A7906 Series_
AT Command Manual

LTE-A Module

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Version History

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Contents

THIS DOCUMENT IS A REFERENCE GUIDE TO ALL THE AT COMMANDS.

1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom A7906 Series, including A7906X-XXXX.

More information about the SIMCom Module which includes the Software Version information can be retrieved by the command ATI. In this document, a short description, the syntax, the possible setting values and responses, and some Examples of AT commands are presented.

Prior to using the Module, please read this document and the Version History to know the difference from the previous document.

In order to implement communication successfully between Customer Application and the Module, it is recommended to use the AT commands in this document, but not to use some commands which are not included in this document.

1.2 Related documents

You can visit the SIMCom Website for more information by the following link:
http://www.simcom.com

1.3 Terms and Abbreviations

For the purposes of the present document, the following abbreviations apply:

Abbreviation	Description
AT	ATtention; the two-character abbreviation is used to start a command

	line to be sent from TE/DTE to TA/DCE
DCE	Data Communication Equipment
DCS	Digital Cellular Network
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi–Frequency
EDGE	Enhanced Data GSM Environment
EGPRS	Enhanced General Packet Radio Service
GPIO	General–Purpose Input/Output
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
I2C	Inter–Integrated Circuit
IMEI	International Mobile station Equipment Identity
IMSI	International Mobile Subscriber Identity
ME	Mobile Equipment
MO	Mobile–Originated
MS	Mobile Station
MT	Mobile–Terminated; Mobile Termination
PCS	Personal Communication System
PDU	Protocol Data Unit
PIN	Personal Identification Number
PUK	Personal Unlock Key
SIM	Subscriber Identity Module
SMS	Short Message Service
SMS-SC	Short Message Service Service Center
TA	Terminal Adaptor; e.g. a data card (equal to DCE)
TE	Terminal Equipment; e.g. a computer (equal to DTE)
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USIM	Universal Subscriber Identity Module
WCDMA	Wideband Code Division Multiple Access
FTP	File Transfer Protocol
HTTP	Hyper Text Transfer Protocol
RTC	Real Time Clock
URC	Unsolicited Result Code

1.4 Definitions and Conventions

1.4.1 Definitions

For the purposes of the present document, the following syntactical definitions apply:

<CR>	Carriage return character.
<LF>	Linefeed character.
<…>	Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line.
[…]	Optional subparameter of AT command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. If subparameter is not given, its value equals to its previous value or the recommended default value.
underline	Underlined and defined subparameter value is the recommended default setting or factory setting.

1.4.2 Parameter Saving Mode

- **NO_SAVE**: The parameter of the current AT command will be lost if module is rebooted or current AT command doesn't have parameter.
- **AUTO_SAVE**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect immediately, and it won't be lost if module is rebooted.
- **AUTO_SAVE_REBOOT**: The parameter of the current AT command will be kept in NVRAM automatically and take in effect after reboot, and it won't be lost if module is rebooted.
- **AT&W_SAVE**: The parameter of the current AT command will be kept inusersetting_save.nvm by sending the command of "AT&W".Restore the previously saved value if module is rebooted by sending the command of "ATZ".

1.4.3 Max Response Time

Max response time is estimated maximum time to get response, the unit is seconds.

1.4.4 Document Conventions

- Generally, the characters <CR> and <LF> are intentionally omitted throughout this document.
- If command response is ERROR, not list the ERROR response inside command syntax.

NOTE

AT commands and responses in figures may be not following above conventions.

1.5 AT Interface Synopsis

1.5.1 Interface Settings

Between Customer Application and the Module, standardized RS–232 interface is used for the communication, and default values for the interface settings as following:

115200bps, 8 bit data, no parity, 1 bit stop, no data stream control.

1.5.2 AT Commands Syntax

The "AT" or "at" or "aT" or "At" prefix must be included at the beginning of each command line (except A/ and +++), and the character <CR> is used to finish a command line so as to issue the command line to the module. It is recommended that a command line only includes a command.

When Customer Application issues a series of AT commands on separate command lines, leave a pause between the preceding and the following command until information responses or result codes are retrieved by Customer Application, for Examples, "OK" is appeared. This advice avoids too many AT commands are issued at a time without waiting for a response for each command.

The AT Command set implemented by A7906 Series is a combination of 3GPP TS 27.005, 3GPP TS 27.007 and ITU-T recommendation V.25ter and the AT commands developed by SIMCom.

In the present document, AT commands are divided into three categories: **Basic Command**, **S Parameter Command**, and **Extended Command**.

1. Basic Command

The format of Basic Command is "**AT<x><n>**" or "**AT&<x><n>**", where "**<x>**" is the command name, and "**<n>**" is/are the parameter(s) for the basic command which is optional. An Examples of Basic Command is "**ATE<n>**", which informs the TA/DCE whether received characters should be echoed back to the TE/DTE according to the value of "**<n>**"; "**<n>**" is optional and a default value will be used if omitted.

2. S Parameter syntax

The format of S Parameter Command is "**ATS<n>=<m>**", "**<n>**" is the index of the **S**–register to set, and "**<m>**" is the value to assign to it. "**<m>**" is optional; in this case, the format is "**ATS<n>**", and then a default value is assigned.

3. Extended Syntax

The Extended Command has several formats, as following table list:

Table 1: Types of AT commands and responses

Test Command **AT+<x>=?**	The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes.
Read Command **AT+<x>?**	This command returns the currently set value of the parameter or parameters.
Write Command **AT+<x>=<…>**	This command sets the user-definable parameter values.
Execution Command **AT+<x>**	The execution command reads non-variable parameters affected by internal processes in the GSM engine.

NOTE

The character "+" between the prefix "AT" and command name may be replaced by other character. For Examples, using "#" or "$"instead of "+".

4. Combining AT commands on the same Command line

You can enter several AT commands on the same line. In this case, you do not need to type the "**AT**" or "**at**" prefix before every command. Instead, you only need type "**AT**" or "**at**" the beginning of the command line. Please note to use a semicolon as the command delimiter after an extended command; in basic syntax or S parameter syntax, the semicolon need not enter, for Examples: ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.

The Command line buffer can accept a maximum of 3071 characters (counted from the first command without "AT" or "at" prefix). If the characters entered exceeded this number then none of the Command will executed and TA will return "**ERROR**".

5. Entering successive AT commands on separate lines

When you need to enter a series of AT commands on separate lines, please Note that you need to wait the final response (for Examples OK, CME error, CMS error) of last AT Command you entered before you enter the next AT Command.

1.5.3 Supported character sets

The A7906 Series AT Command interface defaults to the **IRA** character set. The A7906 Series supports the following character sets:

- GSM format
- UCS2
- IRA

The character set can be set and interrogated using the "AT+CSCS" Command (3GPP TS 27.007). The character set is defined in GSM specification 3GPP TS 27.005.

The character set affects transmission and reception of SMS and SMS Cell Broadcast messages, the entry and display of phone book entries text field and SIM Application Toolkit alpha strings.

2 AT Commands According to V.25TER

2.1 Overview of AT Commands According to V.25TER

Command	Description
A/	Repeat Last Command
ATD	Dial Command
+++	Switch from Data Mode to Command Mode
ATO	Switch from Command Mode to Data Mode
ATI	Display Product Identification Information
ATE	Enable Command Echo
AT&V	Display Current Configuration
ATV	Set Result Code Format Mode
AT&F	Set All Current Parameters to Manufacturer Defaults
ATQ	Set Result Code Presentation Mode
ATX	Set Number of Seconds to Wait for Connection Completion
AT&W	Save the User Setting to ME
ATZ	Restore the User Setting from ME
AT+CGMI	Request Manufacturer Identification
AT+CGMM	Request Model Identification
AT+CGMR	Request Revision Identification
AT+CGSN	Request Product Serial Number Identification
AT+CSCS	Select TE Character Set
AT+GCAP	Request Overall Capabilities

2.2 Detailed Description of AT Commands for V.25TER

2.2.1 A/ Re-issues the Last Command Given

This command is used for implement previous AT command repeatedly (except A/), and the return value depends on the last AT command. If A/ is issued to the Module firstly after power on, the response "OK" is only returned.

A/ Re-issues the Last Command Given	
Execution Command A/	Response Re-issues the previous Command
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Examples

```
AT+CPIN?
+CPIN: READY

OK
A/
+CPIN: READY

OK
```

2.2.2 ATD Mobile Originated Call to Dial a Number

This command is used to list characters that may be used in a dialling string for making a call or controlling supplementary services.

ATD Mobile Originated Call to Dial a Number	
Execution Command ATD<n>[<mgsm][;]	Response 1)Originate a voice call successfully: **OK** **VOICE CALL:BEGIN** Originate a data call successfully: **CONNECT** [**<text>**] Originate a call unsuccessfully during command execution: **ERROR** Originate a call unsuccessfully for failed connection recovery: **NO CARRIER** Originate a call unsuccessfully for error related to the MT: **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	V.25ter

Defined Values

<n>	String of dialing digits and optionally V.25ter modifiers dialing digits: 0 1 2 3 4 5 6 7 8 9 * # + A B C Following V.25ter modifiers are ignored: , T P ! W @
Emergency call:	
<n>	Standardized emergency number 112 (no SIM needed)
<mgsm>	String of GSM modifiers: I Actives CLIR (Disables presentation of own number to called party) i Deactivates CLIR (Enable presentation of own number to called party) G Activates Closed User Group invocation for this call only g Deactivates Closed User Group invocation for this call only
<;>	The termination character ";" is mandatory to set up voice calls. It must not be used for data and fax calls.
<text>	CONNECT result code string; the string formats please refer ATX/AT\V/AT&E command.
<err>	Service failure result code string; the string formats please refer +CME ERROR result code and AT+CMEE command.

Examples

```
ATD10086;
OK

VOICE CALL:BEGIN
```

NOTE

Support several "P" or "p" in the DTMF string but the valid auto-sending DTMF after characters "P" or "p" should not be more than 29.

2.2.3 +++ Switch from Data Mode to Command Mode

This command is only available during a connecting PS data call. The +++ character sequence causes the TA to cancel the data flow over the AT interface and switch to Command Mode. This allows to enter AT commands while maintaining the data connection to the remote device.

+++ Switch from Data Mode to Command Mode	
Execution Command **+++**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	V.25ter

Examples

```
+++
OK
```

NOTE

To prevent the +++ escape sequence from being misinterpreted as data, it must be preceded and followed by a pause of at least 1000 milliseconds, and the interval between two '+' character can't exceed 900 milliseconds.

2.2.4 ATO Switch from Command Mode to Data Mode

ATO is the corresponding command to the +++ escape sequence. When there is a PS data call connected and the TA is in Command Mode, ATO causes the TA to resume the data and takes back to Data Mode.

ATO Switch from Command Mode to Data Mode	
Execution Command **ATO**	Response 1)TA/DCE switches to Data Mode from Command Mode: **CONNECT [<baud rate>]** 2)If connection is not successfully resumed: **NO CARRIER** 3) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	V.25ter

Examples

```
ATO
CONNECT 115200
```

2.2.5 ATI Display Product Identification Information

This command is used to request the product information, which consists of manufacturer identification, model identification, revision identification, International Mobile station Equipment Identity (IMEI) and overall capabilities of the product.

ATI Display Product Identification Information	
Execution Command ATI	Response **Manufacturer: <manufacturer>** **Model: <model>** **Revision: <revision>** **IMEI: <sn>** **+GCAP:** list of **<name>**s **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	120000ms
Reference	V.25ter

Defined Values

<manufacturer>	The identification of manufacturer.
<model>	The identification of model.
<revision>	The revision identification of firmware.
<sn>	Serial number identification, which consists of a single line containing IMEI (International Mobile station Equipment Identity) number.
<name>	List of additional capabilities: +CGSM GSM function is supported +FCLASS FAX function is supported +DS Data compression is supported +ES Synchronous data mode is supported. +CIS707-A CDMA data service command set +CIS-856 EVDO data service command set +MS Mobile Specific command set

Examples

```
ATI
Manufacturer: SIMCOM_Ltd
Model: A7906E-M2
Revision: 2003B01A7906E-M2
IMEI: 352099001761482
+GCAP: +CGSM

OK
```

2.2.6 ATE Enable Command Echo

This command sets whether or not the TA echoes characters.

ATE Enable Command Echo	
Write Command **ATE[<value>]**	Response 1)if format is right **OK** 2) **ERROR**
Execution Command **ATE**	Response 1)if format is right **OK** 2) **ERROR**
Parameter Saving Mode	AT&W_SAVE
Max Response Time	120000ms
Reference	V.25ter

Defined Values

<value>	0	Echo mode off
	1	Echo mode on

Examples

```
ATE1
```

```
OK
ATE0
OK
```

2.2.7 AT&V Display Current Configuration

This command returns some of the base configuration parameters settings.

AT&V Display Current Configuration	
Execution Command AT&V	Response 1) <TEXT> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	120000ms
Reference	V.25ter

Defined Values

<TEXT>	All relative configuration information.

Examples

```
AT&V
&C: 0; &D: 0; &F: 0; &W: 0; E: 1; Q: 0; V: 1; X: 0;
Z: 0; S0: 0; S2: 43; S3: 13; S4: 10; S5: 8; S6: 2;
S7: 1; S8: 2; S9: 6; S10: 7; S11: 63; S30: 10;
+FCLASS: 0; +IPR: 115200; +IPREX: 115200;
+CSCS: IRA; +CREG: 0; +CGREG: 0; +CEREG:
0; +CGDCONT:
(1,"IP","ctnet.mnc011.mcc460.gprs","10.13.20
4.244",0,0,,,,),(2,"IP","CMNET");
+CGDSCONT: ; +CGEQMIN:
(1,0,256000,256000,256000,256000,2,1520,"0E0
,6E8,",3,150,0,0,0);
+CGQMIN:(1,3,4,5,1,1),(2,3,4,5,1,1); +CGEREP:
(2,0); +CGCLASS: "A"; +CGACT: (1,1),(2,0);
+CGAUTH: (1,0),(2,0); +CPBS: "SM"; +CMEE:
2; +CFUN: 1; +CMGF: 0; +CSCA:
```

```
("+316540942000",145); +CSMP: 33,167,0,0;
+CSDH: 0; +CPMS:
"SM",0,50,"SM",0,50,"SM",0,50;

OK
```

2.2.8 ATV Set Result Code Format Mode

This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses.

ATV Set Result Code Format Mode	
Write Command **ATV[<value>]**	Response 1)if <value>=0 **0** 2)If <value>=1 **OK**
Execution Command **ATV**	Response **OK**
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	V.25ter

Defined Values

<value>	0	Information response: <text><CR><LF> Short result code format: <numeric code><CR>
	1	Information response: <CR><LF><text><CR><LF> Long result code format: <CR><LF><verbose code><CR><LF>

Examples

```
ATV1
OK
```

NOTE

In case of using This command without parameter <value> will be set to 1.

2.2.9 AT&F Set All Current Parameters to Manufacturer Defaults

This command is used to set all current parameters to the manufacturer defined profile.
Every ongoing or incoming call will be terminated.

AT&F Set All Current Parameters to Manufacturer Defaults	
Execution Command **AT&F[<value>]**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	V.25ter

Defined Values

<value>	0 Set some temporary TA parameters to manufacturer defaults. The setting after power on or reset is same as value 0.
default values **TA parameters** AT+CNMP AT+CTZU ATE ATV	 **VALUE** 2 0 0 1

Examples

```
AT&F
OK
```

NOTE

List of parameters reset to manufacturer default can be found in defined values, factory default settings restorable with AT&F[<value>].n case of using This command without parameter <value> will be set to 1.

2.2.10 ATQ Set Result Code Presentation Mode

Specify whether the TA transmits any result code to the TE or not. Text information transmitted in response is not affected by this setting

ATQ Set Result Code Presentation Mode	
Write Command **ATQ<n>**	Response 1) If <n>=0: **OK** 2)If <n>=1: No Responses
Execution Command **ATQ**	Response 1) Set default value:0 **OK** 2) No Responses
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	3GPP TS 27.005

Defined Values

<n>	0	DCE transmits result code
	1	DCE not transmits result code

Examples

```
ATQ0
OK
ATQ
OK
```

2.2.11 ATX Set CONNECT Result Code Format

This parameter setting determines whether the TA transmits unsolicited result codes or not. The unsolicited result codes are
<CONNECT><SPEED><COMMUNICATION PROTOCOL>[<TEXT>]

ATX Set CONNECT Result Code Format

Write Command **ATX<VALUE>**	Response 1) **OK** 2) **ERROR**
Execution Command **ATX**	Response 1) Set default value:1 **OK** 2) **ERROR**
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	3GPP TS 27.005

Defined Values

<value>	0 CONNECT result code returned 1,2,3,4 May be transmits extern result codes.

Examples

ATX1
OK
ATX
OK

2.2.12 AT&W Save the User Setting to ME

This command will save the user settings to ME which set by ATE, ATQ, ATV, ATX.After restarted, the value saved by AT&W must be restored by ATZ.

AT&W Save the User Setting to ME	
Write Command **AT&W<value>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT&W**	Response 1)

	Set default value:0 **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<value>	0	Save

Examples

```
AT&W0
OK
AT&W
OK
```

2.2.13 ATZ Restore the User Setting from ME

This command will restore the user setting from ME which set by ATE, ATQ, ATV, ATX.

ATZ Restore the User Setting from ME	
Write Command **ATZ<value>**	Response 1) **OK** 2) **ERROR**
Execution Command **ATZ**	Response 1) Set default value:0 **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.005

Defined Values

<value>	0 Restore

Examples

```
ATZ0
OK
ATZ
OK
```

2.2.14 AT+CGMI Request Manufacturer Identification

This command is used to request the manufacturer identification text, which is intended to permit the user of the Module to identify the manufacturer.

AT+CGMI Request Manufacturer Identification	
Test Command **AT+CGMI=?**	Response **OK**
Execution Command **AT+CGMI**	Response **<manufacturer>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<manufacturer>	The identification of manufacturer.

Examples

```
AT+CGMI
SIMCOM_Ltd

OK
```

```
AT+CGMI=?
OK
```

2.2.15 AT+CGMM Request Model Identification

This command is used to requests model identification text, which is intended to permit the user of the Module to identify the specific model.

AT+CGMM Request Model Identification	
Test Command **AT+CGMM=?**	Response **OK**
Execution Command **AT+CGMM**	Response **<model>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<model>	The identification of model.

Examples

```
AT+CGMM
A7906E-M2

OK
AT+CGMM=?
OK
```

2.2.16 AT+CGMR Request Revision Identification

This command is used to request product firmware revision identification text, which is intended to permit the user of the Module to identify the version.

AT+CGMR Request Revision Identification	
Test Command **AT+CGMR=?**	Response **OK**
Execution Command **AT+CGMR**	Response **+CGMR: <revision>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<revision>	The revision identification of firmware.

Examples

```
AT+CGMR
+CGMR: 2003B01A7906E-M2

OK
AT+CGMR=?
OK
```

2.2.17 AT+CGSN Request Product Serial Number Identification

This command requests product serial number identification text, which is intended to permit the user of the Module to identify the individual ME to which it is connected to.

AT+CGSN Request Product Serial Number Identification	
Test Command **AT+CGSN=?**	Response **OK**
Execution Command **AT+CGSN**	Response **<sn>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<sn>	Serial number identification, which consists of a single line containing the IMEI (International Mobile station Equipment Identity) number of the MT.

Examples

```
AT+CGSN
352099001761482

OK
AT+CGSN=?
OK
```

2.2.18 AT+CSCS Select TE Character Set

Write command informs TA which character set <chest> is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.
Read command shows current setting and test command displays conversion schemes implemented in the TA.

AT+CSCS Select TE Character Set	
Test Command **AT+CSCS=?**	Response **+CSCS:** (list of supported **<chset>**s) **OK**
Read Command **AT+CSCS?**	Response **+CSCS: <chset>** **OK**
Write Command **AT+CSCS=<chset>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CSCS**	Response Set subparameters as default value: **OK**

Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<chest>	Character set, the definition as following: "IRA" International reference alphabet. "GSM" GSM default alphabet; this setting causes easily software flow control (XON /XOFF) problems. "UCS2" 16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF.

Examples

```
AT+CSCS="IRA"
OK
AT+CSCS?
+CSCS: "IRA"

OK
AT+CSCS=?
+CSCS: ("IRA","GSM","UCS2")

OK
AT+CSCS
OK
```

2.2.19 AT+GCAP Request Overall Capabilities

Execution command causes the TA reports a list of additional capabilities.

