply in OnLine Data State if Direct mode of operation is selected.

Defined values

The rate value specified shall be the rate in bits per second at which the DTE-DCE interface should operate, e.g. "19 200" or "115 200". The rates supported by a particular DCE are manufacturer-specific; however, the IPR parameter should permit the setting of any rate supported by the DCE during online operation. Rates which include a non-integral number of bits per second should be truncated to the next lower integer (e.g. 134.5 bit/s should be specified as 134; 45.45 bit/s should be specified as 45). If unspecified or set to 0, automatic detection is selected for the range determined by 4.3 and the DCE manufacturer, and the character format is also forced to autodetect, ICF 0 (see 6.2.11).

Recommended default setting

It is recommended that the default for this parameter be the automatic detection setting (0), which facilitates initial DTE-DCE communications.

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+IPR=?
+IPR: (),(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400)
OK
AT+IPR?
+IPR: 115200
OK
```

2.3.1.19 DTE-DCE character framing (+ICF)

Table: Syntax (+ICF)

Command	Possible response(s)
+ICF=<format>,<parity>	1) OK 2) ERROR
+ICF?	+ICF: <format>,<parity> OK
+ICF=?	+ICF: (list of supported format values),(list of supported parity values) OK

Description

This extended-format compound parameter is used to determine the local serial port start-stop (asynchronous) character framing that the DCE shall use while accepting DTE commands and while transmitting information text and result code, if this is not automatically determined; IPR 0 forces ICF 0 (see IPR, 6.2.10). Note that the definition of fixed character format for OnLine Data State is for further study.

format determines the number of bits in the data bits, the presence of a parity bit, and the number of stop bits in the start-stop frame.
parity determines how the parity bit is generated and checked, if present.
Defined values See Table 5.

Table 5/V.25 ter – Character format values

format	**Valid numeric values**
3	8 Data 1 Stop
parity	**Defined numeric values**
0	Odd
1	Even
2	Mark
3	Space

Recommended default setting

For format : **3**
For parity : **3**

Information examples
- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT+ICF=?
+ICF: (3),(0-3)
OK

AT+ICF?
+ICF: 3,3
OK

AT+ICF=1
ERROR
```

2.3.1.20 DTE-DCE local flow control (+IFC)

Table: Syntax (+IFC)

Command	Possible response(s)
+IFC=<DCE_by_DTE>,<DTE_by_DCE>	1) OK 2) ERROR
+IFC?	+IFC: <DCE_by_DTE>,<DTE_by_DCE>
+IFC=?	IFC: (list of supported DCE_by_DTE values),(list of supported DTE_by_DCE values)

Description

This extended-format compound parameter is used to control the operation of local flow control between the DTE and DCE during the data state when V.42 error control is being used, or when fallback to non-error control mode is specified to include buffering and flow control. It accepts two numeric subparameters:

– DCE_by_DTE, which specifies the method to be used by the DTE to control the flow of received data from the DCE; and

– **DTE_by_DCE**, which specifies the method to be used by the DCE to control the flow of transmitted data from the DTE.

Defined values

See Table 6.

Table 6/V.25 ter – DCE_by_DTE and DTE_by_DCE values

DCE_by_DTE	Description
0	None
1	DC1/DC3 on circuit 103; do not pass DC1/DC3 characters to the remote DCE
2	Circuit 133 (Ready for Receiving)
3	DC1/DC3 on circuit 103 with DC1/DC3 characters being passed through to the remote DCE in addition to being acted upon for local flow control
4 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
DTE_by_DCE	Description
0	None
1	DC1/DC3 on circuit 104
2	Circuit 106 (Clear to Send/Ready for Sending)
3 to 127	Reserved for future standardization
Other	Reserved for manufacturer-specific use
NOTE – DC1 is IA5 1/1; DC3 is IA5 1/3.	

Recommended default setting

For DCE_by_DTE : **2**

For DTE_by_DCE : **2**

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+IFC=?

+IFC: (0-3),(0-2)

OK

AT+IFC?
+IFC: 2,2
OK
AT+IFC=0,0
OK
AT+IFC?
+IFC: 0,0
OK

2.3.2 Data Compression commands

2.3.2.1 Data compression (DS)

Table: Syntax (+DS)

Command	Possible response(s)
+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string>	1) OK 2) ERROR
+DS?	+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string>
+DS=?	+DS: (list of supported direction values), (list of supported compression_negotiation values), (list of supported max_dict values), (list of supported max_string values)

Description

This extended-format compound parameter controls the V.42 bis data compression function if provided in the DCE. It accepts four numeric subparameters:

– direction , which specifies the desired direction(s) of operation of the data compression function; from the DTE point of view;
– compression_negotiation , which specifies whether or not the DCE should continue to operate if the desired result is not obtained;
– max_dict , which specifies the maximum number of dictionary entries which should be negotiated (may be used by the DTE to limit the codeword size transmitted, based on its knowledge of the nature of the data to be transmitted);
– max_string , which specifies the maximum string length to be negotiated (V.42 bis P2).

