iTegno 38XX GPRS Modem

AT Commands Guide

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For enquiries, please contact:

iWOW Connections Pte Ltd
1 Lorong 2 Toa Payoh, #04-01
Yellow Pages Building
Singapore 319637
Office: (65) 6748 8123
Fax : (65) 6748 2668
http://www.iwow.com.sg

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1 INTRODUCTION

1.1 Document Scope

This document describes the AT commands used for interfacing between a host application and the iTegno 38XX modems to manage GSM or GPRS related events and services. The information in this document is relevant to the iTegno 38XX modems.

1.2 Abbreviations/ Conventions

The following abbreviations are used in this document:

ME	Mobile Equipment
	Refers to the GSM engines
MS	Mobile Station
	Refers to the GSM engines
MT	Mobile Terminal
	Refers to mobile device in wireless networks technology
DTE	Data Terminal Equipment
	Refers to the host terminal/ application in control
DCE	Data Communication Equipment
	Refers to the device controlled by the host
“Outgoing call”	Refers to calls made from a GSM mobile station to the network
“Incoming call”	Refers to calls made from the network to the GSM mobile station
CR	Carriage Return
	End of line return to beginning of same line (precedes <LF>)
LF	Line Feed
	Move to next line
TE	Terminal Equipment
	Refer to DTE
TA	Terminal Adaptor
	Refers to a device that connects a terminal to the network

1.3 References

- TS 101 356 V6.1.0 (1998-07) GSM 07.60 Version 6.1.0 Release 1997
- TS 101 113 V7.5.0 (2000-07) GSM 02.60 Version 7.5.0 Release 1998
- ITU-T V.250
- ITU-T V.30
- ETSI IS 100 585 V7.2.1 (1999-07) GSM 07.05 Version 7.0.1 Release 1998
- 3GPP TS 07.07 V7.8.0 (2003-03)
- Digital Cellular Telecommunications System; Technical Realization of the Short Message Service (SMS) Point-to-Point (PP) (GSM 03.40)

1.4 AT Commands Features

Each command always begin with “AT” or “at”; and ends with a command line enter or a <CR> character.

Commands are usually followed by at least a minimal response of “OK” if the command line has been executed successfully, or “ERROR” if the command line has errors or is not executed successfully (becomes an extended “CME ERROR” or “CMS ERROR” if the extended error report in turned on).

The default syntax of a response from the module follows the form of “<CR><LF><response><CR><LF>”. Throughout this document, references to the <CR><LF> are omitted intentionally and should be assumed to be present unless indicated otherwise.

Several AT commands may be combined on the same command line. This eliminates the need to type “AT” or “at” repeatedly for each command and is only needed once at the beginning of the command line. The semicolon “;” must be used as a command separator. Note that appending AT commands should generally be avoided, as the expected response might not be received.

To control the iTegno 38XX modems, one can simply send the AT commands via its serial interface. The serial link handler is set with the following default values (factory settings):

115200 bps baud rate; 8 bits data; 1 stop bit; no parity; hardware (RTS/CTS) flow control

2 GENERAL COMMANDS

2.1 Request Manufacturer Identification +CGMI

Description:

This command gives the manufacturer identification.

Syntax:

AT+CGMI

Command	Possible response(s)
AT+CGMI	<manufacturer> OK
AT+CGMI	iWOW OK

2.2 Request Model Identification +CGMM

Description:

This command gives the manufacturer model identification.

Syntax:

AT+CGMM

Command	Possible response(s)
AT+CGMM	<model> OK
AT+CGMM	TR-800 OK

2.3 Request Firmware Version +CGMR

Description:

This command gives the firmware version name.

Syntax:

AT+CGMR

Command	Possible response(s)
AT+CGMR	<firmware version> OK
AT+CGMR	AB_02_00_30N_DEF000 OK

2.4 Request Product Serial Number Identification +CGSN

Description:

This command gives the IMEI (International Mobile station Equipment Identity) of the GSM module.

Syntax:

AT+CGSN

Command	Possible response(s)
AT+CGSN	<IMEI number> OK
AT+CGSN	446019197507590 OK

2.5 Select TE Character Set +CSCS

Description:

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

Syntax:

AT+CSCS=<chset>

Command	Possible response(s)
AT+CSCS=<chset>	OK
AT+CSCS?	+CSCS: <chset>
AT+CSCS=?	+CSCS: (list of supported <chset>s)
AT+CSCS="GSM"	OK
AT+CSCS?	+CSCS: "GSM" OK
AT+CSCS=?	+CSCS: "GSM","IRA","PCCP437","PCDN","8859-1","HEX","UCS2" OK

Defined values

<chset>:

GSM	=	GSM default alphabet
IRA	=	International reference alphabet (ITU-T T.50 [13])
PCCP437	=	PC character set Code Page 437
PCDN	=	PC Danish/Norwegian character set
8859-1	=	ISO 8859 Latin 1 (1-6) character set
HEX	=	character strings consist only of hexadecimal numbers; no conversions to the original ME character set shall be done.
UCS2	=	16-bit Unicode character

2.6 Request International Mobile Subscriber Identity +CIMI

Description:

This command is used to identify the IMSI (International Mobile Subscriber Number) of an individual SIM which is attached to ME.

Syntax:

AT+CIMI

Command	Possible response(s)
AT+CIMI	<IMSI> OK

2.7 Select Wireless Network +WS46

Description:

This command is used to indicate the networks in which TA can operate.

Syntax:

AT+WS46?

Command	Possible response(s)
AT+WS46?	<n> OK
AT+WS46=?	+WS46: (12) OK
AT+WS46?	+WS46: 12 OK

Defined Values

<n>

12 = GSM Digital Cellular

2.8 Card Identification +CCID

Description:

This command reads the EF-CCID file on the SIM card.

Syntax:

AT+CCID

Command	Possible Response(s)
AT+CCID *Note: Get card ID*	+CCID:"89650105102102732O9" OK
AT+CCID? *Note: Get current value*	+CCID:"89650105102102732O9" OK
AT+CCID=? *Note: Get possible value*	OK *Note: No parameter but this command is valid*

Note:

If there is no EF-CCID file present on the SIM, the +CCID answer will not be sent but the OK message will be returned.

2.9 Repeat Previous Command A/

Description:

This command repeats the previous executed command. A/ command cannot be repeated.

Syntax:

A/

Command	Possible response(s)
A/	OK *Note: Repeat last command*

2.10 Set Real Time Clock +CCLK

Description:

This command set the real time clock of the module. The time-zone set acts as additional information to user.

Syntax:

AT+CCLK=”YY/MM/DD,HH:MM:SS”

Command	Possible Response(s)
AT+CCLK= “YY/MM/DD,HH:MM:SS”	OK
AT+CCLK= “04/12/01,12:45:00”	OK
AT+CCLK?	+CCLK: “04/12/01,12:45:20” OK

2.11 Power Off +CPOF

Description:

This command stops the GSM software stack as well as the hardware layer.

Syntax:

AT+CPOF=<n>

Command	Possible response(s)
AT+CPOF=1 *Note: Power switch off*	OK

Defined Values

<n>

1 = Power Switch off

3 CALL CONTROL COMMANDS

3.1 Select Type of Address +CSTA

Description:

This command selects the type <type> of address octet in integer for further dialing commands (D) according to GSM specifications. Default 145 when dialing string includes international access code character "+", otherwise 129 (please refer GSM 04.08 [8] sub-clause 10.5.4.7).

Syntax:

AT+CSTA=<type>

Command	Possible response(s)
AT+CSTA=<type>	OK
AT+CSTA?	+CSTA: <type> OK
AT+CSTA=?	+CSTA: (list of supported <type>s) OK
AT+CSTA=145	OK
AT+CSTA=?	+CSTA: (129,145) OK

Defined Values

<type>

129 = ISDN / telephony numbering plan, national / international unknown

145 = ISDN / telephony numbering plan, international number

3.2 Dial Command D

Description:

This command is used to initiate voice, data or fax call. Semicolon character shall be added when voice call is initiated.

Syntax:

ATD<str>[;]	=	originate call to phone number
ATD>*mem*<n>[;]	=	originate call to phone number in memory *mem* entry location <n> (*mem* location is selected by +CPBS command)
ATD><n>[;]	=	originate call to phone number in entry location <n> (*mem* location is pre-selected by +CPBS command)
ATD>*mem*"<name>"[;]	=	originate call to phone number of <name> in memory <mem> (*mem* location is pre-selected by +CPBS command)

Command	**Possible response(s)**
ATD<str>;	OK *Note: Voice call is successful*
ATD<str>	Connect *Note: Data call is successful*
	No Answer *Note: Hang up is detected after a fixed network time-out*
	No Carrier *Note: Call setup failed or remote user release call*
ATD96666666;	OK
ATD>AD91;	OK *Note: Voice call from SIM phonebook number stored at location 91*
AT+CPBS="MT"	OK *Note: SIM location selected*
ATD>1;	OK *Note: Voice call from location 1 with selected phonebook memory using +CPBS command*

ATD>SM"Ken";	OK

Defined Values

<str> = string type value, which should equal to an alphanumeric field in at least one phonebook entry in the searched memories; used character set should be the one selected with Select TE Character Set +CSCS

<n> = integer type memory location should be in the range of locations available in the memory used

> = indicate calling from phone memory location or phone number in entry location

mem = "EN","BD","FD","LD","LR","AD","SD","LM","AF"

3.3 Pulse Dialing P

Description:

This command causes subsequent dial digits to be signaled using DTMF.

Syntax:

ATDP

Command	Possible response(s)
ATD<sting>P<string>;	OK
ATD67488123P123;	OK *Note: Voice Call to 67488123 followed by Pulse dial to extension 123*

3.4 Answer a Call A

Description:

This command accepts call after RING or +CRING indication is given.

Syntax:

ATA

Command	Possible response(s)
	RING *Note: Incoming call*
ATA	OK *Note: voice call accepted*
ATA	Connect *Note: data call accepted*
ATA	Connect <text> *Note: data call accepted*

Note:

For more detailed information, please refer to Connect response.

3.5 Hook Control H

Description:

The ATH (or ATH0) command terminates all calls in progress. The **specific** ATH1 command disconnects the current outgoing call, only in dialing or alerting state. It can be useful in the case of multiple calls.

Syntax:

ATH<n>

Command	Possible response(s)
ATH	OK *Note: All calls are released*
ATH0	*OK* *Note: All calls released*

ATH1	*OK* *Note: Outgoing call if any is released*

Defined Values

<n>

0 = Ask for disconnection (default value)

1 = Ask for outgoing call disconnection

3.6 Rings Before Automatic Answer S0

Description:

This S0 parameter determines and controls the product's automatic answering mode.

Syntax:

ATS0=<value>

Command	Possible response(s)
ATS0=2 *Note: Automatic answer after 2 rings*	OK
ATS0=?	S0:(0-255) OK
ATS0? *Note: Current value*	002 OK *Note: always 3 characters padded with zeros*
ATS0=0 *Note: No automatic answer (default)*	OK
ATS0=2 *Note: Automatic answer after 2 rings*	OK

Defined Values

<value> = Number of rings before automatic answer (3 characters padded with zeros is displayed). Range of values is 0 to 255.

3.7 Pause Before Blind Dialing S6=

Description:

This parameter specifies the amount of time, in seconds, that the DCE shall wait between connecting to the line and signaling call addressing information to network (dialing), when dial tone detection is not implemented or enabled.

Syntax:

ATS6=<value>

Command	Possible response(s)
ATS6=<value>	OK
ATS6=2	OK *Note: wait 2 seconds before blind dialing*
ATS6?	002 OK

Defined Values

<value>

2 to 10 = Number of seconds to wait before blind dialing

3.8 Wait for Completion S7

Description:

This parameter specifies the amount of time, in seconds, that the DCE shall allow between either answering a call (automatically or by the A command) or completion of signaling of call addressing information to network (dialing), and establishment of a connection with the remote DCE. If no connection is established during this time, the DCE disconnects from the line and returns a result code indicating the cause of the disconnection

Syntax:

ATS7=<value>

Command	Possible response(s)
ATS7=<value>	OK
ATS7=60	OK *Note: call must be answered in 60 seconds*
ATS7?	060 OK

Defined Values

<value>

1 to 255 = Number of seconds in which connection must be established or call will be disconnected.

3.9 Dial Pause S8

Description:

This parameter specifies the amount of time, in seconds, that the DCE shall pause, during signaling of call addressing information to the network (dialing), when "**,**" (comma) dial modifier is encountered in a dial string.

Syntax:

ATS8=<n>

Command	Possible response(s)
ATS8=<n>	OK
ATS8=2	OK *Note: DCE pauses two seconds when "," is encountered.*
ATS8?	002 OK

Defined Values

<n>

0 = DCE does not pause when “,” encountered in dial string

1 to 255 = Number of seconds to pause

3.10 Hang Up Delay S10

Description:

This parameter specifies the amount of time (in tenths of a second) that the DCE will remain connected to the line (off-hook) after the DCE has indicated the absence of received line signal. If the received line signal is once again detected before the time specified in **S10** expires, the DCE remains connected to the line and the call continues.

Syntax:

ATS10=<value>

Command	Possible response(s)
ATS10=<value>	OK
ATS10=1	OK *Note: 1 second delay*
ATS10?	001 OK

Defined Values

<value>

1 to 254 = Number of tenths of a second of delay

3.11 Call Mode +CMOD

Description:

This command is used to select the call mode of further dialing commands (D) or for next answering command (A). This call mode will be set to zero after a successfully completed alternating mode call. It shall be set to zero also after a failed answering.

Syntax:

AT+CMOD=<mode>

Command	Possible response(s)
AT+CMOD=<mode>	OK
AT+CMOD?	+CMOD: <mode> OK
AT+CMOD=?	+CMOD: (list of supported <mode>s) OK
AT+CMOD=0	OK *Note: Single mode selected*
AT+CMOD?	+CMOD: 0 OK
AT+CMOD=?	+CMOD: (0-3) OK

Defined Values

<mode>

0 = single mode

1 = alternating voice/fax (teleservice 61)

2 = alternating voice/data (bearer service 61)

3 = voice followed by data (bearer service 81)

3.12 Hang Up Call +CHUP

Description:

This command causes the TA to hang up the current GSM call of the ME.

Syntax:

AT+CHUP

Command	Possible response(s)
AT+CHUP	OK *Note: Hang up current GSM call*

3.13 Extended Error Report +CEER

Description:

This command gives text <report> of a call release when last call setup failed.

Syntax:

AT+CEER

Command	Possible response(s)
AT+CEER	+CEER: <report> OK

Defined Values

<report> = the failure in the last unsuccessful call setup (originating or answering) or in-call modification, the last call release, the last unsuccessful GPRS attach or unsuccessful PDP context activation, the last GPRS detach or PDP context deactivation

3.14 DTMF and Tone Generation +VTS

Description:

This command is to transmit DTMF tones on the GSM network when an active call exists.

Syntax:

AT+VTS=<DTMF>,<duration>

Command	Possible response(s)
AT+VTS=<DTMF>	
AT+VTS=?	(list of supported <tone1>s),(list of supported <tone2>s),(list of supported <duration>s)
AT+VTS=0	OK *Note: command valid*
AT+VTS=?	+VTS: (0-9, #,*,A-D),(1-255)
AT+VTS=A;+VTS=B;+VTS=# *Note: to send tone in AB# sequence*	OK *Note: command valid*

Defined Values

<DTMF> = A single ASCII character in the set 0-9, #,*,A-D.
<duration> = Tone Duration in units of 100ms.

3.15 Single Numbering Scheme +CSNS

Description:

This command selects the bearer to be used when MT single numbering scheme call is established

Syntax:

AT+CSNS=<mode>

Command	Possible response(s)
AT+CSNS=<mode>	OK
AT+CSNS?	+CSNS: <mode>
AT+CSNS=?	+CSNS: (list of supported <mode>s)
AT+CSNS=0 *Note: Command valid*	OK
AT+CSNS?	+CSNS: 0 OK
AT+CSNS=?	+CSNS: (0 - 7)

Defined Values

<mode>:

0 = voice
1 = alternating voice/fax, voice first (TS 61)
2 = fax (TS 62)
3 = alternating voice/data, voice first (BS 61)
4 = data
5 = alternating voice/fax, fax first (TS 61)
6 = alternating voice/data, data first (BS 61)
7 = voice followed by data (BS 81)

4 NETWORK SERVICE RELATED COMMANDS

4.1 Signal Quality +CSQ

Description:

This command returns received signal strength indication <rssi> and channel bit error rate <ber> from the ME.

Syntax:

AT+CSQ

Command	Possible response(s)
AT+CSQ	+CSQ: <rssi>,<ber> *+CME ERROR: <err>*
AT+CSQ=?	+CSQ: (list of supported <rssi>s),(list of supported <ber>s)
AT+CSQ	+CSQ: 31,99 OK

Defined Values

<rssi>

0 = -113 dBm or less

1 = -111 dBm

2…30 = -109... -53 dBm

31 = -51 dBm or greater

99 = not known or not detectable

<ber> (in percent)

0…7 = as RXQUAL values in the table in GSM 05.08 [20] subclause 8.2.4

99 = not known or not detectable

4.2 Operator Selection +COPS

Description:

This command is used to select and register the GSM network operator using manual mode, automatic and manual/automatic mode. <mode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <oper> (it shall be given in format <format>).The selected operator name format shall apply to further read commands (+COPS?). <mode>=2 forces an attempt to deregister from the network. The selected mode affects all further network registration (e.g. after <mode>=2, ME shall be unregistered until <mode>=0 or 1 is selected). The read command returns the current mode and the currently selected operator.

Syntax:

AT+COPS=[<mode>[,<format> [,<oper>]]]

Command	**Possible response(s)**
AT+COPS=[<mode>[,<format> [,<oper>]]]	+CME ERROR: <err>
AT+COPS?	+COPS: <mode>[,<format>,<oper>] +CME ERROR: <err>
AT+COPS=?	+COPS: [list of supported (<stat>,long alphanumeric <oper> ,short alphanumeric <oper>,numeric <oper>)s] [,,(list of supported <mode>s),(list of supported <format>s)] +CME ERROR: <err>
AT+COPS=?	+COPS: (2,"SGP M1-GSM","M1-GSM","52503"),(3,"STARHUB-SGP","STARHUB","52505"),(3,"SingTel-G9","SingTel","52501") *Note: List of detectable networks*
AT+COPS=0 *Note: Automatic registration to home network*	OK
AT+COPS=3,1 *Note: Set <format> short format alphanumeric*	OK
AT+COPS?	+COPS: 0,1,"M1-GSM" OK *Note: Automatic mode, short format alphanumeric*
AT+COPS=1,2,52505	+CME ERROR: 32 *Note: Network registration not allowed, Emergency calls only*

Defined Values

<mode>

0 = automatic (<oper> field is ignored)

1 = manual (<oper> field shall be present)

2 = deregister from network

3 = set only <format> (for read command +COPS?), do not attempt registration/ deregistration (<oper> field is ignored); this value is not applicable in read command response manual/automatic (<oper> field shall be present); if manual selection fails, automatic mode (<mode>=0) is entered

<format>

0 = long format alphanumeric <oper>

1 = short format alphanumeric <oper>

2 = numeric <oper>

<oper> = operator identifier

<stat>

0 = unknown

1 = available

2 = current

3 = forbidden

4.3 Network Registration +CREG

Description:

This command is used to get the network registration status of ME

Syntax:

AT+CREG=<n>

Command	Possible response(s)
AT+CREG=<n>	OK
AT+CREG?	+CREG: <n>,<stat>[,<lac>,<ci>] OK
AT+CREG=?	+CREG: (list of supported <n>s)
AT+CREG=?	+CREG: (0-2) OK

AT+CREG=0 *Note:Disable network registration unsolicited result code*	OK
AT+CREG?	+CREG:0,1 OK *Note: registered to home network*

Defined Values

<n>

0 = disable network registration unsolicited result code

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

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

<stat>

0 = not registered, ME is not currently searching a new operator to register to

1 = registered, home network

2 = not registered, but ME is currently searching a new operator to register to

3 = registration denied

4 = unknown

5 = registered, roaming

<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

4.4 Preferred Operator List +CPOL

Description:

This command is used to edit the SIM preferred list of networks. Execute command writes an entry in the SIM list of preferred operators.

Read command returns all used entries from the SIM list of preferred operators.

Syntax:

AT+CPOL=[<index>][,<format>[,<oper>]]

Command	Possible response(s)
AT+CPOL=[<index>][, <format>[,<oper>]]	*+CME ERROR: <err>*
AT+CPOL?	+CPOL: <index1>,<format>,<oper1> [<CR><LF>+CPOL: <index2>,<format>,<oper2> [...]] +CME ERROR: <err>
AT+CPOL=?	+CPOL: (list of supported <index>s),(list of supported <format>s) +CME ERROR: <err>
AT+CPOL? *Note: Ask for preferred list of networks stored in SIM*	+CPOL: 1,2,22801 +CPOL: 2,2,52018 +CPOL: 3,2,23415 OK *Note: Preferred network list in numeric*
AT+CPOL=,1 *Note: Set format to short format alphanumeric*	OK
AT+CPOL?	+CPOL: 1,1,"SWISS" +CPOL: 2,1,"DTAC" +CPOL: 3,1,"VODA OK *Note: Preferred network list in short format alphanumeric*
AT+CPOL=4,1,"3GSM" *Note: Add a new network to the list*	OK *Note: Command valid*

Defined Values

<index*n*>	=	integer type; the order number of operator in the SIM preferred operator list
<format>		
0	=	long format alphanumeric <oper>
1	=	short format alphanumeric <oper>
2	=	numeric <oper>
<oper *n*>	=	string type; <format> indicates if the format is alphanumeric or numeric (see \ +COPS)

4.5 Read Operator Names +COPN

Description:

This command returns the list of operator names from the ME. Each operator code <numeric*n*> that has an alphanumeric equivalent <alpha*n*> in the ME memory shall be returned.

Syntax:

AT+COPN

Command	Possible response(s)
AT+COPN	+COPN: <numeric1>,<alpha1> [<CR><LF>+COPN: <numeric2>,<alpha2> [...]] +CME ERROR: <err>
AT+COPN=?	OK
AT+COPN	… +COPN: 73602,"MOVIL-E" +COPN: 74401,"HOLA PARAGUAY" +COPN: 74601,"ICMS SR" +COPN: 74602,"SR.TELESUR.GSM" OK
AT+COPN?	+CME ERROR: <err>

Defined Values

<numeric*n*> = string type; operator in numeric format (see +COPS)

<alpha*n*> = string type; operator in long alphanumeric format (see +COPS)

5 SECURITY COMMANDS

5.1 Enter PIN +CPIN

Description:

This command is used to enter ME a password that is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards ME and an error message is returned to TE.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin, <newpin>, is used to replace the old pin in the SIM.

Read command returns an alphanumeric string indicating whether some password is required or not. It is up to application to validate the PIN status every time ME is reset or power on.

Syntax:

AT+CPIN=”<pin>”,[“<newpin>”]

Command	**Possible response(s)**
AT+CPIN=<”pin”>[,<”newpin”>]	+CME ERROR: <err>
AT+CPIN?	+CPIN: <code> +CME ERROR: <err>
AT+CPIN=?	
AT+CPIN?	+CPIN: SIM PIN
AT+CPIN=”1234” *Note: enter SIM PIN*	OK *Note: SIM PIN is correct*
AT+COPS=0 *Note: After entering SIM PIN, user must initiate auto-register to network to register back onto the network*	OK

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 PUK	=	ME is waiting SIM PUK to be given
PH-SIM PIN	=	ME is waiting phone-to-SIM card password to be given
PH-FSIM PIN	=	ME is waiting phone-to-very first SIM card password to be given
PH-FSIM PUK	=	ME is waiting phone-to-very first SIM card unblocking password 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 its operation)
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 PIN2 are not entered right after the failure, it is recommended that ME does not block its operation)
PH-NET PIN	=	ME is waiting network personalization password to be given
PH-NET PUK	=	ME is waiting network personalization unblocking password to be given
PH-NETSUB PIN	=	ME is waiting network subset personalization password to be given
PH-NETSUB PUK	=	ME is waiting network subset personalization unblocking password to be given
PH-SP PIN	=	ME is waiting service provider personalization password to be given
PH-SP PUK	=	ME is waiting service provider personalization unblocking password to be given
PH-CORP PIN	=	ME is waiting corporate personalization password to be given
PH-CORP PUK	=	ME is waiting corporate personalization unblocking password to be given

5.2 Facility Lock +CLCK

Description:

This is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions.

Syntax:

AT+CLCK=<fac>,<mode>[,<"passwd">[,<class>]]

Command	Possible response(s)
AT+CLCK=<fac>,<mode>[,<"passwd">[,<class>]]	*+CME ERROR: <err>* when <mode>=2 and command successful: +CLCK: <status>[,<class1> [<CR><LF>+CLCK: <status>,<class2> [...]]
AT+CLCK=?	+CLCK: (list of supported <fac>s) +CME ERROR: <err>
AT+CLCK="SC",1,"1234"	OK *Note: SIM lock enabled*
AT+CPIN="1234"	OK *Note: Correct PIN entered*
AT+CLCK="SC",0,"1234"	OK *Note: SIM lock disabled*
AT+CLCK="AO",2 *Note: Query BAOC status*	+CLCK: 1,1 OK *Note: BAOC is active*
AT+CLCK="SC",2 *Note: Query SIM Card's status*	+CLCK: 0 OK
AT+CLCK=?	+CLCK: ("SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PS","PN","PU","PP","PC","PF","AL") OK

Defined Values

<fac> values reserved by the present document:

"SC"	=	SIM (lock SIM card) (SIM asks password in ME power-up and when this lock command issued)
"AO"	=	BAOC (Barr All Outgoing Calls)
"OI"	=	BOIC (Barr Outgoing International Calls)
"OX"	=	BOIC-ex HC (Barr Outgoing International Calls except to Home Country)
"AI"	=	BAIC (Barr All Incoming Calls)
"IR"	=	BIC-Roam (Barr Incoming Calls when Roaming outside the home country)
"AB"	=	All outgoing barring services (applicable only for <mode>=0)
"AG"	=	All outgoing barring services (applicable only for <mode>=0)
"AC"	=	All incoming barring services (applicable only for <mode>=0)
"FD"	=	SIM fixed dialing memory feature (if PIN2 authentication has not been done during the current session, PIN2 is required as <passwd>)
“PS”	=	SIM lock facility with a 8 digit password
“PN”	=	Network Personalization
“PU”	=	Network Subset lock with 8 digits password
“PP”	=	Service Provider Personalization
“PC”	=	Corporate lock with a 8 digits password
“PF”	=	Lock Phone to the very First inserted SIM card (ME asks password when other than the first SIM card is inserted)
“AL”	=	Lock Phone to the current selected line, PIN 2 is required as password
<mode>		
0	=	unlock
1	=	lock
2	=	query status
<status>		
0	=	not active
1	=	active
<passwd>	=	string type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD

<class*x*> is a sum of integers each representing a class of information (default 7):

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

5.3 Change Password +CPWD

Description:

This command sets a new password for the facility lock function defined by command Facility Lock +CLCK.