AT+GCAP Request Overall Capabilities	
Test Command AT+GCAP=?	Response 1) **OK** 2) **ERROR**
Execution Command	Response

AT+GCAP	1) **+GCAP:** (list of **<name>**s) **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	V.25ter

Defined Values

<name>	List of additional capabilities. +CGSM GSM function is supported +FCLASS FAX function is supported +DS Data compression is supported +ES Synchronous data mode is supported. +CIS707-A CDMA data service command set +CIS-856 EVDO data service command set +MS Mobile Specific command set

Examples

```
AT+GCAP
+GCAP: +CGSM

OK
AT+GCAP=?
OK
```

3 AT Commands for Status Control

3.1 Overview of AT Commands for Status Control

Command	Description
AT+CFUN	Set Phone Functionality
AT+CSQ	Query Signal Quality
AT+AUTOCSQ	Set CSQ Report
AT+CSQDELTA	Set RSSI Delta Change Threshold
AT+CRESET	Reset the Module
AT+CACM	Accumulated Call Meter
AT+CAMM	Accumulated Call Meter Maximum
AT+CAOC	Advice of Charge
AT+CPUC	Price Per Unit and Currency Table
AT+CCLK	Real Time Clock Management
AT+CMEE	Report Mobile Equipment Error
AT+SIMEI	Set IMEI for the Module

3.2 Detailed Description of AT Commands for Status Control

3.2.1 AT+CFUN Set Phone Functionality

This command is used to select the level of functionality <fun> in the ME. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, ME resetting with <rst> parameter may be utilized.

AT+CFUN Set Phone Functionality	
Test Command AT+CFUN=?	Response **+CFUN:** (list of supported **<fun>**s),(range of supported **<rst>**s) **OK**

Read Command **AT+CFUN?**	Response 1) **+CFUN: <fun>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CFUN=<fun>[,<rst>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<fun>	0 minimum functionality 1 full functionality 3 disable phone receive RF circuits 4 disable phone both transmit and receive RF circuits 5 disable SIM 6 second RX off
<rst>	0 do not reset the ME before setting it to <fun> power level 1 reset the ME before setting it to <fun> power level.This value only takes effect when <fun> equals 1.

Examples

```
AT+CFUN=?
+CFUN: (0,1,3,4,5,6),(0-1)

OK
AT+CFUN?
+CFUN: 1

OK
AT+CFUN=1
```

OK

3.2.2 AT+CSQ Query Signal Quality

This command is used to return received signal strength indication <rssi> and channel bit error rate <ber> from the ME. Test command returns values supported by the TA as compound values.

AT+CSQ Query Signal Quality	
Test Command **AT+CSQ=?**	Response **+CSQ:** (list of supported **<rssi>**s),(list of supported **<ber>**s) **OK**
Execution Command **AT+CSQ**	Response 1) **+CSQ: <rssi>,<ber>** **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

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	<0.01%
	1	0.01% --- 0.1%
	2	0.1% --- 0.5%
	3	0.5% --- 1.0%
	4	1.0% --- 2.0%
	5	2.0% --- 4.0%
	6	4.0% --- 8.0%
	7	>=8.0%
	99	not known or not detectable

Examples

```
AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)

OK
AT+CSQ
+CSQ: 31,99

OK
```

3.2.3 AT+AUTOCSQ Set CSQ Report

This command is used to enable or disable automatic report CSQ information, when automatic report enabled, the module reports CSQ information every five seconds or only after <rssi> or <ber> is changed, the format of automatic report is "+CSQ: <rssi>,<ber>".

AT+AUTOCSQ Set CSQ Report	
Test Command **AT+AUTOCSQ=?**	Response **+AUTOCSQ:** (range of supported**<auto>**s),(range of supported**<mode>**s) **OK**
Read Command **AT+AUTOCSQ?**	Response **+AUTOCSQ: <auto>,<mode>** **OK**
Write Command **AT+AUTOCSQ=<auto>[,<mode>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

<auto>	0	Disable automatic report
	1	Enable automatic report

<mode>	0 CSQ automatic report every five seconds 1 CSQ automatic report only after <rssi> or <ber> is changed NOTE: If the parameter of <mode> is omitted when executing write command, <mode> will be set to default value.

Examples

```
AT+AUTOCSQ=?
+AUTOCSQ: (0-1),(0-1)

OK
AT+AUTOCSQ?
+AUTOCSQ: 0,0

OK
AT+AUTOCSQ=1
OK
```

3.2.4 AT+CSQDELTA Set RSSI Delta Change Threshold

This command is used to set RSSI delta threshold for signal strength reporting.

AT+CSQDELTA Set RSSI Delta Change Threshold	
Test Command **AT+CSQDELTA=?**	Response 1) **+CSQDELTA:** (range of supported **<delta>**s) **OK**
Read Command **AT+CSQDELTA?**	Response 1) **+CSQDELTA: <delta>** **OK** 2) **ERROR**
Write Command **AT+CSQDELTA=<delta>**	Response 1) **OK** 2) **ERROR**
Execution Command	Response

AT+CSQDELTA	Set subparameters as default value: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

<delta>	Range: from 0 to 5

Examples

```
AT+CSQDELTA=?
+CSQDELTA: (0-5)

OK
AT+CSQDELTA?
+CSQDELTA: 5

OK
AT+CSQDELTA
OK
```

3.2.5 AT+CRESET Reset the Module

This command is used to reset the module.

AT+CRESET Reset the Module	
Test Command **AT+CRESET=?**	Response **OK**
Execution Command **AT+CRESET**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	Vendor

Examples

AT+CRESET=?
OK
AT+CRESET
OK

3.2.6 AT+CACM Accumulated Call Meter

This command is used to reset the Advice of Charge related accumulated call meter value in SIM file EF_{ACM}.

AT+CACM Accumulated Call Meter	
Test Command **AT+CACM=?**	Response 1) **+CACM: (000000-FFFFFF)** **OK** 2) **ERROR**
Read Command **AT+CACM?**	Response 1) **+CACM: <acm>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CACM=<passwd>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CACM**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-

Reference	3GPP TS 27.007

Defined Values

<passwd>	String type, SIM PIN2.
<acm>	String type, accumulated call meter value similarly coded as <ccm> under +CAOC.

Examples

```
AT+CACM=?
+CACM: (000000-FFFFFF)

OK
AT+CACM?
+CACM: "000000"

OK
AT+CACM="000000"
+CME ERROR: Invalid Param
AT+CACM
+CME ERROR: Invalid Param
```

3.2.7 AT+CAMM Accumulated Call Meter Maximum

This command is used to set the Advice of Charge related accumulated call meter maximum value in SIM file EF_{ACMmax}.

AT+CAMM Accumulated Call Meter Maximum	
Test Command **AT+CAMM=?**	Response 1) **+CAMM: (000000-FFFFFF)** **OK** 2) **ERROR**
Read Command **AT+CAMM?**	1) **+CAMM: <acmmax>** **OK**

	2) **ERROR** 3) **+CME ERROR: <ERR>**
Write Command **AT+CAMM=<acmmax>[,<passwd>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Execution Command **AT+CAMM**	1) **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<acmmax>	String type, accumulated call meter maximum value similarly coded as <ccm> under AT+CAOC, value zero disables ACMmax feature.
<passwd>	String type, SIM PIN2.

Examples

```
AT+CAMM=?
+CAMM: (000000-FFFFFF)

OK
AT+CAMM?
+CAMM: "000000"

OK
AT+CAMM="000000"
+CME ERROR: Invalid Param
AT+CAMM
+CME ERROR: Invalid Param
```

3.2.8 AT+CAOC Advice of Charge

This command enables subscriber to get information about the cost of calls,also includes the possibility to enable an unsolicited event reporting of the CCM information.
The Read command indicates whether the unsolicited reporting is activated or not.

AT+CAOC Advice of Charge	
Test Command **AT+CAOC=?**	Response 1) **+CAOC:** (ranger of supported **<mode>**) **OK** 2) **ERROR**
Read Command **AT+CAOC?**	1) **+CAOC: <mode>** **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Write Command **AT+CAOC=<mode>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Execution Command **AT+CAOC**	1) **+CAOC: <ccm>** **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

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 card or in the active application in the UICC (GSM or USIM)

Examples

```
AT+CAOC=?
+CAOC: (0-2)

OK
AT+CAOC?
+CAOC: 1

OK
```

3.2.9 AT+CPUC Price Per Unit and Currency Table

This command is used to set the parameters of Advice of Charge related price per unit and currency table in SIM file EF_{PUCT}.

AT+CPUC Price Per Unit and Currency Table	
Test Command **AT+CPUC=?**	Response 1) **+CPUC: <currency>,<ppu>,<PIN2>** **OK** 2) **ERROR**
Read Command **AT+CPUC?**	Response 1) **+CPUC: [<currency>,<ppu>]** **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**

Write Command **AT+CPUC=<currency>,<ppu>[,<passwd>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <ERR>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<currency>	String type, three-character currency code (e.g. "GBP", "DEM"), character set as specified by command Select TE Character Set AT+CSCS.
<ppu>	String type, price per unit, dot is used as a decimal separator. (e.g. "2.66").
<passwd>	String type, SIM PIN2

Examples

```
AT+CPUC=?
+CPUC: <currency>,<ppu>,<PIN2>

OK
AT+CPUC?
+CPUC: "","0.000000"

OK
AT+CPUC="1","0.000000"
+CME ERROR: SIM PIN required
```

3.2.10 AT+CCLK Real Time Clock Management

This command is used to manage Real Time Clock of the module.

AT+CCLK Real Time Clock Management	
Test Command **AT+CCLK=?**	Response **OK**

Read Command **AT+CCLK?**	Response **+CCLK: <time>** **OK**
Write Command **AT+CCLK=<time>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<time>	String type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; three last digits are mandatory, range -96…+96). E.g. 6th of May 2008, 14:28:10 GMT+8 equals to "08/05/06,14:28:10+32".

Examples

```
AT+CCLK=?
OK
AT+CCLK?
+CCLK: "14/01/01,02:14:36+08"

OK
AT+CCLK="14/01/01,02:14:36+08"
OK
```

NOTE

Time zone is nonvolatile, and the factory value is invalid time zone.
Command +CCLK? will return time zone when time zone is valid, and if time zone is 00, command +CCLK? will return "+00", but not "-00".

3.2.11 AT+CMEE Report Mobile Equipment Error

This command is used to disable or enable the use of result code "+CME ERROR: <err>" or "+CMS ERROR: <err>" as an indication of an error relating to the functionality of ME; when enabled, the format of <err> can be set to numeric or verbose string.

AT+CMEE Report Mobile Equipment Error	
Test Command **AT+CMEE=?**	Response **+CMEE:** (range of supported **<n>**s) **OK**
Read Command **AT+CMEE?**	Response **+CMEE: <n>** **OK**
Write Command **AT+CMEE=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CMEE**	**Response** **Set subparameters as default value:** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<n>	0	Disable result code,i.e. only "ERROR" will be displayed.
	1	Enable error result code with numeric values.
	2	Enable error result code with string values.

Examples

```
AT+CMEE=?
+CMEE: (0-2)

OK
AT+CMEE?
```

+CMEE: 2

OK
AT+CMEE=2
OK
AT+CMEE
OK

NOTE

The value of CMEE will be set to 2 when module boot

3.2.12 AT+SIMEI Set IMEI for the Module

This command is used to set the module's IMEI value.

AT+SIMEI **Time and Time Zone Reporting**	
Test Command **AT+SIMEI=?**	Response **OK**
Read Command **AT+SIMEI?**	Response **+SIMEI: <imei>** **OK**
Write Command **AT+SIMEI=<imei>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

<imei>	The 15-digit IMEI value.

Examples

```
AT+SIMEI=?
OK
AT+SIMEI?
+SIMEI: 352099001761482

OK
AT+SIMEI=352099001761482
OK
```

4 AT Commands for Network

4.1 Overview of AT Commands for Network

Command	Description
AT+CREG	Network Registration
AT+COPS	Operator Selection
AT+CUSD	Unstructured Supplementary Service Data
AT+CSSN	Supplementary Service Notifications
AT+CPOL	Preferred Operator List
AT+COPN	Read Operator Names
AT+CNMP	Preferred Mode Selection
AT+CNBP	Preferred Band Selection
AT+CPSI	Inquiring UE System Information
AT+CNSMOD	Show Network System Mode
AT+CTZU	Automatic Time and Timezone Update
AT+CTZR	Time and Timezone Reporting

4.2 Detailed Description of AT Commands for Network

4.2.1 AT+CREG Network Registration

This command is used to control the presentation of an unsolicited result code **+CREG: <stat>** when <n>=1 and there is a change in the ME network registration status, or code **+CREG: <stat>[,<lac>,<ci>]** when <n>=2 and there is a change of the network cell.

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

AT+CREG Network Registration	
Test Command	Response
AT+CREG=?	**+CREG:** (list of supported **<n>**s)

	OK
Read Command **AT+CREG?**	Response 1) **+CREG: <n>,<stat>[,<lac>,<ci>]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CREG=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

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. 6 registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)
<lac>	Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal).
<ci>	Cell Identify in hexadecimal format. WCDMA : Maximum is four byte.

Examples

```
AT+CREG=?
+CREG: (0-2)

OK
AT+CREG?
+CREG: 0,1

OK
AT+CREG=1
OK
```

4.2.2 AT+COPS Operator Selection

Write command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <oper> (it shall be given in format <format>). If the selected operator is not available, no other operator shall be selected (except <mode>=4). The selected operator name format shall apply to further read commands (AT+COPS?) also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, ME shall be unregistered until <mode>=0 or 1 is selected).

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

Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks.

It is recommended (although optional) that after the operator list TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list by two commas. When executing AT+COPS=? , any input from serial port will stop this command.

AT+COPS Operator Selection	
Test Command **AT+COPS=?**	Response 1) [**+COPS:** [list of supported **(<stat>,**long alphanumeric **<oper>**,short alphanumeric **<oper>,**numeric

	<oper>[,**<AcT>**])s][**,,**(list of supported **<mode>**s),(list of supported **<format>**s)]] **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Read Command **AT+COPS?**	Response 1) **+COPS: <mode>**[,**<format>**,**<oper>**[,**<AcT>**]] **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	60S
Reference	3GPP TS 27.007

Defined Values

<mode>	0 automatic 1 manual 2 force deregister 3 set only <format> 4 manual/automatic
<format>	0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper>
<oper>	string type, <format> indicates if the format is alphanumeric or numeric.
<stat>	0 unknown 1 available 2 current 3 forbidden

<AcT>	Access technology selected 2 UTRAN 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA 7 EUTRAN 8 UTRAN HSPA+

Examples

```
AT+COPS=?
+COPS: (2, "CHN-UNICOM", "UNICOM",
"46001", 7),(1, "CHN-UNICOM", "UNICOM",
"46001", 2),(1, "CHN-UNICOM", "UNICOM",
"46001", 0),(3, "CHINA MOBILE", "CMCC",
"46000", 7),(3, "CHN-CT", "CT", "46011", 7),(3,
"CHINA MOBILE", "CMCC", "46000",
0),,(0,1,2,3,4),(0,1,2)

OK
AT+COPS?
+COPS: 0,2,"46001",7

OK
AT+COPS=0,2,"46001",7
OK
```

NOTE

If <mode> is set to 1, 4 in write command, the <oper> is needed.

4.2.3 AT+CUSD Unstructured Supplementary Service Data

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) +CUSD: <m>[,<str>,<dcs>] to the TE. In addition, value <n>=2 is used to cancel an ongoing USSD session.

AT+CUSD Unstructured Supplementary Service Data	
Test Command **AT+CUSD=?**	Response **+CUSD:** (list of supported **<n>**s) **OK**
Read Command **AT+CUSD?**	Response **+CUSD: <n>** **OK**
Write Command **AT+CUSD=<n>[,<str>[,<dcs>]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

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)
<str>	String type USSD-string.
<dcs>	Cell Broadcast Data Coding Scheme in integer format (default 0).
<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 needed after mobile initiated operation) 2 USSD terminated by network 4 operation not supported 5 network time out

Examples

```
AT+CUSD=?
+CUSD: (0-2)

OK
AT+CUSD?
```

```
+CUSD: 1

OK
AT+CUSD=1,"*99#"
OK

+CUSD:
2,"556e6578706563746564204461746120566c7565",
0
```

4.2.4 AT+CSSN Supplementary Service Notifications

This command refers to supplementary service related network initiated notifications. The set 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 presented in the present document. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.

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.

AT+CSSN Supplementary Service Notifications	
Test Command **AT+CSSN=?**	Response 1) **+CSSN:** (list of supported **<n>**s),(list of supported **<m>**s) **OK** 2) **ERROR**
Read Command **AT+CSSN?**	Response **+CSSN: <n>,<m>** **OK**
Write Command **AT+CSSN=<n>[,<m>]**	Response 1) **OK** 2)

	ERROR 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

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>	0 unconditional call forwarding is active 1 some of the conditional call forwarding are active 2 call has been forwarded 3 call is waiting 5 outgoing calls are barred
<index>	Refer "Closed user group +CCUG".
<code2>	0 this is a forwarded call (MT call setup) 2 call has been put on hold (during a voice call) 3 call has been retrieved (during a voice call) 5 call on hold has been released (this is not a SS notification) (during a voice call)
<number>	String type phone number of format specified by <type>.
<type>	Type of address octet in integer format; default 145 when dialing string includes international access code character "+", otherwise 129.
<subaddr>	String type sub address of format specified by <satype>.
<satype>	Type of sub address octet in integer format, default 128.

Examples

```
AT+CSSN=?
+CSSN: (0-1),(0-1)

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

OK
AT+CSSN=1,1
OK

4.2.5 AT+CPOL Preferred operator list

This command is used to edit the SIM preferred list of networks.

AT+CPOL Preferred Operator List	
Test Command **AT+CPOL=?**	Response 1) **+CPOL:** (list of supported **<index>**s),(list of supported **<format>**s) **OK** 2) **ERROR**
Read Command **AT+CPOL?**	Response 1) **[+CPOL: <index1>,<format>,<oper1>[<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>][<CR><LF><CR><LF>** **+CPOL: <index2>,<format>,<oper2>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>]** **[...]]]** **OK** 2) **ERROR**
Write Command **AT+CPOL=<index>[,<format>[,<oper>][,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<index>	Integer type, the order number of operator in the SIM preferred operator list. If only input <index>, command will delete the value indicate by <index>.
<format>	0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper>
<operX>	String type.
<GSM_AcTn>	GSM access technology: 0 access technology not selected 1 access technology selected
<GSM_Compact_AcTn>	GSM compact access technology: 0 access technology not selected 1 access technology selected
<UTRA_AcTn>	UTRA access technology: 0 access technology not selected 1 access technology selected
<LTE_AcTn>	LTE access technology: 0 access technology not selected 1 access technology selected

Examples

```
AT+CPOL=?
+CPOL: (1-8),(0-2)

OK
AT+CPOL?
+CPOL: 1,2,"46001"

+CPOL: 2,2,"46001"

+CPOL: 3,2,"46001",0,0,0,1

+CPOL: 4,2,"46009",0,0,0,1

+CPOL: 5,2,"46001",0,0,1,0

+CPOL: 6,2,"46009",0,0,1,0

OK
AT+CPOL=1,2,"46001"
```

OK

NOTE

If using USIM card, the last four parameters of write command must be set.

4.2.6 AT+COPN Read operator names

This command is used to return the list of operator names from the ME. Each operator code <numericX> that has an alphanumeric equivalent <alphaX> in the ME memory shall be returned.

AT+COPN Read Operator Names	
Test Command **AT+COPN=?**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+COPN**	Response 1) **+COPN: <numeric1>,<alpha1>[<CR><LF><CR><LF>** **+COPN: <numeric2>,<alpha2>** **[...]]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<numericX>	String type, operator in numeric format (see AT+COPS).
<alphaX>	String type, operator in long alphanumeric format (see AT+COPS).

Examples

```
AT+COPN=?
OK
AT+COPN
+COPN: "46000","CMCC"

+COPN: "46001","UNICOM"
……
OK
```

4.2.7 AT+CNMP Preferred Mode Selection

This command is used to select or set the state of the mode preference.

AT+CNMP Preferred Mode Selection	
Test Command **AT+CNMP=?**	Response **+CNMP:** (list of supported **<mode>**s) **OK**
Read Command **AT+CNMP?**	Response **+CNMP: <mode>** **OK**
Write Command **AT+CNMP=<mode>**	Response 1) **OK** 2) If **<mode>** not supported by module, this command will return ERROR. **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	10S
Reference	3GPP TS 27.007

Defined Values

<mode>	2	Automatic
	14	WCDMA Only
	38	LTE Only

Examples

```
AT+CNMP=?
+CNMP: (2,13,14,38)