Defined values See Table 26.

Table 26/V.25 ter – Data compression control subparameters

direction	Description
0	Negotiated ... no compression (V.42 bis P0 0)
1	Transmit only
2	Receive only
3	Both directions, accept any direction (V.42 bis P0 11)
compression _ negotiation	Description
0	Do not disconnect if Rec. V.42 bis is not negotiated by the remote DCE as specified in direction
1	Disconnect if Rec. V.42 bis is not negotiated by the remote DCE as specified in direction
max_dict	512 to 65535
max_string:	6 to 250

Recommended default settings

For direction: 3

For compression_negotiation: 0

For max_dict: Determined by the manufacturer

For max_string: 6

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+DS?

+DS: 0,0,2048,6

OK

AT+DS =?

+DS: (0-3),(0),(512-2048),(6)

OK

2.3.2.2 Data compression reporting (DR)

Table: Syntax (+DR)

Command	Possible response(s)
+DR=<value>	1) OK 2) ERROR
+DR?	+DR: <value>
+DR=?	+DR: (list of supported values)

Description

This extended-format numeric parameter controls whether or not the extended-format "DR:" intermediate result code is transmitted from the DCE to the DTE. The DR: type reported shall represent the current (negotiated or renegotiated) DCE-DCE data compression type. If enabled, the intermediate result code is transmitted at the point after error control negotiation (handshaking) at which the DCE has determined which data compression technique will be used (if any) and the direction of operation. The format of this result code is the following (see Table 27):

Table 27/V.25 ter – Data compression reporting intermediate result codes

DR: NONE	Data compression is not in use
DR: V42B	Rec. V.42 *bis* is in use in both directions
DR: V42B RD	Rec. V.42 *bis* is in use in receive direction only
DR: V42B TD	Rec. V.42 *bis* is in use in transmit direction only

The DR intermediate result code, if enabled, is issued after the Error Control Report (ER) and before the final result code (e.g. CONNECT).

Defined values

See Table 28.

Table 28/V.25 ter – Data compression reporting values

value	Description
0	Data compression reporting disabled (no DR result code transmitted)
1	Data compression reporting enabled (DR result code transmitted)

Recommended default setting

0

Information examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT+DR=?
+DR: (0-1)
OK

AT+DR?
+DR: 0

OK
AT+DR=1
OK
AT+DR?
+DR: 1
OK

2.4 GPRS related commands

2.4.1 Define PDP Context +CGDCONT

Table: +CGDCONT parameter command syntax

Command	Possible response(s)

+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]	1) OK 2) ERROR
+CGDCONT?	+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]] [...]]
+CGDCONT=?	+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]] [...]]

Description

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command.

A special form of the set command, +CGDCONT= <cid> causes the values for context number <cid> to become undefined.

The read command returns the current settings for each defined context.

The test command returns values supported as a compound value. If the MT supports several PDP types, <PDP_type>, the parameter value ranges for

each <PDP_type> are returned on a separate line.

Defined values

<cid>: (PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<PDP_type>: (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP	Internet Protocol (IETF STD 5)
IPV6	Internet Protocol, version 6 (IETF RFC 2460)
PPP	Point to Point Protocol (IETF STD 51)

<APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
If the value is null or omitted, then the subscription value will be requested.

<PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP.
If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a dynamic address will be requested.

The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>: a numeric parameter that controls PDP data compression

0 - off (default if value is omitted)

1 – on

Other values are reserved.

<h_comp>: a numeric parameter that controls PDP header compression

0 - off (default if value is omitted)

1 – on

Other values are reserved.

NOTE: At present only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a

command will be provided to select one or more of these.

<pd1>, <pdN>: zero to N string parameters whose meanings are specific to the <PDP_type>

For PDP type OSP: IHOSS the following parameters are defined:

<pd1> = <host> the fully formed domain name extended hostname of the Internet host

<pd2> = <port > the TCP or UDP port on the Internet host

<pd3> = <protocol> the protocol to be used over IP on the Internet - "TCP" or "UDP

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Set APN for TWNGSM

AT+CGDCONT=1,”IP”,”internet”,,

OK

(2) Query +CGDCONT

AT+CGDCONT?

+CGDCONT: 1, “IP”, “internet”, “”,0,0

2.4.2 Quality of Service Profile (Request) +CGQREQ

Table: +CGQREQ parameter command syntax

Command	Possible Response(s)
+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]	1) OK 2) ERROR
+CGQREQ?	+CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]

+CGQREQ=?	+CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQREQ:<PDP_type>,(list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

Description

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQREQ command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQREQ= <cid> causes the requested profile for context number <cid> to become undefined.

