



A7600 Series_ AT Command Manual

LTE Module

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Document Title:	A7600 Series_AT Command Manual
Version:	1.01
Date:	2020.6.19
Status:	Released

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Version History

Version	Date	Chapter	Description
V1.00	2019.5.15		New version
V1.01	2019.5.20	5.2.9 AT+CGEQREQ 5.2.10 AT+CGEQMIN	Modify these commands
	2019.5.22	9.2.9 AT+CNMI 14.2.1 AT+CHTTPSERV 14.2.3 AT+CNTP	Modify these commands
	2019.6.5	2.2.15 AT&W 2.2.16 ATZ	Modify these commands
	2019.6.17	2.2.10 AT&V 9.2.4 AT+CSCA 9.2.6 AT+CSMP 8.2.4 AT+CPBW 8.2.5 AT+CNUM 5.2.14 AT+CGCLASS 14.2.1 AT+CHTTPSERV 14.2.3 AT+CNTP	Modify these commands
	2019.7.8	8.2.5 AT+CNUM 14.2.3 AT+CNTP	Modify these commands
	2019.8.9	5.2.17 AT+CPING	Add this command
	2019.8.9	2.2.8 ATI 2.2.14 ATX 2.2.18 AT+CGMM 2.2.19 AT+CGMR 4.2.2 AT+COPS 5.2.4 AT+CGACT 5.2.5 AT+CGDCONT 5.2.7 AT+CGTFT 5.2.9 AT+CGEQREQ 5.2.11 AT+CGEQMIN 12.2.1 AT+FSCD 13.2.1 AT+CFTRANRX 13.2.2 AT+CFTRANRX	Modify these commands
	2019.12.11	4.2.2 AT+COPS	Modify this command
	2019.12.25	8.2.5 AT+CNUM	Modify this command
	2020.1.7	4.2.7 AT+CNMP	Modify this command
2020.3.6	5.2.11 AT+CGEQMIN	Modify this command	
2020.3.11	4.2.7 AT+CNMP	Modify this command	

2020.3.23	15 AT Commands for TCPIP 16 AT Commands for HTTP(S) 17 AT Commands for FTP(S) 18 AT Commands for MQTT(S) 19 AT Commands for SSL 20 AT Commands for TTS 21 AT Commands for AMR 22 AT Commands for SFOTA	Add Chapter 15/16/17/18/19/21/22/23 and reconstruct the chapters
2020.4.1	7 AT Commands for Call Control	Add Chapter 7 and reconstruct the chapters
2020.4.10	8.2.5 AT+CNUM	Modify this command
2020.4.20	5.2.7 AT+CGTFT	Modify this command
2020.4.20	5.2.1 AT+CGREG	Modify this command
2020.4.20	4.2.2 AT+COPS 4.2.3 AT+CUSD 4.2.4 AT+CSSN 4.2.7 AT+CNMP 4.2.10 AT+CNSMOD 4.2.11 AT+CTZU 4.2.12 AT+CTZR	Modify these commands
2020.4.26	18.2.3 AT+CMQTTACCQ 18.2.8 AT+CMQTTCONNECT 18.2.9 AT+CMQTTDISC 18.2.10 AT+CMQTTTOPIC 18.2.11 AT+CMQTTPAYLOAD 18.2.14 AT+CMQTTSUB 18.2.16 AT+CMQTTUNSUB 18.2.17 AT+CMQTTCFG	Modify these commands
2020.4.26	12.2.5 AT+FSDEL 12.2.6 AT+FSRENAME 12.2.8 AT+FSMEM 12.2.9 AT+FSCOPY	Modify these commands
2020.4.26	10.2.10 AT+CFGRI	Modify this command
2020.4.26	10.2.11 AT+CURCD	Modify this command
2020.4.26	21.2.1 AT+CCMXPLAY	Modify this command
2020.4.27	3.2.4 AT+CSQDELTA	Modify this command
2020.4.16	12 AT Commands for File System 13 AT Commands for File Transmission	Add Notes to these chapters
2020.4.29	10.2.10 AT+CFGRI 17.2.2 AT+CFTPSSSTOP 17.2.9 AT+CFTPSPWD 17.2.14 AT+CFTPSPUT 17.2.15 AT+CFTPSSINGLEIP 17.2.17 AT+FTPSTYPE	Modify these commands