OK
AT+CNMP?
+CNMP: 2

OK
AT+CNMP=2
OK
```

NOTE

The response will be returned immediately for Test Command and Read Command; The Max Response Time for Write Command is 10 seconds.
The set value in Write Command will take efficient immediately.

4.2.8 AT+CNBP Preferred Band Selection

This command is used to select or set the state of the band preference.

AT+CNBP Preferred Band Selection	
Read Command **AT+CNBP?**	Response **+CNBP: <mode>[,<lte_mode>]** **OK**
Write Command **AT+CNBP=<mode>[,<lte_mode>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	64bit number, the value is "1" << "<pos>", then or by bit.
<pos>	Value: 0xFFFFFFFF7FFFFFFF Any (any value) 22 WCDMA_IMT_2000 23 WCDMA_PCS_1900 24 WCDMA_III_1700 25 WCDMA_IV_1700 26 WCDMA_850 27 WCDMA_800 48 WCDMA_VII_2600 49 WCDMA_VIII_900 50 WCDMA_IX_1700
<lte_mode>	64bit number, the value is "1" << "<lte_pos>", then or by bit.
<lte_pos>	Value: 0x000007FF3FDF3FFF Any (any value) 0 EUTRAN_BAND1(UL:1920-1980; DL:2110-2170) 1 EUTRAN_BAND2(UL:1850-1910; DL:1930-1990) 2 EUTRAN_BAND3(UL:1710-1785; DL:1805-1880) 3 EUTRAN_BAND4(UL:1710-1755; DL:2110-2155) 4 EUTRAN_BAND5(UL: 824-849; DL: 869-894) 5 EUTRAN_BAND6(UL: 830-840; DL: 875-885) 6 EUTRAN_BAND7(UL:2500-2570; DL:2620-2690) 7 EUTRAN_BAND8(UL: 880-915; DL: 925-960) 8 EUTRAN_BAND9(UL:1749.9-1784.9; DL:1844.9-1879.9) 9 EUTRAN_BAND10(UL:1710-1770; DL:2110-2170) 10 EUTRAN_BAND11(UL:1427.9-1452.9; DL:1475.9-1500.9) 11 EUTRAN_BAND12(UL:698-716; DL:728-746) 12 EUTRAN_BAND13(UL: 777-787; DL: 746-756) 13 EUTRAN_BAND14(UL: 788-798; DL: 758-768) 16 EUTRAN_BAND17(UL: 704-716; DL: 734-746)

17	EUTRAN_BAND18(UL: 815-830; DL: 860-875)
18	EUTRAN_BAND19(UL: 830-845; DL: 875-890)
19	EUTRAN_BAND20(UL: 832-862; DL: 791-821)
20	EUTRAN_BAND21(UL: 1447.9-1462.9; DL: 1495.9-1510.9)
22	EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200)
23	EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559)
24	EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995)
25	EUTRAN_BAND26(UL: 814-849; DL: 859 -894)
26	EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869)
27	EUTRAN_BAND28(703-748; DL: 758-803)
28	EUTRAN_BAND29(UL:1850-1910 or 1710-1755; DL:716-728)
29	EUTRAN_BAND30(UL: 2305-2315 ; DL: 2350 - 2360)
32	EUTRAN_BAND33(UL: 1900-1920; DL: 1900-1920)
33	EUTRAN_BAND34(UL: 2010-2025; DL: 2010-2025)
34	EUTRAN_BAND35(UL: 1850-1910; DL: 1850-1910)
35	EUTRAN_BAND36(UL: 1930-1990; DL: 1930-1990)
36	EUTRAN_BAND37(UL: 1910-1930; DL: 1910-1930)
37	EUTRAN_BAND38(UL: 2570-2620; DL: 2570-2620)
38	EUTRAN_BAND39(UL: 1880-1920; DL: 1880-1920)
39	EUTRAN_BAND40(UL: 2300-2400; DL: 2300-2400)
40	EUTRAN_BAND41(UL: 2496-2690; DL: 2496-2690)
41	EUTRAN_BAND42(UL: 3400-3600; DL: 3400-3600)
42	EUTRAN_BAND43(UL: 3600-3800; DL: 3600-3800)

Examples

```
AT+CNBP?
+CNBP: 0X0002000000400180,0X000001E200000095

OK
AT+CNBP=0X0002000000400180,0X000001E200000095
OK
```

NOTE

FDD(band1 ~ band32), TDD(band33 ~ band42).

4.2.9 AT+CPSI Inquiring UE System Information

This command is used to return the UE system information.

AT+CPSI Inquiring UE System Information	
Read Command AT+CPSI?	Response 1) If camping on a wcdma cell: **+CPSI: <System Mode>,<Operation Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Frequency Band>,<PSC>,<Freq>,<SSC>,<EC/IO>,<RSCP>,<Qual>,<RxLev>,<TXPWR>** **OK** 2) If camping on a lte cell: **+CPSI: <System Mode>,<Operation Mode>[,<MCC>-<MNC>,<TAC>,<SCellID>,<PCellID>,<Frequency Band>,<earfcn>,<dlbw>,<ulbw>,<RSRQ>,<RSRP>,<RSSI>,<RSSNR>]** **OK** 3) If no service: **+CPSI: NO SERVICE, Online** **OK** 4)

	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	

Defined Values

<System Mode>	System mode, values: "NO SERVICE", "GSM", "WCDMA", "LTE"
<Operation Mode>	UE operation mode, values: "Unknown", "Online", "Offline", "Factory Test Mode", "Reset", "Low Power Mode".
<MCC>	Mobile Country Code (first part of the PLMN code)
<MNC>	Mobile Network Code (second part of the PLMN code)
<LAC>	Location Area Code (hexadecimal digits)
<Cell ID>	Service-cell Identify.
<Absolute RF Ch Num>	AFRCN for service-cell.
<Track LO Adjust>	Track LO Adjust
<C1>	Coefficient for base station selection
<C2>	Coefficient for Cell re-selection
<Frequency Band>	Frequency Band of active set
<PSC>	Primary synchronization code of active set.
<Freq>	Downlink frequency of active set.
<SSC>	Secondary synchronization code of active set
<EC/IO>	Ec/Io value
<RSCP>	Received Signal Code Power
<Qual>	Quality value for base station selection
<RxLev>	RX level value for base station selection
<TXPWR>	UE TX power in dBm. If no TX, the value is 500.
<Cpid>	Cell Parameter ID
<TAC>	Tracing Area Code
<PCellID>	Physical Cell ID
<earfcn>	E-UTRA absolute radio frequency channel number for searching LTE cells
<dlbw>	Transmission bandwidth configuration of the serving cell on the downlink
<ulbw>	Transmission bandwidth configuration of the serving cell on the uplink
<RSRP>	Current reference signal received power in -1/10 dBm. Available for LTE
<RSRQ>	Current reference signal receive quality as measured by L1.
<RSSNR>	Average reference signal signal-to-noise ratio of the serving cell

Examples

```
AT+CPSI?
+CPSI:
LTE,Online,460-01,0x230A,175499523,318,EUTRAN-B
AND3,1650,5,0,21,67,255,19

OK
```

4.2.10 AT+CNSMOD Show Network System Mode

This command is used to return the current network system mode.

AT+CNSMOD Show Network System Mode	
Test Command **AT+CNSMOD=?**	Response **+CNSMOD:** (list of supported **<n>**s) **OK**
Read Command **AT+CNSMOD?**	Response 1) **+CNSMOD: <n>,<stat>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CNSMOD=<n>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	0	disable auto report the network system mode information
	1	auto report the network system mode information, command:

	+CNSMOD: <stat>
<stat>	0 no service 4 WCDMA 5 HSDPA only(WCDMA) 6 HSUPA only(WCDMA) 7 HSPA (HSDPA and HSUPA, WCDMA) 8 LTE

Examples

```
AT+CNSMOD=?
+CNSMOD: (0,1)

OK
AT+CNSMOD?
+CNSMOD: 0,8

OK
AT+CNSMOD=0
OK
```

4.2.11 AT+CTZU Automatic Time and Timezone Update

This command is used to enable and disable automatic time and time zone update via NITZ

AT+CTZU Automatic Time and Timezone Update	
Test Command **AT+CTZU=?**	Response **+CTZU:** (range of supported **<on/off>**s) **OK**
Read Command **AT+CTZU?**	Response **+CTZU: <on/off>** **OK**
Write Command **AT+CTZU=<on/off>**	Response 1) **OK** 2) **ERROR** **3)** **+CME ERROR: <err>**

Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<on/off>	Integer type value indicating: 0 Disable automatic time zone update via NITZ. 1 Enable automatic time zone update via NITZ.

Examples

```
AT+CTZU=?
+CTZU: (0-1)

OK
AT+CTZU?
+CTZU: 0

OK
AT+CTZU=0
OK
```

NOTE

The value of <on/off> is nonvolatile, and factory value is 0.
For automatic time and time zone update is enabled (+CTZU=1):
If time zone is only received from network and it isn't equal to local time zone (AT+CCLK), time zone is updated automatically, and real time clock is updated based on local time and the difference between time zone from network and local time zone (Local time zone must be valid).
If Universal Time and time zone are received from network, both time zone and real time clock is updated automatically, and real time clock is based on Universal Time and time zone from network.

4.2.12 AT+CTZR Time and Timezone Reporting

This command is used to enable and disable the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>[,<time>][,<dst>]whenever the time zone is

changed.

AT+CTZR Time and Timezone Reporting	
Test Command **AT+CTZR=?**	Response **+CTZR:** (range of supported **<on/off>**s) **OK**
Read Command **AT+CTZR?**	Response **+CTZR: <on/off>** **OK**
Write Command **AT+CTZR=<on/off>**	Response 1) **OK** 2) **ERROR**
Unsolicited result code **+CTZV: <tz>[,<time>][,<dst>]**	Unsolicited result code when time zone received from network isn't equal to local time zone, and if the informations from network don't include date and time, time zone will be only reported, and if network daylight saving time is present, it is also reported. For Examples: +CTZV: 32 (Only report time zone) +CTZV: 32,1 (Report time zone and network daylight saving time) +CTZV: 32,08/12/09,17:00:00 (Report time and time zone) +CTZV: 32,08/12/09,17:00:00,1 (Report time, time zone and daylight saving time) For more detailed informations about time and time zone, please refer 3GPP TS 24.008.
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<on/off>	Integer type value indicating: 0 Disable time zone change event reporting. 1 Enable time zone change event reporting.
<tz>	Local time zone received from network
<time>	Universal time received from network, and the format is "yy/MM/dd,hh:mm:ss", where characters indicate year (two last digits), month, day, hour, minutes and seconds.
<dst>	Network daylight saving time, and if it is received from network, it

	indicates the value that has been used to adjust the local time zone. The values as following: 0 No adjustment for Daylight Saving Time. 1 +1 hour adjustment for Daylight Saving Time. 2 +2 hours adjustment for Daylight Saving Time.

Examples

```
AT+CTZR=?
+CTZR: (0-1)

OK
AT+CTZR?
+CTZR: 0

OK
AT+CTZR=0
OK
```

NOTE

The time zone reporting is not affected by the Automatic Time and Time Zone command AT+CTZU. Herein, <time> is Universal Time or NITZ time, but not local time.hen <format> is 2 , <parity> cannot be 3.

5 AT Commands for Packet Domain

5.1 Overview of AT Commands for Packet Domain

Command	Description
AT+CGERG	Network Registration Status
AT+CEREG	EPS Network Registration Status
AT+CGATT	Packet Domain Attach or Detach
AT+CGACT	PDP Context Activate or Deactivate
AT+CGDCONT	Define PDP Context
AT+CGDSCONT	Define Secondary PDP Context
AT+CGTFT	Traffic Flow Template
AT+CGQREQ	Quality of Service Profile (Requested)
AT+CGEQREQ	3G Quality of Service Profile (Requested)
AT+CGQMIN	Quality of Service Profile (Minimum Acceptable)
AT+CGEQMIN	3G Quality of Service Profile (Minimum Acceptable)
AT+CGDATA	Enter Data State
AT+CGPADDR	Show PDP Address
AT+CGCLASS	GPRS Mobile Station Class
AT+CGEREP	GPRS Event Reporting
AT+CGAUTH	Set Type of Authentication for PDP-IP Connections of GPRS

5.2 Detailed Description of AT Commands for Packet Domain

5.2.1 AT+CGREG Network Registration Status

This command controls the presentation of an unsolicited result for package network registration status: **+CGREG: <stat>** when <n>=1 and there is a change in the MT's GPRS networkregistration status, or code **+CGREG: <stat>[,<lac>,<ci>]** when <n>=2 and there is a change of the network cell.
The read command returns the status of result code presentation and an integer <stat> which shows Whether the network has currently indicated the registration of the MT.

AT+CGREG Network Registration Status

Test Command **AT+CGREG=?**	Response **+CGREG:** (range of supported**<n>**s) **OK**
Read Command **AT+CGREG?**	Response **+CGREG: <n>,<stat>[[,<lac>,<ci>]** **OK**
Write Command **AT+CGREG=<n>**	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	0 disable network registration unsolicited result code 1 enable network registration unsolicited result code **+CGREG: <stat>** 2 there is a change in the ME network registration status or a change of the network cell: **+CGREG: <stat>[,<lac>,<ci>]**
<stat>	0 not registered, MT is not currently searching a new operator to register to 1 registered, home network 2: not registered, but MT is currently searching a new operator to register to 3 registration denied 4 unknown 5 registered, roaming 6 registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN) 7 registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN) 8 attached for emergency bearer services only (see NOTE 2) (not applicable) 9 registered for "CSFB not preferred", home network (applicable only when <AcT> indicates E-UTRAN) 10 registered for "CSFB not preferred", roaming (applicable only when <AcT> indicates E-UTRAN) 11 only emergency services are available. 12 registeration denied in roaming 13 sync done in LTE roaming network 14 ecall inactive

<lac>	Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal).
<ci>	Cell ID in hexadecimal format. GSM :Maximum is two byte. WCDMA :Maximum is four byte.

Examples

```
AT+CGREG=?
+CGREG: (0-2)

OK
AT+CGREG?
+CGREG: 2,0

OK
AT+CGREG=1
OK
```

5.2.2 AT+CEREG EPS Network Registration Status

The set command controls the presentation of an unsolicited result code **+CEREG: <stat>** when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN, or unsolicited result code **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]** when <n>=2 and there is a change of the network cell in E-UTRAN; in this latest case <AcT>, <tac> and <ci> are sent only if available.

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

AT+CEREG EPS Network Registration Status	
Test Command **AT+CEREG=?**	Response 1) **+CEREG:** (range of supported**<n>**s) **OK** 2) **ERROR**
Read Command **AT+CEREG?**	Response 1) **+CEREG: <n>,<stat>[[,<lac>,<ci>]**

	OK 2) **ERROR**
Write Command **AT+CEREG=[<n>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 24.008 [8]

Defined Values

<n>	0 disable network registration unsolicited result code 1 enable network registration unsolicited result code **+CEREG: <stat>** 2 enable network registration and location information unsolicited result code **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]**
<stat>	0 not registered, MT is not currently searching an operator to register to 1 registered, home network 2 not registered, but MT is currently trying to attach or searching an operator to register to 3 registration denied 4 unknown (e.g. out of E-UTRAN coverage) 5 registered, roaming 6 registered for "SMS only", home network (not applicable) 7 registered for "SMS only", roaming (not applicable) 8 attached for emergency bearer services only (See NOTE 2) 9 registered for "CSFB not preferred", home network (not applicable) 10 registered for "CSFB not preferred", roaming (not applicable) 11 attached for emergency bearer services only
<lac>	string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
<ci>	string type; four byte E-UTRAN cell identify in hexadecimal format
<AcT>	A numberic parameter that indicates the access technology of serving cell 0 GSM (not applicable) 1 GSM Compact (not applicable)

	2 UTRAN (not applicable) 3 GSM w/EGPRS (see NOTE 3) (not applicable) 4 UTRAN w/HSDPA (see NOTE 4) (not applicable) 5 UTRAN w/HSUPA (see NOTE 4) (not applicable) 6 UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) 7 E-UTRAN

Examples

```
AT+CEREG=?
+CEREG: (0-2)

OK
AT+CEREG?
2,1,"333c","039f9441",7

OK
AT+CEREG=1
OK
```

If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

5.2.3 AT+CGATT Packet Domain Attach or Detach

The write command is used to attach the MT to, or detach the MT from, the Packet Domain service. The read command returns the current Packet Domain service state.

AT+CGATT Packet Domain Attach or Detach	
Test Command **AT+CGATT=?**	Response 1) **+CGATT:** (range of supported **<state>**s) **OK** 2) **ERROR**

Read Command **AT+CGATT?**	Response 1) **+CGATT: <state>** **OK** 2) **ERROR**
Write Command **AT+CGATT=<state>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<state>	Indicates the state of Packet Domain attachment: 0 detached 1 attached

Examples

```
AT+CGATT=?
+CGATT: (0-1)

OK
AT+CGATT?
+CGATT: 1

OK
AT+CGATT=1
OK
```

5.2.4 AT+CGACT PDP Context Activate or Deactivate

The write command is used to activate or deactivate the specified PDP context (s).

AT+CGACT PDP Context Activate or Deactivate

Test Command **AT+CGACT=?**	Response **+CGACT:** (list of supported **<state>**s) **OK**
Read Command **AT+CGACT?**	Response **+CGACT: [<cid>,<state>[<CR><LF>** **+CGACT: <cid>,<state>[<CR><LF>** **[...]]]** **OK**
Write Command **AT+CGACT=<state>[,<cid>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>** 4)PDP context has been activated: **CONNECT** 5)PDP context has been deactivated: **NO CARRIER**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<state>	Indicates the state of PDP context activation: 0 deactivated 1 activated
<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1…15

Examples

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

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

+CGACT: 8,1

OK
```

5.2.5 AT+CGDCONT Define PDP Context

The set command specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the write command (AT+CGDCONT=<cid>) causes the values for context <cid> to become undefined.

AT+CGDCONT Define PDP Context	
Test Command **AT+CGDCONT=?**	Response 1) **+CGDCONT:** (range of supported**<cid>**s),**<PDP_type>**,,,(list of supported **<d_comp>**s),(list of supported **<h_comp>**s)(list of **<ipv4_ctrl>**s),(list of **<request_type>**s) **OK** 2) **ERROR**
Read Command **AT+CGDCONT?**	Response 1) **+CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]<CR><LF>** **+CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]** **OK** 2) **ERROR**
Write Command **AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>][,<ipv4_ctrl>[,<request_type>]]]]]]**	Response 1) **OK** 2) **+CME ERROR: <err>**

Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. 0-16
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol PPP Point to Point Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<APN>	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
<PDP_addr>	A string parameter that identifies the MT in the address space applicable to the PDP.This parameter will be omitted when PDP_type is PPP type. Read 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 command AT+CGPADDR.
<d_comp>	A numeric parameter that controls PDP data compression, this value may depend on platform: 0 off (default if value is omitted) 1 on 2 V.42bis
<h_comp>	A numeric parameter that controls PDP header compression, this value may depend on platform: 0 off (default if value is omitted) 1 RFC1144
<ipv4_ctrl>	Parameter that controls how the MT/TA requests to get the IPv4 address information: 0 Address Allocation through NAS Signaling 1 on
<request_type>	Integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8]

	(subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services. NOTE 4: If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9. 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific) 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment
<P-CSCF_discovery>	Integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L. 0 Preference of P-CSCF address discovery not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling 2 Preference of P-CSCF address discovery through DHCP
<IM_CN_Signalling_Flag_Ind>	Integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not. 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only

Examples

```
AT+CGDCONT=?
+CGDCONT:
(1-16),"IP",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT:
(1-16),"IPV6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT:
(1-16),"IPV4V6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT:
(1-16),"PPP",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

OK
AT+CGDCONT?
+CGDCONT: 1,"IP","cmnet.MNC000.MCC460
```

```
.GPRS","10.122.238.218",0,0,,,,

+CGDCONT:
8,"IPV4V6","ims","254.128.0.0.0.0.0.0.1
.0.0.6.244.161.187",0,0,0,2,1,1

OK
AT+CGDCONT=1,"IP","cmnet"
OK
```

5.2.6 AT+CGDSCONT Define Secondary PDP Context

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local) context identification parameter, <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the set command, AT+CGDSCONT=<cid> causes the values for context number <cid> to become undefined.

AT+CGDSCONT Define Secondary PDP Context	
Test Command **AT+CGDSCONT=?**	Response 1) **+CGDSCONT:** (range of supported **<cid>**s),(list of **<p_cid>s** for active primary contexts**), <PDP_type>,** (list of supported **<d_comp>**s),(list of supported **<h_comp>**s) **OK** 2) **ERROR**
Read Command **AT+CGDSCONT?**	Response 1) **OK** 2) **ERROR**
Write Command **AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>]]]**	Response 1) **OK** 2) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. NOTE: The <cid>s for network-initiated PDP contexts have values outside the ranges activated by the +CGACT.
<p_cid>	a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command and activated by the +CGACT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol PPP Point to Point Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<d_comp>	a numeric parameter that controls PDP data compression (applicable for SNDCPonly) (refer 3GPP TS 44.065 [61]) 0 off 1 on (manufacturer preferred compression) 2 V.42bis Other values are reserved.
<h_comp>	a numeric parameter that controls PDP header compression(refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]) 0 off 1 RFC1144 Other values are reserved.