The read command returns the current settings for each defined context.
The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).
The following parameters are defined in GSM 03.60 -
<precedence>: a numeric parameter which specifies the precedence class
<delay>: a numeric parameter which specifies the delay class

<reliability>: a numeric parameter which specifies the reliability class
<peak>: a numeric parameter which specifies the peak throughput class
<mean>: a numeric parameter which specifies the mean throughput class
If a value is omitted for a particular class then the value is considered to be unspecified.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGQREQ Support

```
AT+CGQREQ=?
+CGQREQ: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31)
OK
```

(2) Set +CGQREQ

```
AT+CGQREQ =1,1,1,1,1,1
OK
AT+CGQREQ?
+CGQREQ: 1,1,1,1,1,1
OK
```

2.4.3 Quality of Service Profile (Minimum acceptable) +CGQMIN

Table : +CGQMIN parameter command syntax

Command	Possible Response(s)
+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	1) OK 2) ERROR
+CGQMIN?	+CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]

+CGQMIN=?	+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) […]]

Description

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

The set command specifies a profile for the context identified by the (local) context identification parameter, <cid>. Since this is the same parameter that is used in the +CGDCONT and +CGDSCONT commands, the +CGQMIN command is effectively an extension to these commands. The QoS profile consists of a number of parameters, each of which may be set to a separate value.

A special form of the set command, +CGQMIN= <cid> causes the minimum acceptable profile for context number <cid> to become undefined. In this case no check is made against the negotiated profile.

The read command returns the current settings for each defined context.
The test command returns values supported as a compound value. If the MT supports several PDP types, the parameter value ranges for each PDP type are returned on a separate line.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

The following parameters are defined in GSM 03.60 -

<precedence>: a numeric parameter which specifies the precedence class
<delay>: a numeric parameter which specifies the delay class
<reliability>: a numeric parameter which specifies the reliability class
<peak>: a numeric parameter which specifies the peak throughput class
<mean>: a numeric parameter which specifies the mean throughput class

If a value is omitted for a particular class then this class is not checked.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGQMIN Support

```
AT+CGQMIN=?
+CGQMIN: "IP",(1-3),(1-4),(1-5),(1-9),(1-18,31)
OK
```

(2) Set +CGQMIN

```
AT+CGQMIN=1,1,1,1,1,1
OK

AT+CGQMIN?
+CGQMIN: 1,1,1,1,1,1
OK

AT+CGQMIN=1,0,1,1,1,1
OK
AT+CGQMIN?
+CGQMIN: 1,0,1,1,1,1
OK
```

2.4.4 GPRS attach or detach +CGATT

Table: +CGATT action command syntax

Command	Possible Response(s)
+CGATT= [<state>]	1) OK 2) ERROR
+CGATT?	+CGATT: <state>
+CGATT=?	+CGATT: (list of supported <state>s)

Description

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.25ter command state. If the MT is already in the requested state, the command is ignored and the OK response is returned. If the requested state cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command.

Any active PDP contexts will be automatically deactivated when the attachment state changes to detached.

The read command returns the current Packet Domain service state.
The test command is used for requesting information on the supported Packet Domain service states.

NOTE: This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

Defined Values

<state>: indicates the state of PS attachment
0 - detached
1 - attached
Other values are reserved and will result in an ERROR response to the execution command.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGATT Support

```
AT+CGATT=?
+CGATT: (0,1)
OK
```

(2) Set +CGATT

```
AT+CGATT=1
OK
```

AT+CGATT?
+CGATT: 1
OK

2.4.5 PDP context activate or deactivate +CGACT

Table: +CGACT action command syntax

Command	Possible Response(s)
+CGACT=[<state>[,<cid>[,<cid>[,…]]]]	1) OK 2) ERROR
+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
+CGACT=?	+CGACT: (list of supported <state>s)

Description

The execution command is used to activate or deactivate the specified PDP context (s). After the command has completed, the MT remains in V.25ter command state. If any PDP context is already in the requested state, the state for that context remains unchanged. If the requested state for any specified context cannot be achieved, an ERROR or +CME ERROR response is returned. Extended error responses are enabled by the +CMEE command. If the MT is not PS attached when the activation form of the command is executed, the MT first performs a PS attach and them attempts to activate the specified contexts. If the attach fails then the MT responds with ERROR or, if extended error responses are enabled, with the appropriate failure-to-attach error message.

If no <cid>s are specified the activation form of the command activates all defined contexts.
If no <cid>s are specified the deactivation form of the command deactivates all active contexts.

An active secondary context can exist if and only if the corresponding active primary context exists. If the primary PDP context associated with a PDP address is deactivated, all the associated secondary contexts are deactivated too and the data transfer for that PDP address is disabled.

The read command returns the current activation states for all the defined PDP contexts.

The test command is used for requesting information on the supported PDP context activation states.

NOTE. This command has the characteristics of both the V.25ter action and parameter commands. Hence it has the read form in addition to the execution/set and test forms.

Defined Values

<state>: indicates the state of PDP context activation

0 - deactivated

1 - activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGACT Support

```
AT+CGACT =?
+CGACT: (0,1)
OK
```

(2) Set +CGACT

```
AT+CGACT =1
OK

AT+CGACT?
+CGACT: 1,1
OK
```

2.4.6 Show PDP address +CGPADDR

Table: +CGPADDR action command syntax

Command	Possible response(s)
+CGPADDR=[<cid> [,<cid> [,…]]]	+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>,<PDP_addr> [...]]
+CGPADDR=?	+CGPADDR: (list of defined <cid>s)

Description

The execution command returns a list of PDP addresses for the specified context identifiers.