Syntax:

AT+CPWD=<fac>,<oldpwd>,<newpwd>

Command	Possible response(s)
AT+CPWD=<fac>,<oldpwd>,<newpwd>	+CME ERROR: <err>
AT+CPWD=?	+CPWD: list of supported (<fac>,<pwdlength>)s +CME ERROR: <err>
AT+CPWD="SC","1234","6789" *Note : Command Valid*	OK *Note: SIM PIN changed from 1234 to 6789*
AT+CPWD="SC",1234,6789 *Note : Command Valid*	OK *Note: SIM PIN changed from 1234 to 6789*
AT+CPWD=?	+CPWD: ("SC",4),("AO",4),("OI",4),("OX",4),("AI",4),("IR",4),("AB",4) ,("AG",4),("AC",4),("P2",4),("PS",16),("PF",16),("PN",16),("PU",16),(" PP",16),("PC",16), OK

Defined Values

<fac>

"P2"	=	SIM PIN2 refer Facility Lock +CLCK for other values
<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
<pwdlength>	=	integer type maximum length of the password for the facility

6 PHONEBOOK COMMANDS

6.1 Select Phonebook Memory Storage +CPBS

Description:

This command selects phonebook memory storage <storage>, which is used by other phonebook commands

Syntax:

AT+CPBS=<storage>

Command	Possible response(s)
AT+CPBS=<storage>	*+CME ERROR: <err>*
AT+CPBS?	+CPBS: <storage>[,<used>,<total>] +CME ERROR: <err>
AT+CPBS=?	+CPBS: (list of supported <storage>s)
AT+CPBS="MT" *Note: select SIM phonebook*	OK *Note: command valid*
AT+CPBS?	+CPBS: "MT",30,50 OK *Note: AND phonebook selected, 30 out of 50 locations are used*
AT+CPBS=?	+CPBS: ("EN","BD","FD","DC","LD","RC","LR","MT","AD","SD","MC","LM","AF","ON","UD") OK

Defined Values

<storage> values reserved by the present document:

"EN" = SIM (or ME) emergency number (+CPBW is not be applicable for this storage)

"BD" = SIM barred-dialing phonebook

"FD" = SIM fixed-dialing phonebook

"DC" = Dialed Calls List

"RC" = Received Calls List

"MT" = Abbreviated dialing numbers
"SD" = SIM service numbers
"MC" = Missed Call numbers
"AF" = combination of fixed and abbreviated dialing phonebook (+CPBW is not be applicable for this storage)
“ON” = SIM own numbers (MSISDNs) list
“AD” = Abbreviated Dialing
“ME” = ME Phonebook
“SM” = SIM Phonebook
<used> = integer type value indicating the number of used locations in selected memory
<total> = integer type value indicating the total number of locations in selected memory

6.2 Read phonebook Entries +CPBR

Description:

This command returns phonebook entries for a selected phonebook memory location specified in +CPBS command.

Syntax:

AT+CPBR=<index1> [,<index2>]

Command	**Possible response(s)**
AT+CPBR=<index1> [,<index2>]	[+CPBR: <index1>,<number>,<type>,<text>[[...] <CR><LF>+CPBR: <index2>,<number>,<type>,<text>]] +CME ERROR: <err>
AT+CPBR=?	+CPBR: (list of supported <index>s), [<nlength>],[<tlength>] +CME ERROR: <err>
AT+CPBS=”MT”	OK
AT+CPBR=2 *Note: Read entry in location 2*	+CPBR: 2,"6598765432",145,"Fu Adrian" OK
AT+CPBR=1,2 *Note: Read entry starting from location 1 to 2*	+CPBR: 1,"6596543210",129,"Shirley Wee" +CPBR: 2,"65987654321",145,"Fu Adrian" OK
AT+CPBR=?	+CPBR: (1-250),44,14 OK *Note: Total location is 250, maximum length for phone number is 44 and maximum length for name/text is 14*

Defined Values

<index1>, <index2> <index>	=	integer type values in the range of location numbers of phonebook memory
<number>	=	string type phone number of format <type>
<type>	=	type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)
<text>	=	string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS
<nlength>	=	integer type value indicating the maximum length of field <number>
<tlength>	=	integer type value indicating the maximum length of field <text>

6.3 Write/Erase phonebook Entry +CPBW

Description:

This command writes phonebook entry in location number <index> in the current phonebook memory storage selected with +CPBS. Entry fields written are phone number <number> (in the format <type>) and text <text> associated with the number.

Syntax:

AT+CPBW=[<index>][,<number> [,<type>[,<text>]]]

Command	Possible response(s)
AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]	+CME ERROR: <err>
AT+CPBW=?	+CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s),[<tlength>] +CME ERROR: <err>
AT+CPBW=1 *Note: Erase phonebook entry in location 1*	OK *Note: Command valid*
AT+CPBW=,"+6596543210",129,"Shirley Wong" *Note: Write into the first available location*	OK *Note: Command valid*

AT+CPBW=3,"+6596543210",129,"Shirley" *Note: Write into location 3*	OK *Note: Command valid*
AT+CPBW?	OK

Defined Values

<index>	=	integer type values in the range of location numbers of phonebook memory
<number>	=	string type phone number of format <type>
<type>	=	type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7) ; default 145 when dialing string includes international access code character "+", otherwise 129
<text>	=	string type field of maximum length <tlength>; character set as specified by Command. Select TE Character Set +CSCS.
<nlength>	=	integer type value indicating the maximum length of field <number>
<tlength>	=	integer type value indicating the maximum length of field <text>

6.4 Find Phonebook Entries +CPBF

Description:

This command returns phonebook entries (from the current phonebook memory storage selected with +CPBS) which alphanumeric field starts with string <findtext>. Entry fields returned are location number <index*n*>, phone number stored there <number> (of format <type>) and text <text> associated with the number.

Syntax:

AT+CPBF=<findtext>

Command	Possible response(s)
AT+CPBF=<findtext>	+CPBF: <index1>,<number>,<type>,<text>[[...] <CR><LF>+CBPF: <indexn>,<number>,<type>,<text>]] +CME ERROR: <err>
AT+CPBF=?	+CPBF: [<nlength>],[<tlength>] +CME ERROR: <err>

AT+CPBF=”a” *Note: Read entries starting with “a”*	+CPBF: 90,"98785631",145,"Amy Ng" OK
AT+CPBF=”Z”	+CME ERROR: 22 OK *Note: No entry starting with “Z”*

Defined Values

<index1>, <indexn>…	=	integer type values in the range of location numbers of phonebook memory
<number>	=	string type phone number of format <type>
<type>	=	type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)
<findtext>, <text>	=	string type field of maximum length <tlength>; character set as specified by command Select TE Character Set +CSCS
<nlength>	=	integer type value indicating the maximum length of field <number>
<tlength>	=	integer type value indicating the maximum length of field <text>

6.5 Subscriber Number +CNUM

Description:

This command returns the MSISDNs 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.

Syntax:

AT+CNUM

Command	Possible response(s)
AT+CNUM	+CNUM: [<alpha1>],<number1>,<type1>
AT+CNUM=?	OK

AT+CNUM	+CNUM: “Phone”,”9999999”,129 +CNUM: “Fax”,”9888888”,129 OK

Defined Values

<alpha*x*> = optional alphanumeric string associated with <number*x*>; used character set should be the one selected with command Select TE Character Set +CSCS

<number*x*> = string type phone number of format specified by <type*x*>

<type*x*> = type of address octet in integer format

6.6 Set Voice Mail Number +CSVM

Description:

The number to the voice mail server is set with this command.

Syntax:

AT+CSVM=<mode>[,<number>[,<type>]]

Command	Possible response(s)
AT+CSVM=<mode>[,<number>[,<type>]]	+CME ERROR: <err>
AT+CSVM?	+CSVM:<mode>,<number>,<type> +CME ERROR: <err>
AT+CSVM=?	+CSVM: (list of supported <mode>s), (list of supported <type>s) +CME ERROR: <err>
AT+CSVM?	+CSVM: 1,”880”,129
AT+CSVM=?	+CSVM: (0,1),(129,145,161) OK
AT+CSVM=0,”888”,129 *Note: disable voice mail and change number to 888*	OK

Defined Values

<mode>

0	=	Disable the voice mail number.
1	=	Enable the voice mail number.
<number>	=	string type; Character string <0..9,+>

<type>: integer type; Type of address octet. (refer GSM 04.08 section 10.5.4.7)

129	=	ISDN / telephony numbering plan, national / international unknown
145	=	ISDN / telephony numbering plan, international number
161	=	ISDN / telephony numbering plan, national number
<type>	=	type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7); default 145 when dialing string includes international access code character "+", otherwise 129

7 SHORT MESSAGES COMMANDS

7.1 Message Storage Parameters

<index> integer type; value in the range of location numbers supported by the associated memory

<mem1> string type; memory from which messages are read and deleted (commands List Messages +CMGL, Read Message +CMGR and Delete Message +CMGD)

"ME" ME message storage

"SM" SIM message storage

<mem2> string type; memory to which writing and sending operations are made (commands Send Message from Storage +CMSS and Write Message to Memory +CMGW)); 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; received CBMs are always stored in manufacturer specific volatile memory. ; received status reports are displayed but not stored.

<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 to SMs)
4	"ALL"	=	all messages (only applicable to +CMGL command)

<total1> integer type; total number of message locations in <mem1>

<total2> integer type; total number of message locations in <mem2>

<total3> integer type; total number of message locations in <mem3>

<used1> integer type; number of messages currently in <mem1>

<used2> integer type; number of messages currently in <mem2>

<used3> integer type; number of messages currently in <mem3>

7.2 Message Data Parameters

<ackpdu> GSM 03.40 RP-User-Data element of RP-ACK PDU; format is same as for <pdu> in case of SMS, but without GSM 04.11 SC address field and parameter shall be bounded by double quote characters like a normal string type parameter

<alpha> string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set +CSCS (see definition of this command in TS 07.07)

<cdata> GSM 03.40 TP-Command-Data in text mode responses; 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))

<ct> GSM 03.40 TP-Command-Type in integer format (default 0)

<da> GSM 03.40 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 TS 07.07); type of address given by <toda>

<data> In the case of SMS: GSM 03.40 TP-User-Data in text mode responses; format:

- if <dcs> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set:
- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS in TS 07.07): 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 P (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))

In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:

- if <dcs> indicates that GSM 03.38 default alphabet is used:
- if TE character set other than "HEX" (refer command +CSCS in GSM 07.07): 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
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<dcs> depending on the command or result code: GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format

<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 GSM 03.40 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> > (or <cdata>) 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)

<mid> GSM 03.41 CBM Message Identifier in integer format

<mn>	GSM 03.40 TP-Message-Number in integer format
<mr>	GSM 03.40 TP-Message-Reference in integer format
<oa>	SM 03.40 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 command +CSCS in TS 07.07); type of address given by <tooa>
<page>	GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 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)) In the case of CBS: GSM 03.41 TPDU in hexadecimal format
<pid>	GSM 03.40 TP-Protocol-Identifier in integer format (default 0)
<ra>	GSM 03.40 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 command +CSCS in TS 07.07); type of address given by <tora>
<sca>	GSM 04.11 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 command +CSCS in TS 07.07); type of address given by <tosca>
<scts>	GSM 03.40 TP-Service-Centre-Time-Stamp in time-string format (refer <dt>)
<sn>	GSM 03.41 CBM Serial Number in integer format
<st>	GSM 03.40 TP-Status in integer format
<toda>	GSM 04.11 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> GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)

<tora> GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)

<tosca> GSM 04.11 RP SC address Type-of-Address octet in integer format (default refer <toda>)

<vp> depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>)

<vp> depending on SMS-SUBMIT <fo> setting: GSM 03.40 TP-Validity-Period either in integer format (default 167), in time-string format (refer <dt>), or if $(EVPF)$ is supported, in enhanced format (hexadecimal coded string with double quotes)

7.3 Select Message Service +CSMS

Description:

This 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.

Syntax:

AT+CSMS=<service>

Command	Possible response(s)
AT+CSMS=<service>	+CSMS: <mt>,<mo>,<bm> *+CMS ERROR: <err>*
AT+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm>
AT+CSMS=?	+CSMS: (list of supported <service>s)
AT+CSMS=0 *Note: SMS AT command Phase 2 version 4.7.0*	+CSMS: 1,1,1 OK *Note: command valid*

AT+CSMS?	+CSMS: 0,1,1,1 OK *Note: displays supported message types for Phase 2 version 4.7.0*
AT+CSMS=?	+CSMS: (0,1) OK

Defined Values

<service>

0 = GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 version 4.7.0; Phase 2+ features which do not require new command syntax may be supported (e.g. correct routing of messages with new Phase 2+ data coding schemes))

1 = GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2+ version; the requirement of <service> setting 1 is mentioned under corresponding command descriptions)

<mt>, <mo>, <bm>

0 = type not supported

1 = type supported

7.4 New Message Acknowledgement to ME/TA +CNMA

Description:

This command confirms correct reception of a new message (SMS-DELIVER or SMS-STATUS-REPORT), which is routed directly to the TE

Positive acknowledgement to the network (RP-ACK) is possible when in Text mode. Positive or negative (RP-ERROR) acknowledgement to the network is possible if in the PDU mode. Acknowledgement with +CNMA is possible only if +CSMS <service> is set to 1, when +CMT or +CDS indication is shown.

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 by setting both <mt> and <ds> values of +CNMI to zero.

Syntax:

AT+CNMA

Command	Possible response(s)
if text mode (+CMGF=1): AT+CNMA	+CMS ERROR: <err>
AT+CNMA=?	
if PDU mode (+CMGF=0): AT+CNMA[=<n>[,<length>[<CR> *PDU is given*<ctrl-Z/ESC>]]]	+CMS ERROR: <err>
AT+CNMA=?	if PDU mode (+CMGF=0): +CNMA: (list of supported <n>s)
	In PDU mode(+CMGF=0) and +CNMI=2,2,0,0,0 +CMT: ,22 06915689450002040A9156382277620000704052614215230 4CFB5CB05
AT+CNMA=0	OK *Note: Sending of RP-ACK successful*
	In Text mode(+CMGF=1) and +CNMI=2,2,0,0,0 +CMT: "6583227726",,"07/04/25,16:28:34+32",145,4,0,0,"6598 540029",145,3
AT+CNMA	OK *Note: Sending of RP-ACK successful*

Defined Values

<n>: Type of acknowledgement in PDU mode

0 = Send RP-ACK without PDU (same as TEXT mode)

1 = Send RP-ACK with optional PDU message

2 = Send RP-ERROR with optional PDU message

<length>: Length of the PDU message

7.5 Preferred Message Storage +CPMS

Description:

This command selects memory storages <mem1>, <mem2> and <mem3> to be used for reading, writing, etc.

Syntax:

AT+CPMS=<mem1>[, <mem2>[,<mem3>]]

Command	Possible response(s)
AT+CPMS=<mem1>[, <mem2>[,<mem3>]]	+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> +CMS ERROR: <err>
AT+CPMS?	+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3> +CMS ERROR: <err>
AT+CPMS=?	+CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)
AT+CPMS="SM" *Note: Select SM location for message writing and reading*	+CPMS: 0,15,0,15,0,15 OK *Note: SM location is selected, with 0 location is used and 15 total location in SM are available*
AT+CPMS=?	+CPMS: ("SM"), ("SM"), ("SM") OK

Defined Values

<mem1> : memory location for SMS
"SM" : SIM card
<mem2>,<mem3> : Please refer to Section 7.1 for description.

7.6 Message Format +CMGF

Description:

This 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.

Syntax:

AT+CMGF=[<mode>]

Command	Possible response(s)
AT+CMGF=[<mode>]	
AT+CMGF?	+CMGF: <mode>
AT+CMGF=?	+CMGF: (list of supported <mode>s)
AT+CMGF=0 *Note: set input and output message format to pdu mode.*	OK
AT+CMGS=17<CR> 0011000A9156092143650000AA04C9E9340B<CTRL-Z>	+CMGS: 199 OK *Note: successful sent message in pdu modem to +6590123456. Message contains "ISSY"*
AT+CMGF=1 *Note: set input and output message format to text mode*	OK
AT+CMGS="+6590123456"<CR> Hello World<CTRL-Z>	+CMGS: 200 OK *Note: successful sent message in text mode to +6590123456.*

Defined Values

<mode>

0 = PDU mode

1 = Text mode

7.7 Save Settings +CSAS

Description:

This command saves active message service settings to a non-volatile memory.

The parameters +CSMP and +CSCA are saved using this command.

Syntax:

AT+CSAS[=<profile>]

Command	Possible response(s)
AT+CSAS[=<profile>]	+CMS ERROR: <err>
AT+CSAS=?	+CSAS: (list of supported <profile>s)
AT+CSAS *Note: save message service settings to non-volatile memory (default Profile 0)*	OK
AT+CSAS=?	+CSAS: (0-2) OK

Defined Values

<profile>

0 - 2 = Profile 0 to 2. Varies for different SIM card.
Parameters saved are +CSMP, +CSCA.

7.8 Restore Settings +CRES

Description:

This command restores message service settings from non-volatile memory to active memory.

The parameters saved using +CSAS are restored using this command.

Syntax:

AT+CRES[=<profile>]

Command	Possible response(s)
AT+CRES[=<profile>]	+CMS ERROR: <err>

AT+CRES=?	+CRES: (list of supported <profile>s)
AT+CRES *Note: Restores default Profile 0 settings*	OK
AT+CRES=?	+CRES: (0-2) OK
AT+CRES=1 *Note: Restores Profile 1 saved message settings*	OK

Defined Values

<profile>

0 - 2 = Profile 0 to 2 (varies for different SIM cards)
Parameters of saved settings restored are +CSMP, +CSCA.

7.9 Set Text Mode Parameters +CSMP

Description:

This command is used to select values for additional parameters needed when SM is sent to the network or placed in 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>.

Syntax:

AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]]

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

AT+CSMP=1,167,0,0	OK *Note: command valid*
AT+CSMP?	+CSMP: 1,,0,0 OK *Note: <vp> is not displayed when VPF parameter in <fo> is set to bit 00*

Defined Values

<fo>:first octet consists of 6 fields:

B7	B6	B5	B4	B3	B2	B1	B0
RP	UDHI	SRR	VPF		RD	MTI	

RP = Reply Path; parameter indication that Reply Path exits. Not used in text mode

UDHI = User data Header Information; parameter indication that the TP-UD field contains Header

SRR = Status Report Request; parameter indication that the MS is requesting a status report

VPF = Validity Period Format,; parameter identifying the time from where the message is no longer valid

RD = Reject Duplicate; parameter whether or not the SC shall accept an SMS-SUMBIT for an SM still held in the SC which has the same TP-MR and the same TP-DA as a previously submitted SM from the same OA

MTI = Message Type Indicator; parameter describing the message type

<pid> = is used to indicate the higher layer protocol being used or indicates interworking with a certain type of telematic device.

<dcs> = is used to determine the way the information is encoded. (GSM 03.38)

7.10 Service Center Address +CSCA

Description:

This updates the SMSC address, through which mobile originated SMS are transmitted. In text mode, settings are 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.

Syntax:

AT+CSCA=<sca>[,<tosca>]

Command	Possible response(s)
AT+CSCA=<sca>[,<tosca>]	
AT+CSCA?	+CSCA: <sca>,<tosca>
AT+CSCA=?	OK
AT+CMGS=”90123456” >Message<CTRL-Z>	+CMS ERROR: 330 *Note: service center unknown, sending message failed*
AT+CSCA="+6596845999"	OK
AT+CMGS=”90123456”<CR> Message<CTRL-Z>	+CMGS: 201 OK
AT+CSCA? *Note: to query the current SMSC address set in SIM card (phase 2+)*	+CSCA: "+6596845999",145 OK *Note: message successfully sent*

Defined Values

<sca>, <tosca>: Please refer to Section 7.2 for description.

7.11 Select Cell Broadcast Message Types +CSCB

Description:

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

Syntax:

AT+CSCB=[<mode>[,<mids>[,<dcss>]]]

Command	Possible response(s)
AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	
AT+CSCB?	+CSCB: <mode>,<mids>,<dcss>
AT+CSCB=?	+CSCB: (list of supported <mode>s)
AT+CSCB?	+CSCB: 1,"",""" OK
AT+CSCB=?	+CSCB: (0,1) OK

Defined Values

<mode>

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

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

7.12 New Message Indications to TE +CNMI

Description:

This command selects the procedure on how receiving of new messages from the network is indicated to the TE when TE is active.

<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.

Syntax:

AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Command	Possible response(s)
AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	+CMS ERROR: <err>
AT+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>
AT+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)
AT+CNMI=2,1,0,0,0	OK
	+CMTI:"SM",2 *Note: message received*
AT+CNMI=2,2,0,0,0	OK
	+CMT: "6583227726",,"07/04/24,17:47:19+32" Test
AT+CNMI=2,2,0,1,0	OK
AT+CSMP=33	OK
	+CDS: 6,224,"98765432",129,"07/04/24,17:58:36+32","07/04/24,17:58:39+32",0 *Note: Message Status report is received*

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 received indications.

1 = Discard indication and reject new received message unsolicited result codes 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>: the rules for storing received SMS depend on its data coding scheme (refer GSM 03.38 [2]), preferred memory storage (+CPMS) setting and this value.

0 = No SMS-DELIVER indications are routed to the TE.

1 = If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem>,<index>

2 = SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) 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 Show Text Mode Parameters +CSDH)

If ME has its own display device then class 0 messages and messages in the message waiting indication group (discard message) may be copied to both ME display and TE. In this case, ME shall send the acknowledgement to the network Class 2 messages and messages in the message waiting indication group (store message) result in indication as defined in <mt>=1.

3 = Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.

<bm>: the rules for storing received CBMs depend on its data coding scheme (refer GSM 03.38 [2]), the setting of Select CBM Types (+CSCB) and this value.

0 = No CBM indications are routed to the TE.

2 = New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled) or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)

If ME supports data coding groups which define special routing also for messages other than class 3 (e.g. SIM specific messages), ME may choose not to route messages of such data coding schemes into TE (indication of a stored CBM may be given as defined in <bm>=1).

<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.

7.13 Show Text Mode Parameters +CSDH

Description:

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

Syntax:

AT+CSDH=[<show>]

Command	Possible response(s)
AT+CSDH=[<show>]	
AT+CSDH?	+CSDH: <show>
AT+CSDH=?	+CSDH: (list of supported <show>s)

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

<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 combinations of CBM data coding schemes (refer

<dcs>) = (default is empty string); e.g. "0-3,5”

7.14 List Messages +CMGL

Description:

This command returns messages with status value <stat> from message storage <mem1> to the TE. If status of the message is 'received unread', status in the storage changes to 'received read' subsequently.

Syntax:

AT+CMGL[=<stat>]

Command	Possible response(s)

AT+CMGL[=<stat>]	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><data>[<CR><LF>
	+CMGL:
	<index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,
	<length>]<CR><LF><data>[...]]
	if text mode (+CMGF=1), command successful and SMS-STATUS-REPORTs:
	+CMGL:
	<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>
	[<CR><LF>
	+CMGL:
	<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>
	[...]]
	if text mode (+CMGF=1), command successful and SMS-COMMANDs:
	+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>
	+CMGL: <index>,<stat>,<fo>,<ct>[...]]
	if text mode (+CMGF=1), command successful and CBM storage:
	+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>
	<CR><LF><data>[<CR><LF>

	+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages> <CR><LF><data>[...]] 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> [...]] otherwise: +CMS ERROR: <err> otherwise: +CMS ERROR: <err>
AT+CMGL=?	+CMGL: (list of supported <stat>s)

Defined Values

In text mode:

<stat>

"REC UNREAD"	=	Received unread messages (default)
"REC READ"	=	Received read messages
"STO UNSENT"	=	Stored unsent messages
"STO SENT"	=	Stored sent messages
"ALL"	=	All messages

In PDU mode:

<stat>

0	=	Received unread messages (default)
1	=	Received read messages
2	=	Stored unsent messages
3	=	Stored sent messages
4	=	All messages

<alpha> = string type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific

<da> = GSM 03.40 TP-Destination-Address Address-Value field in string format;

BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <toda>

<data> = In the case of SMS: GSM 03.40 TP-User-Data in text mode responses; format:

- if <dcs> indicates that GSM 03.38 default alphabet is used and <fo> indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- 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))

In the case of CBS: GSM 03.41 CBM Content of Message in text mode responses; format:

- if <dcs> indicates that GSM 03.38 default alphabet is used: ME/TA converts GSM alphabet into current TE character set according to rules of Annex A
- if <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal number

<length> = integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) 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)

<index> = integer type; value in the range of location numbers supported by the associated memory

<oa> = GSM 03.40 TP-Originating-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters; type of address given by <tooa>

<pdu> = In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 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)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

<scts> = GSM 03.40 TP-Service-Center-Time-Stamp in time-string format (refer <dt>)

<toda> = GSM 04.11 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)

7.15 Read Message +CMGR

Description:

This 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'.

Syntax:

AT+CMGR=<index>

Command	**Possible response(s)**
AT+CMGR=<index>	+CMGF=1 (Text Mode) +CMGR :<stat>,<oa>,[<alpha>,] <scts> [,<tooa>,<fo>, pid>,<dcs>, <sca>, <tosca>,<length>] <CR><LF> <data> (for **SMS-DELIVER** only) +CMGR : <stat>,<da>,[<alpha>,] [,<toda>,<fo>,<pid>,<dcs>, [<vp>], <sca>, <tosca>,<length>]<CR><LF> <data> (for **SMS-SUBMIT** only) +CMGF=0 (PDU Mode) +CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> otherwise: +CMS ERROR: <err>
AT+CMGR=1	+CMGR: "REC READ","6592452195","kELLY","07/04/11,17:44:28+32" Send From PC OK

7.16 Send Message +CMGS

Description:

This 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.

- sending can be cancelled by giving <ESC> character (IRA 27)
- <ctrl-Z> (IRA 26) must be used to indicate the ending of PDU

Syntax:

AT+CMGS

Command	Possible response(s)
If text mode (+CMGF=1): AT+CMGS=<da>[,<toda>]<CR> text is entered<ctrl-Z/ESC>	If text mode (+CMGF=1) and sending successful: +CMGS: <mr>[,<scts>] If sending fails: +CMS ERROR: <err>
AT+CMGS=+6590123456<CR> Hello World<CTRL-Z>	+CMGS: 200 OK *Note: successful sent message in text mode to +6590123456.*
If PDU mode (+CMGF=0): AT+CMGS=<length><CR> PDU is given<ctrl-Z/ESC>	If PDU mode (+CMGF=0) and sending successful: +CMGS: <mr>[,<ackpdu>] If sending fails: +CMS ERROR: <err>
AT+CMGS=17<CR> 0011000A9156092143650000AA04C9E 9340B<CTRL-Z>	+CMGS: 199 OK *Note: successful sent message in PDU mode to +6590123456. Message contains "ISSY"*

Defined Values

<da> = GSM 03.40 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 (specified by +CSCS); type of address given by <toda>

Note:

The first parameter <da> can accept parentheses/non-parentheses enclosed string

<toda> = GSM 04.11 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)

<length> = integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) 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> = GSM 03.40 TP-Message-Reference in integer format

7.17 Send Message from Storage +CMSS

Description:

This command sends message location value <index> from preferred message storage to the network.