Examples

```
AT+CGDSCONT=?
+CGDSCONT: (1-15),(1,8),"IP",(0-2),(0-1)
+CGDSCONT: (1-15),(1,8),"PPP",(0-2),(0-1)
+CGDSCONT: (1-15),(1,8),"IPV6",(0-2),(0-1)
+CGDSCONT: (1-15),(1,8),"IPV4V6",(0-2),(0-1)

OK
AT+CGDSCONT?
OK
AT+CGDSCONT=4,2
+CME ERROR: operation not supported
```

5.2.7 AT+CGTFT Traffic Flow Template

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060 [47]. A TFT consists of from one and up to 15 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

AT+CGTFT Traffic Flow Template	
Test Command **AT+CGTFT=?**	Response 1) **+CGTFT: <cid>**,(list of supported **<packet filter identifier>**s),(list of supported **<evaluation precedence index>**s),(list of supported **<source address and subnet mask>**s),(list of supported **<protocol number (ipv4) / next header (ipv6)**>s),(list of supported **<destination port range>**s),(list of supported **<source port range>**s),(list of supported **<ipsec security parameter index (spi)**>s),(list of supported **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**s),(list of supported **<flow label (ipv6)>**s) [**<CR><LF>+CGTFT**: **<PDP_type>**,(list of supported **<packet filter identifier>**s),(list of supported **<evaluation precedence index>**s),(list of supported **<source address and subnet mask>**s),(list of supported **<protocol number (ipv4) / next header (ipv6)>**s),(list of supported **<destination port range>**s),(list of supported **<source port range>**s),(list of supported **<ipsec security parameter index (spi)>**s),(list of supported **<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>**s),(list of supported **<flow label (ipv6)>**s) [...]] **OK** 2) **ERROR**
Read Command **AT+CGTFT?**	Response 1) **+CGTFT: [<cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<source port range>,<destination port range>,<ipsec security**

	parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<direction> **[<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<source address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<source port range>,<destination port range>,<ipsec security parameter index (spi)>,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>,<direction>** **[...]]]** **OK** 2) **ERROR**
Write Command **AT+CGTFT=<cid>[,[<packet filter identifier>,<evaluation precedence index>[,<source address and subnet mask>[,<protocol number (ipv4) / next header (ipv6)>[,<destination port range>[,<source port range>[,<ipsec security parameter index (spi)>[,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>[,<flow label (ipv6)>[,<direction>]]]]]]]]]**	Response 1) **OK** 2) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see the AT+CGDCONT and AT+CGDSCONT commands).
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol PPP Point to Point Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<packet filter identifier>	a numeric parameter, value range from 1 to 15.

<evaluation precedence index>	a numeric parameter. The value range is from 0 to 255.
<source address and subnet mask>	String type The string is given as dot-separated numeric (0-255) parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6. NOTE: subnet mask can't be 0.0.0.0
<protocol number (ipv4) / next header (ipv6)>	A numeric parameter, value range from 0 to 255.
<destination port range>	String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<source port range>	String type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec security parameter index (spi)>	Numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	String type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	Numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<direction>	Integer type. Specifies the transmission direction in which the packet filter shall be applied. 0 Pre-Release 7 TFT filter 1 Uplink 2 Downlink 3 up & downlink

Examples

```
AT+CGTFT=?
+CGTFT:
"IP",(1-16),(0-255),,(0-255),(0-65535.0-65535),(0-6
5535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFF
FF)

+CGTFT:
"IPV6",(1-16),(0-255),,(0-255),(0-65535.0-65535),(0
-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-F
FFFF)

+CGTFT:
"IPV4V6",(1-16),(0-255),,(0-255),(0-65535.0-65535
),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(
```

```
0-FFFFF)

OK
AT+CGTFT?
+CGTFT: 1,,,"",,",,"",,,

OK
AT+CGTFT=1,1,0,"74.125.71.100.255.255.255.255
"
OK
```

NOTE

If a specified PDP context is deactivate, the corresponding Packet Filter TFT need to be specified again.

5.2.8 AT+CGQREQ Quality of Service Profile (Requested)

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

AT+CGQREQ Quality of Service Profile (Requested)	
Test Command **AT+CGQREQ=?**	Response 1) **+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)** **OK** 2) **ERROR**
Read Command **AT+CGQREQ?**	Response 1) **+CGQREQ: [<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>** **+CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[…]]]**

	OK 2) **ERROR**
Write Command **AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]**	Response 1) **OK** 2) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol
<precedence>	A numeric parameter which specifies the precedence class: 0 network subscribed value 1 high priority 2 normal priority 3 low priority
<delay>	A numeric parameter which specifies the delay class: 0 network subscribed value 1 delay class 1 2 delay class 2 3 delay class 3 4 delay class 4
<reliability>	A numeric parameter which specifies the reliability class: 0 network subscribed value 1 Non real-time traffic,error-sensitive application that cannot cope with data loss 2 Non real-time traffic,error-sensitive application that can cope with infrequent data loss 3 Non real-time traffic,error-sensitive application that can cope with data loss, GMM/-SM, and SMS 4 Real-time traffic,error-sensitive application that can cope with data loss 5 Real-time traffic error non-sensitive application that can cope with data loss

<peak>	A numeric parameter which specifies the peak throughput class: 0 network subscribed value 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s) 4 Up to 8000 (64 kbit/s) 5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s)
<mean>	A numeric parameter which specifies the mean throughput class: 0 network subscribed value 1 100 (~0.22 bit/s) 2 200 (~0.44 bit/s) 3 500 (~1.11 bit/s) 4 1000 (~2.2 bit/s) 5 2000 (~4.4 bit/s) 6 5000 (~11.1 bit/s) 7 10000 (~22 bit/s) 8 20000 (~44 bit/s) 9 50000 (~111 bit/s) 10 100000 (~0.22 kbit/s) 11 200000 (~0.44 kbit/s) 12 500000 (~1.11 kbit/s) 13 1000000 (~2.2 kbit/s) 14 2000000 (~4.4 kbit/s) 15 5000000 (~11.1 kbit/s) 16 10000000 (~22 kbit/s) 17 20000000 (~44 kbit/s) 18 50000000 (~111 kbit/s) 31 optimization

Examples

```
AT+CGQREQ=?
+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
+CGQREQ:
"IPV6",(0-3),(0-4),(0-5),(0-9),(0-18,31)
+CGQREQ:
"IPV4V6",(0-3),(0-4),(0-5),(0-9),(0-18,31)

OK
AT+CGQREQ?
```

+CGQREQ: 1,3,4,3,9,31

OK

AT+CGQREQ=1,3,4,3,9,31

OK

5.2.9 AT+CGEQREQ 3G Quality of Service Profile (Requested)

The test command returns values supported as a compound value.
The read command returns the current settings for each defined context for which a QOS was explicitly specified.

The write command allows the TE to specify a Quality of Service Profile for the context identified by the context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network.

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

AT+CGEQREQ 3G Quality of Service Profile (Requested)	
Test Command **AT+CGEQREQ=?**	Response 1) **+CGEQREQ: <PDP_type>**,(list of supported **<Traffic class>**s),(list of supported **<Maximum bitrate UL>s),(**list of supported **<Maximum bitrate DL>**s),(list of supported **<Guaranteed bitrate UL>**s,(list of supported **<Guaranteed bitrate DL>**s),(list of supported **<Deliv ery order>**s),(list of supported **<Maximum SDU size>**s),(list of supported **<SDU error ratio>**s),(list of supported **<Residual bit error Ratio>**s),(list of supported **<Delivery of erroneous SDUs>s),(list of Supported <Transfer delay>**s),(list of supported **<Traffic handling priority>**s),(list of supported **<Source statistics descriptor>**s),(list of supported **<Signaling indication flag>**s) **OK** 2) **ERROR**
Read Command **AT+CGEQREQ?**	Response 1) **+CGEQREQ: [<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum**

	SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>][<CR><LF> +CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>[…]] **OK** 2) **ERROR**
Write Command **AT+CGEQREQ=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signaling indication flag>]]]]]]]]]]]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	Parameter specifies a particular PDP context definition. The parameter is also used in other PDP context-related commands. The range is from 1 to 15
<Traffic class>	0 conversational 1 streaming 2 interactive 3 background

	4 subscribed value
<Maximum bitrate UL>	This parameter indicates the maximum number of kbits/s delivered to UMTS(up-link traffic)at a SAP. As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Maximum bitrate DL>	This parameter indicates the maximum number of kbits/s delivered to UMTS(down-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.3600-3800)
<Guaranteed bitrate UL>	This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Guaranteed bitrate DL>	This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will

	be requested.
<Delivery order>	This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not. 0 no 1 yes 2 subscribed value
<Maximum SDU size>	This parameter indicates the maximum allowed SDU size in octets. The range is 0, 10 to 1500,1510,1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<SDU error ratio>	This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. As an Examples a target SDU error ratio of 5*10-3 would be specified as "5E3"(e.g. AT+CGEQREQ=..,"5E3",…). "0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"
<Residual bit error ratio>	This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. As an Examples a target residual bit error ratio of 5*10-3 would be specified as "5E3"(e.g. AT+CGEQREQ=…,"5E3",..). "0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"
<Delivery of erroneous SDUs>	This parameter indicates whether SDUs detected as erroneous shall be delivered or not. 0 no 1 yes 2 no detect 3 subscribed value

<Transfer delay>	This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. The range is 0 to 950. When the parameter is between 10 and 150, it should be an integer multiple of 10. When the parameter is between 150 and 950, it should be an integer multiple of 50. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Traffic handling priority>	This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS Bearer compared to the SDUs of the other bearers. The range is from 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Source statistics descriptor>	This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Signaling indication flag>	This parameter indicates Signaling flag. The range is from 0 to 1 The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol

Examples

```
AT+CGEQREQ=?
+CGEQREQ:
"IP",(0-4),(0-256000),(0-256000),(0-256000),(0-2
56000),(0-2),(0-1520),("0E0""1E1"),("0E0""6E8"
),(0-3),(0-62),(0-3),(0-1),(0-1)

OK
AT+CGEQREQ?
+CGEQREQ:
1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
2,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
3,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
4,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0
```

+CGEQREQ:
5,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
6,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
7,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQREQ:
8,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK
AT+CGEQREQ=1,4,0,0,0,0,2,0,"0E0","0E0",3,0,
0,0,0
OK

5.2.10 AT+CGQMIN Quality of Service Profile (Minimum Acceptable)

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message. A special form of the set command, AT+CGQMIN=<cid> causes the minimum acceptable profile for context number <cid> to become undefined.

AT+CGQMIN Quality of Service Profile (Minimum Acceptable)	
Test Command **AT+CGQMIN=?**	Response 1) **+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)[…]] **OK** 2) **ERROR**
Read Command **AT+CGQMIN?**	Response 1) **+CGQMIN:** **[<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<**

	CR><LF> **+CGQMIN:** **<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>** **[…]]]** **OK** 2) **ERROR**
Write Command **AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]**	Response 1) **OK** 2) **ERROR** 3） **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol
<precedence>	A numeric parameter which specifies the precedence class: 0 network subscribed value 1 high priority 2 normal priority 3 low priority
<delay>	A numeric parameter which specifies the delay class: 0 network subscribed value 1 delay class 1 2 delay class 2 3 delay class 3 4 delay class 4
<reliability>	A numeric parameter which specifies the reliability class: 0 network subscribed value 1 Non real-time traffic, error-sensitive application that cannot cope with data loss 2 Non real-time traffic, error-sensitive application that can cope with infrequent data loss 3 Non real-time traffic, error-sensitive application that can cope

	with data loss, GMM/- SM, and SMS 4 Real-time traffic, error-sensitive application that can cope with data loss 5 Real-time traffic error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class: 0 network subscribed value 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s) 4 Up to 8000 (64 kbit/s) 5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s)
<mean>	A numeric parameter which specifies the mean throughput class: 0 network subscribed value 1 100 (~0.22 bit/s) 2 200 (~0.44 bit/s) 3 500 (~1.11 bit/s) 4 1000 (~2.2 bit/s) 5 2000 (~4.4 bit/s) 6 5000 (~11.1 bit/s) 7 10000 (~22 bit/s) 8 20000 (~44 bit/s) 9 50000 (~111 bit/s) 10 100000 (~0.22 kbit/s) 11 200000 (~0.44 kbit/s) 12 500000 (~1.11 kbit/s) 13 1000000 (~2.2 kbit/s) 14 2000000 (~4.4 kbit/s) 15 5000000 (~11.1 kbit/s) 16 10000000 (~22 kbit/s) 17 20000000 (~44 kbit/s) 18 50000000 (~111 kbit/s) 31 optimization

Examples

```
AT+CGQMIN=?
+CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)
```

OK

AT+CGQMIN?

+CGQMIN: 1,3,4,5,1,1

OK

AT+CGQMIN=1,3,4,5,1,1

OK

5.2.11 AT+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)

The test command returns values supported as a compound value.

The read command returns the current settings for each defined context for which a QOS was explicitly specified.

The write command allow the TE to specify a Quallity of Service Profile for the context identified by the context identification parameter<cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

A special form of the write command, AT+CGEQMIN=<cid> causes the requested for context number <cid> to become undefined.

AT+CGEQMIN 3G Quality of Service Profile (Minimum Acceptable)	
Test Command **AT+CGEQMIN=?**	Response 1) **+CGEQMIN: <PDP_type>,(**list of supported **<Traffic class>s),(**list of supported **<Maximum bitrate UL>s),(**list of supported **<Maximum bitrate DL>s),(**list of supported **<Guaranteed bitrate UL>s,(**list of supported**<Guaranteed bitrate DL>s),(**list of supported **<Delivery order>s),(**list of supported **<Maximum SDU size>s),(**list of supported **<SDU error ratio>s),(**list of supported **<Residual bit error Ratio>s),(**list of supported **<Delivery of erroneous SDUs>s),(list of Supported <Transfer delay>s),(**list of supported **<Traffic handlingpriority>s),(**list of supported **<Source statistics descriptor>s),(**list of supported **<Signaling indication flag>s)** **OK** 2) **ERROR**
Read Command **AT+CGEQMIN?**	Response 1)

	+CGEQMIN: [<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>][<CR><LF>+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>[…]] **OK** 2) **ERROR**
Write Command **AT+CGEQMIN=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrateDL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual biterror ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handlingpriority>[,<Source statistics descriptor>[,<Signaling indication flag>]]]]]]]]]]]]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	Parameter specifies a particular PDP context definition.The parameter is also used in other PDP context-related commands. The range is from 1 to 15.

<Traffic class>	0 conversational 1 streaming 2 interactive 3 background 4 subscribed value
<Maximum bitrate UL>	This parameter indicates the maximum number of kbits/s delivered to UMTS(up-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQMIN=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Maximum bitrate DL>	This parameter indicates the maximum number of kbits/s delivered to UMTS(down-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQMIN=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Guaranteed bitrate UL>	This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Guaranteed bitrate DL>	This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=…,32,…). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and

	8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Delivery order>	This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not. 0 no 1 yes 2 subscribed value
<Maximum SDU size>	This parameter indicates the maximum allowed SDU size inoctets. The range is 0, 10 to 1500,1510,1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<SDU error ratio>	This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous.SDU error ratio is defined only for conforming traffic.As an Examples a target SDU error ratio of 5*10-3 would be specified as "5E3"(e.g.AT+CGEQMIN=..,"5E3",…). "0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"
<Residual bit error ratio>	This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested,Residual bit error ratio indicates the bit error ratio in the delivered SDUs.As an Examples a target residual bit error ratio of 5*10-3 would be specified as "5E3"(e.g. AT+CGEQMIN=…,"5E3",..). "0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"
<Delivery of erroneous	This parameter indicates whether SDUs detected as erroneous shall

SDUs>	be delivered or not. 0 no 1 yes 2 no detect 3 subscribed value
<Transfer delay>	Integer type, (0,1,2,…) indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds(refer 3GPP TS 24.008 [8] subclause 10.5.6.5).
<Traffic handling priority>	This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS. Bearer compared to the SDUs of the other bearers. The range is 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Source statistics descriptor>	This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<Signaling indication flag>	This parameter indicates Signaling flag. The range is from 0 to 1 The default value is 0. If the parameter is set to '0' the subscribed value will be requested.
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol

Examples

```
AT+CGEQMIN=?
+CGEQMIN:
"IP",(0-4),(0-256000),(0-256000),(0-256000),(0-2
56000),(0-2),(0-1520),("0E0"-"1E1"),("0E0"-"6E
8"),(0-3),(0-62),(0-3),(0-1),(0-1)

OK
AT+CGEQMIN?
+CGEQMIN:
1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
2,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
3,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
```

```
4,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
5,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
6,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
7,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

+CGEQMIN:
8,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK
AT+CGEQMIN=1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0
,0,0
OK
```

5.2.12 AT+CGDATA Enter Data State

The command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations.

AT+CGDATA Enter Data State	
Test Command **AT+CGDATA=?**	Response 1) **+CGDATA:** (list of supported **<L2P>**s) **OK** 2) **ERROR**
Write Command **AT+CGDATA=[<L2P>,[<cid>]]**	Response 1) **CONNECT [<text>]** 2) **NO CARRIER** 3) **OK** 4) **ERROR**

	5) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<L2P>	A string parameter that indicates the layer 2 protocol to be used between the TE and MT. NULL
<text>	CONNECT result code string; the string formats please refer ATX command.
<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1-8

Examples

```
AT+CGDATA=?
+CGDATA: ("")

OK
AT+CGDATA="",1
CONNECT
```

5.2.13 AT+CGPADDR Show PDP Address

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

AT+CGPADDR Show PDP Address	
Test Command **AT+CGPADDR=?**	Response 1) **[+CGPADDR:** list of defined **<cid>s]** **OK** 2) **ERROR**
Write Command **AT+CGPADDR=<cid>[,<cid>[,…**	Response 1)

]]	**[+CGPADDR: <cid>,<PDP_addr>[<CR><LF>** **+CGPADDR: <cid>,<PDP_addr>[...]]** **]** **OK** 2) SIM card supports IPV4V6 type and the PDP_type of the command "AT+CGDCONT" defined is ipv4v6: **[+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>]** **+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>[...]]** **]** **OK** 3) **ERROR**
Execution Command **AT+CGPADDR**	Response 1) **[+CGPADDR: <cid>,<PDP_addr>]** **+CGPADDR: <cid>,<PDP_addr>[...]]]** **OK** 2) SIM card supports IPV4V6 type and the PDP_type of the command "at+cgdcont" defined is ipv4v6: **[+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>]** **+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>[...]]]** **OK** 3) **ERROR** 4) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. 1…15
<PDP_addr>	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 AT+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_addr> is omitted if none is available.
<PDP_addr_IPV4>	A string parameter that identifies the MT in the address space applicable to the PDP.
<PDP_addr_IPV6>	A string parameter that identifies the MT in the address space applicable to the PDP when the sim_card supports ipv6. The pdp type must be set to "ipv6" or "ipv4v6" by the AT+CGDCONT command.

Examples

```
AT+CGPADDR=?
+CGPADDR: 1,8

OK
AT+CGPADDR=1
+CGPADDR: 1,10.83.214.110

OK
AT+CGPADDR
+CGPADDR: 1,10.83.214.110

OK
```

5.2.14 AT+CGCLASS GPRS Mobile Station Class

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

AT+CGCLASS GPRS Mobile Station Class	
Test Command **AT+CGCLASS=?**	Response 1) **+CGCLASS:** (list of supported **<class>**s) **OK** 2) **ERROR**
Read Command **AT+CGCLASS?**	Response 1) **+CGCLASS: <class>** **OK** 2)

	ERROR
Write Command **AT+CGCLASS=<class>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<class>	A string parameter which indicates the GPRS mobile class (in descending order of functionality) "A" class A (highest)

Examples

```
AT+CGCLASS=?
+CGCLASS: ("A")

OK
AT+CGCLASS?
+CGCLASS: "A"

OK
AT+CGCLASS="A"
OK
```

5.2.15 AT+CGEREP GPRS Event Reporting

The write command enables or disables sending of unsolicited result codes, "+CGEV" from MT to TE in the case of certain events occurring in the Packet Domain 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. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

Read command returns the current <mode> and buffer settings.

Test command returns the modes and buffer settings supported by the MT as compound values.

AT+CGEREP GPRS Event Reporting	
Test Command **AT+CGEREP=?**	Response 1) **+CGEREP:** (list of supported **<mode>s),(**list of supported **<bfr>**s) **OK** 2) **ERROR**
Read Command **AT+CGEREP?**	Response 1) **+CGEREP: <mode>,<bfr>** **OK** 2) **ERROR**
Write Command **AT+CGEREP=<mode>[,<bfr>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Execution Command **AT+CGEREP**	Response 1) Set default value (<mode>=0,<bfr>=0): **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

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 discard 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 when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

The events are valid for GPRS/UMTS and LTE unless explicitly mentioned.
For network attachment, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW DETACH	The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.
+CGEV: ME DETACH	The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.