The test command returns a list of defined <cid>s.

Defined values

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_address>: a string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_address> is omitted if none is available.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGPADDR Support

```
AT+CGPADDR=?
+CGPADDR: (1)
OK
```

(2) Set +CGPADDR

```
AT+CGPADDR =0
```

+CGPADDR: 1
OK

AT+CGPADDR =2
+CGPADDR: 2
OK

AT+CGPADDR =1
+CGPADDR: 1
OK

2.4.7 RS network registration status +CGREG

Table: +CGREG parameter command syntax

Command	Possible response(s)
+CGREG=<n>	1) OK 2) ERROR
+CGREG?	1) +CGREG: <n>,<stat>[,<lac>,<ci>] 2) +CME ERROR: <err>
+CGREG=?	+CGREG: (list of supported <n>s)

Description

The set command controls the presentation of an unsolicited result code +CGREG: <stat> when <n>=1 and there is a change in the MT's GPRS network registration status, or code +CGREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.

NOTE. If the GPRS MT also supports circuit mode services, the +CREG command and +CREG: result code apply to the registration status and location information for those services.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <lac> and <ci> are returned only when <n>=2 and MT is registered in the network.

Defined values

<n>:

0 disable network registration unsolicited result code

1 enable network registration unsolicited result code +CGREG: <stat>

2 enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>]

<stat>:

0 not registered, ME is not currently searching an operator to register to
The MS is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED.
The GPRS service is disabled, the MS is allowed to attach for GPRS if requested by the user.

1 registered, home network
The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN.

2 not registered, but ME is currently trying to attach or searching an operator to register to
The MS is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The MS will start a GPRS attach as soon as an allowable PLMN is available.

3 registration denied
The MS is in GMM state GMM-NULL. The GPRS service is disabled, the MS is not allowed to attach for GPRS if requested by the user.

4 unknown

5 registered, roaming
The MS is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN.

<lac>: string type; two byte location area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)

<ci>: string type; two byte cell ID in hexadecimal format

Informative examples

- Initial the HyperTerminal
- Initial the MS

- AT Command

(1) Query +CGREG Support

AT+CGREG=?
+CGREG: (0-1)
OK

(2) Set +CGREG

AT+CGREG=1
OK
AT+CGREG?
+CGREG: 1, 0
OK

2.4.8 Select service for MO SMS messages +CGSMS

Table: +CGSMS parameter command syntax

Command	Possible Response(s)
+CGSMS=<service>	1) OK 2) ERROR
+CGSMS?	+CGSMS: <service>
+CGSMS=?	+CGSMS: (list of currently available <service>s)

Description

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The read command returns the currently selected service or service preference.

The test command is used for requesting information on the currently available services and service preferences.

Defined Values

<service>: a numeric parameter which indicates the service or service preference to be used

0 Packet Domain
1 circuit switched
2 Packet Domain preferred (use circuit switched if GPRS not

available)

3 circuit switched preferred (use Packet Domain if circuit switched not available)

Other values are reserved and will result in an ERROR response to the set command.

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

(1) Query +CGSMS Support

AT+CGSMS=?

+CGSMS: (0-3)

OK

(2) Set +CGSMS

AT+CGSMS=1

OK

AT+CGSMS?

+CGSMS: 1

OK

2.4.9 Request GPRS service 'D'

Table: D command syntax

Command	Possible Response(s)
D*<GPRS_SC>[*[<called_address>][*[<L2P>][*[<cid>]]]]	1) CONNECT 2) ERROR

Description

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and external PDN.

The V.25ter'D'(Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer2 protocol. The Mt shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

The detailed behavior after the online data state has been entered is dependent on the PDP type. It is described briefly in clauses 8 (for X.25) and 9 (for IP) of GSM 07.06. GPRS attachment and PDP context activation procedures may take place prior to or during the PDP startup if they have not already been performed using the +CGATT and +CGACT commands.

When the layer 2 protocol has terminated, either as a result of orderly shut down of the PDP or an error, the MT shall enter V.25ter command state and return the NO CARRIER final result code.
If<called_address> is supported and provided, the MT shall automatically set up a virtual call to the specified address after the PDP context has been activated.

If <L2P> and <cid> are supported, their usage shall be the same as in the +CGDATA command. The +CGDCONT, +CGQREQ, etc. commands may then be used in the modem initialization AT command string to set values for PDP type, APN, QoS etc.

If <L2P> is not supported of is supported but omitted, the MT shall use a layer 2 protocol appropriate to the PDP type.

If <cid> is not supported of is supported but omitted, the MT shall attempt to activate the context using:

(a) any information provided by the TE during the PDP startup procedure, e.g. the TE may provide a PDP type and/or PDP address to the MT, or
(b) a prior knowledge, e.g. the MT may implement only one PDP type, or
(c) using the 'Empty PDP type' (GSM 04.08). (No PDP address or APN shall be sent in this case and only one PDP context subscription record shall be present in the HLR for this subscriber.)