Syntax:

AT+CMSS=<index>[,<da>[,<toda>]]

Command	Possible response(s)

AT+CMSS=<index>[,<da>[,<toda>]]	if text mode (+CMGF=1) and sending successful:
	+CMSS: <mr>[,<scts>]
	if sending fails:
	+CMS ERROR: <err>

AT+CMSS=<index>[,<da>[,<toda>]]	if PDU mode (+CMGF=0) and sending successful:
	+CMSS: <mr>[,<ackpdu>]
	if sending fails:
	+CMS ERROR: <err>

AT+CMSS=?	OK
AT+CMSS=3,"93683903"	+CMSS: 171 OK *Note: message successfully sent from storage location #3 to local phone number 93683903*

Defined Values

<index> = Integer type; value in the range of location numbers supported by the associated memory

<da> = GSM 03.40 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 (specified by +CSCS);; type of address given by <toda>

<toda> = GSM 04.11 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)

<mr> = GSM 03.40 TP-Message-Reference in integer format

7.18 Write Message to Memory +CMGW

Description:

This command stores message (either SMS-DELIVER or SMS-SUBMIT) to memory storage. 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 text is done similarly as specified in command Send Message +CMGS.

Syntax:

AT+CMGW

Command	Possible response(s)
if text mode (+CMGF=1): AT+CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR> *text is entered*<ctrl-Z/ESC>	+CMGW: <index> +CMS ERROR: <err>
if PDU mode (+CMGF=0): AT+CMGW=<length>[,<stat>]<CR>PDU is given<ctrl-Z/ESC>	+CMGW: <index> +CMS ERROR: <err>
+CMGW=?	OK
In text mode (+CMGF=1): AT+CMGW="9893033",129,"REC UNREAD" > TESTING *Note: Write message in text mode into REC UNREAD memory*	+CMGW: 6 OK *Note: message successfully written into specified memory*
In PDU mode (+CMGF=0): AT+CMGW=17,2 > 0011000A9156382277620000AA04C9E9340B *Note: Write message in PDU mode into STO UNSENT memory*	+CMGW: 7 OK *Note: message successfully written into specified memory*

Defined Values

In text mode:

<stat>

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 to SMS)
4	"ALL"	=	all messages (only applicable to +CMGL command)

In PDU mode:

<stat>

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 to SMS)
4	"ALL"	=	all messages (only applicable to +CMGL command)

<oa> = GSM 03.40 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 (specified by +CSCS);; type of address given by <tooa>

<da> = GSM 03.40 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 (specified by +CSCS);; type of address given by <toda>

<tooa> = GSM 04.11 TP-Originating-Address Type-of-Address octet in integer format (default refer <toda>)

<toda> = GSM 04.11 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)

<pdu> = In the case of SMS: GSM 04.11 SC address followed by GSM 03.40 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)). In the case of CBS: GSM 03.41 TPDU in hexadecimal format.

<length> = integer type value indicating in the text mode (+CMGF=1) the length of the message body <data> (or <cdata>) 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)

<index> = Index of message in selected storage <mem2>

7.19 Delete Message +CMGD

Description:

This command deletes message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag>.

Syntax:

AT+CMGD=<index>[,<delflag>]

Command	Possible response(s)
AT+CMGD=<index>[,<delflag>]	+CMS ERROR: <err>
AT+CMGD=1	OK *Note: Message in selected memory location #1 (memory location set by +CPMS) has been successfully deleted*
AT+CMGD=1,1	OK *Note: All READ messages from the preferred message storage are deleted*

Defined Values

<index>: Integer type values in the range of location numbers of SIM Message memory when the preferred message storage is “SM”

If <DelFlag> is > 0, <index> is ignored. (<index>is set to 1 to access <DelFlag>)

<delflag>: an integer indicating multiple message deletion request as follows:

0 = Delete message at location <index>.
1 = Delete All READ messages
2 = Delete All READ and SENT messages
3 = Delete All READ, SENT and UNSENT messages
4 = Delete All messages

Note:

The <delflag> works similarly to the command +IMGD.

7.20 Delete SMS Based on Group Type +IMGD

Description:

This command deletes SMS messages based on group type (e.g. Unread, Read, Sent, Unsent, All)

Syntax:

AT+IMGD=<mode>

Command	Possible Response(s)
AT+IMGD=1 *Note: Deletes all "REC READ" messages only*	Please Wait... OK Messages to be Deleted: 04 01/04 Message(s) deleted 02/04 Message(s) deleted 03/04 Message(s) deleted 04/04 Message(s) deleted Done
AT+IMGD=? *Note: Get possible values*	+IMGD: (1,2,3,4) OK

Defined Values

<mode>

1 = Deletes all "REC READ" messages only

2 = Deletes all "REC READ" and "STO SENT" messages only

3 = Deletes all "REC READ", "STO SENT" and "STO UNSENT" messages only

4 = Deletes all messages

7.21 Send Command +CMGC

Description:

This command sends a command message from a TE to the network (SMS-COMMAND). The entering of text/pdu (GSM 03.40 TP-Command-Data) is done similarly as specified in command Send Message +CMGS.

In text mode, optionally (when +CSMS <service> value is 1 and network supports) <scts> is returned. Else in PDU mode optionally (when +CSMS <service> value is 1 and network supports) <ackpdu> is returned.

Syntax:

AT+CMGC

Command	Possible response(s)
if text mode (+CMGF=1): +CMGC=<fo>,<ct>[,<pid>[,<mn>[,<da>[,<toda>]]]]<CR> text is entered<ctrl-Z/ESC>	If text mode (+CMGF=1) and sending successful: +CMGC: <mr>[,<scts>] If sending fails: +CMS ERROR: <err>
if PDU mode (+CMGF=0): +CMGC=<length><CR> PDU is given<ctrl-Z/ESC>	If PDU mode (+CMGF=0) and sending successful: +CMGC: <mr>[,<ackpdu>] If sending fails: +CMS ERROR: <err>
+CMGC=?	

PDU: 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.

Defined Values

<fo>	=	first octet of GSM 03.40 SMS-COMMAND (default 2) in integer format
<ct>	=	GSM 03.40 TP-Command-Type in integer format (default 0)
<pid>	=	GSM 03.40 TP-Protocol-Identifier in integer format (default 0)
<mn>	=	GSM 03.40 TP-Message-Number in integer format

<da>	=	GSM 03.40 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 (specified by +CSCS);; type of address given by <toda>
<toda>	=	GSM 04.11 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)
<length>	=	integer type value indicating 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>	=	GSM 03.40 TP-Message-Reference in integer format

7.22 Message Service Failure Result Code +CMS ERROR

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.

8 SUPPLEMENTARY SERVICES COMMANDS

8.1 Calling Line Identification Presentation +CLIP

Description:

This command enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call. It enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network.

+CLIP response is returned after RING or +CRING result code.

Syntax:

AT+CLIP=[<n>]

Command	Possible response(s)
AT+CLIP=[<n>]	
AT+CLIP?	+CLIP: <n>,<m>
AT+CLIP=?	+CLIP: (list of supported <n>s)
AT+CLIP=1 *Note: Enable CLIP*	OK
	RING +CLIP: “966666666,129,1,,,”Tom” or in UCS2 format: +CLIP: “966666666”,129,1,,,,”815765767” *Note: Incoming call alert with presentation of phone number and name*

Defined Values

<n>: parameter sets/shows the result code presentation status in the TA

0 = disable

1 = enable

<m>: parameter shows the subscriber CLIP service status in the network

0 = CLIP not provisioned

1 = CLIP provisioned

2 = unknown (e.g. no network, etc.)

8.2 Calling Line Identification Restriction +CLIR

Description:

This command allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

Syntax:

AT+CLIR=[<n>]

Command	Possible response(s)
AT+CLIR=[<n>]	
AT+CLIR?	+CLIR: <n>,<m>
AT+CLIR=?	+CLIR: (list of supported <n>s)
AT+CLIR=2	OK *Note: Command valid*
AT+CLIR?	+CLIR: 2,2
AT+CLIR=?	+CLIR: (0,1,2) OK

Defined Values

<n>: parameter sets the adjustment for outgoing calls

0 = indicator is used according to the subscription of the CLIR service

1 = CLIR invocation

2 = CLIR suppression

<m>: parameter shows the subscriber CLIR service status in the network

0 = CLIR not provisioned

1 = CLIR provisioned in permanent mode

2 = unknown (e.g. no network, etc.)

3 = CLIR temporary mode presentation restricted

4 = CLIR temporary mode presentation allowed

8.3 Connected Line Identification Presentation +COLP

Description:

This command enables a calling subscriber to get the connected line identity of the called party after setting up a mobile originated call.

Syntax:

AT+COLP=[<n>]

Command	Possible response(s)
AT+COLP=[<n>]	
AT+COLP?	+COLP: <n>,<m>
AT+COLP=?	+COLP: (list of supported <n>s)
AT+COLP=?	+COLP: (0,1) OK
AT+COLP=1 *Note: Enable COLP*	OK
AT+COLP?	+COLP: 1,1
ATD+6596666666;	+COLP:" 96666666",129,,,"TOM" *Note: Connected line with name presentation*

Defined Values

<n>: parameter sets/shows the result code presentation status in the TA

0 = disable

1 = enable

<m>: parameter shows the subscriber COLP service status in the network

0 = COLP not provisioned

1 = COLP provisioned

2 = unknown (e.g. no network, etc.)

<number>, <type>, <subaddr>, <satype>, <alpha>: refer +CLIP

8.4 Closed User Group +CCUG

Description:

This command enables subscribers to form closed user groups to and from which access is restricted. This service shall be provided after prior arrangement with the service provider according to GSM 02.85 [21]).

Syntax:

AT+CCUG=[<n>[,<index>[,<info>]]]

Command	Possible response(s)
AT+CCUG=[<n>[,<index>[,<info>]]]	
AT+CCUG?	+CCUG: <n>,<index>,<info>
AT+CCUG=?	+CCUG: (0,1),(0-10),(0-3) OK *Note: Displays list of parameters allowed*
AT+CCUG?	+CCUG:0,0,0 OK

Defined Values

<n>

0 = disable CUG temporary mode

1 = enable CUG temporary mode

<index>

0…9 = CUG index

10 = no index (preferred CUG taken from subscriber data)

<info>

0 = no information

1 = suppress OA

2 = suppress preferential CUG

3 = suppress OA and preferential CUG

8.5 Call Forwarding Number and Conditions +CCFC

Description:

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

Syntax:

AT+CCFC=<reason>,<mode> [,<number>[,<type> [,<class> [,<subaddr>[,<satype>[,<time>]]]]]]

Command	Possible response(s)
AT+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>]]] […]]
AT+CCFC=?	+CCFC: (list of supported <reason>s)
AT+CCFC=0,2	+CCFC: 0,7 *Note: Call forwarding disabled for voice, data, fax calls*
AT+CCFC=0,3,”+6596666666”	OK
AT+CCFC=0,2	+CCFC: 1,1,”96666666”,129 *Note: Call forwarding active for voice class* +CCFC: 1,2,”97777777”,129 *Note: Call forwarding active for data class*
AT+CCFC=0,4 *Note: Erase call forwarding unconditional*	OK *Note: Command valid*
AT+CCFC= 1,1,"93112345" *Note: Enabled call forwarding when mobile busy*	OK *Note: Command valid*

Defined Values

<reason>

0 = unconditional

1 = mobile busy

2 = no reply

3 = not reachable

4 = all call forwarding (refer GSM 02.30 [19])

5 = all conditional call forwarding (refer GSM 02.30 [19])

<mode>

0 = disable

1 = enable

2 = query status

3 = registration

4 = erasure

<class*x*>: a sum of integers each representing a class of information (default 7, which indicates active voice, data and fax)

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

<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

<number> = string type phone number of forwarding address in format specified by <type>

<type> = type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7); 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 (refer GSM 04.08 [8] subclause 10.5.4.8); default 128

8.6 Call Waiting +CCWA

Description:

This command allows control of the Call Waiting supplementary service according to GSM 02.83 [5]. Activation, deactivation and status query are supported.

Syntax:

AT+CCWA=[<n>[,<mode>[,<class>]]]

Command	Possible response(s)
AT+CCWA=[<n>[,<mode>[,<class>]]]	*+CME ERROR: <err>* when <mode>=2 and command successful +CCWA: <status>,<class1> [<CR><LF>+CCWA: <status>,<class2> [...]]
AT+CCWA?	+CCWA: <n>
AT+CCWA=?	+CCWA: (list of supported <n>s)
	+CCWA: <number>,<type>, <CLI validity>,<alpha>,<classx>
AT+CCWA=?	+CCWA: (0,1) OK
AT+CCWA=1,1,1 *Note: Enable call waiting for voice*	OK *Note: Command valid*
AT+CCWA=1,2 *Note: Interrogate call waiting*	+CCWA: 1,1 *Note: Call waiting active for voice calls*
ATD93112348; *Note: Originate voice call*	OK *Note: Call connected, in conversation…* +CCWA: "62533333",129,1,"iwow3",0 *Note: Another call is waiting*

Defined Values

<n>: sets/shows the result code presentation status in the TA

0 = disable

1 = enable

<mode>: when <mode> parameter is not given, network is not interrogated

0 = disable

1 = enable

2 = query status

<class*x*> is a sum of integers each representing a class of information (default 7)

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

<status>

0 = not active

1 = active

<CLI validity>

0 = CLI valid

1 = CLI has been withheld by the originator.

2 = CLI is not available due to interworking problems or limitations of originating network.

<number> : string type phone number of calling address in format specified by <type>

<type> : type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)

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

When CLI is not available (<CLI validity>=2), <number> shall be an empty string ("") and <type> value will not be significant. Nevertheless, TA may return the recommended value 128 for <type> (TON/NPI unknown in accordance with GSM 04.08 [8] subclause 10.5.4.7).

When CLI is withheld by the originator, (<CLI validity>=1) and the CLIP is provisioned with the "override category" option (refer GSM 02.81[3] and GSM 03.81[40]), <number> and <type> is provided. Otherwise, TA shall return the same setting for <number> and <type> as if the CLI was not available.

8.7 Call Related Supplementary Services +CHLD

Description:

This command allows the control of the following call related services:

A call can be temporarily disconnected from the ME but the connection is retained by the network multiparty conversation (conference calls) the served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection

Calls can be put on hold, recovered, released, added to conversation, and transferred.

Syntax:

AT+CHLD=[<n>]

Command	**Possible response(s)**
AT+CHLD=[<n>]	*+CME ERROR: <err>*
AT+CHLD=?	+CHLD: (list of supported <n>s)
AT+CHLD=?	+CHLD: (0,1,1x,2,2x,3,4) OK
AT+CCWA=1,1,1 *Note: Enable call waiting*	OK
ATD91234567; *Note: Originate voice call*	OK
	+CCWA: "62533333",129,1,"iwow3",0
AT+CHLD=2 *Note: Place active calls on hold and accepts the other (held or waiting) call*	OK *Note: In conversation with second call*
AT+CHLD=1 *Note: Release all active calls and accepts the other*	OK *Note: In conversation with first call and release second call*
AT+CHLD?	+CME ERROR: 3

Defined Values

<n>

0	=	Release all held calls or set User Determined User Busy (UDUB) for a waiting call
1	=	Release all active calls (if any exist) and accepts the other (held or waiting) call
1X	=	Release a specific call X (active call)
2	=	Place all active calls (if any exist) on hold and accepts the other (held or waiting) call.
2X	=	Place all active calls on hold except call X with which communication is supported.
3	=	Adds a held call to the conversation.
4	=	Connects the two calls and disconnects the subscriber from both calls (Explicit Call Transfer)

8.8 Call Deflection +CTFR

Description:

This command allows an incoming alerting call to be forwarded to a specified number.

Syntax:

AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]]

Command	Possible response(s)
AT+CTFR=<number>[,<type>[,<subaddr>[,<satype>]]]	+CME ERROR: <err>
AT+CTFR=”94555555”,129	OK *Note: Command Valid*

Defined Values

<number> : string type phone number of format specified by <type>

<type> : type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7); 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 (refer GSM 04.08 [8] subclause 10.5.4.8); default 128

8.9 Unstructured Supplementary Service Data +CUSD

Description:

This command allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation). The network returns unsolicited result code +CUSD:<m>.

Syntax:

AT+CUSD=[<n>[,<str>[,<dcs>]]]

Command	Possible response(s)
AT+CUSD=[<n>[,<str>[,<dcs>]]]	*+CME ERROR: <err>*
AT+CUSD?	+CUSD: <n>
AT+CUSD=?	+CUSD: (list of supported <n>s)
AT+CUSD=1,"*100#"	OK *Note: USSD response will display subsequently*
AT+CUSD=?	+CUSD: (0,1,2) OK
AT+CUSD=1	OK
ATD*100#	OK +CUSD: 1,"#100# Menu 1> Top-up 2> Balance enquiry … …
	+CUSD: 2 *Note: USSD session has been terminated by network*

Defined Values

<n>

0 = disable the result code presentation in the TA

1 = enable the result code presentation in the TA

2 = cancel session (not applicable to read command response)

<m>

0 = no further user action required (network initiated USSD Notify, or no further information needed after mobile initiated operation)
1 = further user action required (network initiated USSD Request, or further information 3 needed after mobile initiated operation)
2 = USSD terminated by network
3 = other local client has responded
4 = operation not supported
5 = network time out

<str> = string type USSD string (when <str> parameter is not given, network is not interrogated):

- if <dcs> indicates that GSM 03.38 [25] default alphabet is used:
- if TE character set other than "HEX" (refer command Select TE Character Set +CSCS): ME/TA converts GSM alphabet into current TE character set according to rules of GSM 07.05 [24] 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 data coding scheme is used: 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> = GSM 03.38 [25] Cell Broadcast Data Coding Scheme in integer format (default 0)

8.10 Advice of Charge +CAOC

Description:

This refers to Advice of Charge supplementary service (GSM 02.24 [26] and GSM 02.86 [27]) that enables subscriber to get information about the cost of calls.
With <mode>=0, the execute command returns the current call meter value from the ME.

If AOC is supported, the command also includes the possibility to enable an unsolicited event reporting of the CCM information. The unsolicited result code +CCCM: <ccm> is sent when the CCM value changes, but not more than every 10 seconds. Deactivation of the unsolicited event reporting is made with the same command.

When AOC is supported, the Read command indicates whether the unsolicited reporting is activated or not. Read command is available when the unsolicited result code is supported.

Syntax:

AT+CAOC=<mode>

Command	**Possible response(s)**
AT+CAOC=<mode>	+CAOC: <ccm> *+CME ERROR: <err>*
AT+CAOC?	+CAOC: <mode>
AT+CAOC=?	+CAOC: (list of supported <mode>s)
AT+CAOC=0 *Note: query CCM value*	+CAOC: "000A08" OK *Note: display current call meter value CCM=2568*
AT+CAOC=1 *Note: deactivate reporting of CCM value*	OK *Note: command valid*
AT+CAOC=? *Note: request supported values*	+CAOC: (0-2) OK *Note: Supported values 0,1,2*

Defined Values

<mode>

0 = query CCM value

1 = deactivate the unsolicited reporting of CCM value

2 = activate the unsolicited reporting of CCM value

<ccm> = string type; three bytes of the current call meter value in hexadecimal format (e.g. "00001E" indicates decimal value 30); value is in home units and bytes are similarly coded as ACMmax value in the SIM

8.11 Accumulated Call Meter Maximum +CAMM

Description:

This command sets the Advice of Charge related accumulated call meter maximum value in SIM file EF_{ACMmax}. ACMmax contains the maximum number of home units allowed for consumption by the subscriber. When ACM (refer +CACM) reaches ACMmax, calls are prohibited. SIM PIN2 is usually required to set the value

Syntax:

AT+CAMM=[<acmmax>[,<passwd>]]

Command	Possible response(s)
AT+CAMM=[<acmmax>[,<passwd>]]	+CME ERROR: <err>
AT+CAMM?	+CAMM: <acmmax> +CME ERROR: <err>
AT+CAMM=?	OK
AT+CAMM="12","1234"	OK

Defined Values

<acmmax> = string type; accumulated call meter maximum value similarly coded as <ccm> under +CAOC; value zero disables ACMmax feature

<passwd> = string type; SIM PIN2

8.12 Price Per Unit and Currency Table +CPUC

Description:

This command sets the parameters of Advice of Charge related price per unit and currency table in SIM file EF_{PUCT}. PUCT information can be used to convert the home units (as used in +CAOC, +CACM and +CAMM) into currency units.

Syntax:

AT+CPUC=<currency>,<ppu>[,<passwd>]

Command	Possible response(s)
AT+CPUC=<currency>,<ppu>[,<passwd>]	+CME ERROR: <err>
AT+CPUC?	+CPUC: <currency>,<ppu> +CME ERROR: <err>
AT+CPUC=?	OK
AT+CPUC="DEM","2","1234"	OK

Defined Values

<currency> = string type; three-character currency code (e.g. "GBP", "DEM"); character set as specified by command Select TE Character Set +CSCS

<ppu> = string type; price per unit; dot is used as a decimal separator (e.g. "2.66")

<passwd> = string type; SIM PIN2

8.13 Call Meter Maximum Event +CCWE

Description:

Shortly before the ACM (Accumulated Call Meter) maximum value is reached, an unsolicited result code +CCWV will be sent, if enabled by this command. The warning is issued approximately when 30 seconds call time remains. It is also issued when starting a call if less than 30 s call time remains.

Syntax:

AT+CCWE=<mode>

Command	Possible response(s)
AT+CCWE=<mode>	+CME ERROR: <err>
AT+CCWE?	+CCWE: <mode> +CME ERROR: <err>
AT+CCWE=?	+CCWE: (list of supported <mode>s) +CME ERROR: <err>

Defined Values

<mode>

0 = Disable the call meter warning event

1 = Enable the call meter warning event

8.14 Supplementary Service Notifications +CSSN

Description:

This command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes

When <m>=1 and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP") and when several different <code2>s are received from the network, each of them shall have its own +CSSU result code.

Syntax:

AT+CSSN=<n>,<m>

Command	Possible response(s)
AT+CSSN=[<n>[,<m>]]	
AT+CSSN?	+CSSN: <n>,<m>
AT+CSSN=?	+CSSN: (list of supported <n>s),(list of supported <m>s)
AT+CSSN?	+CSSN: 0,0 OK
AT+CSSN=?	+CSSN: (0,1),(0,1)

Defined Values

<n>: parameter sets/shows the +CSSI result code presentation status in the TA

0 = disable

1 = enable

<m> : parameter sets/shows the +CSSU result code presentation status in the TA

0 = disable

1 = enable

<code1>: manufacturer-specific, which of these codes are supported

0 = unconditional call forwarding is active

1	=	some of the conditional call forwardings are active
2	=	call has been forwarded
3	=	call is waiting
4	=	this is a CUG call (also <index> present)
5	=	outgoing calls are barred
6	=	incoming calls are barred
7	=	CLIR suppression rejected
8	=	call has been deflected

<code2>: manufacturer-specific, which of these codes are supported

0	=	this is a forwarded call (MT call setup)
1	=	this is a CUG call (also <index> present) (MT call setup)
2	=	call has been put on hold (during a voice call)
3	=	call has been retrieved (during a voice call)
4	=	multiparty call entered (during a voice call)
5	=	call on hold has been released (this is not a SS notification) (during a voice call)
6	=	forward check SS message received (can be received whenever)
7	=	call is being connected (alerting) with the remote party in alerting state in explicit call transfer operation (during a voice call)
8	=	call has been connected with the other remote party in explicit call transfer operation (also number and subaddress parameters may be present) (during a voice call or MT call setup)
9	=	this is a deflected call (MT call setup)

<number>	: string type phone number of format specified by <type>
<type>	: type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)
<subaddr>	: string type subaddress of format specified by <satype>
<satype>	: type of subaddress octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.8)
<index>	: Please refer to "Closed user group +CCUG"

8.15 List Current Calls +CLCC

Description:

Returns list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE. Refer subclause 13.1 for possible <err> values.

Syntax:

AT+CLCC

Command	Possible response(s)
AT+CLCC	+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>[,<alpha>] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[, <number>,<type>[,<alpha>]] [...]]] +CME ERROR: <err>
AT+CLCC=?	OK
AT+CLCC	+CLCC:1,0,3,0,0, "358317654321",129 OK *Note: phone call is alerting*
ATD96666666; *Note: originate voice call*	OK
AT+CLCC	+CLCC: 1,0,0,0,0,” 96666666”,129 OK *Note: phone call is active*

Defined Values

<dir>

0 = mobile originated (MO) call

1 = mobile terminated (MT) call

<stat>: state of the call

0 = active

1 = held

2 = dialing (MO call)

3 = alerting (MO call)
4 = incoming (MT call)
5 = waiting (MT call)
<mode> :bearer/teleservice
0 = voice
1 = data
2 = fax
3 = voice followed by data, voice mode
4 = alternating voice/data, voice mode
5 = alternating voice/fax, voice mode
6 = voice followed by data, data mode
7 = alternating voice/data, data mode
8 = alternating voice/fax, fax mode
9 = unknown
<mpty>
0 = call is not one of multiparty (conference) call parties
1 = call is one of multiparty (conference) call parties

<number> : string type phone number in format specified by <type>
<type> : type of address octet in integer format (refer GSM 04.08 [8] subclause 10.5.4.7)
<alpha> :string type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS
<idx> : integer type; call identification number as described in GSM 02.30 [19] subclause 4.5.5.1; this number can be used in +CHLD command operations

9 DATA COMMANDS

9.1 Select Bearer Service Type +CBST

Description:

This command is to select the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated. Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls (refer +CSNS).