For MT class, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW CLASS <class>	The network has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS.
+CGEV: ME CLASS <class>	The mobile termination has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS.

For PDP context activation, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW PDN ACT <cid>[,<WLAN_Offload>]	The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. **<WLAN_Offload>**: integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value) and bit 2 (UTRAN offload acceptability value) in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20. 0 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable. 1 offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode. 2 offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode.

	3 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable. Note1: This event is not applicable for EPS.
+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]][,<WLAN_Offload>]	The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above. <reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6. 0 IPv4 only allowed 1 IPv6 only allowed 2 single address bearers only allowed. 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful. <cid_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid_other>. Note 1A: For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid_other> returned to TE
+CGEV: NW ACT <p_cid>,<cid>,<event_type>[,<WLAN_Offload>]	The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <WLAN_Offload> is defined above. <event_type>: integer type; indicates whether this is an informational

	event or whether the TE has to acknowledge it. 0 Informational event 1 Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.
+CGEV: ME ACT <p_cid>,<cid>,<event_type> [,<WLAN_Offload>]	The network has responded to an ME initiated context activation. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

+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. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.
+CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>]	The mobile termination has forced a context deactivation. The <cid>that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.
+CGEV: NW PDN DEACT <cid>[,<WLAN_Offload>]	The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above. Note 2: Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>].
+CGEV: ME PDN DEACT <cid>	The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter<cid> is found in command +CGDCONT. Note 3: Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>].
+CGEV: NW DEACT <p_cid>,<cid>,<event_type> [,<WLAN_Offload>]	The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

	Note 4: Occurrence of this event replaces usage of the event +CGEV: NW DEACT <PDP_type>,<PDP_addr>,[<cid>].
+CGEV: ME DEACT <p_cid>,<cid>,<event_type>	The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above. Node 5: Occurrence of this event replaces usage of the event +CGEV: ME DEACT <PDP_type>,<PDP_addr>,[<cid>].

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW MODIFY <cid>,<change_reason>,<event_type>[,<WLAN_Offload>]	The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter<cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type>, and <WLAN_Offload> are defined above. <change_reason>: integer type; a bitmap that indicates what kind of change occurred. The <change_reason> value is determined by summing all the applicable bits. For Examples if both the values of QoS changed (Bit 2) and <WLAN_Offload> changed (Bit 3) have changed, then the <change_reason> value is 6. The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN_Offload> defined above. Bit 1 TFT changed Bit 2 Qos changed Bit 3 WLAN Offload changed
+CGEV: ME MODIFY <cid>,<change_reason>,<event_type>[,<WLAN_Offload>]	The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type> and <WLAN_Offload>are defined above.

For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:

+CGEV: REJECT	A network request for context activation occurred when the MT was

<PDP_type>,<PDP_addr>	unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type>and <PDP_addr> are found in command +CGDCONT.
+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. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.

Examples

```
AT+CGEREP=?
+CGEREP: (0-2),(0-1)

OK
AT+CGEREP?
+CGEREP: 2,0

OK
AT+CGEREP=2,0
OK
AT+CGEREP
OK
```

5.2.16 AT+CGAUTH Set Type of Authentication for PDP-IP Connections of GPRS

This command is used to set type of authentication for PDP-IP connections of GPRS.

AT+CGAUTH Set Type of Authentication for PDP-IP Connections of GPRS	
Test Command **AT+CGAUTH=?**	Response 1) **+CGAUTH:**(range of supported **<cid>**s),(list of supported **<auth_type>** s),50,50 **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Read Command **AT+CGAUTH?**	Response 1)

	+CGAUTH: **[<cid>,<auth_type>[,<user>,<passwd>]]<CR><LF>** **…** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CGAUTH=<cid>[,<auth_type>[,<passwd>[,<user>]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	Parameter specifies a particular PDP context definition. This is also used in other PDP context-related commands. 1…15
<auth_type>	Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters<passwd> and <user> need to specified. 0 none 1 PAP 2 CHAP
<passwd>	Parameter specifies the password used for authentication.
<user>	Parameter specifies the user name used for authentication.

Examples

```
AT+CGAUTH=?
+CGAUTH: (1-15),(0-2),50,50

OK
AT+CGAUTH?
+CGAUTH: 1,0
```

```
OK
AT+CGAUTH=1,0
OK
```

6 AT Commands for SIM Card

6.1 Overview of AT Commands for SIM Card

Command	Description
AT+CICCID	Read ICCID from SIM Card
AT+CPIN	Enter PIN
AT+CLCK	Facility Lock
AT+CPWD	Change Password
AT+CIMI	Request International Mobile Subscriber Identity
AT+CSIM	Generic SIM Access
AT+CRSM	Restricted SIM Access
AT+SPIC	Times Remain to Input SIM PIN/PUK
AT+CSPN	Get Service Provider Name from SIM

6.2 Detailed Description of AT Commands for SIM Card

6.2.1 AT+CICCID Read ICCID from SIM Card

This command is used to Read the ICCID from SIM card

AT+CICCID Read ICCID from SIM Card	
Test Command AT+CICCID=?	Response **OK**
Execution Command AT+CICCID	Response 1) **+ICCID: <ICCID>** **OK** 2) **ERROR** 3)

	+CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	120S
Reference	Vendor

Defined Values

<ICCID>	Integrate circuit card identity, a standard ICCID is a 20-digit serial number of the SIM card,it presents the publish state, network code, publish area, publish date, publish manufacture and press serial number of the SIM card.

Examples

```
AT+CICCID
+ICCID: 89860318760238610932

OK
AT+CICCID=?
OK
```

6.2.2 AT+CPIN Enter PIN

This command is used to send the ME a password which 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 MT and an error message, +CME ERROR, 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.

AT+CPIN Enter PIN	
Test Command **AT+CPIN=?**	Response **OK**
Read Command **AT+CPIN?**	Response 1) **+CPIN : <code>** **OK** 2) **ERROR**

	3) **+CME ERROR: <err>**
Write Command **AT+CPIN=<pin>[,<newpin>]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	120S
Reference	3GPP TS 27.007

Defined Values

<pin>	String type values.
<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 SIM PIN2 ME is waiting SIM PIN2 to be given SIM PUK2 ME is waiting SIM PUK2 to be given PH-NET PIN ME is waiting network personalization password to be given

Examples

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

OK
AT+CPIN=1234
OK
```

6.2.3 AT+CLCK Facility Lock

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

AT+CLCK Facility Lock	
Test Command **AT+CLCK=?**	Response **+CLCK:** (list of supported **<fac>**s) **OK**
Write Command **AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]**	Response 1) **OK** 2) When <mode>=2 and command successful: **+CLCK: <status>[,<class1>[<CR><LF>** **+CLCK: <status>,<class2>** **[...]]** **OK** 3) **ERROR** 4) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	120S
Reference	3GPP TS 27.007

Defined Values

<fac>	"PF" lock Phone to the very First inserted SIM card or USIM card "SC" lock SIM card or USIM card "AO" Barr All Outgoing Calls "OI" Barr Outgoing International Calls "OX" Barr Outgoing International Calls except to Home Country "AI" Barr All Incoming Calls "IR" Barr Incoming Calls when roaming outside the home country "AB" All Barring services (only for <mode>=0) "AG" All outGoing barring services (only for <mode>=0) "AC" All inComing barring services (only for <mode>=0) "FD" SIM fixed dialing memory feature "PN" Network Personalization

	"PU" network subset Personalization "PP" service Provider Personalization "PC" Corporate Personalization
<mode>	0 unlock 1 lock 2 query status
<status>	0 not active 1 active
<passwd>	Password. string type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD
<class>	It is a sum of integers each representing a class of information (default 7): 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 8 short message service 16 data circuit sync 32 data circuit sync 64 dedicated packet access 128 dedicated PAD access 255 The value 255 covers all classes

Examples

```
AT+CLCK="SC",2
+CLCK: 0

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

OK
```

6.2.4 AT+CPWD Change Password

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

Test command returns a list of pairs which present the available facilities and the maximum length of their

password.

AT+CPWD Change Password	
Test Command **AT+CPWD=?**	Response 1) **+CPWD:** (list of supported (**<fac>,<pwdlength>**)s) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	120S
Reference	3GPP TS 27.007

Defined Values

<fac>	Refer Facility Lock +CLCK for other values: "SC" SIM or USIM PIN1 "P2" SIM or USIM PIN2 "AB" All Barring services "AC" All inComing barring services (only for <mode>=0) "AG" All outGoing barring services (only for <mode>=0) "AI" Barr All Incoming Calls "AO" Barr All Outgoing Calls "IR" Barr Incoming Calls when roaming outside the home country "OI" Barr Outgoing International Calls "OX" Barr Outgoing International Calls except to Home Country
<oldpwd>	String type, it shall be the same as password specified for the facility from the ME user interface or with command Change Password AT+CPWD.
<newpwd>	String type, it is the new password; maximum length of password can be determined with <pwdlength>.
<pwdlength>	Integer type, max length of password.

Examples

```
AT+CPWD=?
+CPWD:
("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("I
R",4),("OI",4),("OX",4),("SC",8),("P2",8)

OK
AT+CPWD="SC",1234,5678
OK
```

6.2.5 AT+CIMI Request International Mobile Subscriber Identity

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

AT+CIMI Request International Mobile Subscriber Identity	
Test Command **AT+CIMI=?**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+CIMI**	Response 1) **<IMSI>** **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	120S
Reference	3GPP TS 27.007

Defined Values

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

Examples

```
AT+CIMI=?
OK
AT+CIMI
460010222028133

OK
```

NOTE

If USIM card contains two apps, like China Telecom 4G card, one RUIM/CSIM app, and another USIM app; so there are two IMSI in it; AT+CIMI will return the RUIM/CSIM IMSI.

6.2.6 AT+CSIM Generic SIM Access

This command is used to control the SIM card directly.
Compared to restricted SIM access command AT+CRSM, AT+CSIM allows the ME to take more control over the SIM interface.
For SIM–ME interface please refer 3GPP TS 11.11.

AT+CSIM Generic SIM Access	
Test Command **AT+CSIM=?**	Response **OK**
Write Command **AT+CSIM=<length>,<command>**	Response 1) **+CSIM: <length>,<response>** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	120S
Reference	3GPP TS 27.007

Defined Values

<length>	Interger type; length of characters that are sent to TE in <command> or <response>

<command>	Command passed from MT to SIM card.
<response>	Response to the command passed from SIM card to MT.

Examples

```
AT+CSIM=?
OK
AT+CSIM=10,"A0F2000016"
+CSIM: 4,"6E00"

OK
```

NOTE

The SIM Application Toolkit functionality is not supported by AT+CSIM. Therefore the following SIM commands can not be used: TERMINAL PROFILE, ENVELOPE, FETCH and TEMINAL RESPONSE.

6.2.7 AT+CRSM Restricted SIM Access

By using AT+CRSM instead of Generic SIM Access AT+CSIM, TE application has easier but more limited access to the SIM database.
Write command transmits to the MT the SIM <command> and its required parameters. MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

AT+CRSM Restricted SIM Access	
Test Command **AT+CRSM=?**	Response **OK**
Write Command **AT+CRSM=<command>[,<fileID>[,<p1>,<p2>,<p3>[,<data>]]]**	Response 1) **+CRSM: <sw1>,<sw2>[,<response>]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<command>	Command passed on by the MT to the SIM: 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 203 RETRIEVE DATA 219 SET DATA
<fileID>	Identifier for an elementary data file on SIM, if used by <command>. The following list the fileID hex value, user needs to convet them to decimal. EFs under MF 0x2FE2 ICCID 0x2F05 Extended Language Preferences 0x2F00 EF DIR 0x2F06 Access Rule Reference EFs under USIM ADF 0x6F05 Language Indication 0x6F07 IMSI 0x6F08 Ciphering and Integrity keys 0x6F09 C and I keys for pkt switched domain 0x6F60 User controlled PLMN selector w/Acc Tech 0x6F30 User controlled PLMN selector 0x6F31 HPLMN search period 0x6F37 ACM maximum value 0x6F38 USIM Service table 0x6F39 Accumulated Call meter 0x6F3E Group Identifier Level 0x6F3F Group Identifier Level 2 0x6F46 Service Provider Name 0x6F41 Price Per Unit and Currency table 0x6F45 Cell Bcast Msg identifier selection 0x6F78 Access control class 0x6F7B Forbidden PLMNs 0x6F7E Location information 0x6FAD Administrative data 0x6F48 Cell Bcast msg id for data download

0x6FB7	Emergency call codes
0x6F50	Cell bcast msg id range selection
0x6F73	Packet switched location information
0x6F3B	Fixed dialling numbers
0x6F3C	Short messages
0x6F40	MSISDN
0x6F42	SMS parameters
0x6F43	SMS Status
0x6F49	Service dialling numbers
0x6F4B	Extension 2
0x6F4C	Extension 3
0x6F47	SMS reports
0x6F80	Incoming call information
0x6F81	Outgoing call information
0x6F82	Incoming call timer
0x6F83	Outgoing call timer
0x6F4E	Extension 5
0x6F4F	Capability Config Parameters 2
0x6FB5	Enh Multi Level Precedence and Pri
0x6FB6	Automatic answer for eMLPP service
0x6FC2	Group identity
0x6FC3	Key for hidden phonebook entries
0x6F4D	Barred dialling numbers
0x6F55	Extension 4
0x6F58	Comparison Method information
0x6F56	Enabled services table
0x6F57	Access Point Name Control List
0x6F2C	De-personalization Control Keys
0x6F32	Co-operative network list
0x6F5B	Hyperframe number
0x6F5C	Maximum value of Hyperframe number
0x6F61	OPLMN selector with access tech
0x6F5D	OPLMN selector
0x6F62	HPLMN selector with access technology
0x6F06	Access Rule reference
0x6F65	RPLMN last used access tech
0x6FC4	Network Parameters
0x6F11	CPHS: Voice Mail Waiting Indicator
0x6F12,	CPHS: Service String Table
0x6F13	CPHS: Call Forwarding Flag
0x6F14	CPHS: Operator Name String
0x6F15	CPHS: Customer Service Profile
0x6F16	CPHS: CPHS Information
0x6F17	CPHS: Mailbox Number
0x6FC5	PLMN Network Name
0x6FC6	Operator PLMN List

0x6F9F	Dynamic Flags Status
0x6F92	Dynamic2 Flag Setting
0x6F98	Customer Service Profile Line2
0x6F9B	EF PARAMS - Welcome Message
0x4F30	Phone book reference file
0x4F22	Phone book synchronization center
0x4F23	Change counter
0x4F24	Previous Unique Identifier
0x4F20	GSM ciphering key Kc
0x4F52	GPRS ciphering key
0x4F63	CPBCCH information
0x4F64	Investigation scan
0x4F40	MExE Service table
0x4F41	Operator Root Public Key
0x4F42	Administrator Root Public Key
0x4F43	Third party Root public key
0x6FC7	Mail Box Dialing Number
0x6FC8	Extension 6
0x6FC9	Mailbox Identifier
0x6FCA	Message Waiting Indication Status
0x6FCD	Service Provider Display Information
0x6FD2	UIM_USIM_SPT_TABLE
0x6FD9	Equivalent HPLMN
0x6FCB	Call Forwarding Indicator Status
0x6FD6	GBA Bootstrapping parameters
0x6FDA	GBA NAF List
0x6FD7	MBMS Service Key
0x6FD8	MBMS User Key
0x6FCE	MMS Notification
0x6FD0	MMS Issuer connectivity parameters
0x6FD1	MMS User Preferences
0x6FD2	MMS User connectivity parameters
0x6FCF	Extension 8
0x5031	Object Directory File
0x5032	Token Information File
0x5033	Unused space Information File
EFs under Telecom DF	
0x6F3A	Abbreviated Dialing Numbers
0x6F3B	Fixed dialling numbers
0x6F3C	Short messages
0x6F3D	Capability Configuration Parameters
0x6F4F	Extended CCP
0x6F40	MSISDN
0x6F42	SMS parameters
0x6F43	SMS Status
0x6F44	Last number dialled

	0x6F49 Service Dialling numbers 0x6F4A Extension 1 0x6F4B Extension 2 0x6F4C Extension 3 0x6F4D Barred Dialing Numbers 0x6F4E Extension 4 0x6F47 SMS reports 0x6F58 Comparison Method Information 0x6F54 Setup Menu elements 0x6F06 Access Rule reference 0x4F20 Image 0x4F30 Phone book reference file 0x4F22 Phone book synchronization center 0x4F23 Change counter 0x4F24 Previous Unique Identifier
<p1> <p2> <p3>	Integer type; parameters to be passed on by the Module to the SIM.
<data>	Information which shall be written to the SIM (hexadecimal character format, refer AT+CSCS).
<sw1> <sw2>	Status information from the SIM about the execution of the actual command. It is returned in both cases, on successful or failed execution of the command.
<response>	Response data in case of a successful completion of the previously issued command. "STATUS" and "GET RESPONSE" commands return data, which gives information about the currently selected elementary data field. This information includes the type of file and its size. After "READ BINARY" or "READ RECORD" commands the requested data will be returned. <response> is empty after "UPDATE BINARY" or "UPDATE RECORD" commands.

Examples

```
AT+CRSM=?
OK
AT+CRSM=242
+CRSM:
144,0,"000000003F00040000FFBB01020000"

OK
```

6.2.8 AT+SPIC Times Remain to Input SIM PIN/PUK

This command is used to inquire times remain to input SIM PIN/PUK.

AT+SPIC Times Remain to Input SIM PIN/PUK	
Test Command **AT+SPIC=?**	Response **OK**
Execution Command **AT+SPIC**	Response **+SPIC: <pin1>,<puk1>,<pin2>,<puk2>** **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

<pin1>	Times remain to input PIN1 code.
<puk1>	Times remain to input PUK1 code.
<pin2>	Times remain to input PIN2 code.
<puk2>	Times remain to input PUK2 code.

Examples

```
AT+SPIC=?
OK
AT+SPIC
+SPIC: 3,10,0,10

OK
```

6.2.9 AT+CSPN Get Service Provider Name from SIM

This command is used to get service provider name from SIM card.

AT+CSPN Get Service Provider Name from SIM	
Test Command **AT+CSPN=?**	Response 1)

	OK 2) **ERROR**
Read Command **AT+CSPN?**	Response 1) **+CSPN: <spn>,<display mode>** **OK** 2) **OK** 3) **ERROR** 4) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

<spn>	String type; service provider name on SIM
<display mode>	0 doesn't display PLMN. Already registered on PLMN. 1 display PLMN

Examples

```
AT+CSPN=?
OK
AT+CSPN?
+CSPN: "China Telecom",1

OK
```

7 AT Commands for Phonebook

7.1 Overview of AT Commands for Phonebook

Command	Description
AT+CPBS	Set Phone Functionality
AT+CPBR	Read Phonebook Entries
AT+CPBF	Find Phonebook Entries
AT+CPBW	Write Phonebook Entry
AT+CNUM	Subscriber Number

7.2 Detailed Description of AT Commands for Phonebook

7.2.1 AT+CPBS Select Phonebook Memory Storage

This command selects the active phonebook storage, i.e. the phonebook storage that all subsequent phonebook commands will be operating on.

AT+CPBS Select Phonebook Memory Storage	
Test Command AT+CPBS=?	Response **+CPBS:** (list of supported **<storage>**s) **OK**
Read Command AT+CPBS?	Response 1) **+CPBS: <storage>[,<used>,<total>]** **OK** 2) **+CME ERROR: <err>**
Write Command AT+CPBS=<storage>	Response 1)

	OK 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<storage>	values reserved by the present document: **"FD"** SIM/USIM fixdialling-phonebook. If a SIM card is present or if a UICCan active GSM application is present, the information in EF_{FDN} under $DF_{Telecom}$ is selected. If a UICC with an active USIM application is present, the information in EF_{FDN} under ADF_{USIM} is selected. **"ON"** SIM (or MT) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also). When storing information in the SIM/UICC, if a SIM card is present or if a UICC with an active GSM application is present, the information in EF_{MSISDN} under $DF_{Telecom}$ is selected. If a UICC with an active USIM application is present, the information in EF_{MSISDN} under ADF_{USIM} is selected. **"SM"** SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present,the EF_{ADN} under $DF_{Telecom}$ is selected. If a UICC with an active USIM application is present, the global phonebook, $DF_{PHONEBOOK}$ under $DF_{Telecom}$ is selected. **"AP"** Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, $DF_{PHONEBOOK}$ under ADF_{USIM} is selected.
<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.

Examples

```
AT+CPBS=?
+CPBS: ("SM","FD","ON","AP")

