



A7908 Series_AT Command Manual

LTE Module

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1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom A1803 Open Linux Series, including A76XXX-XXXX.

A1803 Open Linux Series is a secondary development project, it is not recommended to use AT instruction, please try to use API interface.

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.
<u>underline</u>	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 in `usersetting_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 A1803 Open Linux 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 A1803 Open Linux Series AT Command interface defaults to the **IRA** character set. The A1803 Open Linux 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.

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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
ATI	Display Product Identification Information
ATE	Enable Command Echo
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
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	Response
A/	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

	Response
	1) Originate a voice call successfully: OK VOICE CALL:BEGIN
	Originate a data call successfully: CONNECT [<text>]
Execution Command	Originate a call unsuccessfully during command execution: ERROR
ATD<n>[<mgs>][;]	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: 0-9,*, #,+,A,B,C Following V.25ter modifiers are ignored: ,(comma),T,P,!,W,@
Emergency call:	
<n>	Standardized emergency number 112 (no SIM needed)
<mgsn>	String of GSM modifiers: l Activates 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/ATV/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 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 INCORPORATED
Model: A7606E-H
Revision: A76xxMA_V5.0
IMEI: 865771056566706
```

OK

2.2.4 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
```

2.2.5 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.

2.2.6 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	Response
AT&F[<value>]	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	V.25ter

Defined Values

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

2.2.7 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	Response
ATQ<n>	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

2.2.8 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
```

2.2.9 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

2.2.10 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	Response
AT+CGMI=?	OK
Execution Command	Response
AT+CGMI	<manufacturer>
	OK
Parameter Saving Mode	-
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<manufacturer>	The identification of manufacturer.
----------------	-------------------------------------

Examples

AT+CGMI

SIMCOM INCORPORATED

OK

AT+CGMI=?

OK

2.2.11 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
A7600E-H

OK
AT+CGMM=?
OK
```

2.2.12 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: A7334B01A76xxMA_Linux_SDK

OK
AT+CGMR=?
OK
```

2.2.13 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
```

2.2.14 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

<chset>	Character set, the definition as following: "IRA" International reference alphabet. "GSM" GSM default alphabet; this setting causes easily software flow control (XON /XOFF) problems. "<u>UCS2</u>" 16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF. "HEX" Character strings consist only of hexadecimal number from 00 to FF.
---------	---

Examples

AT+CSCS="IRA"

OK

AT+CSCS?

+CSCS: "IRA"

OK

AT+CSCS=?

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

OK

AT+CSCS

OK

2.2.15 AT+GCAP Request Overall Capabilities

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

AT+GCAP Request Overall Capabilities

Test Command	Response
AT+GCAP=?	1) OK
	2) ERROR

Execution Command AT+GCAP	Response
	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. +CGSMGSM function is supported +FCLASSFAX function is supported +DSData 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+CRESET	Reset the Module
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)

Write Command AT+CFUN=<fun>[,<rst>]	ERROR 3) +CME ERROR: <err>
	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
	<u>1</u>	full functionality
	4	disable phone both transmit and receive RF circuits
	5	disable SIM
	6	Reset
	7	Offline Mode
<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=?
+CFCUN: (0,1,4,5,6,7),(0-1)
```