This command may be used in both normal and modem compatibility modes.

NOTE:

The dial string conforms to the syntax specified in GSM 02.30.

Defined Values

<GPRS_SC>: (GPRS Service Code) a digit string (value 99) which identifies a request to use the GPRS

<called_address>: a string that identifies thecalled party in the address space applicable to the PDP. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. Also, the character comma','. May be used as a substitute for the character period'.'.

[<host>][@[<port>][@[<protocol>]]]

where <host>, <port> and <protocol> are defined in the +CGDCONT description. For communications software that does not support arbitrary characters in the dial string, a numeric equivalent may be used. However, this should be avoided if at all possible.

<L2P>: a string which indicates the layer 2 protocol to be used (see +CGDATA command). For communications software that does not support arbitrary characters in the dial string, a numeric equivalent shall be used:

0	NULL
1	PPP
2	PAD
3	X25
9yyyy	M-xxxx

Other values are reserved and will result in an ERROR response to the set command.

NOTE:
V.250 (and certain communications software) does not permit arbitrary characters in the dial string. The <L2P> and <called_address> strings are therefore specified as containing digits (0-9) only.

<cid> : a digit string which specifies a particular PDP context definition (see +CGDCONT command).

2.5 H21 - specific AT Commands

2.5.1 Reset $QCPWRDN

Table: $QCPWRDN parameter command syntax

Command	Possible Response(s)
$QCPWRDN	OK

Description

This command is used to reset the module. The module is controlled by hardware. we do not support SW power off. (If you want to save power, please turn off RF to save power (AT+CFUN=4).)

Defined values

Listing the parameters and defining the values

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
/* power off the module */
AT$QCPWRDN
OK
```

2.5.2 List phonebook $BQVCARDL (VCARD version only)

Table: $BQVCARDL parameter command syntax

Command	Possible Response(s)
$BQVCARDL=<storage>	(1) $BQVCARDL:<storage>,(list of exist <index>s) OK (2) $BQVCARDERR: <err>
$BQVCARDL=?	$BQVCARDL:(< storage >)

Description

This command is used to list indexes with records exist.

Defined values

<storage>:

"SM": Abbreviated dialing numbers

<err>

0	Success
1	Out of memory
2	Invalid index
3	Invalid Storage
4	Invalid parameter
5	Unknown error
-32768	Timeout

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT$BQVCARDL="SM"
$BQVCARDL:"SM",1,2,3,4,5
OK

AT$BQVCARDL=?
$BQVCARDL:("SM")
OK
```

2.5.3 Read phonebook to VCARD format $BQVCARDR (VCARD version only)

Table: $BQVCARDR parameter command syntax

Command	Possible Response(s)
$BQVCARDR=<storage>,<index>	(1) $BQVCARDR: <index>,<len>,<VCARD content> OK (2) $BQVCARDERR: <err>
$BQVCARDR=?	$BQVCARDR:(<storage>),(list of supported

	<index>s)

Description

This command is used to read phonebook records to vcard format (vcard 2.0 standard format).

Defined values

<storage>:

“SM”: Abbreviated dialing numbers

<index>:

Integer type value in the range of location numbers of phonebook memory.

<err>

0	Success
1	Out of memory
2	Invalid index
3	Invalid Storage
4	Invalid parameter
5	Unknown error
-32768	Timeout

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT$BQVCARDR="SM",1
+CME ERROR: not found

AT$BQVCARDR="SM",2
$BQVCARDR: 2,113
BEGIN:VCARD
N;U8;QP:??;;;
TEL;V;H:0939234324
END:VCARD
OK
```

AT$BQVCARDR=?
$BQVCARDR:("SM"),(1-100)
OK

2.5.4 Delete phonebook record $BQVCARDD (VCARD version only)

Table: $BQVCARDD parameter command syntax

Command	Possible Response(s)
$BQVCARDD=<storage>,<act>[,<index>]	(1) OK (2) $BQVCARDERR: <err>
$BQVCARDD=?	$BQVCARDD:(<storage>),(list of supported <index>s)

Description

This command is used to delete phonebook records.

Defined values

<storage>:

"SM": Abbreviated dialing numbers

<act>:

0	record in specific index
1	All records

<index >:

Integer type value in the range of location numbers of phonebook memory.

<err>

0	Success
1	Out of memory
2	Invalid index
3	Invalid Storage
4	Invalid parameter
5	Unknown error
-32768	Timeout

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$BQVCARDD="SM",0,1 (Delete index = 1 record in SIM)
OK

AT$BQVCARDD="SM",1 (Delete all records in SIM)
OK

AT$BQVCARDD=?
$BQVCARDD:("SM"),(1-100)

2.5.5 Write phonebook record by vcard format $BQVCARDW (VCARD version only)

Table: $BQVCARDW parameter command syntax

Command	Possible Response(s)
$BQVCARDW =<storage>, <index>,<Name>,<Num>	$BQVCARDW:<index> OK

Description

This command is used to write phonebook record to SIM

Defined values

<storage>:

"SM": Abbreviated dialing numbers

<index >:

0: find proper empty column to write

Else: integer type value in the range of location numbers of phonebook memory.

<Name>:

Phone book data, the input format is UCS2 data,

<Phone> :

Phone number with ASCII code

<err>

0	Success
1	Out of memory
2	Invalid index
3	Invalid Storage
4	Invalid parameter
5	Unknown error
-32768	Timeout

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