OK
```

```
AT+CPBS?
+CPBS: "SM",8,500

OK
AT+CPBS="SM"
OK
```

7.2.2 AT+CPBR Read Phonebook Entries

This command gets the record information from the selected memory storage in phonebook. If the storage is selected as "SM" then the command will return the record in SIM phonebook, the same to others.

AT+CPBR Read Phonebook Entries	
Test Command **AT+CPBR=?**	Response 1) **+CPBR:** (list of supported **<index>**s),[**<nlength>**],[**<tlength>**] **OK** 2) **+CME ERROR: <err>**
Write Command **AT+CPBR=<index1>[,<index2>]**	Response 1) **[+CPBR: <index>,<number>,<type>,<text>[<CR><LF>** **+CPBR: <index>,<number>,<type>,<text>[…]]]** **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<Index1>	Integer type value in the range of location numbers of phonebook memory.
<Index2>	Integer type value in the range of location numbers of phonebook memory.

<Index>	Integer type.the current position number of the Phonebook index.
<number>	String type, phone number of format <type>, the maximum length is <nlength>
<type>	Type of phone number octet in integer format, default 145 when dialing string includes international access code character "+", otherwise 129.
<text>	String type field of maximum length <tlength>; often this value is set as name.
<nlength>	Integer type value indicating the maximum length of field <number>
<tlength>	Integer type value indicating the maximum length of field <text>.

Examples

```
AT+CPBR=?
+CPBR: (1-500),40,14

OK
AT+CPBR=7
+CPBR: 7,"12345678",129,"John"

OK
```

7.2.3 AT+CPBF Find Phonebook Entries

This command finds the record in phonebook (from the current phonebook memory storage selected with AT+CPBS) which alphanumeric field has substring <findtext>.If <findtext> is null, it will lists all the entries.

AT+CPBF Find Phonebook Entries	
Test Command **AT+CPBF=?**	Response 1) **OK** 2) **+CME ERROR: <err>**
Write Command **AT+CPBF=[<findtext>]**	Response 1) **[+CPBF: <Index1>,<number>,<type>,<text>[<CR><LF>** **+CPBF: <IndexN>,<number>,<type>,<text>[…]]]** **OK** 2)

	ERROR 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<findtext>	String type, this value is used to find the record. Character set should be the one selected with command AT+CSCS.
<index>	Integer type values in the range of location numbers of phonebook memory.
<number>	String type, phone number of format <type>, the maximum length is <nlength>.
<type>	Type of phone number octet in integer format, default 145 when dialing string includes international access code character "+", otherwise 129.
<text>	String type field of maximum length <tlength>; Often this value is set as name.

Examples

```
AT+CPBF=?
OK
AT+CPBF="Bill"
+CPBF:4,8,"13312345904",129,"Bill"

OK
```

7.2.4 AT+CPBW Write Phonebook Entry

This command writes phonebook entry in location number <index> in the current phonebook memory storage selected with AT+CPBS.

AT+CPBW Write Phonebook Entry	
Test Command **AT+CPBW=?**	Response 1) **+CPBW:** (list of supported **<index>**s),[**<nlength>**],(list of supported **<type>**s),[**<tlength>**]

	OK 2) **+CME ERROR: <err>**
Write Command **AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]**	Response 1) **OK** 2) **ERROR** 3) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<index>	Integer type values in the range of location numbers of phonebook memory. If <index> is not given, the first free entry will be used. If <index> is given as the only parameter, the phonebook entry specified by <index> is deleted. If record number <index> already exists, it will be overwritten.
<number>	String type, phone number of format <type>, the maximum length is <nlength>.It must be an non-empty string.
<type>	Type of address octet in integer format, The range of value is from 129 to 255. If <number> contains a leading "+" <type> = 145 (international) is used. Supported value are: 145 when dialling string includes international access code character "+" 161 national number. The network support for this type is optional 177 network specific number, ISDN format 129 otherwise NOTE: Other value refer TS 24.008 [8] subclause 10.5.4.7.
<text>	String type field of maximum length <tlength>; character set as specified by command Select TE Character Set AT+CSCS.
<nlength>	Integer type value indicating the maximum length of field <number>.
<tlength>	Integer type value indicating the maximum length of field <text>. NOTE: If the parameters of <type> and <text> are omitted and the first character of <number> is '+', it will specify <type> as 145(129 if the first character isn't '+') and <text> as NULL.

Examples

```
AT+CPBW=?
+CPBW: (1-500),40,(129,145),14

OK
AT+CPBW=2,"1111",129,"Name"

OK
```

7.2.5 AT+CNUM Subscriber Number

Execution 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.

AT+CNUM Subscriber Number	
Test Command **AT+CNUM=?**	Response **OK**
Execution Command **AT+CNUM**	Response 1) **+CNUM: <text>,<number>,<type>[...]]]** **OK** 2) **+CME ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<index>	Integer type values in the range (0,1,2). If <index> is given as the only parameter and is 1 or 2, the MSISDN specified by <index> is deleted. If record number <index> already exists, it will be overwritten. If <index> is given as the only parameter and is 0, All the MSISDNs will be listed
<number>	String type phone number of format specified by <type>.
<type>	Only types 129 and 145 are supported, and the rest default to type 129.
<text>	String type field of maximum length <tlength>; character set as

	specified by command Select TE Character Set AT+CSCS.

Examples

```
AT+CNUM=?
OK
AT+CNUM

OK
```

8 AT Commands for SMS

8.1 Overview of AT Commands for SMS

Command	Description
AT+CSMS	Select Message Service
AT+CPMS	Preferred Message Storage
AT+CMGF	Select SMS Message Format
AT+CSCA	SMS Service Centre Address
AT+CSCB	Select Cell Broadcast Message Indication
AT+CSMP	Set Textmode Parameters
AT+CSDH	Show Textmode Parameters
AT+CNMA	New Message Acknowledgement to ME/TA
AT+CNMI	New Message Indications to TE
AT+CGSMS	Select Service for MO SMS Messages
AT+CMGL	List SMS Messages from Preferred Store
AT+CMGR	Read Message
AT+CMGS	Send Message
AT+CMSS	Send Message from Storages
AT+CMGW	Write Message to Memory
AT+CMGD	Delete Message
AT+CMGMT	Change Message Status
AT+CMVP	Set Message Valid Period
AT+CMGRD	Read and Delete Message
AT+CMGSEX	Send Message
AT+CMSSEX	Send Multi Messages from Storage

8.2 Detailed Description of AT Commands for SMS

8.2.1 AT+CSMS Select Message Service

This command is used to select messaging service <service>.

AT+CSMS Select Message Service	
Test Command **AT+CSMS=?**	Response **+CSMS:** (list of supported **<service>**s) **OK**
Read Command **AT+CSMS?**	Response **+CSMS: <service>,<mt>,<mo>,<bm>** **OK**
Write Command **AT+CSMS=<service>**	Response 1) **+CSMS: <mt>,<mo>,<bm>** **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<service>	0	SMS at command is compatible with GSM phase 2.
	1	SMS at command is compatible with GSM phase 2+.
<mt>	0	type not supported.
	1	type supported.
<mo>	0	type not supported.
	1	type supported.
<bm>s	0	type not supported.
	1	type supported.

Examples

```
AT+CSMS=0
+CSMS: 1,1,1

OK
AT+CSMS?
+CSMS: 0,1,1,1

OK
```

AT+CSMS=?
+CSMS: (0,1)

OK

8.2.2 AT+CPMS Preferred Message Storage

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

AT+CPMS Preferred Message Storage	
Test Command **AT+CPMS=?**	Response **+CPMS:** (list of supported **<mem1>**s),(list of supported **<mem2>**s),(list of supported **<mem3>**s) **OK**
Read Command **AT+CPMS?**	Response **+CPMS:** **<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK**
Write Command **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]**	Response 1) **+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

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

	"ME" FLASH message storage "SM" SIM message storage
<mem2>	String type, memory to which writing and sending operations are made (commands Send Message from Storage AT+CMSS and Write Message to Memory AT+CMGW). "ME" FLASH message storage "SM" SIM message storage
<mem3>	String type, memory to which received SMS is preferred to be stored (unless forwarded directly to TE; refer command New Message Indications AT+CNMI). "ME" FLASH message storage "SM" SIM message storage
<usedX>	Integer type, number of messages currently in <memX>.
<totalX>	Integer type, total number of message locations in <memX>.

Examples

```
AT+CPMS=?
+CPMS:
("ME","SM"),("ME","SM"),("ME","SM")

OK
AT+CPMS?
+CPMS:"ME",0,180,"ME", 0, 180,"ME",0,180

OK
AT+CPMS="SM","SM","SM"
+CPMS:3,50,3,50,3,50

OK
```

8.2.3 AT+CMGF Select SMS Message Format

This command is used to specify the input and output format of the short messages.

AT+CMGF Select SMS Message Format	
Test Command **AT+CMGF=?**	Response 1) **+CMGF:** (list of supported **<mode>**s) **OK**

	2) **ERROR**
Read Command **AT+CMGF?**	Response 1) **+CMGF: <mode>** **OK** 2) **ERROR**
Write Command **AT+CMGF=<mode>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<mode>	0	PDU mode
	1	Text mode

Examples

```
AT+CMGF?
+CMGF: 0

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

OK
AT+CMGF=1
OK
```

8.2.4 AT+CSCA SMS Service Centre Address

This command is used to update the SMSC address, through which mobile originated SMS are transmitted.

AT+CSCA SMS Service Centre Address	
Test Command **AT+CSCA=?**	Response **OK**
Read Command **AT+CSCA?**	Response 1) **+CSCA: <sca>,<tosca>** **OK** 2) **ERROR**
Write Command **AT+CSCA=<sca>[,<tosca>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<sca>	Service Centre Address, value field in string format, BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to command AT+CSCS), type of address given by <tosca>.
<tosca>	SC address Type-of-Address octet in integer format, when first character of <sca> is + (IRA 43) default is 145, otherwise default is 129.

Examples

```
AT+CSCA="+8613012345678"
OK
AT+CSCA?
+CSCA: "+8613010314500", 145

OK
```

8.2.5 AT+CSCB Select Cell Broadcast Message Indication

The test command returns the supported <mode>s as a compound value.

The read command displays the accepted message types.

Depending on the <mode> parameter, the write command adds or deletes the message types accepted.

AT+CSCB Select Cell Broadcast Message Indication	
Test Command **AT+CSCB=?**	Response 1) **+CSCB:** (list of supported **<mode>**s) **OK** 2) **ERROR**
Read Command **AT+CSCB?**	Response 1) **+CSCB: <mode>,<mids>,<dcss>** **OK** 2) **ERROR**
Write Command **AT+CSCB=<mode>[,<mids>[,<dcss>]]**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<mode>	0 message types specified in <mids> and <dcss> are accepted. 1 message types specified in <mids> and <dcss> are not accepted.
<mids>	String type; all different possible combinations of CBM message identifiers.
<dcss>	String type; all different possible combinations of CBM data coding schemes(default is empty string)

NOTE

The Read command for A7906 series return a list of available parameters <mids> and <dcss> with <mode> 0. If no parameters are available, return <mode> 1.

Examples

```
AT+CSCB=?
+CSCB: (0,1)

OK
AT+CSCB?
+CSCB: 1,"","""

OK
AT+CSCB=0,"15-17,50,86",""
OK
```

8.2.6 AT+CSMP Set Text Mode Parameters

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.

AT+CSMP Set Text Mode Parameters	
Test Command **AT+CSMP=?**	Response **OK**
Read Command **AT+CSMP?**	Response 1) **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
Write Command **AT+CSMP=<fo>[,<vp>[,<pid>[,<dcs>]]]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<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. SMS status report is supported under text mode if <fo> is set to 49.
<vp>	Depending on SMS-SUBMIT <fo> setting: GSM 03.40,TP-Validity-Period either in integer format (default 167), in time-string format, or if is supported, in enhanced format (hexadecimal coded string with quotes), (<vp> is in range 0... 255).
<pid>	GSM 03.40 TP-Protocol-Identifier in integer format (default 0).
<dcs>	GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code.

Examples

```
AT+CSMP=17,167,0,0
OK
```

8.2.7 AT+CSDH Show Text Mode Parameters

This command is used to control whether detailed header information is shown in text mode result codes.

AT+CSDH Show Text Mode Parameters	
Test Command **AT+CSDH=?**	Response **+CSDH:** (list of supported **<show>**s) **OK**
Read Command **AT+CSDH?**	Response **+CSDH: <show>** **OK**
Write Command **AT+CSDH=<show>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S

Reference	3GPP TS 27.005

Defined Values

<show>	0 Do not show header values defined in commands AT+CSCA and AT+CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <tooa> in +CMT, AT+CMGL, AT+CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in AT+CMGR result code, do not show <pid>, <mn>, <da>, <toda>, <length> or <data> 1 Show the values in result codes

Examples

```
AT+CSDH=?
+CSDH: (0,1)

OK
AT+CSDH?
+CSDH: 0

OK
AT+CSDH=1
OK
```

8.2.8 AT+CNMA New Message Acknowledgement to ME/TA

This command is used to confirm successful receipt of a new message (SMS-DELIVER or SMS-STATUSREPORT) routed directly to the TE. If ME does not receive acknowledgement within required time (network timeout), it will send RP-ERROR to the network.

AT+CNMA New Message Acknowledgement to ME/TA	

Test Command
AT+CNMA=?
	Response
	if text mode(AT+CMGF=1):
	OK
	if PDU mode (AT+CMGF=0):
	+CNMA: (list of supported **<n>**s)
	
	OK

Write Command	Response

AT+CNMA=<n>	1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Execution Command **AT+CNMA**	1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<n>	Parameter required only for PDU mode. 0 Command operates similarly as execution command in text mode. 1 Send positive (RP-ACK) acknowledgement to the network. Accepted only in PDU mode. 2 Send negative (RP-ERROR) acknowledgement to the network. Accepted only in PDU mode.

Examples

AT+CNMA **OK**	//send ACK to the network
AT+CNMA **+CMS ERROR:340**	//the second time return error, it needs ACK only once

NOTE

The execute / write command shall only be used when AT+CSMS parameter <service> equals 1 (= phase 2+) and appropriate URC has been issued by the module, i.e.:

<+CMT> for <mt>=2 incoming message classes 0, 1, 3 and none;

<+CMT> for <mt>=3 incoming message classes 0 and 3;

<+CDS> for <ds>=1.

8.2.9 AT+CNMI New Message Indications to TE

This command is used to select the procedure how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF). If set <mt> = 3 or <ds> = 1, make sure <mode> = 1, If set <mt>=2,make sure <mode>=1 or 2, otherwise it will return error.

AT+CNMI New Message Indications to TE	
Test Command **AT+CNMI=?**	Response **+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) **OK**
Read Command **AT+CNMI?**	Response **+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**
Write Command **AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

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, preferred memory storage (AT+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: <mem3>,<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 AT+CSDH). 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, the setting of Select CBM Types (AT+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)
<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) 2 If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: **+CDSI: <mem3>,<index>**.
<bfr>	0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 to 2 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 to 2 is entered.

Examples

```
AT+CNMI?
+CNMI: 1,2,2,1,1

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

OK
AT+CNMI=2,1
OK
```

8.2.10 AT+CGSMS Select Service for MO SMS Messages

The write command is used to specify the service or service preference that the MT will use to send MO SMS messages.
The test command is used for requesting information on which services and service preferences can be set by using the AT+CGSMS write command
The read command returns the currently selected service or service preference.

AT+CGSMS Select Service for MO SMS Messages	
Test Command **AT+CGSMS=?**	Response **+CGSMS:** (range of supported **<service>**s) **OK**
Read Command **AT+CGSMS?**	Response **+CGSMS: <service>** **OK**
Write Command **AT+CGSMS=<service>**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<service>	A numeric parameter which indicates the service or service preference to be used 0 GPRS(value is not really supported and is internally mapped to 2) 1 circuit switched(value is not really supported and is internally mapped to 3) 2 GPRS preferred (use circuit switched if GPRS not available) 3 circuit switched preferred (use GPRS if circuit switched not available)

Examples

```
AT+CGSMS?
+CGSMS: 3

OK
AT+CGSMS=?
+CGSMS: (0-3)

OK
AT+CGSMS=3
OK
```

8.2.11 AT+CMGL List SMS Messages from Preferred Store

This command is used to return messages with status value <stat> from message storage <mem1> to the TE.

If the status of the message is 'received unread', the status in the storage changes to 'received read'.

AT+CMGL List SMS Messages from Preferred Store	
Test Command **AT+CMGL=?**	Response **+CMGL:** (list of supported **<stat>**s) **OK**
Read Command **AT+CMGL=<stat>**	Response 1) If text mode (AT+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs: **+CMGL:** **<index>,<stat>,<oa>/<da>,[<alpha>],[<scts>][,<tooa>/<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[<CR><**

	LF> **+CMGL:** **<index>,<stat>,<oa>/<da>,[<alpha>],[<scts>][,<tooa>/<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[...]]** **OK** 2) If text mode (AT+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>[...]]** **OK** 3) If text mode (AT+CMGF=1), command successful and SMS-COMMANDs: **+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>** **+CMGL: <index>,<stat>,<fo>,<ct>[...]]** **OK** 4) If text mode (AT+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>[...]]** **OK** 5) If PDU mode (AT+CMGF=0) and Command successful: **+CMGL:** **<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>** **+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>** **[…]]** **OK** 6) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<stat>	1. Text Mode: "REC UNREAD" received unread message (i.e. new message) "REC READ" received read message "STO UNSENT" stored unsent message "STO SENT" stored sent message "ALL" all messages 2. PDU Mode: 0 received unread message (i.e. new message) 1 received read message 2 stored unsent message 3 stored sent message 4 all messages
<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<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 AT+CSCS.
<scts>	TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<toda>	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). The range of value is from 128 to 255.
<length>	Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> in characters; or in PDU mode (AT+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)
<data>	In the case of SMS: TP-User-Data in text mode responses; format: 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set.

	b. If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. (e.g. character (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55)) 2. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dcs> indicates that GSM 7 bit default alphabet is used: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. 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 numbers.
<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. SMS status report is supported under text mode if <fo> is set to 49.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address 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 to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time 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.
<st>	Status GSM 03.40 TP-Status in integer format 0…255
<ct>	Status GSM 03.40 TP-Status in integer format 0…255
<ct>	Command Type GSM 03.40 TP-Command-Type in integer format 0…255

<sn>	Serial Number GSM 03.41 CBM Serial Number in integer format
<mid>	Message Identifier GSM 03.41 CBM Message Identifier in integer format
<page>	Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	Page Parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Examples

```
AT+CMGL=?
+CMGL: ("REC UNREAD","REC READ","STO
UNSENT","STO SENT","ALL")

OK
AT+CMGL="ALL"
+CMGL: 1,"STO UNSENT","+10011",,,145,4
Hello World

OK
```

8.2.12 AT+CMGR Read Message

This command is used to return message with location value <index> from message storage <mem1> to the TE.

AT+CMGR Read Message	
Test Command **AT+CMGR=?**	Response **OK**
Write Command **AT+CMGR=<index>**	Response 1) If text mode (AT+CMGF=1), command successful and SMS-DELIVER: **+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>**

	OK 2) If text mode (AT+CMGF=1), command successful and SMS- SUBMIT: **+CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>** **OK** 3) If text mode (AT+CMGF=1), command successful and SMS-STATUS-REPORT: **+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **OK** 3) If text mode (AT+CMGF=1), command successful and SMS-COMMAND: **+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR><LF><data>** **OK** 4) If text mode (AT+CMGF=1), command successful and CBM storage: **+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** **OK** 5) If PDU mode (AT+CMGF=0) and Command successful: **+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK** 6) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<stat>	1. Text Mode:

	"REC UNREAD" received unread message (i.e. new message) "REC READ" received read message "STO UNSENT" stored unsent message "STO SENT" stored sent message 2. PDU Mode: 0 received unread message (i.e. new message) 1 received read message 2 stored unsent message 3 stored sent message
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<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 AT+CSCS.
<scts>	TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<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. SMS status report is supported under text mode if <fo> is set to 49.
<pid>	Protocol Identifier GSM 03.40 TP-Protocol-Identifier in integer format 0…255
<dcs>	Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<sca>	RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tosca>.
<tosca>	RP SC address Type-of-Address octet in integer format (default refer <toda>).
<length>	Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> in characters; or in PDU mode (AT+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)
<data>	In the case of SMS: TP-User-Data in text mode responses; format: 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set:

	a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. (e.g. character (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55)) 2. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dcs> indicates that GSM 7 bit default alphabet is used: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. 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 numbers.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	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). The range of value is from 128 to 255.
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>).
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address 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 to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time 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.
<st>	Status GSM 03.40 TP-Status in integer format

	0…255
<ct>	Command Type GSM 03.40 TP-Command-Type in integer format 0…255
<mn>	Message Number GSM 03.40 TP-Message-Number in integer format
<sn>	Serial Number GSM 03.41 CBM Serial Number in integer format
<mid>	Message Identifier GSM 03.41 CBM Message Identifier in integer format
<page>	Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	Page parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (eg. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Examples