Syntax:

AT+CBST=[<speed>[,<name>[,<ce>]]]

Command	Possible response(s)
AT+CBST=[<speed>[,<name>[,<ce>]]]	OK
AT+CBST?	+CBST: <speed>,<name>,<ce> OK
AT+CBST=?	+CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s) OK
AT+CBST=7,0,1	OK *Note: Bearer supported*
AT+CBST?	+CBST: 7,0,1 OK
AT+CBST=?	+CBST: (0-7,12,14,65,66,68,70,71,75),(0,1),(0-3) OK

Defined Values

<speed>

0 = autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service

1 = 300 bps (V.21)

2 = 1200 bps (V.22)
3 = 1200/75 bps (V.23)
4 = 2400 bps (V.22bis)
5 = 2400 bps (V.26ter)
6 = 4800 bps (V.32)
7 = 9600 bps (V.32)
12 = 9600 bps (V.34)
14 = 14400 bps (V.34)
65 = 300 bps (V.110)
66 = 1200 bps (V.110)
68 = 2400 bps (V.110 or X.31 flag stuffing)
70 = 4800 bps (V.110 or X.31 flag stuffing)
71 = 9600 bps (V.110 or X.31 flag stuffing)
75 = 14400 bps (V.110 or X.31 flag stuffing)

<name>

0 = data circuit asynchronous (UDI or 3.1 kHz modem)
1 = data circuit synchronous (UDI or 3.1 kHz modem)

<ce>

0 = transparent
1 = non-transparent
2 = both, transparent preferred
3 = both, non-transparent preferred

9.2 Radio Link Protocol +CRLP

Description:

This command is used to alter the Radio link protocol (RLP) parameters used when non-transparent data calls are originated.

Syntax:

AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>]]]]

Command	Possible response(s)
AT+CRLP=[<iws>[,<mws>[,<T1>[,<N2>]]]]	OK
AT+CRLP?	+CRLP: <iws>,<mws>,<T1>,<N2> OK

AT+CRLP=?	+CRLP: (list of supported <iws>s),(list of supported <mws>s), (list of supported <T1>s),(list of supported <N2>) OK
AT+CRLP=61,61,48,6	OK *Note: <ver> and <T4> are not implemented*
AT+CRLP?	+CRLP: 61,61,48,6 OK
AT+CRLP=?	+CRLP: (0-61),(0-61),(39-255),(1-255) OK

Defined Values

<iws>, <mws>, <T1>, <N2> = IWF to MS window size, MS to IWF window size, acknowledgement timer T1, retransmission attempts N2, re-sequencing period T4 in integer format (default values and value ranges depend on RLP version; refer GSM 04.22 [18]): T1 are in units of 10 ms.

Note:

Versions 0 and 1 share the same parameter set. For this command, only Version 0 is supported.

9.3 Service Reporting Control +CR

Description:

This command is to control whether or not intermediate result code +CR: <serv> is returned from the TA to the TE. If enabled, the intermediate result code is transmitted at the point during connect negotiation at which the TA has determined which speed and quality of service will be used, before any error control or data compression reports are transmitted, and before the intermediate result code CONNECT is transmitted.

Syntax:

AT+CR=[<mode>]

Command	Possible response(s)
AT+CR=[<mode>]	OK
AT+CR ?	+CR : <mode> OK

AT+CR=?	+CR: (list of supported <mode>s) OK
AT+CR=0 *Note: Disables reporting of result code*	OK *Note: Command valid*
AT+CR?	+CR : 0 OK
AT+CR=?	+CR : (0,1) OK
	+CR : ASYNC ATA CONNECT

Defined Values

<mode>

0	=	disables reporting
1	=	enables reporting

<serv>

ASYNC	=	asynchronous transparent
SYNC	=	synchronous transparent
REL ASYNC	=	asynchronous non transparent
REL SYNC	=	synchronous non transparent
GPRS [<L2P>]	=	GPRS

The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the Enter GPRS Data Mode (+CGDATA) command.

9.4 Cellular Result Codes +CRC

Description:

This command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation is used.

When this command is enabled, an incoming call is indicated to the TE with unsolicited result code +CRING: <type> instead of the normal RING.

Syntax:

AT+CRC=<mode>

Command	Possible response(s)
AT+CRC=<mode>	
AT+CRC?	+CRC: <mode>
AT+CRC=?	+CRC: (list of supported <mode>s)
AT+CRC=0 *Note: disable extended format*	OK *Note: Command valid*
AT+CRC?	+CRC: 0 OK
AT+CRC=?	+CRC: (0,1) OK
AT+CRC=1 *Note: enables extended RING information*	OK
	+CRING: VOICE

Defined Values

<mode>

0	=	disables extended format
1	=	enables extended format

<type>

ASYNC	=	asynchronous transparent
SYNC	=	synchronous transparent
REL ASYNC	=	asynchronous non transparent
REL SYNC	=	synchronous non transparent
FAX	=	facsimile (TS 62)
VOICE	=	normal voice (TS 11)
VOICE/XXX	=	Voice followed by data (BS81)(XXX is ASYNC, SYNC, REL ASYNC or REL SYNC
ALT VOICE/XXX	=	alternating voice/data, voice first (BS 61)
ALT XXX/VOICE	=	alternating voice/data, data first (BS 61)
ALT VOICE/FAX	=	alternating voice/fax, voice first (TS 61)

ALT FAX/VOICE	=	alternating voice/fax, fax first (TS 61)
GPRS <PDP_type>, <PDP_addr>[, <L2P>]	=	GPRS network request for PDP context activation

<PDP_type> and <PDP_addr> are as defined in the Define PDP Context (+CGDCONT) command. The optional <L2P> proposes a layer 2 protocol to use between the MT and the TE. It is defined in the Enter GPRS Data Mode (+CGDATA) command. If the MT is unable to announce to the TE the network's request (for example it is in V.25ter online data state) the MT shall reject the request. No corresponding unsolicited result code shall be issued when the MT returns to a command state.

9.5 Select Mode +FCLASS

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

Syntax:

AT+FCLASS=<n>

Command	Possible Response(s)
AT+FCLASS=<n>	
AT+FCLASS?	<n>
AT+FCLASS=?	(list of supported <n>s)
AT+FCLASS=2.0 *Note: set to fax service class 2.0*	OK *Note: command valid*

Defined Values

<n>: mode

0	=	data
2.0	=	fax class 2 (ITU T T.32 [12] and TIA 592)
8	=	voice

9.6 Local Rate Reporting +ILRR

Description:

This command determines whether the used local TE-TA data rate is informed using intermediate result code +ILRR: <rate> before going to online data state after call answering or originating.

Syntax:

AT+ILRR=<n>

Command	Possible response(s)
AT+ILRR=<n>	OK

Defined Values

<n>

0 = Local data rate is disabled

1 = Local data rate is enabled

10 MOBILE EQUIPMENT CONTROL AND STATUS COMMANDS

10.1 Phone Activity Status +CPAS

Description:

This command returns the activity status of the ME.

Syntax:

AT+CPAS

Command	Possible response(s)
AT+CPAS	+CPAS: <pas> +CME ERROR: <err>
AT+CPAS=?	+CPAS: (list of supported <pas>s) +CME ERROR: <err>
AT+CPAS?	+CME ERROR: 3
AT+CPAS	+CPAS: 0 OK *Note: Ready for commands*

Defined Values

<pas>

0 = ready (ME allows commands from TA/TE)

1 = unavailable (ME does not allow commands from TA/TE)

2 = unknown (ME is not guaranteed to respond to instructions)

3 = ringing (ME is ready for commands from TA/TE, but the ringer is active)

4 = call in progress (ME is ready for commands from TA/TE, but a call is in progress)

5 = asleep (ME is unable to process commands from TA/TE because it is in a low functionality state)

10.2 Set Phone Functionality +CFUN

Description:

This 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.

Syntax:

AT+CFUN=[<fun>[,<rst>]]

Command	Possible response(s)
AT+CFUN=[<fun>[,<rst>]]	+CME ERROR: <err>
AT+CFUN?	+CFUN: <fun> +CME ERROR: <err>
AT+CFUN=?	+CFUN: (list of supported <fun>s), (list of supported <rst>s) +CME ERROR: <err>
AT+CFUN=?	+CFUN: (0,1,4),(0)
AT+CFUN=1 *Note: Reset ME and set to full functionality*	OK *Note: Command valid*
AT+CFUN=1,0 *Note: Set to full functionality without resetting ME*	OK *Note: Command Valid*
AT+CFUN?	+CFUN: 1 OK

Defined Values

<fun>

0 = minimum functionality

1 = full functionality

4 = disable phone both transmit and receive RF circuits.

<rst>

0 = Do not reset the ME before setting it to <fun> power level

1 = Resets the ME before setting it to <fun> power level (default)

10.3 Set Language +CLAN

Description:

This command sets the language in the ME. The set-command must confirm the selected language with the MMI-module in the ME.

Syntax:

AT+CLAN=<code>

Command	Possible response(s)
AT+CLAN=<code>	+CME ERROR: <err>
AT+CLAN?	+CLAN: <code> +CME ERROR: <err>
AT+CLAN=?	+CLAN: (list of supported <code>s) +CME ERROR: <err>
AT+CLAN?	+CLAN: fr OK
AT+CLAN=?	+CLAN: en,fr,de,it,es,pt,no,el,pl,in,cs,zh,ar OK
AT+CLAN=”da”	OK

Defined Values

<code>

"AUTO"	=	Read language from SIM. "Auto" is not returned by the read-command.
"sw"	=	Swedish
"fi"	=	Finnish
"da"	=	Danish
"no"	=	Norwegian
"de"	=	German
"fr"	=	French
"es"	=	Spanish
"it"	=	Italian
"en"	=	English

Note:

Not all language codes are present in this list.

10.4 Language Event +CLAE

Description:

This command is used to enable/disable unsolicited result code +CLAV: <code>. If <mode>=1, +CLAV: <code > is sent from the ME when the language in the ME is changed.

Syntax:

AT+CLAE=<mode>

Command	Possible response(s)
AT+CLAE=<mode>	+CME ERROR: <err>
AT+CLAE?	+CLAE: <mode> +CME ERROR: <err>
AT+CLAE=?	+CLAE: (list of supported <mode>s) +CME ERROR: <err>
AT+CLAE?	+CLAE: 0 OK
AT+CLAE=?	+CLAE: (0-1) OK

Defined Values

<mode>

0 = Disable unsolicited result code +CLAV to ME

1 = Enable unsolicited result code +CLAV to ME

<code>: Please refer to +CLAN.

11 MOBILE EQUIPMENT ERRORS

11.1 Report Mobile Equipment Error +CMEE

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 enabled, 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.

Syntax:

AT+CMEE=[<n>]

Command	Possible response(s)
AT+CMEE=[<n>]	
AT+CMEE?	+CMEE: <n>
AT+CMEE=?	+CMEE: (list of supported <n>s)
AT+CMEE=1 *Note: enable +CME ERROR result code*	OK *Note: command valid*
AT+CPIN? *Note: ask for status of SIM card*	+CME ERROR: 10 OK *Note: SIM card not detected*
AT+CMEE=0 *Note: disable +CME ERROR result code*	OK
AT+CPIN?	ERROR OK
AT+CMEE=2	OK
AT+CPIN?	+CME ERROR: SIM not inserted OK

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 (refer next subclause)
2	=	enable +CME ERROR: <err> result code and use verbose <err> values (refer next subclause)

11.2 Mobile Equipment Error Result Code +CME ERROR

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.

12 GENERIC TA CONTROL COMMANDS – V25

12.1 Set All TA Parameters to Default Configuration Z

Description:

This command reset to default configuration.

Syntax:

ATZ

Command	Possible response(s)
ATZ	OK

12.2 Save Configuration &W

Description:

This command writes the active configuration into a non-volatile memory. It saves the parameters given in Appendix B.

Syntax:

AT&W

Command	Possible Response(s)
AT&W	OK

12.3 Restore Default Factory Settings &F

Description:

This command is used to restore the factory settings being set by iWOW. It restores the parameters given in Appendix B.

Syntax:

AT&F

Command	Possible Response(s)
AT&F	OK

12.4 Manufacturer Information About TA I

Description:

This command tells the manufacturer Information about TA

Syntax:

ATI

Command	Possible response(s)
ATI	OK *Note: modem response to be updated*

Parameters

ATI0

ATI1

12.5 TA Manufacturer ID +GMI

Description:

This command gives the manufacturer Identification.

Syntax:

AT+GMI

Command	Possible response(s)
AT+GMI	iWOW OK

12.6 TA Model ID +GMM

Description:

This command gives the TA model identification.

Syntax:

AT+GMM

Command	Possible response(s)
AT+GMM	TR-800 OK

12.7 TA Revision Number +GMR

Description:

This command gives the TA revision Number

Syntax:

AT+GMR

Command	Possible response(s)
AT+GMR	AB_02_00_30N_DEF000 OK

12.8 TA Serial Number +GSN

Description:

This command gives the TA serial number

Syntax:

AT+GSN

Command	Possible response(s)
AT+GSN	446019197507590 OK

12.9 Request Overall Capabilities for TA +GCAP

Description:

This command list out the overall capabilities for TA

Syntax:

AT+GCAP

Command	Possible response(s)
AT+GCAP	+GCAP: +CGSM,+FCLASS OK

12.10 Command Line Termination Character S3=

Description:

This command 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.

Syntax:

ATS3=<n>

Command	Possible response(s)
ATS3=3	OK

Defined Values

<n>

0 to 127	=	Set command line termination character to this value.
13	=	Carriage Return character (CR, IA5 0/13)
		Default setting

12.11 Response Formatting Character S4=

Description:

This command 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.

Syntax:

ATS4=<n>

Command	Possible response(s)
ATS4=10	OK

Defined Values

<n>

0 to 127	=	Set response formatting character to this value.
10	=	Line Feed character (LF, IA5 0/10)
		Default setting

12.12 Editing Character S5=

Description:

This command 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.

Syntax:

ATS5=<n>

Command	Possible response(s)
ATS5=8	OK

Defined Values

0 to 127	=	Set command line editing character to this value.
8	=	Backspace character (BS, IA5 0/8)
		Default setting

12.13 Return to Data State O

Description:

This command cause DCE to return to online data state and issue a CONNECT or CONNECT <text> result code.

Syntax:

ATO

Command	Possible response(s)
ATO	OK CONNECT

12.14 Command Echo Mode E

Description:

This command is used to turn on or off the echoes characters received by an external application.

Syntax:

ATE<n>

Command	Possible response(s)
ATE<n>	OK

Defined Values

<n>

0 = characters are not echoed

1 = characters are echoed

12.15 Result Code Suppression Q

Description:

This command determines whether TA sends result codes or not.

Syntax:

ATQ<n>

Command	Possible response(s)
ATQ<n>	OK

Defined Values

<n>

0 = TA transmits result codes

1 = Result codes are suppressed and not transmitted

12.16 Response Format V

Description:

This command determines the response format, with or without header character <CR><LF>, and with the use osf numeric result codes.

Syntax:

ATV<n>

Command	Possible response(s)
ATV0	0tv0
ATV1	OK

Defined Values

<n>

0 = response format with limited headers and trailers and numeric result codes

1 = response format with full headers and trailers and verbose response text

12.17 Result Code Selection & Call Progress Monitoring Control X

Description:

The setting of this parameter determines whether or not the DCE transmits particular result codes to the DTE. It also controls whether or not the DCE verifies the presence of dial tone when it first goes off-hook to begin dialling, and whether or not engaged tone (busy signal) detection is enabled.

If the specified value is not recognized, an **ERROR** result code is issued.

Command	Possible response(s)
ATX<n>	OK
ATX1	*OK*
	CONNECT 9600 *Note: Connected speed is displayed on entering online data state*

Defined Values

<n>

0	=	CONNECT result code is given upon entering online data state. Dial tone and busy detection are disabled.
1	=	CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are disabled.
2	=	CONNECT <text> result code is given upon entering online data state. Dial tone detection is enabled, and busy detection is disabled.
3	=	CONNECT <text> result code is given upon entering online data state. Dial tone detection is disabled, and busy detection is enabled.
4	=	CONNECT <text> result code is given upon entering online data state. Dial tone and busy detection are both enabled.

Note:

<text> indicates the connected speed

12.18 DCD-usage &C

Description:

This command controls the Data Carrier Detect (DCD) signal. The GPIO-2 pin on the module is used for DCD signaling.

Syntax:

AT&C<n>

Command	Possible response(s)
AT&C<n>	OK
AT&C0	OK *Note: DCD always on*
AT&C1	OK *Note: DCD matches state of the remote* modem's data carrier. *(ON when CONNECT message is received)*

Defined Values

<n>

0 = DCD always on

1 = DCD matches the states of the remote end's data carrier

12.19 DTR-Usage &D

Description:

This command controls the Data Terminal Ready (DTR) signal. The GPIO-3 pin on the module is used for DTR signaling.

Syntax:

AT&D<n>

Command	Possible response(s)
AT&D<n>	OK

Defined Values

<n>

0 = DTR signal is ignore

1 = ME switch from data to command mode when DTR switches from ON to OFF

2 = Call is cleared when DTR switches from ON to OFF

12.20 Fixed TE-TA Data Rate +IPR

Description:

This command specified the data rate at which command is accepted.

For serial autobauding, any AT command issued by the DTE must start with both capital 'A' and 'T' (or '/') or both lower case 'a' and 't' (or '/') to synchronize with the modem.

Syntax:

AT+IPR=<n>

Command	Possible response(s)
AT+IPR=<n>	OK
AT+IPR=?	+IPR: (0,75,150,300,600,1200,2400,4800,7200,9600,14400,19200,28800,33900,38400,57600,115200)

Defined Values

<n> = supported data rates
0,75,150,300,600,1200,2400,4800,7200,9600,14400,19200,28800,33900,38400,57600,115200

12.21 TE-TA Character Framing +ICF

Description:

This command is used to determine the local serial port start-stop (asynchronous) character framing that the TA shall use.

Syntax:

AT+ICF=<format>,<parity>

Command	Possible response(s)
AT+ICF=<format>,<parity>	OK
AT+ICF=?	+ICF: (1-6),(0-3) OK
AT+ICF=5,1 *Note: Set format to 7 data, Even parity and 1 stop bit*	OK
AT+ICF?	+ICF: 5,1 OK

Defined Values

<format>

1 = 8 data 2 stop

2 = 8 data 1 parity 1 stop

3 = 8 data 1 stop

4 = 7 data 2 stop

5 = 7 data 1 parity 1 stop

6 = 7 data 1 stop

<parity>

0 = Odd

1 = Even

2 = Mark

3 = Space

4 = None

12.22 TE-TA Local Flow Control +IFC

Description:

This command is used to control the operation of the local flow control between TE and TA. The <DCE_by_DTE> and <DTE_by_DCE> values must be equal.

Syntax:

AT+IFC=<DCE_by_DTE>,<DTE_by_DCE>

Command	Possible response(s)
AT+IFC=<DCE_by_DTE>,<DTE_by_DC>	OK

Defined Values

<DCE_by_DTE> and <DTE_by_DCE>

0 = none

1 = DC1/DC3 on circuit 103/104

2 = circuit 133/106

13 GPRS COMMANDS

13.1 Define PDP Context +CGDCONT

Description:

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

Syntax:

AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]

Command	Possible response(s)
AT+CGDCONT=[<cid> [,<PDP_type> [,<APN> [,<PDP_addr> [,<d_comp> [,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]	OK ERROR
+CGDCONT?	+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,…[,pdN]]] [<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,…[,pdN]]] [...]]
AT+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)]]] [...]]
AT+CGDCONT=1,"IP","internet" *Note: APN for the particular network is set to internet*	OK
AT+CGDCONT?	+CGDCONT: 1,"IP","internet",,0,0 OK
AT+CGDCONT=?	+CGDCONT: (1-2),"IP",,,(0),(0,1) OK

Defined Values

<cid> : (PDP Context Identifier) a numeric parameter that 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 that specifies the type of packet data protocol

X25 : ITU-T/CCITT X.25 layer 3

IP : Internet Protocol (IETF STD 5)

OSPIH : Internet Hosted Octet Stream Protocol (Obsolete)

PPP : Point to Point Protocol (IETF STD 51)

<APN> : (Access Point Name) a string parameter that is a logical name that is used to select the GGSN or the external packet data network.

<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.

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

<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.

13.2 Quality of Service Profile (Requested) +CGQREQ

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 command, the +CGQREQ command is effectively an extension to the +CGDCONT command. 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.

Syntax:

AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]

Command	Possible Response(s)
AT+CGQREQ=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR
AT+CGQREQ?	+CGQREQ: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQREQ: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]
AT+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) […]]
AT+CGQREQ=1,1,1,1,1,1	OK
AT+CGQREQ=?	+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-31) +CGQREQ: "PPP",(0-3),(0-4),(0-5),(0-9),(0-31) OK
AT+CGQREQ?	+CGQREQ: 1,1,1,1,1,1 OK

Defined Values

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

<precedence>: a numeric parameter which specifies the precedence class

1 (High priority) = Service commitments shall be maintained ahead of precedence classes 2 and 3

2 (Normal priority) = Service commitments shall be maintained ahead of precedence class 3

3 (Low priority) = Service commitments shall be maintained after precedence classes 1 and 2

<delay>: a numeric parameter which specifies the delay class:

Delay classes	Delay (maximum values)			
	SDU size: 128 octets		SDU size: 1024 octets	
	Mean Transfer Delay (sec)	95 percentile Delay (sec)	Mean Transfer Delay (sec)	95 percentile Delay (sec)
1. (Predictive)	< 0.5	< 1.5	< 2	< 7
2. (Predictive)	< 5	< 250	< 15	< 75
3. (Predictive)	< 50	< 250	< 75	< 375
4. (Best Effort)	Unspecified			

<reliability>: a numeric parameter which specifies the reliability class:

Reliability Class	GTP Mode	LLC Frame Mode	LLC Data Protection	RLC Block Mode	Traffic Type
1	Acknowledged	Acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that cannot cope with data loss
2	Unacknowledged	Acknowledged	Protected	Acknowledged	Non real-time traffic, error-sensitive application that can cope with infrequent data loss
3	Unacknowledged	Unacknowledged	Protected	Acknowledged	Non real-time

					traffic, error-sensitive application that can cope with data loss, GMM/SM, and SMS
4	Unacknowledged	Unacknowledged	Protected	Unacknowledged	Real-time traffic, error-sensitive application that can cope with data loss
5	Unacknowledged	Unacknowledged	Unprotected	Unacknowledged	Real-time traffic, error non-sensitive application that can cope with data loss.

<peak>: a numeric parameter which specifies the peak throughput class:

Peak Throughput Class	Peak Throughput in octets per second
1	Up to 1 000 (8 kbits/s)
2	Up to 2 000 (16 kbits/s)
3	Up to 4000 (32 kbits/s)
4	Up to 8000 (64 kbits/s)
5	Up to 16 000 (128 kbits/s)
6	Up to 32 000 (256 kbits/s)
7	Up to 64000 (512 kbits/s)
8	Up to 128 000 (1 024 kbits/s)
9	Up to 256 000 (2 048 kbits/s)

<mean>: a numeric parameter which specifies the mean throughput class:

Mean Throughput Class	Mean Throughput in octets per hour
1	100 (~0.22 bit/s)
2	200 (~0.44 bit/s)
3	500 (~1.1 bit/s)
4	1 000 (~2.2 bit/s)
5	2 000 (~4.4 bit/s)
6	5 000 (~11.1 bit/s)
7	10 000 (~22 bit/s)
8	20 000 (~44 bit/s)
9	50 000 (~111 bit/s)
10	100 000 (~0.22 kbit/s)
11	200 000 (~0.44 kbit/s)
12	500 000 (~1.11 kbit/s)

13	1 000 000 (~2.2 kbit/s)
14	2 000 000 (~4.4 kbit/s)
15	5 000 000 (~11.1 kbit/s)
16	10 000 000 (~22 kbit/s)
17	20 000 000 (~44 kbit/s)
18	50 000 000 (~111 kbit/s)
31	Best effort

13.3 Quality of Service Profile (Minimum acceptable) +CGQMIN

Description:

This command allows the TE to specify a minimum acceptable profile that 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 command, the +CGQMIN command is effectively an extension to the +CGDCONT command. 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.

Syntax:

AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]

Command	Possible Response(s)
AT+CGQMIN=[<cid> [,<precedence > [,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]	OK ERROR
AT+CGQMIN?	+CGQMIN: <cid>, <precedence >, <delay>, <reliability>, <peak>, <mean> [<CR><LF>+CGQMIN: <cid>, <precedence >, <delay>, <reliability.>, <peak>, <mean> […]]
AT+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) […]]
AT+CGQMIN?	+CGQMIN: 1,1,4,5,2,31 OK
AT+CGQMIN=?	+CGQMIN: “IP”,(0-3),(0-4),(0-5),(0-9),(0-31) +CGQMIN: “PPP”,(0-3),(0-4),(0-5),(0-9),(0-31) OK
AT+CGQMIN?	+CGQMIN: 1,1,4,5,2,31 OK

Defined Values

<cid>	=	a numeric parameter which specifies a particular PDP context definition (see +CGDCONT command).
<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

13.4 GPRS Attach or Detach +CGATT

Description:

The execution command is used to attach the MT to, or detach the MT from, the GPRS 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.

Syntax:

AT+ CGATT= [<state>]

Command	Possible Response(s)
AT+CGATT= [<state>]	OK ERROR
AT+CGATT?	+CGATT: <state>
AT+CGATT=?	+CGATT: (list of supported <state>s)
AT+CGATT=1 *Note: force MT to attach*	OK
AT+CGREG? *Note: request for GPRS registration status*	+CGREG: 0,1 OK *Note: MT has attached to GPRS network*
AT+CGATT=0 *Note: ask for detach from GPRS service*	OK
AT+CGREG?	+CGREG: 0,0 OK *Note: MT has detached from GPRS network*

Defined Values

<state>: indicates the state of GPRS attachment

0 = detached

1 = attached

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

13.5 PDP Context Activate or Deactivate +CGACT

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 GPRS attached when the activation form of the command is executed, the MT first performs a GPRS 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.

Syntax:

AT+CGACT=[<state> [,<cid>[,<cid>[,…]]]]

Command	Possible Response(s)
AT+CGACT=[<state> [,<cid>[,<cid>[,…]]]]	OK ERROR
AT+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>, <state> [...]]
AT+CGACT=?	+CGACT: (list of supported <state>s)
AT_CGACT=1,1	OK
AT+CGACT?	+CGACT:1,1 OK
AT+CGACT=?	+CGACT: (0-1) OK

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 +CGDCONT command).+CGDCONT

13.6 Enter Data State +CGDATA

Description:

This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more GPRS PDP types. This may include performing a GPRS attach and one or more PDP context activations. If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.

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.

If context activation takes place during the PDP startup, one or more <cid>s may be specified in order to provide the values needed for the context activation request(s).

During the PDP startup procedure the MT may have access to some or all of the following information.

The MT may have a priori knowledge, for example, it may implement only one PDP type.

The TE may provide one or both of PDP type and PDP address to the MT in the PDP startup.

If any of this information is in conflict, the command will fail.

If one or more <cid> is given then an attempt shall be made to identify an appropriate context definition by matching any PDP type and PDP address present in this information, with the PDP type and PDP address in each of the specified context definitions (in the order in which their <cid>s appear in the command) as follows:

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if either or both addresses are unspecified. For example, a PPP NCP request specifying PDP type = IP and no PDP address would cause the MT to search through the specified context definitions for one with PDP type = IP and any PDP address.