```
OK
AT+CFUN?
+CFCUN: 1
```

```
OK
AT+CFUN=1
OK
```

3.2.2 AT+CSQ Query Signal Quality

This command is used to return received signal strength indication <rss> 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<rss>s),(list of supported<ber>s) OK
Execution Command AT+CSQ	Response 1) +CSQ: <rss>,<ber> OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<rss>	0	-113dBm or less
	1-11	11dBm
	2-30	-109--- -53dBm
	31-51	31dBm 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+CRESET Reset the Module

This command is used to reset the module.

AT+CRESET Reset the Module

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

Examples

AT+CRESET=?

OK

AT+CRESET

OK

3.2.4 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	Response
AT+CCLK=?	OK
Read Command	Response
AT+CCLK?	+CCLK: <time>
	OK

Write Command AT+CCLK=<time>	Response
	1) OK
	2) ERROR
	3) +CME ERROR: <err>
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".

3.2.5 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

3.2.6 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 +SIMEI: (15) 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=?

+SIMEI: (15)

OK

AT+SIMEI?

+SIMEI: 352099001761482

OK

AT+SIMEI=352099001761482

OK

SIMCom
Confidential

4 AT Commands for Network

4.1 Overview of AT Commands for Network

Command	Description
AT+CREG	Network Registration
AT+COPS	Operator Selection
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 $\langle n \rangle = 1$ and there is a change in the ME network registration status, or code **+CREG: <stat>[,<lac>,<ci>]** when $\langle n \rangle = 2$ and there is a change of the network cell.

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

AT+CREG Network Registration

Test Command AT+CREG=?	Response +CREG: (list of supported $\langle n \rangle$ s) OK
Read Command	Response

AT+CREG?	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>,<AcT>] 3 enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[,<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]
<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: (0-3)
```

```
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+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)

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

Defined Values

<mode>	<u>2</u>	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.

4.2.4 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	AUTO_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) 7 GSM_DCS_1800 8 GSM_EGSM_900 9 GSM_PGSM_900 16 GSM_450 17 GSM_480 18 GSM_750 19 GSM_850 20 GSM_RGSM_900 21 GSM_PCS_1900 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).

4.2.5 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>,<RSS NR>]
	OK 3) If no service: +CPSI: NO SERVICE, Online
Parameter Saving Mode	OK 4)
	ERROR
	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 (RSRP report value -140) dBm. Available for LTE
<RSRQ>	The signal reception quality is: (RSRQ report value -40)/2 dBm.
<RSSI>	Received signal strength indicator value: (RSSI report value -110) dBm.
<RSSNR>	Average reference signal signal-to-noise ratio of the serving cell

Examples

AT+CPSI?

+CPSI: LTE,Online,460-00,0x333C,39589680,308,EUTRAN-BAND3,1350,5,5,21,61,60,13

OK

4.2.6 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)

Examples

AT+CNSMOD=?

+CNSMOD: (0,1)

OK

AT+CNSMOD?

+CNSMOD: 0,8

OK

AT+CNSMOD=0

OK

4.2.7 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.

4.2.8 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 disables automatic reporting of nitz 1 Enable automatic reporting of nitz, and the reporting format is +CTZV: "+32" (that is, only the time zone in the reported information) 2 Enable automatic reporting of nitz, and the reporting format is +CTZE: "+32",0,"2024/01/19,15:20:51" (that is, there is both a time

zone and a specific time in the reported information)

Examples

AT+CTZR=?

+CTZR: (0-2)

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

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 network registration status, or code
+CGREG: <stat>[,<lac>,<ci>,<AcT>], when <n>=2 and there is a change of the network cell in GERAN/UTRAN. The parameters <AcT>, <lac>, <rac> and <ci> are provided only if available. The value <n>=3 further extends the unsolicited result code with **[,<cause_type>,<reject_cause>]**, when available, when the value of <stat> changes.

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>,<AcT>,<rac>] [,<cause_type>,<reject_cause>] 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	enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>,<AcT>,<rac>]
	3	enable network registration, location information and GMM cause value information unsolicited result code +CGREG: <stat>[,<lac>,<ci>,<AcT>,<rac>]

	[,<cause_type>,<reject_cause>]]
<stat>	0 not registered, MT is not currently searching a new operator to register to 1 egistered, 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) (notapplicable) 9 registered for "CSFB not preferred", home network (applicableonly when <AcT> indicates E-UTRAN) 10 registered for "CSFB not preferred", roaming (applicable onlywhen <AcT> indicates E-UTRAN) 11 only emergency services are available. 12 registration 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 value <n>=3 further extends the unsolicited result code with **[,<cause_type>,<reject_cause>]**, when available, when the value of <stat> changes.

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>[,<tac>],[<ci>],[<AcT>,<cause_type>,<reject_cause>]]] 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>]] 3 enable network registration, location information and EMM cause value information unsolicited result code +CEREG:<stat>,[<tac>],[<ci>],[<AcT>],[<cause_type>,<reject_cause>]]
<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 NOTE2) 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 numeric 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 NOTE3) (not applicable) 4 UTRAN w/HSDPA (see NOTE4) (not applicable) 5 UTRAN w/HSUPA (see NOTE4) (not applicable) 6 UTRAN w/HSDPA and HSUPA (see NOTE4) (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 +CEREG command and +CEREG: 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	Response

AT+CGACT=<state>[,<cid>]	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. 0-15
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.

	IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack PPP Point-to-Point Protocol
<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_In d>	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: (0-15),"IP",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT: (0-15),"IPV6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT: (0-15),"IPV4V6",,,(0-3),(0-4),(0,1),(0,1),(0-2),(0,1)

+CGDCONT: (0-15),"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+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	Response
--------------	----------

AT+CGPADDR=?	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 4) +CME ERROR: <err>
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

5.2.7 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	Response
AT+CGAUTH=?	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+CIMI	Request International Mobile Subscriber Identity

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+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> 2) OK 3) 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.

7 AT Commands for Phonebook

7.1 Overview of AT Commands for Phonebook

Command	Description
AT+CNUM	Subscriber Number

7.2 Detailed Description of AT Commands for Phonebook

7.2.1 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 <length>; character set as specified by command Select TE Character Set AT+CSCS.

Examples