```
AT$BQVCARDW="SM",0,"00540069006E0061","0920933828"
$BQVCARDW:5
OK

AT$BQVCARDR="SM",2
$BQVCARDR: 2,113
BEGIN:VCARD
N;U8;QP:??;;;
TEL;V;H:0939234324
END:VCARD
OK
```

2.5.6 Get PIN1, PIN2, PUK1, PUK2 remaining number $BQPVRF

Table: $BQPVRF parameter command syntax

Command	Possible Response(s)
$BQPVRF	(1) $BQPVRF: <remaining number> (2) ERROR

Description:

This command will return the remaining number of PIN1, PIN2, PUK1, and PUK2.

Defined values

None

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$BQPVRF

$BQPVRF =3,3,10,10

OK

2.5.7 Get current network status $BQNETMODE

Table: $BQNETMODE parameter command syntax

Command	Possible Response(s)
$BQNETMODE	$BQNETMODE: <mode
$BQNETMODE?	$BQNETMODE: <mode

Description

This command is used to query current network mode.

Defined values

<mode>:

0: no service
1: GSM
2: GPRS
3: EDGE
4: WCDMA
5: HSDPA
6: HSUPA
7: HSDPA and HSUPA

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$BQNETMODE

$BQNETMODE: 1 (GSM)

OK

AT$BQNETMODE?

$BQNETMODE: 5(HSDPA, 3.5G)
OK

2.5.8 Set/Query the counter of unread SMS status $BQMGC

Table: $BQMGC parameter command syntax

Command	Possible Response(s)
$BQMGC=<act>,<value>	OK
$BQMGC?	$BQMGC: <value>
$BQMGC=?	$BQMGC: (list supported <act>s), (list supported <value>s)

Description

This command is used to set or query message counter in SIM.

Defined values

<act>:

0 - reset the counter of unread SMS
1 - increase the counter of unread SMS
2 - decrease the counter of unread SMS

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$BQMGC?<CR>
$BQMGC: 1
OK

AT$BQMGC=1, 1<CR>
OK

AT$BQMGC?<CR>
$BQMGC: 2
OK

AT$BQMGC=0<CR>
OK

AT$BQMGC?<CR>
$BQMGC: 0
OK

2.5.9 Total flow of data that transmitted and received in device $QTTR

Table: $ QTTR parameter command syntax

Command	Possible Response(s)
$QTTR=<act>	(1) OK (2) $QTTR: (list of <Tx/Rx info>),<status> OK (3) ERROR
$QTTR=?	$QTTR: (list of support<act>)

Description

This command is used to query, reset, and store the total flow and current flow of data that transmitted and received in device.

Please reset counter (AT$QTTR=1) if it is full (status = 1).

Defined values

<act>:

1: reset the counter that use to save total data flow
2: current data flow
3: total data flow

<status>:

0: the counter use to save total data flow is not full.
1: the counter use to save total data flow is full.

<Tx/Rx info>:

Tx_Speed (the value will be “0” if <act=3>)
Rx_Speed (the value will be “0” if <act=3>)
Tx_Byte
Tx_Kilo

Tx_Mega
Tx_Giga
Tx_Tera
Tx_Peta
Tx_Exa
Rx_Byte
Rx_Kilo
Rx_Mega
Rx_Giga
Rx_Tera
Rx_Peta
Rx_Exa

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$QTTR=?
$QTTR: (1-3)
OK

AT$QTTR=2
$QTTR:1171,63,10, 731,0, 0, 0, 0, 0,3, 570, 0, 0, 0, 0, 0,0
OK
(Tx Speed: 1171)
(Tx Speed: 63)
(Tx Flow: 10B, 731K, 0M, 0G, 0T, 0P, 0E)
(Rx Flow: 3B, 570K, 0M, 0G, 0T, 0P, 0E)
(Full Status: 0)

AT$QTTR=3
$QTTR: 0,0,31, 49, 2, 0, 0, 0, 0,167, 311, 1, 0, 0, 0, 0, 0
OK
(Tx Speed: 0)
(Tx Speed: 0)
(Tx Flow: 31B, 49K, 2M, 0G, 0T, 0P, 0E)
(Rx Flow: 167B, 311K, 1M, 0G, 0T, 0P, 0E)
(Full Status: 0)

AT$QTTR=1
OK

2.5.10 List Messages $QMGL

Table: $QMGL Action Command Syntax (Text / PDU)

Command	Possible response(s)
$QMGL[=<stat>]	**1) if text mode (+CMGF=1) and command successful:** $QMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[<CR><LF> **2) if PDU mode (+CMGF=0) and command successful:** $QMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]] **3) otherwise:** ERROR
$QMGL=?	$QMGL: (list supported <stat>s)

Description

- Text mode (+CMGF=1)

Execution command returns messages with status value <stat> from message storage <mem1> to the TE. About text mode parameters in italics, refer command Show Text Mode Parameters +CSDH. If status of the message is 'received unread', status in the storage will not change to 'received read' (Means status still in ‘received unread’.). Message will change from unread to read status after send “AT+CMGR=<index>” command. If listing fails, final result code +CMS ERROR: <err> is returned.

NOTE: If the selected <mem1> can contain different types of SMs (e.g. SMS-DELIVERs, SMS-SUBMITs), the response may be a mix of the responses of different SM types. TE application can recognize the response format by examining the third response parameter.

- PDU mode (+CMGF=0)

Execution command returns messages with status value <stat> from preferred message storage <mem1> to the TE. Entire data units <pdu> are returned. If status of the message is 'received unread', status in the storage will not change to 'received read' (Means status still in ‘received unread’.). Message will change from unread to read status after send “AT+CMGR=<index>” command. If listing fails, final result code +CMS ERROR: <err> is returned.

Defined values

<stat> integer type in PDU mode (default 0), or string type in text mode (default "REC UNREAD"); indicates the status of message in memory; defined values:

0 "REC UNREAD" received unread message (i.e. new message)
1 "REC READ" received read message
2 "STO UNSENT" stored unsent message (only applicable to SMS)
3 "STO SENT" stored sent message (only applicable toSMS)
4 "ALL" all messages (only applicable to +CMGL command)

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command
  - Text mode