```
AT+CMGR=?
OK
AT+CMGR=1
+CMGR:"STO
UNSENT","+10011",,145,17,0,0,167,"+861380
0100500",145,11
Hello World

OK
```

8.2.13 AT+CMGS Send Message

This command is used to send message from a TE to the network (SMS-SUBMIT).

AT+CMGS Send Message	
Test Command	Response
AT+CMGS=?	**OK**
Write Command	Response
If text mode(AT+CMGF=1)	1)
AT+CMGS=<da>[,<toda>]	If sending successfully:

Text is entered. **<CTRL-Z/ESC>** If PDU mode(AT+CMGF=0) **AT+CMGS=<length>** PDU is entered **<CTRL-Z/ESC>**	**+CMGS: <mr>** **OK** 2) If cancel sending: **OK** 3) If sending fails **ERROR** 4) If sending fails: **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	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). The range of value is from 128 to 255.
<length>	integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (AT+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>	Message Reference GSM 03.40 TP-Message-Reference in integer format.

Examples

AT+CMGS=?
OK
AT+CMGS="13012832788"
> ABCD<ctrl-Z/ESC>
+CMGS: 46

OK

NOTE

The maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

8.2.14 AT+CMSS Send Message from Storage

This command is used to send message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).

AT+CMSS Send Message from Storage	
Test Command **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>[,<toda>]]**	Response 1) **+CMSS: <mr>** **OK** 2) **ERROR** 3) If sending fails: **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<toda>	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). The range of value is from 128 to 255.

Examples

```
AT+CMSS=?
OK
AT+CMSS=3
+CMSS: 0

OK
AT+CMSS=3,"13012345678"
+CMSS: 55

OK
```

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

8.2.15 AT+CMGW Write Message to Memory

This command is used to store message (either SMS-DELIVER or SMS-SUBMIT) to memory storage <mem2>.

AT+CMGW Write Message to Memory	
Test Command **AT+CMGW=?**	Response **OK**
Write Command If text mode(AT+CMGF=1) **AT+CMGW=<oa>/<da>[,<tooa>/<toda>[,<stat>]]** Text is entered. <CTRL-Z/ESC> If PDU mode(AT+CMGF=0): **AT+CMGW=<length>[,<stat>]** PDU is entered. <CTRL-Z/ESC>	Response 1) If write successfully: **+CMGW: <index>** **OK** 2) If write fails: **ERROR** 3) If write fails:

	+CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	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). The range of value is from 128 to 255.
<length>	Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (AT+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).
<stat>	1. Text Mode: "STO UNSENT" stored unsent message "STO SENT" stored sent message 2. PDU Mode: 2 stored unsent message 3 stored sent message

Examples

```
AT+CMGW=?                                   //TEXT MODE
OK
AT+CMGW="13012832788"
ABCD<ctrl-Z/ESC>
+CMGW:1

OK
```

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

8.2.16 AT+CMGD Delete Message

This command is used to delete 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> shown below.

AT+CMGD Delete Message	
Test Command **AT+CMGD=?**	Response **+CMGD:** (list of supported **<index>**s)[,(range of supported **<delflag>**s)] **OK**
Write Command **AT+CMGD=<index>[,<delflag>]**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<delflag>	0 (or omitted) Delete the message specified in <index>. 1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not) untouched. 2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and

	unsent mobile originated messages untouched. 3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched. 4 Delete all messages from preferred message storage including unread messages.

Examples

```
AT+CMGD=?
+CMGD: (1),(0-4)

OK
AT+CMGD=1
OK
```

8.2.17 AT+CMGMT Change Message Status

This command is used to change the message status. If the status is unread, it will be changed read. Other statuses don't change.

AT+CMGMT Change Message Status	
Test Command **AT+CMGMT=?**	Response **OK**
Write Command **AT+CMGMT=<index>**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

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

	associated memory and start with one.

Examples

```
AT+CMGMT=?
OK
AT+CMGMT=1
OK
```

8.2.18 AT+CMVP Set Message Valid Period

This command is used to set valid period for sending short message.

AT+CMVP Set Message Valid Period	
Test Command **AT+CMVP=?**	Response **OK**
Read Command **AT+CMVP?**	Response **+CMVP: <vp>** **OK**
Write Command **AT+CMVP=<vp>**	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<vp>	Validity period value: 0 to 143 (<vp>+1) x 5 minutes (up to 12 hours) 144 to 167 12 hours + (<vp>-143) x 30 minutes 168 to 196 (<vp>-166) x 1 day 197 to 255 (<vp>-192) x 1 week

Examples

```
AT+CMVP=?
OK
AT+CMVP=167
OK
AT+CMVP?
+CMVP: 167

OK
```

8.2.19 AT+CMGRD Read and Delete Message

This command is used to read message, and delete the message at the same time. It integrate AT+CMGR and AT+CMGD, but it doesn't change the message status.

AT+CMGRD Read and Delete Message	
Test Command **AT+CMGRD=?**	Response **OK**
Write Command **AT+CMGRD=<index>**	Response 1) If text mode(AT+CMGF=1),command successful and SMS-DE-LIVER: **+CMGRD:** **<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>** **OK** 2) If text mode(AT+CMGF=1),command successful and SMS-SU-BMIT: **+CMGRD:** **<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>** **OK** 3) If text mode(AT+CMGF=1),command successful and SMS-STA-TUS- REPORT:

	+CMGRD: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> **OK** 4) If text mode(AT+CMGF=1),command successful and SMS-CO-MMAND: **+CMGRD: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length><CR><LF><data>]** **OK** 5) If text mode(AT+CMGF=1),command successful and CBM storage: **+CMGRD: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>** **OK** 6) If PDU mode(AT+CMGF=0) and command successful: **+CMGRD: <stat>,[<alpha>],<length><CR><LF><pdu>** **OK** 7) **ERROR** 8) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

Refer to command AT+CMGR.	

Examples

```
AT+CMGRD=?
OK
AT+CMGRD=6
+CMGRD:"REC
READ","+8613917787249",,"06/07/10,12:09:3
```

```
8+32",145,4,0,0, "+86138002105 00",145,4
How do you do

OK
```

8.2.20 AT+CMGSEX Send Message

This command is used to send message from a TE to the network (SMS-SUBMIT).

AT+CMGSEX Send Message	
Test Command **AT+CMGSEX=?**	Response **OK**
Write Command If text mdoe(AT+CMGF=1): **AT+CMGSEX=<da>[,<toda>][,<mr>,<msg_seg>,<msg_total>]** Text is entered. <CTRL-Z/ESC>	Response 1) **OK** 2) **ERROR** 3) **+CMS ERROR: <err>**
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	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). The range of value is from 128 to 255.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<msg_seg>	The segment number for long sms
<msg_total>	The segment number for long sms

Examples

```
AT+CMGSEX=?
OK
AT+CMGSEX="13012832788",190,1,2
> ABCD<ctrl-Z/ESC>
+CMGSEX: 190

OK
AT+CMGSEX="13012832788",190,2,2
> EFGH<ctrl-Z/ESC>
+CMGSEX: 190

OK
```

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: For single SMS, it is 160 characters if the 7 bit GSM coding scheme is used; For multiple long sms, it is 153 characters if the 7 bit GSM coding scheme is used.

8.2.21 AT+CMSSEX Send Multi Messages from Storage

This command is used to send messages with location value <index1>,<index2>,<index3>… from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).The max count of index is 13 one time.

AT+CMSSEX Send Multi Messages from Storage	
Test Command **AT+CMSSEX=?**	Response **OK**
Write Command **AT+CMSSEX=<index>[,<index>[,…]]**	Response 1) **OK** 2) **ERROR** 3) If sending fails: **[+CMSSEX: <mr>[,<mr>[,…]]]**

	+CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<mr>	Message Reference

Examples

```
AT+CMSSEX=?
OK
AT+CMSSEX=0,1
+CMSSEX: 239,240

OK
AT+CMSSEX=0,1
+CMSSEX: 238
+CMS ERROR: Invalid memory index
```

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: For single SMS, it is 160 characters if the 7 bit GSM coding scheme is used.

9 AT Commands for Serial Interface

9.1 Overview of AT Commands for Serial Interface

Command	Description
AT&D	Set DTR function mode
AT&C	Set DCD function mode
AT+IPR	Set local baud rate temporarily
AT+IPREX	Set local baud rate permanently
AT+ICF	Set control character framing
AT+CSCLK	Control UART Sleep
AT+CMUX	Enable the multiplexer over the UART
AT+CATR	Configure URC destination interface
AT+CURCD	Configure the delay time and number of URC

9.2 Detailed Description of AT Commands for Serial Interface

9.2.1 AT&D Set DTR function mode

This command determines how the TA responds when DTR PIN is changed from the ON to the OFF condition during data mode.

AT&D Set DTR function mode	
Execution Command AT&D[<value>]	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<value>	0 TA ignores status on DTR. 1 ON->OFF on DTR: Change to Command mode with remaining the connected call. 2 ON->OFF on DTR: Disconnect call, change to Command mode.During state DTR = OFF is auto-answer off.

Examples

```
AT&D1
OK
```

9.2.2 AT&C Set DCD function mode

This command determines how the state of DCD PIN relates to the detection of received line signal from the distant end.

AT&C Set DCD function mode	
Execution Command **AT&C[<value>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<value>	0 DCD line shall always be on. 1 DCD line shall be on only when data carrier signal is present. 2 Setting the DCD line be on just 1 second after the data calls end.

Examples

```
AT&C1
OK
```

9.2.3 AT+IPR Set local baud rate temporarily

This command sets the baud rate of module's serial interface temporarily, after reboot the baud rate is set to value of IPREX.

AT+IPR Set local baud rate temporarily	
Test Command **AT+IPR=?**	Response **+IPR:** (list of supported **<speed>**s) **OK**
Read Command **AT+IPR?**	Response **+IPR: <speed>** **OK**
Write Command **AT+IPR=<speed>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+IPR**	Response Set the value to boot value: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<speed>	Baud rate per second: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600, 1842000, 3686400.

Examples

```
AT+IPR?
+IPR: 115200

OK
AT+IPR=?
+IPR:
```

```
(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1842000,3686400
)

OK
AT+IPR=115200
OK
```

9.2.4 AT+IPREX Set local baud rate permanently

This command sets the baud rate of module's serial interface permanently, after reboot the baud rate is also valid.

AT+IPREX Set local baud rate permanently	
Test Command **AT+IPREX=?**	Response **+IPREX:** (list of supported **<speed>**s) **OK**
Read Command **AT+IPREX?**	Response **+IPREX: <speed>** **OK**
Write Command **AT+IPREX=<speed>**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+IPREX**	Response Set default value 115200: **OK**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<speed>	Baud rate per second: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600, 1842000, 3686400.

Examples

```
AT+IPREX?
+IPREX: 115200

OK
AT+IPREX=?
+IPREX:
(300,600,1200,2400,4800,9600,19200,38400,5760
0,115200,230400,460800,921600,1842000,368640
0)

OK
AT+IPREX=115200
OK
```

9.2.5 AT+ICF Set control character framing

This command sets character framing which contains data bit, stop bit and parity bit.

AT+ICF Set control character framing	
Test Command **AT+ICF=?**	Response **+ICF:** (range of supported**<format>**s),(range of supported**<parity>**s) **OK**
Read Command **AT+ICF?**	Response **+ICF: <format>,<parity>** **OK**
Write Command **AT+ICF=<format>[,<parity>]**	Response 1) **OK** 2) **ERROR**
Execution Command **AT+ICF**	Response Set default value: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<format>	1	data bit 8, parity bit 1,stop bit 1.
	2	data bit 8, stop bit 1.
	3	data bit 7, parity bit 1,stop bit 1.
	4	data bit 7, stop bit 1.
<parity>	0	Odd
	1	Even
	2	none

Examples

```
AT+ICF?
+ICF: 2,2

OK
AT+ICF=?
+ICF: (1-4),(0-2)

OK
```

```
AT+ICF=2,2
OK
AT+ICF
OK
```

9.2.6 AT+CSCLK Control UART Sleep

This command is used to enable UART Sleep or always work, If set to 1, UART can sleep when DTR pull high. If set to 0, UART always work.

AT+CSCLK Control UART Sleep	
Test Command **AT+CSCLK=?**	Response **+CSCLK:** (range of supported **<status>**s) **OK**
Read Command **AT+CSCLK?**	Response **+CSCLK: <status>** **OK**
Write Command **AT+CSCLK=<status>**	Response 1) **OK**

	2) **ERROR**
Execution Command **AT+CSCLK**	Response Set <status>=0: **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<status>	0	Off
	1	On

Examples

```
AT+CSCLK?
+CSCLK: 0

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

OK
AT+CSCLK=1
OK
AT+CSCLK
OK
```

9.2.7 AT+CMUX Enable the multiplexer over the UART

This command is used to enable the multiplexer over the UART, after enabled four virtual ports can be used as AT command port or MODEM port, the physical UART can no longer transfer data directly under this case. By default all of the four virtual ports are used as AT command port. Second serial port is not support this command.

AT+CMUX Enable the multiplexer over the UART	
Test Command **AT+CMUX=?**	Response **+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)**

	OK
Read Command **AT+CMUX?**	Response **+CMUX: <value>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>** **OK**
Write Command **AT+CMUX=<value>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>]]]]]]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<value>	0 currently only 0 is supported (basic operation mode).
<subset>	Currently omitted
<port_speed>	Currently omitted, you can set speed before enable multiplexer
<N1>	1-1500
<T1>	Currently omitted
<N2>	Currently omitted
<T2>	2-1000

Examples

```
AT+CMUX?
+CMUX: 0,0,5,1500,0,0,600

OK
AT+CMUX=?
+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)

OK
AT+CMUX=0
OK
```

9.2.8 AT+CATR Configure URC destination interface

This command is used to configure the serial port which will be used to output URCs. We recommend

configure a destination port for receiving URC in the system initialization phase, in particular, in the case that transmitting large amounts of data, e.g. use TCP/UDP and MT SMS related AT command.

AT+CATR Configure URC destination interface	
Test Command **AT+CATR=?**	Response **+CATR:** (range of supported **<port>**s) **OK**
Read Command **AT+CATR?**	Response **+CATR: <port>** **OK**
Write Command **AT+CATR=<port>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<port>	0	all ports
	1	use UART port to output URCs
	2	use MODEM port to output URCs
	3	use ATCOM port to output URCs
	4	use cmux virtual port1 to output URCs
	5	use cmux virtual port2 to output URCs
	6	use cmux virtual port3 to output URCs
	7	use cmux virtual port4 to output URCs

Examples

```
AT+CATR?
+CATR: 0

OK
AT+CATR=?
+CATR: (0-7)

OK
AT+CATR=1
```

OK

9.2.9 AT+CURCD Configure the delay time and number of URC

This command is used to configure delay time when output URC and the number of cached URCs. You can control delay time if some URC supports delay output. You can also set size to store URCs, they will output together when the delay time ends. For Examples, if you set delay time to 10ms and set number to 1, there is only one URC output after 10ms.

AT+CURCD Configure the delay time and number of URC	
Test Command **AT+CURCD=?**	Response **+CURCD:** (range of supported **<delay_time>**ms),(range of supported **<cache_size>**s) **OK**
Read Command **AT+CURCD?**	Response **+CURCD: <delay_time>,<cache_size>** **OK**
Write Command **AT+CURCD=<delay_time>,<cache_size>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<delay_time>	0-10000
<cache_size>	1 currently only 1 is supported

Examples

AT+CURCD?
+CURCD: 0,1

OK
AT+CURCD=?

```
+CURCD: (0-10000),(1)

OK
AT+CURCD=100,1
OK
```

10 AT Commands for Hardware

10.1 Overview of AT Commands for Hardware

Command	Description
AT+CVALARM	Open or Close the Low Voltage Alarm
AT+CMTE	Control the Module Whether Power Shutdown When the Module's Temperature upon the Critical Temperature
AT+CPMVT	Low and High Voltage Power Off
AT+CRIIC	Read Values from Register of IIC Device nau8810
AT+CWIIC	Write Values to Register of IIC Device nau8810
AT+CBC	Read the Voltage Value of the Power Supply
AT+CPMUTEMP	Read the Temperature of the Module
AT+CGDRT	Set the Direction of Specified GPIO
AT+CGSETV	Set the Value of Specified GPIO
AT+CGGETV	Get the Value of Specified GPIO
AT+CGFUNC	Configure the Function of Specified GPIO

10.2 Detailed Description of AT Commands for Hardware

10.2.1 AT+CVALARM Low and High Voltage Alarm

This command is used to open or close the low voltage alarm function.

AT+CVALARM Low and High Voltage Alarm	
Test Command **AT+CVALARM=?**	Response **+CVALARM:** (list of supported **<enable>**s),(range of supported **<low voltage>**s),(range of supported **<high voltage>**s) **OK**
Read Command **AT+CVALARM?**	Response **+CVALARM: <enable>,<low voltage>,<high voltage>** **OK**

Write Command **AT+CVALARM=<enable>[,<low voltage>],[<high voltage>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	-

Defined Values

<enable>	0 Close 1 Open. If less than <low voltage>, it will report "UNDER-VOLTAGE WARNNING" every 10s. If voltage voltage greater than <high voltage>, it will report "OVER-VOLTAGE WARNNING" every 10s.
<low voltage>	Between 3300mV and 4000mV. Default value is 3300.
<high voltage>	Between 4001mV and 4300mV. Default value is 4300.

Examples

```
AT+CVALARM=1,3300,4300
OK
AT+CVALARM?
+CVALARM: 1,3300,4300

OK
AT+CVALARM=?
+CVALARM: (0,1),(3300-4000),(4001-4300)

OK
```

10.2.2 AT+CMTE Control the Module Critical Temperature URC Alarm

This command is used to control the module whether URC alarm when the module's temperature upon the critical temperature.

AT+CMTE Control the Module Critical Temperature URC Alarm	
Test Command **AT+CMTE=?**	Response **+CMTE: (**list of supported **<on/off>s)**

	OK
Read Command **AT+CMTE?**	Response **+CMTE: <on/off>** **OK**
Write Command **AT+CMTE=<on/off>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<on/off>	0	Disable temperature detection
	1	Enable temperature detection

Examples

```
AT+CMTE=?
+CMTE: (0,1)

OK
AT+CMTE=1
OK
AT+CMTE?
+CMTE: 1

OK
```

10.2.3 AT+CPMVT Related Low and High Voltage Causing Power Off

This command is used to open or close the low and high voltage power off function and set the threshold of power off voltage.

AT+CPMVT Related Low and High Voltage Power Off	
Test Command **AT+CPMVT=?**	Response **+CPMVT: (**list of supported **<enable>s),(**range of supported **<low**

	voltage>s),(range of supported **<high voltage>s)** **OK**
Read Command **AT+CPMVT?**	Response **+CPMVT: <enable>,<low voltage>,<high voltage>** **OK**
Write Command **AT+CPMVT=<enable>[,<low voltage>],[<high voltage>]**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	-

Defined Values

<enable>	0 Close 1 Open. If voltage less than <low voltage>, it will report "OVER-VOLTAGE WARNNING POWER DOWN" and reboot the module. If voltage greater than <high voltage>, it will report "UNDER-VOLTAGE WARNNING POWER DOWN" and reboot the module
<low voltage>	Between 3200mV and 4000mV. Default value is 3200.
<high voltage>	Between 4001mV and 4300mV. Default value is 4300.

Examples

```
AT+CPMVT=1,3200,4300
OK
AT+CPMVT?
+CPMVT: 1,3200,4300

OK
AT+CPMVT=?
+CPMVT: (0,1),(3200-4000),(4001-4300)

OK
```

10.2.4 AT+CRIIC Read Values from Register of IIC Device nau8810

This command is used to read values from register of IIC device nau8810.

AT+CRIIC Read Values from Register of IIC Device Nau8810	
Test Command **AT+CRIIC=?**	Response **OK**
Write Command **AT+CRIIC=<addr>,<reg>,<len>**	Response 1) **+CRIIC: <data>** **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<addr>	Device address. Input format must be hex, such as 0xFF (is not necessary to input "0x").
<reg>	Register address. Input format must be hex, such as 0xFF (is not necessary to input "0x").
<len>	Read length. Range:4; unit:byte.
<data>	Data read. Input format must be hex, such as 0xFFFF (is not necessary to input "0x").

Examples