```
AT+CNUM=?
```

```
OK
```

```
AT+CNUM
```

```
+CNUM: "", "+8618623138735", 145
```

```
OK
```

8 AT Commands for SMS

8.1 Overview of AT Commands for SMS

Command	Description
AT+CPMS	Preferred Message Storage
AT+CMGF	Select SMS Message Format
AT+CSCA	SMS Service Centre Address
AT+CSMP	Set Textmode Parameters
AT+CSDH	Show Textmode Parameters
AT+CNMI	New Message Indications to TE
AT+CMGL	List SMS Messages from Preferred Store
AT+CMGR	Read Message
AT+CMGS	Send Message
AT+CMGD	Delete Message

8.2 Detailed Description of AT Commands for SMS

8.2.1 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)

Read Command AT+CPMS?	OK Response +CPMS: <code><mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3></code>
Write Command AT+CPMS=<mem1>[,<mem2>[,<mem3>]]	OK Response 1) +CPMS: <code><used1>,<total1>,<used2>,<total2>,<used3>,<total3></code> 2) ERROR 3) +CMS ERROR: <code><err></code>
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
```

8.2.2 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

8.2.3 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 3) +CMS ERROR: <err>
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
```

8.2.4 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>,<dc>
Write Command AT+CSMP=<fo>[,<vp>[,<pid>[,<dc>]]]	OK 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

<fo>	Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 33), 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).
<dc>	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

8.2.5 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>

Write Command AT+CSDH=<show>	OK
	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

<show>	0 Do not show header values defined in commands AT+CSCA and AT+CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dc>) 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

```

8.2.6 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 <code><mode>s</code>),(list of supported <code><mt>s</code>),(list of supported <code><bm>s</code>),(list of supported <code><ds>s</code>),(list of supported <code><bfr>s</code>) OK
Read Command AT+CNMI?	Response +CNMI: <code><mode></code> , <code><mt></code> , <code><bm></code> , <code><ds></code> , <code><bfr></code> 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: <code><mem3></code>,<code><index></code>. 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>,<dcsc>,<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>,<dcsc>,<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: (0,1,2),(0,1,2,3),(0,2),(0,1,2),(0,1)

OK

AT+CNMI=2,1

OK

8.2.7 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

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>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data>[<CR><LF>

+CMGL:

<index>,<stat>,<oa>/<da>,<[alpha]>,<[scts]>,<[tooa>/<toda>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>]<CR><LF><data>[...]

Read Command

AT+CMGL=<stat>

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 zero.

<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 <toa>.
<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 <toa>.
<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>).
<toa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toa>).
<toa>	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 <dc> 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 <dc> 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 <dc> 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 <dc> 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
```

8.2.8 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

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:

Write Command

AT+CMGR=<index>

	<stat>,<fo>,<ct>[,<pid>,<mn>,<da>,<toa>,<length>]<CR><LF><data> OK 4) If text mode (AT+CMGF=1), command successful and CBM storage: +CMGR: <stat>,<sn>,<mid>,<dc>,<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) ERROR 7) +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 <toa>.
<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>).
<toa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toa>).
<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
<dc>	Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<sc>	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 <toa>).
<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 <dc> 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 <dc> 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 <dc> 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 <dc> 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 <tda>.
<tda>	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 <tda>)
<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
```

8.2.9 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.	+CMGS: <mr>
<CTRL-Z/ESC>	OK
If PDU mode(AT+CMGF=0)	2)
AT+CMGS=<length>	If cancel sending:
PDU is entered	OK
<CTRL-Z/ESC>	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 <tda>.
<tda>	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.

8.2.10 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

9 AT Commands for Serial Interface

9.1 Overview of AT Commands for Serial Interface

Command	Description
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

9.2 Detailed Description of AT Commands for Serial Interface

9.2.1 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+IPRSet 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, <u>115200</u> , 230400, 460800, 921600.
---------	--

Examples

AT+IPR?

+IPR: 115200

OK

AT+IPR=?

+IPR:(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600)

OK

AT+IPR=115200

OK

NOTE

Automatic baud rate is not supported.

9.2.2 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+IPREXSet local baud rate permanently

Test Command	Response
--------------	----------

AT+IPREX=?	+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, <u>115200</u> , 230400, 460800, 921600.
----------------------	--

Examples

AT+IPREX?

+IPREX: 115200

OK

AT+IPREX=?

+IPREX:(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600)

OK

AT+IPREX=115200

OK

9.2.3 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+CSCLKControl 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

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+CBC	Read the Voltage Value of the Power Supply

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	Response

AT+CVALARM?	+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>	<u>0</u>	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	NOTE: It is not saved by default
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+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

10.3 Unsolicited result codes

URC	Description	AT Command
CMTE: <temp_level>	While module's temperature over the high	AT+CMTE

	threshold and below the low threshold, the URC will occur.	
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 Summary of ERROR Codes

11.1 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
```

11.2 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

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