```
AT+CMGF=1
OK
AT$QMGL="ALL"
$QMGL: 0,"REC READ","+886910103076",,"08/11/05,09:16:05+32"
20081105, test 5
$QMGL: 1,"REC READ","+886910103076",,"08/11/05,14:50:17+32"
20081105, Test 8
OK
```

  - PDU mode

```
AT+CMGF=0
OK
AT$QMGL=4
$QMGL: 0,1,,33
```

07918896230480150 40C9188960101036700008011509061502310321 80C
178BC16A2C10BD3CA7836A
$QMGL: 1,1,,33
07918896230480150 40C9188960101036700008011504105712310321 80C
178BC16A2C10B53CA78370
OK

2.5.11 Chang GRPS Anite GCF NV item (947) $QGPRSANI

Table: $QGPRSANI parameter command syntax

Command	Possible Response(s)
$QGPRSANI=<act>	OK
$QGPRSANI?	$QGPRSANI: <act>
$QGPRSANI=?	$QGPRSANI: (list supported <act>s)

Description

This command is used to change GRPS Anite GCF NV (947) item.

Defined values

<act>:

0 – Disable.

1 – Enable

Informative examples

- Initial the HyperTerminal
- Initial the MS
- AT Command

AT$QGPRSANI=0<CR>
OK

AT$QGPRSANI?<CR>
$QGPRSANI: 0
OK

2.6 Error Message

2.6.1 Mobile Equipment error result code +CME ERROR: <unsolicited><p>

Table: +CME ERROR parameter Syntax

Command	Possible response(s)
	Wrong: +CME ERROR: <err>

Description

The operation of +CME ERROR:<err> result code is similar to the regular ERROR result code: if +CME ERROR:<err> is the result code for any of the commands in a command line, none of the following commands in the same command line is executed.(neither ERROR nor OK result code shall be returned as a result of a completed command line execution). The format of <err> can be either numeric or verbose. This is set with command +CMEE.

Defined value

Code of <err>	**Meaning**
0	Phone failure
1	No connection to phone
2	phone-adaptor link reserved
3	Operation not allowed
4	Operation not supported
5	PH-SIM PIN required
6	PH-FSIM PIN required
7	PH-FSIM PUK required
10	SIM not inserted
11	SIM PIN required
12	SIM PUK required
13	SIM failure
14	SIM busy
15	SIM wrong
16	Incorrect password
17	SIM PIN2 required
18	SIM PUK2 required
20	Memory full

21	Invalid index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service
31	Network timeout
32	Network not allowed – emergency calls only
33	Network busy
34	Network operation failed
35	Network incorrect password
36	PLMN no service
37	Hardware failure
38	ACM Max exceeded
39	FDN not matched
40	Network personalization PIN required
41	Network personalization PUK required
42	Network subset personalization PIN required
43	Network subset personalization PUK required
44	Service provider personalization PIN required
45	Service provider personalization PUK required
46	Corporate personalization PIN required
47	Corporate personalization PUK required
51	Voice memo memory problem
52	Voice dial training fail
53	Voice dial need more sample
54	Voice dial similar sample exist
55	Voice dial recognize fail
56	Voice erase not finished
57	Voice erase finished
58	Voice erase restart
100	Unknown
103	illegal MS
106	illegal ME
107	GPRS service not allowed

111	PLMN not allowed
112	Location not allowed
113	Roaming not allowed in Location Area
132	GPRS service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
150	invalid module class
512	fail to abort
513	ACM reset needed

2.6.2 Message Service Failure Result Code +CMS ERROR: <unsolicited><p>

Table: +CMS ERROR parameter Syntax

Command	Possible response(s)
	Wrong: +CMS ERROR: <err>

Description

Final result code +CMS ERROR: <err> indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same command line is executed. Neither ERROR nor OK result code shall be returned. ERROR is returned normally when error is related to syntax or invalid parameters.

Defined Values

0…127	GSM 04.11, annex E-2 values
1	Unassigned (unallocated) number
8	Operator determined barring
10	Call barred
21	Short message transfer rejected
27	Destination out of service
28	Unidentified subscriber
29	Facility rejected
30	Unknown subscriber
38	Network out of order
41	Temporary failure

42	Congestion
47	Resources unavailable, unspecified
50	Requested facility not subscribed
69	Requested facility not implemented
81	Invalid short message transfer reference value