The context shall be activated using the matched value for PDP type and a static PDP address if available, together with the other information found in the PDP context definition. If a static PDP address is not available then a dynamic address is requested.

If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context with whatever information is available to the MT. The other context parameters will be set to their default values.

If the activation is successful, data transfer may proceed. After data transfer is complete, and the layer-2 protocol termination procedure has completed successfully, the V.250 command state is re-entered and the MT returns the final result code OK.

In the event of an erroneous termination or a failure to startup, the V.250 command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported.

Syntax:

AT +CGDATA=[<L2P> ,[<cid> [,<cid> [,…]]]]

Command Possible	**Response(s)**
AT+CGDATA=[<L2P> ,[<cid> [,<cid> [,…]]]]	CONNECT ERROR
AT+CGDATA=?	+CGDATA: (list of supported <L2P>s)
AT+CGDATA="PPP",1 *Note: force a PDP context activation with PDP id 1 of +CGDCONT*	CONNECT

Defined Values

<L2P> : a string parameter that indicates the layer 2 protocol to be used between the TE and MT

PPP Point-to-point protocol for a PDP such as IP

PAD character stream for X.25 character (triple X PAD) mode

X25 X.25 L2 (LAPB) for X.25 packet mode

M-xxxx manufacturer-specific protocol (xxxx is an alphanumeric string)

If the value is omitted, the layer 2 protocol is unspecified. Other values are reserved and will result in an ERROR response.

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

13.7 Show PDP Address +CGPADDR

Description:

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

Syntax:

AT+CGPADDR=[<cid> [,<cid>[,…]]]

Command	Possible response(s)
AT+CGPADDR=[<cid> [,<cid> [,…]]]	+CGPADDR: <cid>,<PDP_addr> [<CR><LF>+CGPADDR: <cid>,<PDP_addr> [...]]
AT+CGPADDR=?	+CGPADDR: (list of defined <cid>s)
AT+CGPADDR=1	+CGPADDR: 1,"172.22.156.68" OK *Note: PDP address is displayed during a GPRS connection when an IP is assigned. It is omitted if none is available*
AT+CGPADDR=?	+CGPADDR: (1,2) OK

Defined Values

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

13.8 Automatic Response to a Network Request for PDP Context Activation +CGAUTO

Description:

The set command disables or enables an automatic positive response (auto-answer) to the receipt of a Request PDP Context Activation message from the network. It also provides control over the use of the V.250 basic commands 'S0', 'A and 'H' for handling network requests for PDP context activation. The setting does not affect the issuing of the unsolicited result code RING or +CRING.

When the +CGAUTO=1 command is received, the MT shall attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR or, if enabled, +CME ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING or +CRING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.250 online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

Syntax:

AT+CGAUTO =[<n>]

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

AT+CGAUTO=3	OK
AT+CGAITO=?	+CGAUTO: (0-3) OK
AT+CGAUTO?	+CGAUTO: 3 OK

Defined Values

<n>

0 = turn off automatic response (circuit switched as in GSM 07.07)

1 = turn on automatic response (circuit switched as in GSM 07.07)

2 = modem compatibility mode, GPRS only

3 = modem compatibility mode, GPRS and circuit switched calls (default)

For <n> = 0 or 1 GPRS network requests are manually accepted or rejected by the +CGANS command. The 'S0', 'A' and 'H' commands control only circuit switched calls.

For <n> = 2, automatic acceptance of GPRS network requests is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Incoming circuit switched calls can be neither manually nor automatically answered.

For <n> = 3, automatic acceptance of both GPRS network requests and incoming circuit switched calls is controlled by the 'S0' command. Manual control uses the 'A' and 'H' commands, respectively, to accept and reject GPRS requests. (+CGANS may also be used.) Circuit switched calls are handled according to GSM 07.07.

13.9 Manual Response to a Network Request for PDP Context Activation +CGANS

Description:

The command requests the MT to respond to a network request for GPRS PDP context activation which has been signaled to the TE by the RING or +CRING: unsolicited result code. The <response> parameter allows the TE to accept or reject the request.

If <response> is 0, the request is rejected and the MT returns OK to the TE.
If <response> is 1, the MT follows the following procedure.
Commands following the +CGANS command in the AT command line, shall not be processed by the MT.

If the <L2P> parameter value is unacceptable to the MT, the MT shall return an ERROR or +CME ERROR response. Otherwise, the MT issues the intermediate result code CONNECT and enters V.250 online data state.

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) and in more detail in GSM 09.61 and the specifications for the relevant PDPs. PDP context activation procedures shall take place prior to or during the PDP startup.

One or more <cid>s may be specified in order to provide the values needed for the context activation request. During the PDP startup procedure the MT has the PDP type and the PDP address provided by the network in the Request PDP Context Activation message. The MT may also have some or all of the following information -

The MT may have a priori knowledge, for example, it may implement only one PDP type.

The command may have provided an <L2P> parameter value.

The TE may provide one or both of PDP type and PDP address to the MT in the PDP startup.

If any of this information is in conflict, the command will fail.

If one or more <cid> is given then an attempt shall be made to identify an appropriate context definition by matching the PDP type and PDP address in the network request with the PDP type and

PDP address in each of the specified context definitions (in the order in which their <cid>s appear in the command) as follows -

The PDP type must match exactly.

The PDP addresses are considered to match if they are identical or if the address in the context definition is unspecified.

The context shall be activated using the values for PDP type and PDP address provided by the network, together with the other information found in the PDP context definition. An APN may or may not required, depending on the application.
If no <cid> is given or if there is no matching context definition, the MT will attempt to activate the context using the values for PDP type and PDP address provided by the network, together with any other relevant information known to the MT. The other context parameters will be set to their default values.

If the activation is successful, data transfer may proceed.

After data transfer is complete, and the layer-2 protocol termination procedure has completed successfully, the V.250 command state is re-entered and the MT returns the final result code OK

In the event of an erroneous termination or a failure to startup, the V.250 command state is re-entered and the MT returns the final result code NO CARRIER or, if enabled, +CME ERROR. Attach, activate and other errors may be reported. It is also an error to issue the +CGANS command when there is no outstanding network request.

Note:
This is not the same as if the MT issues a +CGDATA (or +CGACT) command after receiving a +CRING unsolicited result code. A +CGDATA (or +CGACT) does not command the MT to acknowledge the network request but rather to make a new request for context activation. The network request would be ignored.

Syntax:
AT+CGANS=[<response>, [<L2P> ,[<cid>]]]

Command	Possible response(s)
AT+CGANS=[<response>,[<L2P> ,[<cid>]]]	OK ERROR
AT+CGANS=?	+CGANS: (list of supported <response>s), (list of supported <L2P>s)
AT+CGANS=1	CONNECT
AT+CGANS=?	+CGANS: (0-1) OK

Defined Values

<response>: is a numeric parameter which specifies how the request should be responded to.

0 = reject the request

1 = accept and request that the PDP context be activated

If <response> is omitted it is assumed to be 0. Other values are reserved and will result in the ERROR response.

<L2P> : a string parameter that indicates the layer 2 protocol to be used (see +CGDATA command).

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

13.10 GPRS Mobile Station Class +CGCLASS

Description:

This command is used to set the MT to operate according to the specified GPRS mobile class.

The read command returns the current GPRS mobile class. The value returned may indicate a lower class than the last value set since the network can downgrade the class.

The test command is used for requesting information on the supported GPRS mobile classes. It returns the classes that may currently be used. Due to a network downgrading, these may form a subset of those actually supported by the MT.

Syntax:

AT+CGCLASS= [<class>]

Command	Possible Response(s)
AT+CGCLASS= [<class>]	OK ERROR
AT+CGCLASS?	+CGCLASS: <class>
AT+CGCLASS=?	+CGCLASS: (list of supported <class>s)
AT+CGCLASS="B"	OK
AT+CGCLASS?	+CGCLASS: "B" OK
AT+CGCLASS=?	+CGCLASS: ("B","CG","CC") OK

Defined Values

<class>: a string parameter which indicates the GPRS mobile class (in descending order of functionality)

B = class B

CG = class C in GPRS only mode

CC = class C in circuit switched only mode

If the MT is GPRS attached when the set command is issued with a <class> = CC specified, a GPRS detach request shall be sent to the network.

If the MT is GSM attached when the set command is issued with a <class> = CC specified, a GSM detach request shall be sent to the network.

13.11 GPRS Event Reporting +CGEREP

Description:

Set command enables or disables sending of unsolicited result codes, +CGEV: XXX from MT to TE in the case of certain events occurring in the GPRS MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered.

Syntax:

AT+CGEREP=[<mode>[,<bfr>]]

Command	Possible Response(s)
AT+CGEREP=[<mode>[,<bfr>]]	OK ERROR
AT+CGEREP?	+CGEREP: <mode>,<bfr>
AT+CGEREP=?	+CGEREP: (list of supported <mode>s),(list of supported <bfr>s)
AT+CGEREP=0	OK
AT+CGEREP=?	+CGEREP: (0,2),(0,1) OK
AT+CGEREP?	+CGEREP: 0,0 OK

Defined Values

<mode>

0 = buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.

1 = discards unsolicited result codes when MT-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 MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>

0 = MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered

1 = MT buffer of unsolicited result codes defined within this command is flushed to the TE <mode> 1 or 2 is entered (OK response shall be given before flushing the codes)

Defined Events

The following unsolicited result codes and the corresponding events are defined:

+CGEV = REJECT <PDP_type>, <PDP_addr>
A network request for PDP context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected.

+CGEV = NW REACT <PDP_type>, <PDP_addr>, [<cid>]
The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT.

+CGEV = NW DEACT <PDP_type>, <PDP_addr>, [<cid>]
The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV = ME DEACT <PDP_type>, <PDP_addr>, [<cid>]
The mobile equipment has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT.

+CGEV = NW DETACH
The network has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV = ME DETACH
The mobile equipment has forced a GPRS detach. This implies that all active contexts have been deactivated. These are not reported separately.

+CGEV = NW CLASS <class>
The network has forced a change of MS class. The highest available class is reported (see +CGCLASS).

+CGEV = ME CLASS <class>
The mobile equipment has forced a change of MS class. The highest available class is reported (see +CGCLASS).

13.12 GPRS Network Registration Status +CGREG

Description:

This 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.

Syntax:

AT+CGREG=[<n>]

Command	Possible response(s)
AT+CGREG=[<n>]	
AT+CGREG?	+CGREG: <n>,<stat>[,<lac>,<ci>] +CME ERROR: <err>
AT+CGREG=?	+CGREG: (list of supported <n>s)
AT+CGREG?	+CGREG: 0,0
AT+CGATT=1 *Note: attach to GPRS network*	OK
AT+CGREG? *Note: request for GPRS registration status*	+CGREG: 0,1 *Note: successful registered/attached to home 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

1 = registered, home network

2 = not registered, but ME is trying to attach or searching an operator to register to

3 = registration denied

4 = unknown

5 = registered, roaming 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

13.13 Select Service for MO SMS Messages +CGSMS

Description:

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

Syntax:

AT+CGSMS=[<service>]

Command	Possible Response(s)
AT+CGSMS= [<service>]	OK ERROR
AT+CGSMS?	+CGSMS: <service>
AT+CGSMS=?	+CGSMS: (list of currently available <service>s)
AT+CGSMS=3	OK
AT+CGSMS=?	+CGSMS: (0-3) OK
AT+CGSMS?	+CGSMS: 3 OK

Defined Values

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

0 = GPRS

1 = circuit switched

2 = GPRS preferred (use circuit switched if GPRS not available)

3 = circuit switched preferred (use GPRS if circuit switched not available)

13.14 Request GPRS Service 'D'

Description:

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

The V.250 'D' (Dial) command causes the MT to enter the V.250 online data state and, with the TE, to start the specified layer-2 protocol. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.250 online data state. No further commands may follow on the AT command line.

When the layer-2 protocol has terminated, either as a result of an orderly shut down of the PDP or an error, the MT shall enter V.250 command state and return the NO CARRIER final result code.

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

Syntax:

ATD*<GPRS_SC>[*[<called_address>][*[<L2P>][*[<cid>]]]]#

Command	Possible Response(s)
ATD*<GPRS_SC>[*[<called_address>][*[<L2P>][*[<cid>]]]]#	CONNECT ERROR
AT+CGDCONT=1,”IP”,”internet”	OK
AT+CGDCONT=2,”IP”,”net”	OK
AT+CGDCONT?	+CGDCONT: 1,"IP","internet",,0,0 +CGDCONT: 2,"IP","net",,0,0 OK
ATD*99***2# *Note: use second cid identifier PDP context definition to connect to GPRS service*	CONNECT

Defined Values

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

<called_address> : a digit string (see note) that specifies the address of a called party in the address space applicable to the PDP.

<L2P> : a digit string (see note) that indicates the layer 2 protocol to be used (see +CGDATA command).

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

Numeric equivalents to the alphanumeric values used by +CGDATA are:

1 = PPP

2 = PAD

3 = X25

9yyyy = M-xxxx

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

13.15 Network Requested PDP Context Activation

Description:

In this mode of operation, the MT behaves like an answering modem and accepts the normal V.250 commands associated with answering a call. If GPRS-specific configuration commands are required, they may be sent to the MT as part of the modem initialization commands.

The +CGANS command is used to select modem compatibility mode.

13.16 Automatic Response to a Network Request for PDP Context Activation 'S0'

The V.250 'S0=n' (Automatic answer) command may be used to turn off (n=0) and on (n>0) the automatic response to a network request for a PDP context activation.

When the 'S0=n' (n>0) command is received, the MT shall attempt to perform a GPRS attach if it is not already attached. Failure will result in ERROR being returned to the TE. Subsequently, the MT will announce a network request for PDP context activation by issuing the unsolicited result code RING to the TE, followed by the intermediate result code CONNECT. The MT then enters V.250 online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified.

Note:
The 'S0=n' (n=0) command does not perform an automatic GPRS detach.

13.17 Manual Acceptance of a Network Request for PDP Context Activation 'A'

The V.250 'A' (Answer) command may be used to accept a network request for a PDP context activation announced by the unsolicited result code RING. The MT responds with CONNECT, enters V.250 online data state and follows the same procedure as it would after having received a +CGANS=1 with no <L2P> or <cid> values specified. It is an error to issue the 'A' command when there is no outstanding network request.

13.18 Manual Rejection of a Network Request for PDP Context Activation 'H'

The V.250 'H' or 'H0' (On-hook) command may be used to reject a network request for PDP context activation announced by the unsolicited result code RING. The MT responds with OK. It is an error to issue the 'H' command when there is no outstanding network request.

Note:
This is an extension to the usage of the 'H' command that is described in ITU-T V.250.

14 iTEGNO 38XX SPECIFIC AT COMMANDS

14.1 Cell Environment Description +CCED

Description:

This command can be used to retrieve the parameters of the main cell and of up to six neighboring cells. There are two possible methods to ascertain these cell parameters:

1. on request
2. automatically every 5 seconds

Automatic mode is not supported during registration

Syntax:

AT+CCED=<mode>[,<requested dump>]

Command	**Possible Response(s)**
AT+CCED=0,1 *Note: Only Main cell request*	+CCED: 525,001,32,1159,52,,46,,,0,,, OK
AT+CCED=0,2 *Note: Neighboring cell request*	+CCED: 525,001,32,36e3,39,,24,525,001,32,d5,37,,13,525,001, 32,388b,37,,26,525,00 1,0,,0,,0,525,001,0,,0,,0,525,001,0,,0,,0 OK

Defined Values

<mode>

0 = One shot requested

1 = Automatic shots requested

2 = Stop automatic shots

<requested dump>

1 = Main Cell:

- if the Cell Identity is available

  MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev, RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS

- if the Cell Identity is not available

  MCC, MNC, LAC,, BSIC, BCCH Freq (absolute), RxLev, RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS

2 = Neighboring1 to Neighboring6:

- if the Cell Identity is available

  MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev

- if the Cell Identity is not available

  MCC, MNC, LAC,, BSIC, BCCH Freq (absolute), RxLev

4 = Timing Advance

8 = Main cell RSSI indications (RxLev), in a range from 0 to 31

Note:

- The response for the requested dump 1, 2 and 4 will be:

  +CCED: <value1>,…, <valuen>

  OK

  Where <value> is the ASCII string of the values (in decimal form except the LAC and CI values which are in hexadecimal form) of the parameters. If a field cannot be measured or is meaningless, the parameter is not filled in and two consecutive commas are sent.

- The response for the requested dump 8 will be a +CSQ response and not a +CCED response. The 07.07 format for +CSQ is respected. The <ber> is not evaluated by this command and the <ber> value will always be 99.

  +CSQ: <rssi>, 99

  OK

- In idle mode, only RxLev measurements (on the main cell and on the neighboring cells) are made.

14.2 Reset +IRST

Description:

This command resets the module after the time specified by the second parameter. An immediate reset can also be performed using AT+IRST.

Syntax:

AT+IRST=[<Mode>],[<Delay>[

Response Syntax:

+IRST: <Mode>,<Delay>,<RemainTime>

Command	Possible response(s)
AT+IRST=?	OK
AT+IRST=0 *Note: Disable timer*	OK
AT+IRST=1,”001:03” *Note: Enable timer and set delay to 1 hour 3 minutes*	OK
AT+IRST?	+IRST: 1,”001:03”,”001:01” *Note: Timer activated to reset after 1 hour and 3 minutes. At this point, 1 hour and 1 minute remain before next reset.*
AT+IRST=1,”05” *Note: Enable timer and set delay to 5 seconds*	OK
AT+IRST?	+IRST: 1,”05”,”02” *Note: Timer activated to reset after 5 seconds. At this point, 2 seconds before reset.*
AT+IRST	*Note: Resets module immediately*

Defined Values

<mode>

0 = Timer reset is disabled

1 = Timer reset is enabled

<Delay>: Sets the time before reset

Range “000:01”-“168:59” (format hhh:mm)

Range "01"-"59" (format ss)

<RemainTime>: Time before next reset

Range “000:01”-“168:59” (format hhh:mm)

Range "01"-"59" (format ss)

14.3 UART Sleep +SLEEP

Description:

This specific command is used to set the UART to sleep.

When enabled, UART goes into sleep mode when idle for more than 10 seconds.

To awake UART, the first command entered is ignored.

(E.g. issuing an “AT” wakes the module before subsequent commands can be processed)

Syntax:

AT+SLEEP=<n>

Command	**Possible response(s)**
AT+SLEEP?	+SLEEP: 0 OK
AT+SLEEP=?	+SLEEP: (0,1) OK
AT+SLEEP=1 *Note: Enable UART sleep*	OK

Defined Values

<n>

0 = Enable UART sleep

1 = Disable UART sleep

14.4 Read Cell Broadcast Message +ICBMR

Description:

This specific command is used to read Cell Broadcast messages that have been stored in volatile memory.

Syntax:

AT+ICBMR

Response Syntax:

+ICBMR : <bmc>,<cbm>

Command	Possible response(s)
AT+ICBMR *Note: If AT+CMGF=1*	+ICBMR: 3, 49952,50,1,1,1 Toa Payoh Lor1-106 *Note: Reference message number 3 CBM displayed in Text mode*
AT+ICBMR *Note: If AT+CMGF=0*	+ICBMR: 5, 88 C32000320111D47718040DE7DF6810F32D8FB562305 BA3D168341A8D46A3D168341A8D46A3D168341A8D4 6A3D168341A8D46A3D168341A8D46A3D168341A8D4 6A3D168341A8D46A3D168341A8D46A3D168341A8D4 6A3D100 *Note: Reference message number 5 CBM displayed in PDU mode*
AT+ICBMR?	+CME Error: 3 *Note: Operation not allowed*
AT+ICBMR=?	+CME Error: 3 *Note: Operation not allowed*

Defined Values

<bmc> : Integer representation of a reference number of CBM submitted to TA. TE increments by 1 for each CBM submitted to TA.

<cbm> : (PDU mode) - <length><CR><LF><pdu>
(Text mode) - <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>

14.5 General Indications +ITRACE

Description:

This command allows the user to enable or disable unsolicited indications for different levels of module readiness.

Syntax:

AT+ITRACE= <mode>

Command	Possible response(s)
AT+ITRACE=?	+ITRACE: (0-511) *Note: Gives the possible value range*
AT+ITRACE=256	OK RING +ITRACE: 8 *Note: Audio On*
AT+ITRACE?	+ITRACE: 0 OK
	+ITRACE: 5,1 *Note: Call created at index 1*
	+ITRACE: 6,1 *Note: Call released from index 1*

AT+ITRACE settings are automatically stored in Non- Volatile memory. This means the &W command does not need to be used and the selected flows are always activated after initialization.

The unsolicited response would be:

+ITRACE: <ind>,[<idx>]

<idx>: Call identifier, defined in +CLCC command

Defined Values

<mode>

0	=	No unsolicited “+ITRACE: <ind>” will occur (default value)
1 (bit 0)	=	SIM Remove indication
2 (bit 1)	=	Product is ready to process AT commands (except phonebooks, AOC, SMS), but still in emergency mode.
4 (bit 2)	=	The product is ready to process all AT commands, at the end of initialization or after swapping to ADN in case of FDN configuration
8 (bit 3)	=	Network service available indication
16 (bit 4)	=	Network lost indication
32 (bit 5)	=	A new call identifier has been created (after an ATD command, +CCWA indication)
64 (bit 6)	=	An active, held or waiting call has been released by network or other party
128 (bit 7)	=	Calling party alert indication
256 (bit 8)	=	Audio ON indication

Combination (addition of the values) is used to allow more than one indication flow: 0 ≤ mode≤ 511
The response is OK if the values are in the previous range.

<ind>

0	=	SIM presence not detected
1	=	Product is ready to process AT commands (except phonebooks, AOC, SMS), at initialization or after AT+CFUN=1
2	=	Product is ready to process all AT commands, end of phonebook init or swap (FDN to ADN)
3	=	The network service is available
4	=	The network is lost
5	=	Call <idx> has been created
6	=	Call <idx> has been released, after a NO CARRIER, or after the release of a call waiting
7	=	Calling party is alerting
8	=	Audio ON

14.6 Request Hardware revision +HVER

Description:

This command requests the current revision of the module.

Syntax:

AT+HVER?

Command	Possible Response(s)
AT+HVER?	+HVER: <revision> OK
AT+HVER? *Note: request hardware revision of the module*	+HVER: AMB OK

15 USER FILE SYSTEM (UFS) COMMANDS

User File System is a simple file service for file storage with a capacity of 600K bytes. X-Modem and 1K-X-Modem are used for file transfer between the iTegno 38XX GPRS modem via Serial COM Port.

15.1 Upload File to iTegno 38XX Modem $FUPL

Description:

This command is used to upload a file to iTegno 38XX. The UFS maximum storage capacity is 600Kbytes.

Command Syntax:

AT$FUPL=”<filename>”[,<filesize>]

Command	Possible response(s)
AT$FUPL=”<filename>”[,<filesize>] *Note: Copy a file into Module*	Ok_Info_FileUploadStarted *Note: X-modem Mode Started*

Defined Values

<filename> : String. Support 8.4 file format with extenstion, example: picture.jpg (First character must be an Alphabet). This file will be received via X-Modem file transfer protocol and create into the modem.

<filesize> : Size of file in bytes. Range from 1 to 600000.

Note:

30 seconds after X-Modem mode has started, system will time out and return to AT-Command mode.

Example:

Connect module to HyperTerminal and execute the following commands:

Command	Possible Response(s)
AT$FUPL=”MyPic”,10 *Note: Copy a file into Module*	Ok_Info_FileUploadStarted *Note: Xmodem Mode Started*
	§§§§§§§ *Note: Xmodem started*
On the Hyperterminal, goto Menu → [Transfer]→ [Send].	

From the prompted dialog (as shown in the figure below), select the source file (from [Browse]) and select Xmodem in the Protocol field. Click on [Send] to start file transfer. 	
	§§§§§§§ *Note: Xmodem transferring file*
NOTE: If there is no error	Ok_Info_FileClose OK *Note: Xmodem has completed the file transfer successfully*
NOTE: If there is an error	Ok_Info_FileClose $FERR: 4005

15.2 Download File From iTegno 38XX Modem $FDWL

Description:

This command is used to download a file from iTegno 38XX GPRS modem.

Syntax:

AT$FDWL="<filename>"

Command	Possible response(s)
AT$FDWL="<filename>" *Note: Copy file from Modem*	Ok_Info_FileUploadStarted *Note: X-Modem Mode Started*

Defined Values

<filename> : String Support 8.4 file format with extenstion, example: picture.jpeg. (First character must be an Alphabet). The **mod**e**m** will send this file via X-Modem file transfer protocol.

Note:

15 seconds after X-Modem mode has started, the system will time-out and return to AT-Command mode.

Example:

Connect module to HyperTerminal and execute the following commands:

Command	**Possible Response(s)**
AT$FDWL=”MyPic” *Note: Copy a file into Modem*	Ok_Info_FileDownloadStarted *Note: Xmodem Mode Started*
	§§§§§§§ *Note: Xmodem started*
On the Hyperterminal, goto Menu and select [Transfer]→ [Send].	
From the prompted dialog (as show in figure below), select the folder and select Xmodem in the Protocol field. Click on [Receive] to start file transfer.  	
	§§§§§§§ *Note: Xmodem transferring file*
NOTE: If there is no error	Ok_Info_FileClose OK *Note: Xmodem has completed transferring file successfully*
NOTE: If there is an error	Ok_Info_FileClose $FERR: 4006

15.3 Delete a File in iTegno 38XX Modem $FDEL

Description:

This command is used to delete a file in the iTegno 38XX GPRS modem.

Syntax:

AT$FDEL="<filename>"

Command	Possible response(s)
AT$FDEL="<filename>" *Note: Delete a file from the Modem*	OK *Note: File deleted successfully*
AT$FDEL="<filename>"	$FEER:<file error code> *Note: File Error*

Defined Values

<filename> : String. Support 8.4 file format with extenstion, example: picture.jpg (First character must be an Alphabet). This file will be deleted from the mode.

If <filename> = "*", all files stored will be deleted.

Example:

Command	Possible Response(s)
AT$FDEL="haha.jpg"	OK
AT$FDEL="*" *Note: Delete all files from User File System (UFS)*	OK *Note: All files deleted from UFS*

15.4 List File Properties $FLST

Description:

This command is used to list all files and their properties.

Syntax:

AT$FLST

Command	Possible response(s)
AT$FLST *Note: List all files in the Module*	$FLST: <filename>,<file size> $FLST: <filename>,<file size> … $FLST: <filename>,<file size> OK *Note: Successfully listed all files*
AT$FLST *Note: List all files in the Modem*	OK *Note: No file in the Modem*

Defined Values

<filename> : String (Up to 8 alphanumeric characters)
<file size> : Numeric. 0 to 600,000 bytes.

This field reports the file size of the respective files.