```
AT+CRIIC=34,f,2
+CRIIC: 0xff

OK
AT+CRIIC=34,6,2
+CRIIC: 0x140

OK
```

10.2.5 AT+CWIIC Write Values to Register of IIC Device nau8810

This command is used to write values to register of IIC device nau8810.

AT+CWIIC Write Values to Register of IIC Device nau8810	
Read Command **AT+CWIIC=?**	Response **OK**
Write Command **AT+CWIIC=<addr>,<reg>,<data>,<len>**	1) **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<System Mode>	System mode, values: "NO SERVICE", "GSM", "WCDMA", "LTE"
<addr>	Device address. Input format must be hex, such as 0xFF (is not necessary to input "0x").
<reg>	Register address. Input format must be hex, such as 0xFF (is not necessary to input "0x").
<len>	Read length. Range: 4; unit: byte.
<data>	Data written. Input format must be hex, such as 0xFFFF (is not necessary to input "0x").

Examples

```
AT+CWIIC=34,6,141,2
OK
```

10.2.6 AT+CBC Read the Voltage Value of the Power Supply

This command is used to read the voltage value of the power supply.

AT+CBC Read the Voltage Value of the Power Supply	
Execution Command **AT+CBC**	Response 1) **+CBC: <vol>**

	OK 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<vol>	The voltage value, such as 3800mV.

Examples

```
AT+CBC
+CBC: 3749

OK
```

10.2.7 AT+CPMUTEMP Read the temperature of the module

This command is used to read the temperature of the module.

AT+CPMUTEMP Read the temperature of the module	
Execution Command **AT+CPMUTEMP**	Response **+CPMUTEMP: <temp>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<temp>	The Temperature value, such as 29000(one of thousand degree).

Examples

```
AT+CPMUTEMP
+CPMUTEMP: 15000

OK
```

10.2.8 AT+CGDRT Set the Direction of Specified GPIO

This command is used to set the specified GPIO to input or output state. If setting to input state, then this GPIO can not be set to high or low value.
The specified GPIO must be set as gpio function by using AT+CGFUNC before this AT command, otherwise an error will be returned.

AT+CGDRT Set the Direction of Specified GPIO	
Test Command **AT+CGDRT=?**	Response **+CGDRT: (**list of supported **<GPIO>s),(**range of supported **<gpio_io>s)** **OK**
Read Command **AT+CGDRT=<GPIO>**	Response 1) **+CGDRT: <GPIO>,<gpio_io>** **OK** 2) **ERROR**
Write Command **AT+CGDRT=<GPIO>,<gpio_io>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.
<gpio_io>	0 in 1 out

Examples

```
AT+CGDRT=?
+CGDRT: (2,3,5,6,7,8,10),(0-1)

OK
AT+CGDRT=3,0
OK
AT+CGDRT=3
+CGDRT: 3,0

OK
```

10.2.9 AT+CGSETV Set the Value of Specified GPIO

This command is used to set the value of the specified GPIO to high or low.
The specified GPIO must be set as gpio function by using AT+CGFUNC before this AT command, and this specified GPIO must be set as output, otherwise an error will be returned.

AT+CGSETV Set the Value of Specified GPIO	
Test Command **AT+CGSETV=?**	Response **+CGSETV:** (list of supported **<GPIO>**s),(range of supported **<gpio_hl>**s) **OK**
Write Command **AT+CGSETV=<GPIO>,<gpio_hl>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.
<gpio_hl>	0 Low 1 High

Examples

```
AT+CGSETV=?
+CGSETV: (2,3,5,6,7,8,10),(0-1)

OK
AT+CGSETV=3,0
OK
```

10.2.10 AT+CGGETV Get the Value of Specified GPIO

This command is used to get the value (high or low) of the specified GPIO.
The specified GPIO must be set as gpio function by using AT+CGFUNC before this AT command, otherwise an error will be returned.

AT+CGSETV Get the Value of Specified GPIO	
Test Command **AT+CGGETV=?**	Response **+CGGETV:** (list of supported **<GPIO>**s) **OK**
Write Command **AT+CGGETV=<GPIO>**	Response 1) **+CGGETV: <GPIO>,<gpio_hl>** **OK** 2) **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.
<gpio_hl>	0 Low 1 High

Examples

```
AT+CGGETV=?
+CGGETV: (2,3,5,6,7,8,10)

OK
AT+CGGETV=3
+CGGETV: 3,0

OK
```

10.2.11 AT+CGFUNC Configure the Function of Specified GPIO

This command is used to configure the function of the specified GPIO.

AT+CGFUNC Configure the Function of Specified GPIO	
Test Command **AT+CGFUNC=?**	Response **+CGFUNC:** (list of supported **<GPIO>**s),(range of supported **<function>**s) **OK**
Read Command **AT+CGFUNC=<GPIO>**	Response **+CGFUNC: <GPIO>,<function>** **OK** or **ERROR**
Write Command **AT+CGFUNC=<GPIO>,<function>**	Response **+CGFUNC: <GPIO>,<function>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.

<function>	0	GPIO function
	1	Other function

Examples

```
AT+CGFUNC=?
+CGFUNC: (2,3,5,6,7,8,10),(0-1)

OK
AT+CGFUNC=2,0

OK
```

10.3 Unsolicited result codes

URC	Description	AT Command
CMTE: <temp_level>	While module's temperature over the high threshold and below the low threshold, the URC will occur.	AT+CMTE
UNDER-VOLTAGE WARNING	This is a URC ALARM when Current voltage is UNDER the value which you set.	AT+CVALARM
OVER-VOLTAGE WARNING	This is a URC ALARM when Current voltage is OVER the value which you set.	AT+CVALARM
UNDER-VOLTAGE WARNING POWER DOWN	This is a URC ALARM when Current voltage is UNDER the value which you set.	AT+CPMVT
OVER-VOLTAGE WARNING POWER DOWN	This is a URC ALARM when Current voltage is OVER the value which you set.	AT+CPMVT

Defined Values

<temp_level>	-2	below -45 celsius degree.
	-1	(-45,-30] celsius degree.
	1	(80,85] celsius degree.
	2	over 85 celsius degree.

11 AT Commands for File Transmission

11.1 Overview of AT Commands for File Transmission

Command	Description
AT+FSCD	Select Directory as Current Directory
AT+FSMKDIR	Make New Directory in Current Directory
AT+FSRMDIR	Delete Directory in Current Directory
AT+FSLS	List Directories/files in Current Directory
AT+FSDEL	Delete File in Current Directory
AT+FSRENAME	Rename File in Current Directory
AT+FSATTRI	Request File Attributes
AT+FSMEM	Check the Size of Available Memory
AT+FSCOPY	Copy an Appointed File

11.2 Detailed Description of AT Commands for File System

11.2.1 AT+CFTRANRX Transfer a File to EFS

This command is used to transfer a file to EFS.Support "C:", "D:".

AT+CFTRANRX Transfer a File to EFS	
Test Command AT+CFTRANRX=?	Response **+CFTRANRX: FILEPATH** **OK**
Write Command AT+CFTRANRX="<filepath>",<len>	Response 1)If successfully: **>** **OK**

	2)If failed: **>** **ERROR** 3)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the file data to send. Because of the system resources, The length could not set too large. If use the UART to send data, it may can set to 3Mb. If use USB to send data, it may just can set to 200Kb. If limit the send speed, it can set larger. The actual size could not ensure. Usually it is safer to set a smaller size.

Examples

```
AT+CFTRANRX="c:/t1.txt",10
>

OK
AT+CFTRANRX="d:/MyDir/t1.txt",10
>

OK
```

NOTE

The <filepath> must be a full path with the directory path.

11.2.2 AT+CFTRANTX Transfer a File from EFS to Host

This command is used to transfer a file from EFS to host.

AT+CFTRANTX Transfer a File from EFS to Host

Test Command **AT+CFTRANTX=?**	Response **+CFTRANTX: FILEPATH** **OK**
Write Command **AT+CFTRANTX="<filepath>"[,<location>][,<size>]**	Response 1)If successfully: **[+CFTRANTX: DATA,<len>** **…** **+CFTRANTX: DATA,<len>]** **+CFTRANTX: 0** **OK** 2)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the following file data to output.
<location>	The beginning of the file data to output.
<size>	The length of the file data to output.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 2.2.1.

Examples

```
AT+CFTRANTX="c:/t1.txt"
+CFTRANTX: DATA, 11
Testcontent
+CFTRANTX: 0

OK
AT+CFTRANTX="d:/MyDir/t1.txt"
+CFTRANTX: DATA, 11
```

```
Testcontent
+CFTRANTX: 0

OK
AT+CFTRANTX="d:/MyDir/t1.txt",1,4
+CFTRANTX: DATA, 4
estc
+CFTRANTX: 0

OK
```

NOTE

The <filepath> must be a full path with the directory path.
If not set the size, it means range from location to the end of the file.
If the (size + location) lager than the file size, it means range from location to the end of the file.

12 AT Commands for UIM Hotswap

12.1 Overview of AT Commands for UIM hotswap

Command	Description
AT+UIMHOTSWAPON	Set UIM Hotswap Function on
AT+UIMHOTSWAPLEVEL	Set UIM Card Detection Level

12.2 Detailed Description of AT Commands for UIM Hotswap

12.2.1 AT+UIMHOTSWAPON Set UIM Hotswap Function On

AT+UIMHOTSWAPON Set UIM Hotswap Function On	
Test Command AT+UIMHOTSWAPON=?	Response 1) **+UIMHOTSWAPON:** (range of supported **<on/off>**s) **OK** 2) **ERROR**
Read Command AT+UIMHOTSWAPON?	Response 1) **+UIMHOTSWAPON: <onoff>** **OK** 2) **ERROR**
Write Command AT+UIMHOTSWAPON=<onoff>	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S

Reference	

Defined Values

<onoff>	0	The UIM hotswap function is disabled
	1	The UIM hotswap function is enabled

Examples

```
AT+UIMHOTSWAPON=?
+UIMHOTSWAPON: (0-1)

OK
AT+UIMHOTSWAPON?
+UIMHOTSWAPON: 0

OK
AT+UIMHOTSWAPON=1
OK
```

NOTE

Module reset to take effect

12.2.2 AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level

AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level	
Test Command **AT+UIMHOTSWAPLEVEL=?**	Response 1) **+UIMHOTSWAPLEVEL:** (range of supported **<level>**s) **OK** 2) **ERROR**
Read Command **AT+UIMHOTSWAPLEVEL?**	Response 1) **+UIMHOTSWAPLEVEL: <level>**

	OK 2) **ERROR**
Write Command **AT+UIMHOTSWAPLEVEL=<level>**	Response 1) **OK** 2) **ERROR**
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	

Defined Values

<level>	0 ACTIVE LOW 1 ACTIVE HIGH

Examples

```
AT+UIMHOTSWAPLEVEL=?
+UIMHOTSWAPLEVEL: (0-1)

OK
AT+UIMHOTSWAPLEVEL?
+UIMHOTSWAPLEVEL: 0

OK
AT+UIMHOTSWAPLEVEL=1
OK
```

NOTE

Module reset to take effect
UIM card detection level depends on the SIM card holder, usually it's a "normal open kind" one.
The default value 0

13 AT Commands for Internet Service

13.1 Overview of AT Commands for HTP and NTP

Command	Description
AT+CHTPSERV	Set HTP server info
AT+CHTPUPDATE	Updating date time using HTP protocol
AT+CNTP	Update system time

13.2 Detailed Description of AT Commands for HTP and NTP

13.2.1 AT+CHTPSERV Set HTP server information

This command is used to add or delete HTP server information. There are maximum 16 HTP servers.

AT+CHTPSERV Set HTP server information	
Test Command AT+CHTPSERV=?	Response **+CHTPSERV:"ADD","HOST",(1-65535),(0-1)["PROXY",(1-65535)]** **+CHTPSERV: "DEL",(0-15)** **OK**
Read Command AT+CHTPSERV?	Response **+CHTPSERV: <index>"<host>",<port>,<http_version>["<proxy>",<proxy_port>]** **…** **+CHTPSERV: <index>"<host>",<port>["<proxy>",<proxy_port>]** **OK**
Write Command AT+CHTPSERV="<cmd>","<host_or_idx>"[,<port>,<http_version>["<proxy>",<proxy_port>]]	Response a)If successfully: **OK** b)If failed: **ERROR**

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cmd>	This command to operate the HTP server list. "ADD": add a HTP server item to the list "DEL": delete a HTP server item from the list
<host_or_idx>	If the <cmd> is "ADD", this field is the same as <host>, length is 0-255, needs quotation marks; If the <cmd> is "DEL", this field is the index of the HTP server item to be deleted from the list, does not need quotation marks.
<host>	The HTP server address, length is 1-255.
<port>	The HTP server port, the range is (1-65535) .
<http_version>	The HTTP version of the HTP server: 0 HTTP 1.0 1 HTTP 1.1
<proxy>	The proxy address, length is 1-255.
<proxy_port>	The port of the proxy, the range is (1-65535).
<index>	The HTP server index.

Examples

```
AT+CHTPSERV="ADD","www.baidu.com",80,1
OK
```

13.2.2 AT+CHTPUPDATE Updating date time using HTP protocol

This command is used to updating date time using HTP protocol.

AT+CHTPUPDATE Updating date time using HTP protocol	
Test Command **AT+CHTPUPDATE=?**	Response **OK**
Read Command **AT+CHTPUPDATE?**	Response **+CHTPUPDATE: <status>** **OK**
Execute Command	Response

AT+CHTPUPDATE	a)If successfully: **OK** **+CHTPUPDATE: <err>** b)If failed: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<status>	The status of HTP module: Updating HTP module is synchronizing date time NULL HTP module is idle now
<err>	The result of the HTP updating

Examples

```
AT+CHTPUPDATE
OK

+CHTPUPDATE: 0
```

13.2.3 AT+CNTP Update system time

This command is used to update system time with NTP server.

AT+CNTP Update system time	
Test Command **AT+CNTP=?**	Response **+CNTP: "HOST",(-47~48)** **OK**
Read Command **AT+CNTP?**	Response **+CNTP: <host>,<timezone>** **OK**
Write Command **AT+CNTP="<host>"[,<timezone>]**	Response 1)If successfully: **OK**

	2)If failed: **ERROR**
Execute Command **AT+CNTP**	Response 1) If successfully: **+CNTP: <err_code>** **OK** 2) If failed: **+CNTP: <err_code>** **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<host>	NTP server address or hostname, length is 0-255.
<timezone>	Local time zone,the range is (-47 to 48), default value is 32.

Examples

```
AT+CNTP="ntp1.aliyun.com",32
OK
AT+CNTP
+CNTP: 0

OK
```

13.3 Command result codes

13.3.1 Unsolicited HTP Codes

Code of <err>	Meaning
0	Operation succeeded
1	Unknown error
2	Wrong parameter

3	Wrong date and time calculated
4	Network error

13.3.2 Unsolicited NTP Codes

Code of <err>	Meaning
0	Operation succeeded
1	Unknown error
2	Wrong parameter
3	Wrong date and time calculated
4	Network error
5	Time zone error
6	Time out error

14 Summary of ERROR Codes

14.1 Response string of AT+CEER

Number	Response string
CS internal cause	
0	Phone is offline
21	No service available
25	Network release, no reason given
27	Received incoming call
29	Client ended call
34	UIM not present
35	Access attempt already in progress
36	Access failure, unknown source
38	Concur service not supported by network
29	No response received from network
45	GPS call ended for user call
46	SMS call ended for user call
47	Data call ended for emergency call
48	Rejected during redirect or handoff
100	Lower-layer ended call
101	Call origination request failed
102	Client rejected incoming call
103	Client rejected setup indication
104	Network ended call
105	No funds available
106	No service available
108	Full service not available
109	Maximum packet calls exceeded
301	Video connection lost
302	Video call setup failure
303	Video protocol closed after setup
304	Video protocol setup failure
305	Internal error

CS network cause	
1	Unassigned/unallocated 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/incomplete number
29	Facility rejected
30	Response to Status Enquiry
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Incoming calls barred within the CUG
57	Bearer capability not authorized
58	Bearer capability not available
63	Service/option not available
65	Bearer service not implemented
68	ACM >= ACMmax
69	Requested facility not implemented
70	Only RDI bearer is available
79	Service/option not implemented
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information

97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented
100	Conditional IE error
101	Message not compatible with state
102	Recovery on timer expiry
111	Protocol error, unspecified
117	Interworking, unspecified
CS network reject	
2	IMSI unknown in HLR
3	Illegal MS
4	IMSI unknown in VLR
5	IMEI not accepted
6	Illegal ME
7	GPRS services not allowed
8	GPRS & non GPRS services not allowed
9	MS identity cannot be derived
10	Implicitly detached
11	PLMN not allowed
12	Location Area not allowed
13	Roaming not allowed
14	GPRS services not allowed in PLMN
15	No Suitable Cells In Location Area
16	MSC temporarily not reachable
17	Network failure
20	MAC failure
21	Synch failure
22	Congestion
23	GSM authentication unacceptable
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of orde
38	Call cannot be identified
40	No PDP context activated
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent
98	Message type not compatible with state
99	Information element non-existent
101	Message not compatible with state

161	RR release indication
162	RR random access failure
163	RRC release indication
164	RRC close session indication
165	RRC open session failure
166	Low level failure
167	Low level failure no redial allowed
168	Invalid SIM
169	No service
170	Timer T3230 expired
171	No cell available
172	Wrong state
173	Access class blocked
174	Abort message received
175	Other cause
176	Timer T303 expired
177	No resources
178	Release pending
179	Invalid user data
PS internal cause lookup	
0	Invalid connection identifier
1	Invalid NSAPI
2	Invalid Primary NSAPI
3	Invalid field
4	SNDCP failure
5	RAB setup failure
6	No GPRS context
7	PDP establish timeout
8	PDP activate timeout
9	PDP modify timeout
10	PDP inactive max timeout
11	PDP lowerlayer error
12	PDP duplicate
13	Access technology change
14	PDP unknown reason
PS network cause	
25	LLC or SNDCP failure
26	Insufficient resources
27	Missing or unknown APN

28	Unknown PDP address or PDP type
29	User Aauthentication failed
30	Activation rejected by GGSN
31	Activation rejected, unspecified
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
35	NSAPI already used (not sent)
36	Regular deactivation
37	QoS not accepted
38	Network failure
39	Reactivation required
40	Feature not supported
41	Semantic error in the TFT operation
42	Syntactical error in the TFT operation
43	Unknown PDP context
44	PDP context without TFT already activated
45	Semantic errors in packet filter
46	Syntactical errors in packet filter
81	Invalid transaction identifier
95	Semantically incorrect message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented
100	Conditional IE error
101	Message not compatible with state
111	Protocol error, unspecified

14.2 Summary of CME ERROR codes

This result code is similar to the regular ERROR result code. The format of <err> can be either numeric or verbose string, by setting AT+CMEE command.

Code of <err>	Meaning
1	Unassigned(unallocated) number
3	No route to destination
6	Channel unacceptable

8	Operator determined barring
10	Call barred
11	Reserved
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Short message transfer rejected
22	Number changed
25	Pre-emption
26	Non-selected user clearing
27	Destination out of service
28	Invalid number format (incomplete number)
29	Facility rejected
30	Response to STATUS ENQUIRY
32	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment Congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable
50	Requested facility not subscribed
55	Requested facility not subscribed
57	Bearer capability not authorized
58	Bearer capability not presently available
63	Service or option not available, unspecified
65	Bearer service not implemented
68	ACM equal or greater than ACM maximum
69	Requested facility not implemented
70	Only restricted digital information bearer capability is available
79	Service or option not implemented, unspecified
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
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 information element error
101	Message not compatible with protocol
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified
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 acted
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
212	SIM Application Toolkit Busy
213	SIM data download error
224	CP retry exceed
225	RP trim timeout
226	SMS connection broken
255	Unspecified error cause
300	ME failure
301	SMS reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode

305	invalid text mode
310	SIM not inserted
311	SIM pin necessary
312	PH SIM pin necessary
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
323	invalid input parameter
324	invalid input format
325	invalid input value
330	SMSC address unknown
331	no network
332	network timeout
340	no cnma ack
500	Unknown
512	SMS no error
513	Message length exceeds maximum length
514	Invalid request parameters
515	ME storage failure
516	Invalid bearer service
517	Invalid service mode
518	Invalid storage type
519	Invalid message format
520	Too many MO concatenated messages
521	SMSAL not ready
522	SMSAL no more service
523	Not support TP-Status-Report & TP-Command in storage
524	Reserved MTI
525	No free entity in RL layer
526	The port number is already registered
527	There is no free entity for port number
528	More Message to Send state error
529	MO SMS is not allow
530	GPRS is suspended
531	ME storage full

532	Doing SIM refresh

Examples

```
AT+CPIN="1234","1234"
+CME ERROR: SIM failure
```

14.3 Summary of CMS ERROR codes

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. The format of <err> can be either numeric or verbose. This is set with command AT+CMEE.

Code of <err>	Meaning
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 ACK EXPECTED

341	Buffer overflow
342	SMS size more than expected
500	unknown error

Examples

```
AT+CMGS=02112345678
+CMS ERROR: 304
```