95	Invalid message, unspecified
96	Invalid mandatory information
97	Message type non-existent or not implemented
98	Message not compatible with short message protocol state
99	Information element non-existent or not implemented
111	Protocol error, unspecified
127	Interworking, unspecified
128…255	TP Failure-Cause(TP-FCS) values according to GSM 03.40
128	Telematic interworking not supported
129	Short message Type 0 not supported
130	Cannot replace short message
143	Unspecified TP-PID error
144	Data coding scheme not supported
145	Message class not supported
159	Unspecified TP-DCS error
160	Command cannot be actioned
161	Command unsupported
175	Unspecified TP command error; either the message type identifier is other than SMS command, or the service center address is corrupt
176	TPDU not supported
192	SC busy
193	No SC subscription
194	SC system failure
195	Invalid SME address
196	Destination SME barred
208	SIM SMS storage full
209	No SMS storage capability exceeded
210	Error in MS
211	Memory capacity exceeded
255	Unspecified error cause
300	ME failure

301	SMS service of ME reserved; the phone is busy sending a message
302	Operation not allowed
303	Operation not supported
304	Invalid PDU mode parameter
305	Invalid text mode parameter
310	SIM not inserted
311	SIM PIN necessary
312	SIM PIN necessary for PH-SM
313	SIM failure
314	SIM busy
315	SIM wrong
316	SIM PUK required
317	SIM PIN2 required
318	SIM PUK2 required
320	Memory failure; write of SMS to specified memory failed
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout
500	Unknown error
…511	Other values within the range from 256 to 511 are reserved
512	Fail to abort
513	ACM reset needed
520	Invalid parameter in primitive
521	Entity is busy
523	SMS service not supported on SIM
555	Memory full, and at least one SMS in SC

2.6.3 Extended Error result code +EXT ERROR: <unsolicited><p>

Table: +EXT ERROR parameter Syntax

Command	Possible response(s)
	Wrong: +EXT ERROR: <err>

Defined Values

Code of <err>	Meaning
1	Parameter not allowed
2	Data corrupted
3	Internal error
4	Call table full
5	Service table full
6	Call not found
7	No data-call supported
8	One call on hold
9	Hold call not supported for this type
10	Number not allowed by FDN
11	Number not allowed by BDN
12	Parallel USSD not supported
13	Fax minimum speed condition
14	Conflict with command details
15	Error unknown
100	Other error

2.6.4 UMTS specific cause values for call control +CEER: <unsolicited><p>

See 3GPP 24.008 Annex H for more detail information.

Defined Values

ID	Meaning
1	unassigned number
3	no route to destination
6	channel unacceptable
8	operator determined barring
16	normal call clearing
17	user busy
18	no user responding
19	user alerting, no answer
21	call rejected
22	number changed
26	non selected user clearing
27	destination out of order

28	invalid number format
29	facility rejected
30	response to status enquiry
31	normal, unspecified
34	no channel available
38	network out of order
41	temporary failure
42	switching equipment congestion
43	access information discarded
44	requested channel unavailable
47	recources unavailable
49	quality of service unavailable
50	requested facility unsubscribed
55	incoming calls barred within CUG
57	bearer capability not authorized
58	bearer capability not available
63	service not available
65	bearer service not implemented
68	ACM reached ACM maximum
69	facility not implemented
70	only restricted bearer cap. avail.
79	service not implemented
81	invalid TI
87	no member of CUG
88	incompatible destination
91	invalid transit network selection
95	incorrect message
96	invalid mandatory information
97	message type not implemented
98	message type incompatible
99	info element not implemented
100	conditional info element error
101	message incompatible
102	recovery on time expiry
111	protocol error
127	interworking error
200	bearer service not available

201	no TI available
202	timer 303 expiry
203	establishment failure
210	no error
211	operation failed
212	timeout
213	bearer service not compatible