15.5 List Folder Properties $FFLD

Description:

This command is used to list folder properties.

Syntax:

AT$FFLD

Command	Possible response(s)
AT$FFLD *Note: List folder properties*	$FFLD: <used>,<free>,<total>,<file count> OK *Note: Successfully listed folder properties*

Defined Values

<used>	=	Numeric. 0 to 600,000 bytes. This field reports the used space in the UFS.
<free>	=	Numeric. 0 to 600,000 bytes. This field reports the available free space in the UFS.
<total>	=	Numeric. 0 to 600,000 bytes. This field reports the total available folder capacity in UFS.
<file count>	=	Numeric: 0 to 20. This field reports the number of files that are currently saved in UFS.

15.6 Last File Error: $FERR

Description:

This command allows you to query for the last reported file error.

Syntax:

AT$FERR

Command	Possible response(s)
AT$FERR *Note: Query last reported file error*	$FERR: <file error code> OK

Defined Values

<file error code>: Please refer to File Error Code table in Appendix B.

16 INTERNET CONNECTION

16.1 GPRS Dialing Service

16.1.1 APN server: $APNSRV

Description:

This parameter is provided by the GSM operator for access to GPRS.

Syntax:

Set value: AT$APNSRV = “<value>”

Get value: AT$APNSRV? or AT$LSTGPRS

Command	Possible response(s)
AT$APNSRV=”sunsurf”	OK
AT$APNSRV?	$APNSRV: “sunsurf” OK
AT$APNSRV?	$APNSRV: “” OK

Defined Values

<value>

Legal values : Alphanumeric ASCII text string up to 20 characters

16.1.2 APN username: $APNUSR

Description:

This parameter is provided by the GSM operator for access to GPRS.

Syntax:

Set value: AT$APNUSR = “<value>”

Get value: AT$APNUSR? or AT$LSTGPRS

Command	Possible response(s)
AT$APNUSR=”user”	OK
AT$APNUSR?	$APNUSR: “user” OK
AT$APNUSR?	$APNUSR: “” OK

Defined Values

<value>

Legal values : Alphanumeric ASCII text string up to 20 characters

16.1.3 APN password: $APNPASS

Description:

This parameter is provided by the GSM operator for access to GPRS.

Syntax:

Set value: AT$APNPASS = “<value>”

Get value: AT$APNPASS? or AT$LSTGPRS

Command	Possible response(s)
AT$APNPASS=”password”	OK

AT$APNPASS?	$APNPASS: “password” OK
AT$APNPASS?	$APNPASS: “” OK

Defined Values

<value>

Legal values : Alphanumeric ASCII text string up to 20 characters

16.2 GPRS CID: $GPRSCID

Description:

This command is used to specify active PDP context.

Syntax:

Set value: AT$GPRSCID = <value>

Get value: AT$GPRSCID? or AT$LSTGPRS

Command	Possible response(s)
AT$GPRSCID=1	OK
AT$GPRSCID?	$GPRSCID: 1 OK

Defined Values

<value>

Legal values : Numeric value 1 or 2. Default value is 1.

16.2.1 Listing GPRS parameters: $LSTGPRS

Description:

This command directs the TCP/IP to display all the AT$ parameters related to the GPRS connection configuration.

Syntax:

AT$LSTGPRS

Command	Possible response(s)
AT$LSTGPRS	$APNSRV: “sunsurf” $APNUSR: “user123” $APNPASS: “pass123” $GPRSCID: 1 OK
AT$LSTGPRS	$APNSRV: “” $APNUSR: “” $APNPASS: “” $GPRSCID: 1 OK

Parameters:

APNSRV

APNUSR

APNPASS

GPRSCID

16.3 GSM Dialing Services

16.3.1 Dialing number: $DIALNUM

Description:

ISP provided dial-up phone number that is used to connect with local ISP. Length depends on country.

Syntax:

Set value: AT$DIALNUM = “<value>”

Get value: AT$DIALNUM?

Command	Possible response(s)
AT$DIALNUM=”96162531”	OK
AT$DIALNUM?	$DIALNUM: ”96162531” OK
AT$DIALNUM?	$DIALNUM: ”” OK

Defined Values:

<value>

Legal value : Decimal phone numbers

16.3.2 Username: $ISPUSR

Description:

ISP account username that must be provided to ISP upon successful establishment of the physical layer.

Syntax:

Set value: AT$ISPUSR = “<value>”

Get value: AT$ISPUSR?

Command	Possible response(s)
AT$ISPUSR=”username”	OK
AT$ISPUSR?	$ISPUSR: ” username” OK
AT$ISPUSR?	$ISPUSR: ”” OK

Defined Values:

<value>

Legal value : Alphanumeric ASCII text string up to 64 characters.

16.3.3 Password: $ISPPASS

Description:

ISP account password that must be provided to ISP upon successful establishment of the physical layer.

Syntax:

Set value: AT$ISPPASS = “<value>”

Get value: AT$ISPPASS?

Command	Possible response(s)
AT$ISPPASS=”password”	OK
AT$ISPPASS?	$ISPPASS: ” password” OK
AT$ISPPASS?	$ISPPASS: ”” OK

Defined Values:

<value>

Legal value : Alphanumeric ASCII text string up to 64 characters.

16.3.4 Listing GSM dial-up parameters: $LSTPPP

Description:

This command directs the TCP/IP to display all the AT$ parameters related to the PPP connection configuration.

Syntax:

AT$LSTPPP

Command	Possible response(s)
AT$LSTPPP	$DIALNUM: “1234567” $PPPUSR: “user123” $PPPPASS: “pass123” OK
AT$LSTPPP	$DIALNUM: “” $PPPUSR: “” $PPPPASS: ”” OK

Parameters:

DIALNUM

PPPUSR

PPPPASS

16.4 Connection Services

16.4.1 Connection Mode: $BEARER

Description:

This command is used to choose active connection mode (GSM or GPRS).

Syntax:

Set value: AT$BEARER= <value>

Get value: AT$BEARER? or AT$LSTGPRS

Command	Possible response(s)
AT$BEARER=1	OK
AT$BEARER?	$BEARER: 1 OK

Defined Values:

<value>

0 = GSM

1 = GPRS (Default value)

16.4.2 Starting a bearer: $CONNSTART

Description:

This command is used to dial out and establish connection to the Internet using context defined by $BEARER.

Upon receiving this instruction, the TCP/IP stack initiates a complete session according to the following:

- In GSM mode, the TCP/IP stack will establish a GSM data connection with DIALNUM, PPPUSR, and PPPPASS parameters.

- In GPRS mode, the TCP/IP stack will establish a GPRS session using APNUSR, APNPASS, and GPRSCID parameters. Successful GPRS link indicates that the device is connected to the Internet. The AT$CONNSTOP command closes the connection.

Command	Possible response(s)
AT$CONNSTART *Note: Connect*	Ok_Info_GprsActivation EXT: 0 OK

16.4.3 Ending a bearer connection: $CONNSTOP

Description:

This command directs the TCP/IP stack to end a GPRS or GSM connection previously established with the $CONNSTART command.

Syntax:

AT$CONNSTOP

Command	Possible response(s)
AT$CONNSTOP *Note: Disconnect*	Ok_Info_GprsDeactivation EXT: 0 OK *Note: Phone line is released.*

16.5 TCP/IP Configuration

16.5.1 Configuring data-mode or command-mode data transfer: $SENDMODE

Description:

This command is used to define what mode (data-mode or command-mode) to employ when sending/receiving data through a TCP/UDP socket.

Syntax:

Set value: AT$SENDMODE = <mode>

Get value: AT$SENDMODE?

Note:

This command is not allowed when TCP/UDP socket is established.

Command	Possible response(s)
AT$SENDMODE?	$SENDMODE: 1 OK
AT$SENDMODE=0 *Note: Enable command-mode data sending/receiving*	OK

Defined Values:

<mode>

0 = Using command-mode for data sending and receiving.

1 = Using data-mode for data sending and receiving (Default value).

16.5.2 Data Link Escape mode: $DLEMODE

Description:

This command is used by the user to decide whether to code the ETX (End of Text) character when opening a TCP/UDP socket.

Syntax:

AT$DLEMODE = <mode>

AT$DLEMODE?

Command	Possible response(s)
AT$DLEMODE?	$DLEMODE: 1 OK
AT$DLEMODE=0	OK

Defined Values:

<mode>

0 = When DLEMODE is set to 0, no specific process is needed on ETX characters. It means that it is not possible for a host to request an end of connection or to receive a clear indication of end of connection from the TCPIP or UDP stack.

1 = Default value. When DLEMODE is set to 1, the ETX character means a request/indication/end of connection. The ETX characters belonging to payload data have to be sent by the host on the serial port preceded by a DLE character. This is similar to ETX characters received by the IP.

16.5.3 Toggling Between Online and Offline Modes During Data Mode: +++/ATO

Description:

These commands allow the user to switch between online and offline mode during a data connection. To switch from online mode to offline mode, the '+++' sequence must be sent after which the module goes to offline mode with an 'OK' response and AT-commands can be entered. To switch from offline mode to online mode, 'ATO' must be sent after which a 'CONNECT' response is observed.

Syntax:

+++

ATO

Command	Possible response(s)
+++ *Note: During a data connection*	OK *Note: AT-command can be entered.*
ATO	CONNECT *Note: Data connection reestablished.*

16.6 TCP Socket Services

16.6.1 Setting a TCP Server: $TCPSRV

Description:

This command is used to define the IP address of the remote TCP server (or host) when using a TCP connection.

Syntax:

AT$TCPSRV = <mode>, “<value>”

AT$TCPSRV?

Command	Possible response(s)
AT$TCPSRV?	$TCPSRV: “0.0.0.0” OK
AT$TCPSRV=0,”111.222.111.222”	OK
AT$TCPSRV?	$TCPSRV: “111.222.111.222” OK

Defined Values

0 = Mode 0, the value is a 32-bit number in dotted-decimal notation (i.e. xxx.xxx.xxx.xxx)
1 = Mode 1, the alphanumeric ASCII text string up to 120 characters

Note:
The command would use the latest server IP/name entered despite the mode used. This means that it is possible to set a server name different from the server IP you entered, but the TCP/IP stack would always use the last setting entered. $LSTTCP can be used to check settings.

16.6.2 Setting a TCP Port: $TCPPORT

Description
This command is used to define the port number of the remote TCP server (or host) when using a TCP connection.

Syntax
Set value: AT$TCPPORT = <value>
Get value: AT$TCPPORT? Or AT$LSTTCP

Command	Possible response(s)
AT$TCPPORT?	$TCPPORT: 0 OK
AT$TCPPORT=1111	OK
AT$TCPPORT?	$TCPPORT: 1111 OK

Defined Values

<value>
0 to 65535 = Default value is 0

16.6.3 Listing TCP Parameters: $LSTTCP

Description:

This command directs the TCP/IP to display all the AT$ parameters related to the TCP socket configuration.

Command	Possible response(s)
AT$LSTTCP	$DLEMODE: 1 $TCPSRV: “123.145.123.124” $TCPPORT: 5013 OK
AT$LSTTCP	$DLEMODE: 1 $TCPSRV: “” $TCPPORT: 0 OK

16.6.4 Opening a TCP Connection: $TCPOPEN

Description:

This local command directs the TCP/IP stack to open a TCP connection to the specified TCP server. Once the physical link (using $CONNSTART) is established, the attached host can open a TCP connection at any time (except when the TCP/IP stack software is already in the process using TCP/IP resources).

Depending on the mode (AT$SENDMODE) selected for the data transfer, this command gives different responses.

- For command-mode (AT$SENDMODE=0) sending, after this command is issued, AT$TCPSEND (refer to Section 7.5) is used to send the data and any data received is shown as unsolicited responses.

- For data-mode (AT$SENDMODE=1) sending, after this command is issued, the TCP socket is opened and data can be sent directly over the link. All 8-bit ASCII characters are accepted. The TCP/IP socket may be closed using the ETX character (^C) (Refer to Section 6.2: AT$DLEMODE).

Syntax:

Set value: AT$TCPOPEN = [<timeout>]

Command	Possible response(s)
AT$TCPOPEN *Note: Request opening of TCP socket for command-mode sending.*	OK
AT$TCPOPEN *Note: Request opening of TCP socket for data-mode sending.*	Ok_InfoWaitingForData EXT: 0 *Note: This message signals that the TCP socket has been opened.*
AT$TCPOPEN=5 *Note: Set TCPIP connection time-out value to 5 seconds*	OK *Note: The TCP socket has been opened in command-mode sending*

Defined Values

<timeout>

5-120 = Optional. Connection Time-out value (in seconds)

Note:

If <timeout> is not specified, the connection time-out will be dependent on the network

16.6.5 Sending/Receiving Data Using Command-Mode: $TCPSEND

Description:

This local command directs the TCP/IP stack to send data to the TCP server specified by $TCPSRV and $TCPPORT.

Once the TCP connection is opened, the attached host can send data at any time (except when the TCP/IP stack software is already in the process using TCP/IP resources).

One command is able to send 255 characters.

All 7-bit ASCII characters are accepted, all other characters e.g. ';' and '\' can be sent using the following format "\XX" where "XX" is their ASCII hex code

Command	Possible response(s)
AT$TCPSEND=”<data>” *Note: Can send up to 255 bytes.*	OK

16.6.6 Closing a TCP Connection: $TCPCLOSE

Description:

This local command directs the TCP/P stack to close a TCP connection. This command can only be performed in command-mode to close the TCP socket.

Command	Possible response(s)
AT$TCPCLOSE *Note: Request closing of TCP/ IP socket in command-mode*	Ok_Info_DataClosed EXT: O OK

16.7 UDP Socket Services

16.7.1 Setting a UDP Server: $UDPSRV

Description:

This command is used to define the IP address of the remote UDP server (or host).

If UDP is connected in listening mode, this setting is not used.

Syntax:

Set value: AT$UDPSRV = <mode>, “<value>”

Get value: AT$UDPSRV?

Command	Possible response(s)
AT$UDPSRV?	$UDPSRV: “0.0.0.0” OK
AT$UDPSRV=0,”111.222.111.222”	OK
AT$UDPSRV?	$UDPSRV: “111.222.111.222” OK

Defined Values

<value>

0 = Mode 0, the value is a 32-bit number in dotted-decimal notation (i.e. xxx.xxx.xxx.xxx)

1 = Mode 1, the alphanumeric ASCII text string up to 120 characters

Note:

The command would use the latest server IP/name entered despite the mode used. This means that it is possible to set a server name different from the server IP you entered, but the IP stack would always use the last setting entered. $LSTUDP can be used to check settings.

16.7.2 Setting a UDP Port: $UDPPORT

Description:

This command is used to define the port number of the remote UDP server (or host) when using a UDP connection. The port number set is used in UDP sending mode.

Syntax:

Set value: AT$UDPPORT = <value>

Get value: AT$UDPPORT?

Command	Possible response(s)
AT$UDPPORT?	$UDPPORT: 0 OK
AT$UDPPORT=1111	OK
AT$UDPPORT?	$UDPPORT: 1111 OK

Defined Values

<value> = Numbers 0 to 65535.
Default value 0

16.7.3 Setting a UDP Listening Port: $UDPLPORT

Description:

This command is used to define the port number of UDP server (or host) when using a UDP connection. The port number set is used in UDP listening mode.

Syntax:

Set value: AT$UDPLPORT = <value>

Get value: AT$UDPLPORT?

Command	Possible response(s)
AT$UDPLPORT?	$UDPLPORT: 0 OK
AT$UDPLPORT=2222	OK
AT$UDPLPORT?	$UDPLPORT: 2222 OK

Defined Values

<value> = 0 to 65535.
Default value 0

16.7.4 Listing UDP Parameters: $LSTUDP

Description

This command directs the UDP to display all the AT$ parameters related to the UDP socket configuration.

Command	Possible response(s)
AT$LSTUDP	$DLEMODE: 1 $UDPSRV: “123.145.123.124” $UDPPORT:1111 $UDPLPORT: 2222 OK
AT$LSTUDP	$DLEMODE: 1 $UDPSRV: “” $UDPPORT: 0 $UDPLPORT: 0 OK

16.7.5 Opening a UDP Connection: $UDPOPEN

Description:

This local command directs the IP stack to open a UDP connection. Once the physical link (using $CONNSTART) is established, the attached host can open a UDP connection at any time (except when the IP stack software is already in the process using IP resources).

Depending on the mode (AT$SENDMODE) selected for the data transfer, this command gives different responses.

- For command-mode (AT$SENDMODE=0) sending, after this command is issued, AT$UDPSEND (refer to Section 8.6) is used to send the data and any data received is shown as unsolicited responses.

- For data-mode (AT$SENDMODE=1) sending, after this command is issued, the UDP is opened and data can be sent directly over the link. All 8-bit ASCII characters are accepted. The IP socket may be closed using the ETX character (^C) (Refer to Section 6.2: AT$DLEMODE).

Command	Possible response(s)
AT$UDPOPEN *Note: Request opening of UDP for command-mode sending.*	OK
AT$UDPOPEN *Note: Request opening of UDP for data-mode sending.*	Ok_InfoWaitingForData EXT: 0 *Note: This message signals that the UDP has been opened.*

16.7.6 Sending/Receiving Data Using Command-Mode: $UDPSEND

Description:

This local command directs the IP stack to send data to the UDP server specified by $UDPSRV and $UDPPORT.

Once the UDP connection is opened, the attached host can send data at any time (except when the IP stack software is already in the process using IP resources).
One command is able to send 255 characters.

All 7-bit ASCII characters are accepted, all other characters e.g. ';' and '\' can be sent using the following format "\XX" where "XX" is their ASCII hex code.

Command	Possible response(s)
AT$UDPSEND=”<data>” *Note: Can send up to 255 bytes.*	OK

16.7.7 Closing a UDP Connection: $UDPCLOSE

Description:

This local command directs the IP stack to close a UDP connection. This command can only be performed in command-mode to close the IP socket.

Command	Possible response(s)
AT$UDPCLOSE *Note: Request closing of UDP socket in command-mode*	Ok_Info_DataClosed EXT: O OK

16.8 Usage Example

16.8.1 TCP Connection via GPRS for Command-Mode

This example illustrates how user sends data over a TCP connection using the TCP/IP stack for command-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port. After the TCP connection has been successfully opened, a string “hello world” is sent to the server. The server echoes the string back and “hello world” will be displayed on the AT command line. A TCP connection close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$TCPSRV=0,”203.127.161.123”	OK	Set the TCP server using IP address (dotted quad format)

AT$TCPPORT=5062	OK	Set the TCP port
AT$SENDMODE=0	OK	Select command-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$TCPOPEN	Ok_Info_WaitingForData EXT: O OK	Open connection to TCP server. Connection successful
AT$TCPSEND=”hello world”	OK $RECV: “hello world”	Sends “hello world” to TCP echo server. Receives echo of “hello world” back.
AT$TCPCLOSE	Ok_Info_DataClosed EXT: O OK	Closes TCP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

16.8.2 TCP Connection via GPRS for Data-Mode

This example illustrates how user sends data over a TCP connection using the TCP/IP stack for data-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port. After the TCP connection has been successfully opened, data sent to server will be echo back and is displayed.

This example also shows how ‘+++’ and ‘ATO’ are used to switch between online and offline modes. To close TCP connection, a close command will be executed followed by a GPRS connection close command.

Command	**Possible response(s)**	**Explanation**
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings

AT$TCPSRV=0,"203.127.161.123"	OK	Set the TCP server using IP address (dotted quad format)
AT$TCPPORT=5062	OK	Set the TCP port
AT$SENDMODE=1	OK	Select data-mode for data transfer.
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$TCPOPEN	Ok_Info_WaitingForData EXT: O	Open connection to TCP server. Connection successful. Data can be sent by keying in.
+++	OK	Exit online mode to offline mode.
AT+COPS?	+COPS: 0,0,"SGP-M1-3GSM"	AT-commands can be entered now.
ATO	CONNECT	Exit offline mode back to online mode. Data can be sent by keying in.
^C	Ok_Info_DataClosed EXT: O OK	Close TCP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

16.8.3 UDP Connection via GPRS for Command-Mode

This example illustrates how user sends data over a UDP connection using the IP stack for command-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port/listening port. After the UDP connection has been successfully opened, a string "hello world" is sent to the server. The server echoes the string back and "hello world" will be displayed on the AT command line. A UDP connection close command will be executed followed by a GPRS connection close command.

Command	**Possible response(s)**	**Explanation**
AT$APNSRV="sunsurf"	OK	Set the correct APN server

AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$UDPSRV=0,"203.127.161.123"	OK	Set the UDP server using IP address (dotted quad format)
AT$UDPPORT=5062	OK	Set the UDP port
AT$UDPLPORT=5062	OK	Set the UDP Listening port
AT$SENDMODE=0	OK	Select command-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$UDPOPEN	Ok_Info_WaitingForData EXT: O OK	Open connection to UDP server. Connection successful
AT$UDPSEND="hello world"	OK $RECV: "hello world"	Sends "hello world" to UDP echo server. Receives echo of "hello world" back.
AT$UDPCLOSE	Ok_Info_DataClosed EXT: O OK	Closes UDP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

16.8.4 UDP Connection via GPRS for Data-Mode

This example illustrates how user sends data over a UDP connection using the IP stack for data-mode. A GPRS connection is made to M1 GPRS network.

When GPRS connection has been successfully established, connection will be made to an echo server with pre-defined IP address and port/listening port. After the UDP connection has been successfully opened, data sent to server will be echo back and is displayed.

This example also shows how '+++' and 'ATO' are used to switch between online and offline modes. To close UDP connection, a close command will be executed followed by a GPRS connection close command.

Command	Possible response(s)	Explanation
AT$APNSRV=”sunsurf”	OK	Set the correct APN server
AT$LSTGPRS	$APNSRV: "sunsurf" $APNUSR: "" $APNPASS: "" $GPRSCID: 1 OK	View GPRS settings
AT$UDPSRV=0,”203.127.161.123”	OK	Set the UDP server using IP address (dotted quad format)
AT$UDPPORT=5062	OK	Set the UDP port
AT$UDPLPORT=5062	OK	Set the UDP Listening port
AT$SENDMODE=1	OK	Select data-mode for data transfer
AT$CONNSTART	Ok_Info_GprsActivation EXT: O OK	Attach to GPRS.
AT$UDPOPEN	Ok_Info_WaitingForData EXT: O	Open connection to TCP server. Connection successful. Data can be sent by keying in.
+++	OK	Exit online mode to offline mode.
AT+COPS?	+COPS: 0,0,"SGP-M1-3GSM"	AT-commands can be entered now.
ATO	CONNECT	Exit offline mode back to online mode. Data can be sent by keying in.
^C	Ok_Info_DataClosed EXT: O OK	Close UDP connection to server. Connection closed successfully.
AT$CONNSTOP	Ok_Info_GprsDeactivation EXT: O OK	Close GPRS connection successfully.

16.9 Commands Affected By AT&W and AT&F

16.9.1 GPRS Dialing Services

Command	AT&W	AT&F	Default Values
$APNSRV	X	X	
$APNUSR	X	X	
$APNPASS	X	X	

16.9.2 TCP/IP Configuration

Command	AT&W	AT&F	Default Values
$SENDMODE	X	X	1

16.9.3 TCP Socket Services

Command	AT&W	AT&F	Default Values
$TCPSRV	X	X	0.0.0.0
$TCPPORT	X	X	0

16.9.4 UDP Socket Services

Command	AT&W	AT&F	Default Values
$UDPSRV	X		0.0.0.0
$UDPPORT	X	X	0
$UDPLPORT	X	X	0

17 MMS COMMANDS

MMS Commands are a set of extended AT Command for MMS Service. The MMS AT Commands are categorized in the following:

MMS Configuration	: AT Commands for configuring MMS service such as Bearer, Proxy, MMSC URL and Communication Mode.
MMS Header Inbox	: MMS Headers are received and stored in the Module MMS Header Inbox. This set of AT Commands allows user to List, Read and Delete MMS Headers.
MMS Compose	: This set of AT Commands allows user to compose an MMS. The objects to be attached into the MMS are linked from the UFS (User File System).
MMS Message Extraction	: This set of AT Commands allows user to download an MMS from the MMS Header Inbox and extracts its contents, such as TO/CC, Subject and Attachments.
MMS Events	: This set of AT Commands provides user to enable events indications on MMS behaviour.

17.1 MMS Configuration Commands

17.1.1 MMS Bearer: $MMSBEARER

Description:

This command sets the bearer for the MMS transaction.

For this release, only GPRS proxy is available.

Syntax:

AT$MMSBEARER=1,"<apn >","<userid>","<pw>"

Command	Possible Response(s)
AT$MMSBEARER=?	$MMSBEARER: 1,"<apn>","<userid>","<pw>" OK

AT$MMSBEARER=1,"<apn>","<userid>","<pw>"	OK
AT$MMSBEARER?	$MMSBEARER: 1,"<apn>","<userid>","<pw>" OK

Defined Values

<apn> : String. Up to 150 characters. MMS GPRS APN
<userid> : String. Up to 50 characters. MMS GPRS log-in User ID
<pw> : String. Up to 50 characters. MMS GPRS log-in password

Example:

Command	Possible Response(s)
AT$$MMSBEARER=1,"e-ideas","",""	OK
AT$MMSBEARER?	$MMSBEARER: 1,"e-ideas","","" OK

17.1.2 MMS Proxy: $MMSPROXY

Description:

This command sets the MMS proxy/URL

Syntax:

AT$MMSPROXY="<proxy hostname/ip>",<port>

Command	Possible Response(s)
AT$MMSPROXY=?	$MMSPROXY: “255",(1 – 65535) OK
AT$MMSPROXY="<proxy hostname/ip>",<port>	OK
AT$MMSPROXY?	$MMSPROXY: "<proxy hostname/ip>",<port> OK

Defined Values

<proxy hostname/ip> : String. Up to 255 characters, MMS Proxy URL or IP address
<port> : Numeric. 1 to 65000.
MMS Proxy Port number (1 to 65535)

Example:

Command	Possible Response(s)
AT$MMSPROXY="165.22.32.81",8080	OK
AT$MMSPROXY?	$MMSPROXY: "165.22.32.81",8080 OK *Note: MMS Proxy has been set*

17.1.3 MMSC URL: $MMSCURL

Description:

This command sets the MMSC URL.

Syntax:

AT$MMSCURL="<proxy hostname/ip>"

Command	Possible Response(s)
AT$MMSCURL=?	$MMSCURL: “255” OK
AT$MMSCURL="<proxy hostname/ip>"	OK
AT$MMSCURL?	$MMSCURL: "<proxy hostname/ip>" OK

Defined Values

<proxy hostname/ip> : String. Up to 255 characters. MMS URL or IP address

Example:

Command	Possible Responses
AT$MMSCURL="http://mmsgw:8002/"	OK
AT$MMSCURL?	$MMSCURL: http://mmsgw:8002/ OK

17.1.4 MMS Communication Mode: $MMSCOMMMODE

Description:

This command sets the MMS communication mode.

Syntax:

AT$MMSCOMMMODE=<mode>

Command	Possible response(s)
AT$MMSCOMMMODE=?	$MMSCOMMMODE: (2,3) OK
AT$MMSCOMMMODE=<mode>	OK
AT$MMSCOMMMODE?	$MMSCOMMMODE: <mode> OK

Defined Values

<mode>

2 = PROXY (Connect to MMSC via a Proxy Server)

3 = DIRECT (Connect to MMSC directly)

Example:

Command	Possible Response(s)
AT$MMSCOMMMODE=2	OK
AT$MMSCOMMMODE?	$MMSCOMMMODE: 2 OK

17.2 MMS Header Inbox Management Commands

17.2.1 List MMS Headers: $MMSHL

Description:

This command lists the MMS Headers from the MMS inbox.

Syntax:

AT$MMSHL="<type>"

Command	Possible response(s)
AT$MMSHL=? *Note: Testing the command*	$MMSHL: ("READ","UNREAD","ALL","DOWNLOADED") OK *Note: Command is valid with the required parameters*
AT$MMSHL="<type>"	$MMSHL:<location>,"<frnum>","<type>",<dl>,"<date>", "<time>","<size>" … $MMSHL:<location>,"<frnum>","<type>",<dl>,"<date>", "<time>","<size>" OK

Defined Values

<type>:String. Case sensitive selection from "READ","UNREAD","ALL","DOWNLOADED".

"READ"	=	To list all MMS headers that are already being read by AT$MMSHL or AT$MMSHR.
"UNREAD"	=	To list all MMS headers that are not being read by AT$MMSHL or AT$MMSHR.
"DOWNLOADED"	=	To list all MMS headers that are being downloaded by AT$MMSHDRDWL.
"ALL"	=	To list all MMS headers in the MMS inbox.
<dl>		
0	=	indicates current MMS message has not been downloaded
1	=	indicates current MMS message has been downloaded

<size> : total size of MMS message in Bytes

<location> : Numeric. 1 – 20.
This field represents the current header in ascending order.

<frnum> : String. Phone number of sender.

<date> : String. Format: “DD/MM/YYYY”

<time> : String. Format: “hh:mm:ss”

Note:

The <date> and <time> field states the date and time stamp of the received MMS from the MMSC.

17.2.2 Delete MMS Header $MMSHD

Description:

This command deletes the select MMS Headers from the MMS inbox.

Syntax:

AT$MMSHD=<from>,[<to>]

Command	Possible response(s)
AT$MMSHD=? *Note: Testing the command*	$MMSHD: (1-20),(1-20) OK *Note: Command is valid with the required parameters*
AT$MMSHD=<from>,[<to>] *Note: To delete MMS header from location #1 to #4*	OK *Note: MMS header deleted successfully*
AT$MMSHD=<from> *Note: To delete MMS header in location #4*	OK *Note: MMS header deleted successfully*

Defined Values

<from> : Numeric. 1 to 20.
This field specifies the start/current index of the MMS Header that is to be deleted.

<to> : Numeric. 1 to 20.
This field specifies the end index of the MMS Header that is to be deleted.
This field is optional. If this field is absent, the command will only delete the index that is specified in the <from> field.

Example:

Command	Possible Response(s)
AT$MMSHD=1,4 *Note: To delete MMS header from location #1 to #4*	OK *Note: MMS header deleted successfully*
AT$MMSHD=4 *Note: To delete MMS header in location #4*	OK *Note: MMS header deleted successfully*
AT$MMSHD=5 *Note: To delete MMS header in location #5*	ERROR *Note: Location #5 is not filled with an MMS header*

17.2.3 Read MMS Header $MMSHR

Description:

This command reads the selected MMS Header from the MMS inbox.

Syntax:

AT$MMSHD=<from>,[<to>]

Command	Possible response(s)
AT$MMSHR=?	$MMSHR: (1-20) OK
AT$MMSHR?	$MMSHR: <location> OK
AT$MMSHR=<location> *Note: To read MMS header in location #1*	$MMSHR:<location>,"<frnum>","<type>",<dl>,"<date>", "<time>","<size>" OK *Note: MMS header read successfully*

Defined Values

Please refer to the parameters list in AT$MMSHL command description.

Example:

Commands	Possible Responses
AT$MMSHR?	$MMSHR: <location> OK
AT$MMSHR=1 *Note: To read MMS header in location #1*	$MMSHL:<location>,"<frnum>","<type>",<dl>,"<date>","<time>","<size>" OK *Note: MMS header read successfully*
AT$MMSHR=5 *Note: To read MMS header in location #5*	ERROR *Note: Location #5 is not filled with an MMS header*

17.3 MMS Compose Commands

17.3.1 Set MMS Character Coding Set

Description:

This command sets the Character Coding Set used in the entire MMS message session.

Syntax:

AT$MMSW=0

Command	Possible response(s)
AT$MMSCS=<chset>	OK
AT$MMSCS=? *Note: Query available MMS character coding set*	+MMSCS: "DEF", "UCS2" OK
AT$MMSCS? *Note: Query selected character coding set*	+MMSCS: "DEF" OK
AT$MMSCS="UCS2"	OK *Note: MMS Character Coding set UCS2 has been successfully selected*

Defined Values

<chset>

"DEF"	=	8-bit ASCII character
"USC2"	=	16-bit Unicode character

17.3.2 Compose New MMS message $MMSW=0

Description:

This command resets all MMS compose parameters to compose new MMS message. Maximum MMS message size allowed is 200Kbytes.

Syntax:

AT$MMSW=0

Command	Possible response(s)
AT$MMSW=0 *Note: Resets all MMS compose parameters*	OK

17.3.3 Set MMS TO List $MMSW=1

Description:

This command sets the targeted phone number into the MMS TO list.

Syntax:

AT$MMSW=1,[<index>]

Command	Possible response(s)
AT$MMSW=1 *Note: To query all number in the TO list*	$MMSW: 1 <number> OK

Defined Values

<index> : Numeric. 0,1
If <index> is '0', <number> can be ignored and all number in the list will be flushed.
If <index> is '1', <number> is set.

<number> : String. Up to 255 characters.
This field specifies the targeted phone number and email address separated by a semicolon ';'.

Example:

Commands	Possible Responses
AT$MMSW=1,1 >91111111; 92333446; hello@iwow.com.sg *Note: To set numbers into list*	OK *Note: Number written successfully*
AT$MMSW=1 *Note: To query all number in the list*	$MMSW: 1 91111111; 92333446; hello@iwow.com.sg OK
AT$MMSW=1,0 *Note: To flush all numbers in the list*	OK *Note: All numbers flushed successfully*

17.3.4 Set MMS CC List: $MMSW=2

Description:

This command set the targeted phone number into the MMS CC list.

Syntax:

AT$MMSW=2,[<index>]

Command	Possible response(s)
AT$MMSW=2	$MMSW: 2 <number> OK

Defined Values

<index> : Numeric. 0,1
If <index> is '0', <number> can be ignored and all number in the list will be flushed.
If <index> is '1', <number> is set.

<number> : String. Up to 255 characters.
This field specifies the targeted phone number and email address separated by a semicolon ';'.

Example:

Commands	Possible Responses
AT$MMSW=2,1 >91111111; 92333446; hello@iwow.com.sg *Note: To set a number into the list #1*	OK *Note: Number written successfully*
AT$MMSW=2 *Note: To query all number in the CC list*	$MMSW: 2 91111111; 92333446; hello@iwow.com.sg OK
AT$MMSW=2,0 *Note: To flush all numbers in the list*	OK *Note: All numbers flushed successfully*

17.3.5 Set MMS BCC List: $MMSW=3

Description:

This command set the targeted phone number into the MMS BCC list.

Syntax:

AT$MMSW=3,[<index>]

Command	Possible response(s)
AT$MMSW=3	$MMSW: 3 <number> OK

Defined Values

<index> : Numeric. 0,1 to 5.
This field specifies the index of the MMS Header that is to be read.
If <index> is '0', <number> can be ignored and all number in the list will be flushed.

<number> : String. Up to 255 characters.
This field specifies the targeted phone number and email address separated by a semicolon ';'.

Example:

Commands	Possible Responses
AT$MMSW=3,1 >91111111; 92333446; hello@iwow.com.sg *Note: To set a numbers into the list*	OK *Note: Number written successfully*
AT$MMSW=3 *Note: To query all number in the list*	$MMSW: 3 <number> OK
AT$MMSW=3,0 *Note: To flush all numbers in the list*	OK *Note: All numbers flushed successfully*

17.3.6 Set MMS Subject: $MMSW=4

Description:

This command sets MMS message subject.

Syntax:

AT$MMSW=4,[<mode>]

Command	Possible response(s)
AT$MMSW=4,<mode> ><source>	OK

AT$MMSW=4	$MMSW: 4,1 <source> OK

Defined Values

<mode> : Numeric. 0,1
This field specifies the type of entry of the MMS Subject field.
If <mode> is '0', <source> can be ignored and the MMS subject will be emptied.

<source> : String. Up to 255 characters.

Example:

Commands	Possible Responses
AT$MMSW=4,1 >Hello How are you?<Ctrl+z> *Note: To set MMS subject directly with text*	OK *Note: MMS Subject is set by the given text*
AT$MMSW=4	$MMSW: 4,1 Hello How are you? OK
AT$MMSW=4,0 *Note: To empty MMS subject*	OK
AT$MMSW=4	$MMSW: 4,1 <source> OK

17.3.7 Set MMS Text Message: $MMSW=5

Description:

This command sets MMS message text.

Syntax:

AT$MMSW=5,[<page>],[<mode>]

Command	Possible response(s)
AT$MMSW=5,<page>,<mode> ><source> *Note: To set MMS Message Text with the contents in <source>*	OK *Note: MMS Message Text is retrieved from <source>*
AT$MMSW=5	$MMSW=5,<mode> <source> OK

Defined Values

<page> : Numeric. 0, 1 - 10.
This field specifies the page number of the text message.
If <page> is '0', all MMS message texts are removed.

<source> : String. Up to 255 characters.
This field specifies the source of the Message Text.

<mode>: This field specifies the type of entry of the MMS message text field.

0 = <source> can be ignored and the MMS message text will be emptied.

1 = <source> is where MMS Message Text is directly set with text.

2 = When set to this value, text file is attached to MMS Message.
File Type supported is Text (.txt) in Unicode Encoding.
Please refer to Section 8.11 on how to save text file in Unicode.

Example:

Command	Possible response(s)
AT$MMSW=5,1,1 >Hello How are you?<Ctrl+Z> *Note: To set MMS Message Text directly with text*	OK *Note: MMS Message Text is set buy the given text*
AT$MMSW=5	$MMSW: 5,1 Hello How are you? $MMSW: 5,2 … $MMSW: 5,10 OK
AT$MMSW=5,0 *Note: To empty MMS message text*	OK
AT$MMSW=5,1,2,"hello.txt" *Note: To set MMS Message Text as attached text file*	OK

For $MMSW=6, $MMSW=7, only file extension of type IMAGE / VIDEO/ AUDIO is accepted. Text file not accepted. The following object combination (per page) is allowed:

- 1 image only
- 1 image + 1 audio
- 1 audio only
- 1 video only

Any combinations of AT$MMSW=6 and AT$MMSW=7 other than the above stated will result in Error (Base on the file extension). So the user have to make sure that the file is in correct extension. This restriction is needed in order for the MMS recipient to display the MMS properly. The recipient of the MMS will treat file received as a “MEDIA” rather than a “FILE”.

17.3.8 Set MMS Objects: $MMSW=6

Description:

This command sets each MMS Object.

Syntax:

AT$MMSW=6,[<page>],[<number>]

Command	Possible response(s)
AT$MMSW=6,<page>,”<filename>” *Note: To link first object <filename> into <page>*	OK *Note: Object is successfully set (linked)*
AT$MMSW=6 *Note: To query the list*	$MMSW: 6,1,”<filename>” $MMSW: 6,2,”<filename>” … $MMSW: 6,10,”<filename>” OK

Defined Values

<page> : Numeric. 0, 1 - 10.
This field specifies the page number of the object in the object list.
If <page> is ‘0’, all objects links in the list is removed.

<filename> : String. Up to 8 characters.
This field specifies the source of the Message Object.

Example:

Command	Possible response(s)
AT$MMSW=6,1,”pic1.jpg” *Note: To link “pic1.jpg” into Page 1*	OK *Note: Object is successfully set (linked)*
AT$MMSW=6,2,”vid1.mp4” *Note: To link “vid1.mp4” into Page 2*	OK *Note: Object is successfully set (linked)*
AT$MMSW=6 *Note: To query the list*	$MMSW: 6,1,”pic1.jpg” $MMSW: 6,2,”vid1.mp4” … $MMSW: 6,10,”” OK
AT$MMSW=6,0 *Note: To remove all object links in the list*	OK *Note: Object is successfully removed (unlinked)*
AT$MMSW=6 *Note: To query the list*	$MMSW: 6,1,”” $MMSW: 6,2,”” … $MMSW: 6,10,”” OK
AT$MMSW=6,1,”pic1.jpg” *Note: To link “pic1.jpg” into Page 1*	OK *Note: Object is successfully set (linked)*

17.3.9 Set MMS Objects: $MMSW=7

Description:

This command sets each MMS Object Text.

Syntax:

AT$MMSW=7,<page>,”<filename>”

Command	Possible response(s)
AT$MMSW=7,<page>,"<filename>" *Note: To link first object <filename> into <page>*	OK *Note: Object is successfully set (linked)*
AT$MMSW=7 *Note: To query the list*	$MMSW: 7,1,"<filename>" $MMSW: 7,2,"<filename>" … $MMSW: 7,10,"<filename>" OK

Defined Values

<page> : Numeric. 0, 1 - 10.
This field specifies the page number of the object in the object list.
If <page> is '0', all objects links in the list is removed.

<filename> : String. Up to 8 characters.
This field specifies the source of the Message Object.

Example:

Command	Possible response(s)
AT$MMSW=7,1,"pic2.jpg" *Note: To link "pic1.jpg" into Page 1*	OK *Note: Object is successfully set (linked)*
AT$MMSW=7,2,"vid2.mp4" *Note: To link "vid1.mp4" into Page 2*	OK *Note: Object is successfully set (linked)*
AT$MMSW=7 *Note: To query the list*	$MMSW: 7,1,"pic2.jpg" $MMSW: 7,2,"vid2.mp4" … $MMSW: 7,10,"" OK
AT$MMSW=7,0 *Note: To remove all object links in the list*	OK *Note: Object is successfully removed (unlinked)*
AT$MMSW=7 *Note: To query the list*	$MMSW: 7,1,"" $MMSW: 7,2,"" … $MMSW: 7,10,"" OK

17.3.10 Send MMS $MMSSEND

Description:

This command sends the MMS.

Syntax:

AT$MMSSEND

Command	Possible response(s)
AT$MMSSEND=? *Note: Testing the command*	OK
AT$MMSSEND *Note: To start sending the composed MMS*	OK *Note: MMS is successfully sent*

17.3.11 MMS Abort $MMSABORT

Description:

This command aborts currently active MMS message sending or receiving activity.

Syntax:

AT$MMSABORT

Command	Possible Response(s)
AT$MMSABORT	OK

Example:

Command	Possible Response(s)
AT$MMSABORT *Note: Abort any MMS sending/receiving activity*	OK
Note: Unsolicited response of successful abort of MMS operation	$MMSTRACE: 4 OK

17.4 MMS Message Extraction

17.4.1 Get Objects: $MMSMGET

Description:

This command gets each MMS Object Text.

Syntax:

AT$MMSMGET=<hdr_index>

Command	Possible Response(s)
AT$MMSMGET=? *Note: Testing the command*	OK
AT$MMSMGET=<hdr_index> *Note: To retrieve MMS from MMSC*	OK *Note: Successful*
	+MMSTRACE: 2,1 *Note: MMS received and stored at memory location #1*

Defined Values

<hdr_index> : Numeric. 1 - 20.
This field specifies the index of the MMS headers that is to be retrieved.

17.4.2 Downloaded MMS Message Command: $MMSM

Command	Possible Response(s)
AT$MMSM=? *Note: Testing the command*	$MMSM: (0-4) OK

17.4.3 Read MMS Sender Number: $MMSM=0

Description:

This command queries the sender's phone number.

Syntax:

AT$MMSM=0

Command	Possible response(s)
AT$MMSM=0 *Note: To query sender's phone number*	$MMSM: 0 <number> OK
AT$MMSM=0 *Note: To query sender's phone number*	$MMSM: 0 92222222 OK

Defined Values

<number> : String. Up to 255 characters.
This field specifies the targeted phone number and email addresses separated by a semicolon ';'.

17.4.4 Read MMS TO List: $MMSM=1

Description:

This command queries all targeted phone number into the MMS TO list.

Syntax:

AT$MMSM=1

Command	Possible response(s)
AT$MMSM=1 *Note: To query all number in the TO list*	$MMSW: 1 <number> OK
AT$MMSM=1 *Note: To query all number in the TO list*	$MMSW: 1 92222288;hello@iwow.com.sg OK

Defined Values

<number> : String. Up to 255 characters.
This field specifies the targeted phone numbers and email addresses separated by a semicolon ';'.

17.4.5 Read MMS CC List: $MMSM=2

Description:

This command queries all targeted phone number into the MMS CC list.

Syntax:

AT$MMSM=2

Command	Possible response(s)
AT$MMSM=2	$MMSW: 2 <number> OK
AT$MMSM=2 *Note: To query all number in the CC list*	$MMSW: 2 92222288;hello@iwow.com.sg OK

Defined Values

<number> : String. Up to 255 characters.
This field specifies the targeted phone numbers and email addresses separated by a semicolon ';'.

17.4.6 Query MMS Subject: $MMSM=3

Description:

This command queries MMS subject.

Syntax:

AT$MMSM=3

Command	Possible response(s)
AT$MMSM=3	$MMSM: 3 <source> OK
AT$MMSM=3 *Note: To query MMS subject*	$MMSM: 3 TR-800 MMS-Demo OK *Note: MMS Subject is extracted*

Defined Values

<source> : String. Up to 255 characters.
This field specifies the target subject text.

17.4.7 Query MMS Text/Objects: $MMSM=4

Description:

This command queries for the MMS messages text/objects.

Syntax:

AT$MMSM=4

Command	Possible response(s)
AT$MMSM=4,[<index>],[”<filename>”]	OK

Defined Values

<index> : Numeric. According to the number of MMS objects received
This field specifies the type of retrieval of the MMS message text.

<filename> : String. Up to 50 characters.
Support 8.4 file format with extension. This field specifies the target file to save to.

Example:

Command	**Possible response(s)**
AT$MMSM=4 *Note: Lists all text/objects in downloaded MMS message*	$MMSM: 4,1,1,"16820292.txt","text/plain",24 $MMSM: 4,2,1,"bmw.jpg","image/jpeg",12288 $MMSM: 4,3,1,"xmas.mid","audio/midi",1024 OK
AT$MMSM=4,1,”mytext” *Note: To save MMS Message Text into “mytext” file*	OK *Note: MMS Message Text file* "16820292.txt" *is saved into “mytext” file*
AT$MMSM=4,1 *Note: To get MMS Message Text directly*	Hello How are you? OK

17.5 MMS Events

17.5.1 MMS Event Trace

Description:

This unsolicited response provides information on MMS activities.

Syntax:

$MMSTRACE: <value>, [<loc>]

Defined Values

Event Activity:

<value>

1 = MMS message is successfully sent

2 = MMS header is received and stored

3 = MMS message is downloaded and stored

4 = MMS operation (Sending/Receiving) has been successfully aborted

General Error Codes:

<value>

1100 = MMS Stack is currently busy (sending / receiving in progress)

1099 = Other Error

1098 = Inbox is Full. Incoming MMS header cannot be stored.

1097 = Receive Error

1096 = Server Reject

1095 = Unsupported Content Type

1094 = Invalid Data Received

1093 = Restricted Media Type

1092 = Max size reached

1091 = Invalid Media Type

1090 = Bearer Failure

1089 = Message more than maximum allowable size

1088 = Message does not exist

1087 = No message downloaded

1086 = Cannot recognize downloaded message

1085 = File system full

1084 = File system writing fail
1083 = File already exists
1082 = Invalid Filename
1081 = Maximum number of files reached
1080 = File Error
1079 = Object Extract Fail
1078 = Object Not Found
1077 = Incorrect object type. Object is a text file
1061 = TCP/IP occupying the GPRS bearer
1060 = GPRS activation failure

Possible Error Codes During MMS Compose:

<value>

1076 = No Recipient Specified
1075 = Subject Not Specified
1074 = Invalid TO field
1073 = Invalid CC field
1072 = Invalid BCC field
1071 = Invalid Text
1070 = Invalid Media 1
1069 = Invalid Media 2
1068 = Encapsulating Error
1067 = Error in Starting MMS Send
1066 = Media Type not allowed
1065 = File does not exist

Possible Error Codes During MMS Sending:

1064 = Network Timeout
1063 = Network DNS resolved
1062 = Other Network Errors

17.6 MMS Example

17.6.1 MMS Operations

Initial settings:

1. Setup MMS Configurations
2. Setup Files on Module

To send MMS message:

1. Reset MMS message compose parameters (Not required for 1st MMS message composed)
2. Compose MMS
3. Send MMS

To receive MMS message:

1. Receive MMS header
2. List MMS header
3. Download MMS message corresponding to the selected MMS header index

To read MMS message:

1. Read MMS message

17.6.2 Setup MMS Configurations

MMS configurations are set at the start of MMS sending/receiving.

Setting MMS Bearer

```
at$mmsbearer=?
$MMSBEARER: 1,"apn","userid","pw"

OK
at$mmsbearer=1,"miworld","65","user123"

OK
at$mmsbearer?
$MMSBEARER: 1,"miworld","65","user123"

OK
```

Setting MMS Proxy

```
at$mmsproxy="172.16.14.10",8080

OK
```

Setting MMS Communication Mode

```
at$mmscommmode=2

OK
```

Setting MMSC URL

```
at$mmscurl="http://mmsgw:8002/"

OK
```

17.6.3 Setup Files on Modem

Files are uploaded to the module for MMS compose and downloaded to PC from module. These sets of commands are used whenever selected files are required.

```
at$ffld
$FFLD: 0,600000,600000,0

OK
at$fupl="bmw.jpg"
Ok_Info_FileUploadStarted
CCCC
Ok_Info_FileClose

OK
at$flst
$FLST: "bmw.jpg",12288

OK
at$fupl="mycar.jpg"
Ok_Info_FileUploadStarted
CCCCC
Ok_Info_FileClose
```

OK
at$flst
$FLST: "bmw.jpg",12288
$FLST: "mycar.jpg",185088

OK
at$fdel="mycar.jpg"

OK
at$flst
$FLST: "bmw.jpg",12288

OK
at$fdwl="bmw.jpg"
Ok_Info_FileDownloadStarted
Ok_Info_FileClose

OK
at$ffld
$FFLD: 12288,600000,587712,1

OK
at$fupl="baby.gif"
Ok_Info_FileUploadStarted
CCCCCC
Ok_Info_FileClose

OK
at$flst
$FLST: "baby.gif",23936
$FLST: "bmw.jpg",12288

OK
at$fupl="xmas.mid"
Ok_Info_FileUploadStarted
CCCCCCCCC□
Ok_Info_FileClose

```
OK
at$flst
$FLST: "baby.gif",23936
$FLST: "bmw.jpg",12288
$FLST: "xmas.mid",1024

OK
```

17.6.4 MMS Message Compose

The following are recommended steps when composing MMS message.

```
at$mmscs=”DEF”

OK

at$mmsw=1,1
> 98022222;90933333

OK
at$mmsw=2,1
> hello@iwow.com.sg

OK
at$mmsw=3,1
> hello@iwow.com.sg

OK
at$mmsw=4,1
> TR800 MMS Demo - 2 Pages

OK
at$mmsw=5,1,1
> Page 1. Text

OK
at$mmsw=6,1,"bmw.jpg"
```

```
OK
at$mmsw=7,1,"xmas.mid"

OK
at$mmsw=5,2,1
> Page 2. Text

OK
at$mmsw=6,2,"baby.gif"

OK
```

17.6.5 MMS Send

This command is required for sending MMS message composed in the previous section.

```
at$mmssend

OK
$MMSTRACE: 1
```

17.6.6 MMS Header Receive

Incoming MMS headers will be automatically stored in the next available location.

```
$MMSTRACE: 2,1

OK
```

17.6.7 List MMS Headers

MMS headers are listed according to the specified location type in the commands below.

```
at$mmshl="UNREAD"
$MMSHL: 1,"+6590923194","UNREAD",0,"01/01/2000","00:25:19",30720
TR800 MMS Demo - 2 Pages

OK
```

```
at$mmshl="ALL"
$MMSHL: 1,"+6590923194","READ",0,"01/01/2000","00:25:19",30720
TR800 MMS Demo - 2 Pages

OK
```

17.6.8 Download MMS Message

MMS message can only be downloaded when MMS headers have been received. Downloading MMS message corresponding to the respective MMS headers will be stored directly into the next available location.

```
at$mmsmget=1

OK
$MMSTRACE: 3,1

OK
```

17.6.9 Read MMS Message

To read MMS message the following commands can be issued.

List all TO list

```
at$mmsm=1
$MMSM: 1
+6598053071;+6590923194

OK
```

List all CC number/email address

```
at$mmsm=2
$MMSM: 2
alexwow@iwow.com.sg

OK
```

List MMS subject

```
at$mmsm=3
$MMSM: 3
TR800 MMS Demo - 2 Pages

OK
```

List all MMS Objects/Text

```
at$mmsm=4
$MMSM: 4,1,1,"16820292.txt","text/plain",24
$MMSM: 4,2,1,"bmw.jpg","image/jpeg",12288
$MMSM: 4,3,1,"xmas.mid","audio/midi",1024
$MMSM: 4,4,2,"16821268.txt","text/plain",24
$MMSM: 4,5,2,"baby.gif","image/gif",23936

OK
```

Read MMS Text directly

```
at$mmsm=4,1
$MMSM: 4,1
Page 1. Text

OK
```

Copy Media into file

```
at$mmsm=4,2,"bmwcar2.jpg"

OK
```

List all files

```
at$flst
$FLST: "bmwcar2.jpg",12288
$FLST: "baby.gif",23936
$FLST: "bmw.jpg",12288
$FLST: "xmas.mid",1024

OK
```

Download file from modem to PC

```
at$fdwl="bmwcar2.jpg"
Ok_Info_FileDownloadStarted
Ok_Info_FileClose

OK
```

17.6.10 Compose New MMS Message

The command below is required to reset/clear the message before composing new messages.

```
at$mmsw=0

OK
```

17.7 Example to Send MMS in Chinese Characters Using UCS2

Set character set to UCS2

```
at$mmscs="UCS2"

OK
at$mmsw=1,1
> hello@iwow.com.sg ; 90000071

OK
at$mmsw=2,1
> 90000194

OK
at$mmsw=4,1
> 738B51325A3659BB

OK
at$mmsw=5,1,1
>97399742738B513262C960F97D0D83326797548C51C6738B5983838E62C96C387D50540C5FC3
FF0162C960F97D0D83326797548C838E62C99031516D6B635F0F59275A5A
```

```
OK
at$mmsw=6,1,"m08.jpg"

OK
at$mmssend

OK
$MMSTRACE: 1
$MMSTRACE: 2,9

at$mmsmget=9

OK
$MMSTRACE: 3,9
at$mmsm=4

$MMSM: 4,1,1,"16822692.txt","text/plain",68
$MMSM: 4,2,1,"m08.jpg","image/jpeg",15104

OK
at$mmsm=4,1,"test2.txt"

OK
at$flst

$FLST: "hello.txt",114
$FLST: "test2.txt",70

OK
at$fdwl="test2.txt"

Ok_Info_FileDownloadStarted
Ok_Info_FileClose
```

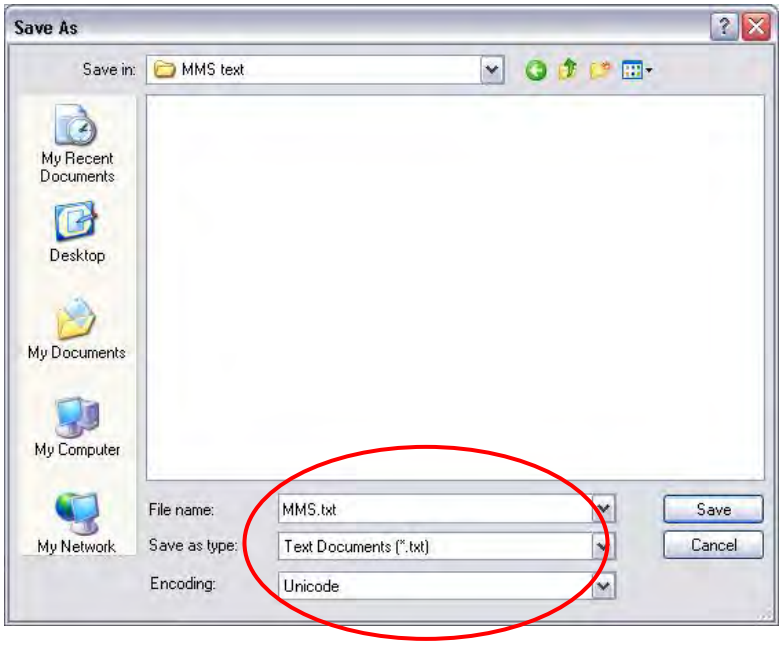
17.8 Example on How to Save Text File in Unicode Format (Windows)

1. In Windows Notepad, click " File > Save As "

2. Enter Filename (e.g. MMS)
3. Next, set the parameters as follow:

   Save As Type: Text Document (*.txt)

   Encoding: Unicode



4. Click "Save" to save text file into folder.

17.9 Supported Media Types

The following table lists the media types supported:

Extension	Media Type/extension
Text Media	
.txt	text/plain
Image Media	
gif	image/gif
jpeg	image/jpeg
jpg	image/jpeg
jpe	image/jpeg
wbmp	image/vnd.wap.wbmp
bmp	image/bmp
png	image/x-png
tiff	image/tiff
tif	image/tiff
Audio Media	
wav	audio/wav
mid	audio/midi
mp3	audio/mp3
midi	audio/midi
amr	audio/amr
qcp	audio/vnd.qcelp
Video Media	
mp4	video/mp4
3gp	video/3gpp
3g2	video/3gpp2
mpg	video/mpeg
mpeg	video/mpeg
mpe	video/mpeg
wmv	video/wmv
dat	video/dat

18 iCOMM SERVICES

iCOMM is a watchdog service for GPRS and TCP Socket connections.

18.1 Software Watchdogs & Events

Situation	Action from iCOMM
1. When GPRS disconnects	iCOMM retry GPRS connection
2. When Five consecutive retries could not connect to GPRS	iCOMM soft-reset the Modem
3. In Server Mode: When Client socket dis-connected	iCOMM returns to Listening Mode
4. In Client Mode: Server socket dis-connected	iCOMM re-connects to the Server.
5. In Client Mode: When iCOMM cannot connect to Server for five consecutive re-tries	ICOMM detach and re-attach GPRS connection

18.2 iCOMM Service ON/OFF +iCOMM

Description:

This command enables or disables iCOMM Service. The settings are saved instantly when set.

Syntax:

AT+iCOMM=<n>

Command	Possible response(s)
AT+iCOMM=?	+ iCOMM: (0,1)
AT+ iCOMM?	+ iCOMM: 1 *Note: iCOMM is enabled*
AT+ iCOMM=0	OK *Note: iCOMM is disabled*

Defined Values

<n>

0 = Disable iCOMM service

1 = Enable iCOMM service

Note:

<n> set by flag

18.3 Application Name +iAPPNAME

Description:

The command set/requests the user-defined application name

Syntax:

AT+iAPPNAME

Command	Possible response(s)
AT+iAPPNAME=”Demo”	+iAPPNAME: "Demo" OK
AT+iAPPNAME?	+iAPPNAME: "Demo" OK

Default Value

“iCOMM Demo”

18.4 Remote IP Address +iDISTANTIP

Description:

The command requests for the distant IP address. The IP address is captured when the remote client successfully is connected to the iCOMM. The Address is not saved to the storage flash. 0.0.0.0 will be returned if remote is not connected to the iCOMM. Please note that this IP address is the public IP address of the remote client.

Syntax:

AT+IDSTANTIP

Command	Possible response(s)
AT+iDISTANTIP?	+ iDISTANTIP: “203.21.2.3” OK *Note: a client is connected*
AT+iDISTANTIP?	+ iDISTANTIP: “0.0.0.0” OK *Note: a client is not connected*

18.5 Local IP Address +iLOCALIP

Description:

The command requests for the local IP address**.** The IP address is assigned to the Modem when a successful GPRS connection is established. The Address is not saved to the storage flash.

Note: This IP address is a subnet address used by the Telco’s internal network

Syntax:

AT+iLOCALIP

Command	Possible response(s)
AT+iLOCALIP?	+iLOCALIP: “10.10.10.1” OK

Default Value

“0.0.0.0”

18.6 Target IP Address +iTARGETIP

Description:

The command requests for the target IP address. The IP address is used for client mode connection.

The Address is saved to the storage flash

Syntax:

AT+iTARGETIP

Command	Possible response(s)
AT+iTARGETIP=”10.10.10.1”	+iTARGET: “10.10.10.1” OK
AT+iTARGETIP?	+iTARGET: “10.10.10.1” OK

Default Value

“0.0.0.0”

18.7 Local IP Port +iLOCALPORT

Description:

The command set/requests for the local IP port. The Address is saved into the storage flash

This IP address is an internal address used by the Telco’s internal network

Syntax:

AT+iLOCALPORT

Command	Possible response(s)
AT+iLOCALPORT=1000	OK
AT+iLOCALPORT?	+iLOCALPORT: 1000 OK

Defined Values

Port Number : (1 – 65,000) Default value is 0.

18.8 GPRS Settings +iIPGPRS

Description:

This command set the APN information for GPRS connection

The settings will be saved into the storage flash

Syntax:

AT+iIPGPRS

Command	Possible response(s)
AT+iIPGPRS?	+iIPGPRS:<Cid>,<APN>,<UN>,<PW> OK
AT+iIPGPRS=?	+iIPGPRS: (1-4) , (100) , (50) , (50) OK

Defined Values

<APN> : Operator access point name. Up to 100 characters.

<UN> : User name (Up to 50 characters)

<PW> : Password (Up to 50 characters)

<cid>

1-4 = Context ID

Default value is 1.

18.9 TCP Socket Mode +iTCPMode

Description:

The command set/requests for the TCP Socket connection mode. The setting is saved into the storage flash

Note:

When using Client mode, ensure that +iTargetIP and +iLocalPort are set.

Syntax:

AT+iTCPMode

Command	Possible response(s)
AT+iTCPMode=1	+iTCPMode=1 OK
AT+iTCPMode?	+iTCPMode=1 OK

Defined Values

0 = Client mode
1 = Server listening mode
Default value

18.10 iCOMM Messages

The following are the unsolicited response messages issued by iCOMM through RS232/USB port(s).

+iMsg Response Format:

iMsg: <system message><carriage return><linefeed>

Defined Values

<system message>

"iCOMM Loaded"	=	This message is issued when iCOMM stack is loaded after a reset of modem. Message will only be issued once after a power cycle.
"iCOMM Initiated"	=	This message is issued when iCOMM stack is loaded after a reset of modem. This message will only be issued once after +iCOMM Loaded.
"GPRS Connected"	=	GPRS is connected. Following with +iGATEWAYIP and +iLOCALIP responses. Upon receiving this message, iCOMM will proceed to establish TCP operation.
"Listening"	=	iCOMM has entered listening Mode (data mode).
"Waiting for Data"	=	iCOMM has entered client mode (data mode).

18.11 Setting Initial Configuration

1. Connect the Modem to PC with Hyper-Terminal software application.
2. Run Hyper-Terminal and open the com port. (for new units, use 115200,8,N,1,hardware flow control)
3. When modem responses "+Msg: iCOMM Initiated", send your APN settings (by +iIPGPRS), local TCP port number (by +iLocalPort) and Target IP address (by +iTargetIP)
4. Perform all AT commands before modem entered datamode

18.12 Rebooting the Modem

Use AT+CFUN=1 to reboot the modem.

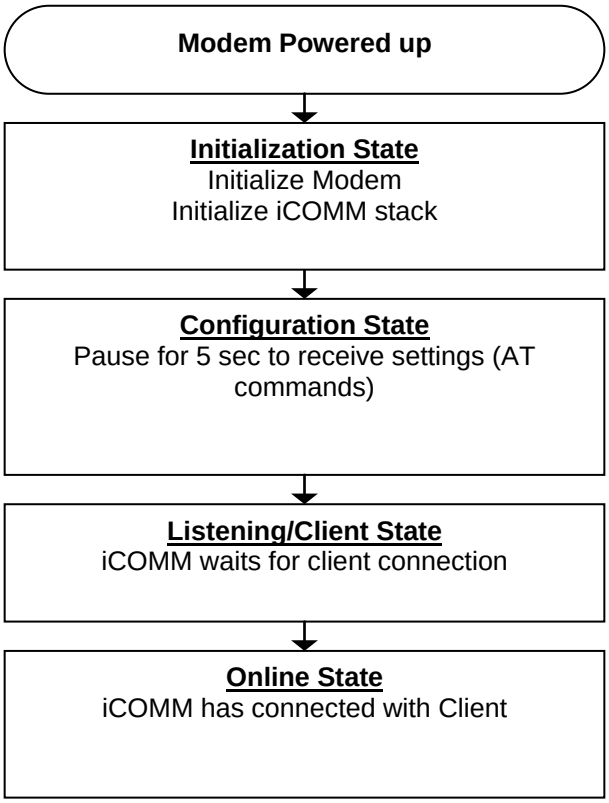
18.13 Changing Settings

Reset the modem to apply modified settings.

Use +++ to switch to AT-Command mode if the modem is connected to a socket.

Use ATO to switch from AT-Command Mode to online mode.

18.14 iCOMM Operations



19 MOBILE EQUIPMENT RESULT CODE AND DEFINITION

19.1 General Errors

<error>

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
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
100	=	Unknown
512	=	Failed to Abort
513	=	Lower Layer Failure (for SMS)
514	=	SIM Busy with SIM Application Toolkit

19.2 CMS Error Codes

19.2.1 RP-ERROR Message in a Mobile Originating SM-Transfer Attempt

<error>

1	=	Unassigned (unallocated) number
8	=	Operator determined barring
10	=	Call barred
21	=	Short message transfer rejected
27	=	Destination out of order
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	=	Semantically incorrect message
96	=	Invalid mandatory information
97	=	Message type non-existent or not implemented
98	=	Message not compatible with short message protocol
99	=	Information element non-existent or not implemented
111	=	Protocol error, unspecified
127	=	Interworking, unspecified

19.2.2 Failure to Transfer or Process a Short Message

<error>

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 (alphabet) 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
176	=	TPDU not supported
192	=	SC busy
193	=	No SC subscription
194	=	SC system failure
195	=	Invalid SME address
196	=	Destination SME barred
197	=	SM Rejected-Duplicate SM
198	=	TP-VPF not supported
199	=	TP-VP not supported
208	=	SIM SMS storage full
209	=	No SMS storage capability in SIM
210	=	Error in MS
211	=	Memory Capacity Exceeded
255	=	Unspecified error cause
300	=	ME failure
301	=	SMS service of ME reserved
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 required
312	=	PH-SIM PIN required
313	=	SIM failure
314	=	SIM busy

315	=	SIM wrong
316	=	SIM PUK required
317	=	SIM PIN2 required
318	=	SIM PUK2 required
320	=	Memory failure
321	=	invalid memory index
322	=	memory full
330	=	SMSC address unknown
331	=	no network service
332	=	network timeout
340	=	no +CNMA acknowledgement expected
500	=	unknown error
512	=	Failed to Abort
513	=	ACM Reset Needed

19.3 CEER Error Codes

19.3.1 Normally Occurring Errors

<error>

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	=	Status enquiry
31	=	Unspecified

19.3.2 Errors Caused by Unavailable Resources

<error>

34	=	No circuit/ channel unavailable
38	=	Network out of order
41	=	Temporary failure
42	=	Switching equipment congestion
43	=	Access information discarded
44	=	Requested circuit/ channel unavailable
47	=	Resource unavailable
34	=	No circuit/ channel unavailable
38	=	Network out of order
41	=	Temporary failure
42	=	Switching equipment congestion
43	=	Access information discarded

44 = Requested circuit/channel unavailable
47 = Resource unavailable

19.3.3 Errors Due to Service or Option Not Available

<error>
49 = Quality of service unavailable
50 = Requested facility not subscribed
55 = Incoming calls barred within the CUG
57 = Bearer capability not recognized
58 = Bearer capability not presently available
63 = Service unavailable
68 = ACM equal to or greater than ACMmax
49 = Quality of service unavailable
50 = Requested facility not subscribed
55 = Incoming calls barred within the CUG
57 = Bearer capability not recognized
58 = Bearer capability not presently available
63 = Service unavailable
68 = ACM equal to or greater than ACMmax
49 = Quality of service unavailable
50 = Requested facility not subscribed

19.3.4 Errors Due to Service or Option Not Implemented

<error>
65 = Bearer service not implemented
69 = Requested facility not implemented
70 = Only restricted digital information bearer capability is available
79 = Service not implemented

19.3.5 Errors Caused by Invalid Message

<error>

81 = Invalid transaction identifier value

87 = User not member of CUG

88 = Incompatible destination

91 = Invalid transit network selection

95 = Semantically incorrect message

19.3.6 Errors Caused by Protocol Error

<error>

96 = Invalid Mandatory Information

97 = Message type non-existent or not implemented

98 = Message type not compatible with protocol state

99 = Information element non-existent or not implemented

100 = Conditional IE error

101 = Message not compatible with protocol state

102 = Recovery on timer expiry

111 = Protocol error, unspecified

19.3.7 Interworking Errors

<value>

127 = Interworking, unspecified

19.3.8 Other Error Codes

<error>

200 = Requested Bearer Service Not Available

201 = No Transaction ID available

202 = Timer 303

203 = GPRS establish fail

210 = No Error

211 = Failed

212 = Timeout

213 = Bearer Service Not Compatible

19.4 GPRS-Related Errors

19.4.1 Errors Related to a Failure to Perform an Attach

<error>

103	=	Illegal MS (#3)
106	=	Illegal ME (#6)
107	=	GPRS services not allowed (#7)
111	=	PLMN not allowed (#11)
112	=	Location area not allowed (#12)
113	=	Roaming not allowed in this location area (#13)

Note:
Values in parentheses are GSM 04.08 cause codes.

19.4.2 Errors Related to a Failure to Activate a Context

<error>

132	=	Service option not supported (#32)
133	=	Requested service option not subscribed (#33)
134	=	Service option temporarily out of order (#34)
149	=	PDP authentication failure

19.4.3 Other GPRS Errors

<error>

150	=	Invalid mobile class
148	=	Unspecified GPRS error

19.5 CME Error Codes

<error>

3000	=	An asynchronous error network event has occurred
3001	=	A parameter given to the function is invalid
3002	=	An internal error has happened
3003	=	The address or port is already in use
3004	=	There is not enough memory to fulfill the request
3005	=	The socket is not of a type that can support this operation
3006	=	The specified host cannot be reached
3007	=	The connection to the specified address was refused by the remote host
3008	=	The request could not be fulfilled because the socket is already connected
3009	=	The connection attempt timed out without establishing a connection
3010	=	The specified host could not be found in the DNS
3011	=	A temporary DNS error has occurred. Retrying the query may be successful
3012	=	A permanent DNS error has occurred
3013	=	The specified name has been found in the DNS, but no IP address is available
3014	=	The size of the data buffer is too large for a UDP socket
3015	=	The connection has been reset by the remote peer
3016	=	The connection was aborted due to timeout or some other error condition
3017	=	Sending failed temporarily because the space to buffer the message was exhausted.
3018	=	The operation failed because TCP/IP's bearer connection has been disconnected
3019	=	The operation failed because the bearer connection has not been opened.
3020	=	The bearer connection could not be opened because the mobile is not yet completely attached to the network. A retry at a later time may be successful.
3021	=	The operation failed because a similar operation is already in progress.
3022	=	The operation failed because a bearer connection is already open.
3023	=	Mobile equipment is not ready for TCP/IP connectivity
3024	=	Bearer is not open
3025	=	Connection is not open yet
3026	=	Bearer open fail
3027	=	Socket create fail
3028	=	Operation not allowed

APPENDIX A: TCP DISPLAY MESSAGES

Message	Description
Ok_Info_GprsActivation	GPRS bearer context is activated - ready to be used by socket connection
Ok_Info_GprsDeactivation	GPRS bearer context is de-activated
Ok_Info_WaitingForData	Socket connected - ready for data transmission
Ok_Info_DataClosed	Socket disconnected & destroyed - bearer context still active
Error_Info_GprsActivation	Failed to activate GPRS bearer context
Error_Info_GsmActivation	Failed to activate GSM bearer context
Error_Info_SockCreateFail	Socket creation failed
Error_Info_InvalidParameter	Invalid parameter in TCP or UDP settings (some settings are not set)
Error_Info_AddressInUse	The address or port is already in use
Error_Info_OutOfMemory	There is not enough memory to fulfill the request
Error_Info_NotSupported	The socket is not of a type that can support this operation
Error_Info_Unreachable	The specified host cannot be reached
Error_Info_ConnRefused	The connection to the specified address was refused by the remote host
Error_Info_ConnTimeout	The connection attempt timed out without establishing a connection
Error_Info_AlreadyConnected	The request could not be fulfilled because the socket is already connected
Error_Info_HostNotFound	The specified host could not be found in the DNS
Error_Info_TempDNSError	A temporary DNS error has occurred. Retrying the query may be successful
Error_Info_PermDNSError	A permanent DNS error has occurred
Error_Info_NoIPAddress	The specified name has been found in the DNS, but no IP address is available
Error_Info_MsgTooBig	The size of the data buffer is too large for a TCP or UDP socket
Error_Info_ConnReset	The connection has been reset by the remote peer
Error_Info_ConnAborted	The connection was aborted due to timeout or some other error condition
Error_Info_NoBufSpace	Sending failed temporarily because the space to buffer the message was exhausted
Error_Info_NetworkLost	The operation failed because TCP/IP and UDP bearer

	connection has been disconnected. As an asynchronous event code: The bearer connection has been closed.
Error_Info_InProgress	The operation failed because a similar operation is already in progress
Error_Info_AsyncError	Network event: an asynchronous error has occurred
Ok_Info_GsmActivation	GSM bearer context is activated
Ok_Info_GsmDeactivation	GSM bearer context is de-activated
Error_Info_OperNotAllowed	Current command is not allowed (eg: $SENDMODE cannot be changed during a connected TCP session. Need to close TCP first)

APPENDIX B: USER FILE SYSTEM (UFS) ERROR CODES

The error codes and descriptions are listed in the following table:

File Error Code	Description
$FERR: 0	No error
$FERR: 4001	File already exist
$FERR: 4002	File not found
$FERR: 4003	Invalid Filename
$FERR: 4004	File is corrupted
$FERR: 4005	Not enough free space
$FERR: 4006	File Transfer Failed
$FERR: 4007	File Transfer Aborted
$FERR: 4008	Maximum number of files exceeded
$FERR: 4009	FS Not Ready
$FERR: 4010	Unknown Error (internal error)
Ok_Info_FileUploadStarted	Receiving File in Xmodem
Ok_Info_FileDownloadStarted	Transferring File in Xmodem
Ok_Info_FileClose	File transfer mode closed

APPENDIX C: SHORT MESSAGE SERVICE ELEMENTS

First Octet <f0>

MTI:

Bit1	Bit 0 Message type
0	0 SMS-DELIVER (in the direction SC to MS)
0	0 SMS-DELIVER REPORT (in the direction MS to SC)
1	0 SMS-STATUS-REPORT (in the direction SC to MS)
1	0 SMS-COMMAND (in the direction MS to SC)
0	1 SMS-SUBMIT (in the direction MS to SC)
0	1 SMS-SUBMIT-REPORT (in the direction SC to MS)
1	1 Reserved

RD:

Bit 2	
0	Instruct the SC to accept an SMS-SUBMIT for an SM still held in the SC that has the same TP-MR and the same TP-DA as a previously submitted SM from the same OA.
1	Instruct the SC to reject an SMS-SUBMIT for an SM still held in the SC that has the same TP-MR and the same TP-DA as the previously submitted SM from the same OA. In this case an appropriate TP-FCS value will be returned in the SMS-SUBMITREPORT.

VPF:

Bit 4	Bit 3
0	0 TP-VP field not present
1	0 TP-VP field present - relative format
0	1 TP-VP field present - enhanced format
1	1 TP-VP field present – absolute format

SRR:

Bit 5	
0	A status report is not requested
1	A status report is requested

UDHI:

Bit 6	
0	The TP-UD field contains only the short message
1	The beginning of the TP-UD field contains a Header in addition to the short message

RP:

0	TP-Reply-Path parameter is not set in this SMS-SUBMIT/DELIVER
1	TP-Reply-Path parameter is set in this SMS-SUBMIT/DELIVER

Validity Period<VP>

The representation of time is as follows:

0 to 143 = (TP-VP + 1) x 5 minutes (i.e. 5 minutes intervals up to 12 hours)
144 to 167 = 12 hours + ((TP-VP -143) x 30 minutes)
168 to 196 = (TP-VP - 166) x 1 day
197 to 255 = (TP-VP - 192) x 1 week

Protocol Identifier <pid>

Bits	Usage
7	6
0	0 Assigns bits 0..5 as defined below
0	1 Assigns bits 0..5 as defined below
1	0 reserved
1	1 Assigns bits 0-5 for SC specific use

In the case where bit 7 = 0 and bit 6 = 0, bit 5 indicates telematic interworking:

value = 0 : no interworking, but SME-to-SME protocol
value = 1 : telematic interworking

In the case of telematic interworking, the following five bit patterns in bits 4..0 are used to indicate different types of telematic devices:

4...0	
00000	implicit - device type is specific to this SC, or can be concluded on the basis of the address
00001	telex (or teletex reduced to telex format)
00010	group 3 telefax
00011	group 4 telefax
00100	voice telephone (i.e. conversion to speech)
00101	ERMES (European Radio Messaging System)
00110	National Paging system (known to the SC)
00111	Videotex (T.100/T.101)
01000	teletex, carrier unspecified
01001	teletex, in PSPDN
01010	teletex, in CSPDN
01011	teletex, in analog PSTN
01100	teletex, in digital ISDN
01101	UCI (Universal Computer Interface, ETSI DE/PS 3 01-3)
01110..01111	(reserved, 2 combinations)
10000	a message handling facility (known to the SC)
10001	any public X.400-based message handling system
10010	Internet Electronic Mail
10011..10111	(reserved, 5 combinations)
11000..11110	values specific to each SC, usage based on mutual agreement between the SME and the SC (7 combinations available for each SC)
11111	A GSM mobile station. The SC converts the SM from the received TP-Data-Coding-Scheme to any data coding scheme supported by that MS (e.g. the default).

If bit 5 has value 1 in an SMS-SUBMIT PDU, it indicates that the SME is a telematic device of a type which is indicated in bits 4..0, and requests the SC to convert the SM into a form suited for that device type. If the destination network is ISDN, the SC must also select the proper service indicators for connecting to a device of that type.

If bit 5 has value 1 in an SMS-DELIVER PDU, it indicates that the SME is a telematic device of a type which is indicated in bits 4..0.

If bit 5 has value 0 in an SMS-DELIVER PDU, the value in bits 4..0 identifies the SM-AL protocol being used between the SME and the MS.

Note that for the straightforward case of simple MS-to-SC short message transfer the Protocol Identifier is set to the value 0.

In the case where bit 7 = 0, bit 6 = 1, bits 5..0 are used as defined below:

5....0	
000000	Short Message Type 0
000001	Replace Short Message Type 1
000010	Replace Short Message Type 2
000011	Replace Short Message Type 3
000100	Replace Short Message Type 4
000101	Replace Short Message Type 5
000110	Replace Short Message Type 6
000111	Replace Short Message Type 7
001000..011 110	Reserved
011111	Return Call Message
100000..111 101	Reserved
111110	ME de-personalization Short Message
111111	SIM Data download

APPENDIX D: PARAMETERS AFFECTED BY AT&W, AT&F

AT-Command	AT&W	AT&F	Default Values
&D	X		2
+ICF	X		3,4
&C	X		1
+CBST	X	X	7,0,1
+CMEE	X	X	0
+CSCS	X	X	“PCCP437”
+CSNS	X	X	0
+COPS	X	X	0,2
+CREG	X	X	0
+CSDH	X	X	0
+CCWA	X	X	0 (0,0,7)
+COLP	X	X	0
+CR	X	X	0
+CRC	X	X	0
+ILRR	X	X	0
Q	X	X	0
V	X	X	1
+IPR	X		115200
+IFC	X		2,2
+CMGF	X	X	1
+CNMI	X	X	0,1,0,0,0
+CSSN	X	X	0,0
ATE<n>	X		1
+CLIP	X	X	0
+CRLP	X	X	61,61,48,6
+CPMS	X	X	“SM”,”SM”,”SM”
S0	X	X	0
+CSMS	X	X	0
+FCLASS	X	X	0
+SLEEP	X	X	0
+CGAUTO	X		3
+CGEREP	X	X	0,0
+CGREG	X	X	0