2020.5.6	21.2.1 AT+CCMXPLAY 21.2.2 AT+CCMXSTOP	Modify these commands
2020.5.8	12.2 Detailed Description of AT Commands for File System	Add description to this section
2020.5.11	3.2.1 AT+CFUN 3.2.3 AT+AUTOCSQ 3.2.4 AT+CSQDELTA 3.3.10 AT+CCLK 3.3.11 AT+CMEE 4.2.7 AT+CNMP 4.2.9 AT+CPSI 5.2.2 AT+CEREG 5.2.3 AT+CGATT 5.2.4 AT+CGACT 5.2.5 AT+CGDCONT 5.2.6 AT+CGDSCONT 5.2.8 AT+CGQREQ 5.2.9 AT+CGEQREQ 5.2.10 AT+CGQMIN 5.2.11 AT+CGEQMIN 5.2.15 AT+CGEREP 5.2.16 AT+CGAUTH 8.2.5 AT+CNUM	Modify these commands
2020.5.12	2.2.5 ATSO 2.2.21 AT+CSCS 6.2.4 AT+CPWD 6.2.7 AT+CRSM 19.2.2 AT+CCERTDOWN 19.2.12 AT+CCHOPEN	Modify these commands
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.2020.5.19	6.2.11 AT+UIMHOTSWAPON 6.2.11 AT+UIMHOTSWAPLEVEL	Add these commands
2020.5.20	18 AT Commands for MQTT(S)	Modify this chapter
2020.5.20	3.2.11 AT+CMEE 4.2.4 AT+CSSN 4.2.6 AT+COPN 5.2.7 AT+CGTFT 5.2.15 AT+CGEREP 5.2.16 AT+CGAUTH 5.2.17 AT+CGPIN 8.2.5 AT+CNUM 17.2.16 AT+CFTPSSIZE	Modify these commands
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2020.5.26	21.AT Commands for Audio	Modify this chapter
2020.5.26	22.2.3 AT+CREC	Add this command
2020.5.27	17.2.16 AT+CFTPSSIZE	Modify this command
2020.5.28	5.2.1 AT+CGREG 5.2.2 AT+CEREG	Modify these commands
2020.5.29	6.2.2 AT+CPIN 6.2.3 AT+CLCK 6.2.4 AT+CPWD	Modify these commands
2020.5.29	12.2.9 AT+FSCOPY 13.2.1 AT+CFTRANRX 13.2.2 AT+CFTRANRX	Modify these commands
2020.5.29	18.2.9 AT+CMQTTDISC	Modify this command
2020.6.1	3.2.1 AT+CFUN 3.2.2 AT+CSQ 3.2.3 AT+AUTOCSQ 4.2.1 AT+CREG 4.2.3 AT+CUUSD 4.2.5 AT+CPOL 4.2.11 AT+CTZU	Modify these commands

	4.2.12	AT+CTZR	
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2020.6.2	21.2.1	AT+CCMXPLAY	Modify this command
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2020.6.4	12.2.3 12.2.4 12.2.8 12.2.9 13.2.1	AT+FSRMDIR AT+FSLs AT+FSMEM AT+FSCOPY AT+CFTRANRX	Modify these commands
2020.6.10	5.2.13 15.2.3 15.2.6 15.2.9	AT+CGPADDR AT+CIPOPEN AT+CIPCLOSE AT+CIPSRI	Modify these commands
2002.6.19	All		

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

1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom A7600 Series, including A7600XX-XXXX, A5360E, and A7670X.

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

- [1] A7600 Series_TCPIP_Application_Note
- [2] A7600 Series_HTTP(S)_Application_Note
- [3] A7600 Series_FTP(S)_Application_Note
- [4] A7600 Series_MQTT(S)_Application_Note
- [5] A7600 Series_SSL_Application_Note
- [6] A7600 Series_AUDIO_Application_Note

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:

- 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; Data Circuit terminating 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. Definitions

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

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

- ◆ **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.

◆ Max Response Time

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

2. 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 A7600 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 A7600 Series AT Command interface defaults to the **IRA** character set. The A7600 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
AT	Repeat last command
ATD	Dial command
ATA	Call answer
ATH	Disconnect existing call
ATSO	Automatic answer incoming call
+++	Switch from data mode to command mode
ATO	Switch from command mode to data mode
ATI	Display product identification information
ATE	Enable command echo
AT&V	Display current configuration
ATV	Set result code format mode
AT&F	Set all current parameters to manufacturer defaults
ATQ	Set Result Code Presentation Mode
ATX	Set number of seconds to wait for connection completion
AT&W	Save the user setting to ME
ATZ	Restore the user setting from ME
AT+CGMI	Request manufacturer identification
AT+CGMM	Request model identification
AT+CGMR	Request revision identification
AT+CGSN	Request product serial number identification
AT+CSCS	Select TE character set
AT+GCAP	Request overall capabilities

2.2 Detailed Description of AT Commands for V.25TERNetwork

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? //just for show the A/ command
+CPIN: READY

OK
A/
+CPIN: READY

OK

```

2.2.2 ATD Dial command

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

ATD Mobile Originated Call to Dial A Number

Execution Command	Response
ATD<n>[<mgsms>][:]	1) Originate a voice call successfully: OK VOICE CALL:BEGIN
	Originate a data call successfully: CONNECT [<text>]
	Originate a call unsuccessfully during command execution:

	<p>ERROR</p> <p>Originate a call unsuccessfully for failed connection recovery: NO CARRIER</p> <p>Originate a call unsuccessfully for error related to the MT: +CME ERROR: <err></p>
Parameter Saving Mode	-
Max Response Time	-
Reference	-

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)
<mgsms>	String of GSM modifiers: I 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 command.
<err>	Service failure result code string; the string formats please refer +CME ERROR result code and AT+CME command.

Examples

```
ATD10086;
OK
VOICE CALL:BEGIN
```


NOTE

- 1.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.Auto-sending DTMF after character “P” or “p” should be ASCII character in the set 0-9, *, #.

2.2.3 ATA Call answer

This command is used to make remote station to go off-hook, e.g. answer an incoming call. If there is no an incoming call and entering this command to TA, it will be return “NO CARRIER” to TA.

ATA Call answer

Execution Command ATA	Response 1)For voice call: OK VOICE CALL: BEGIN 2)For data call, and TA switches to data mode: CONNECT 3)No connection or no incoming call: NO CARRIER
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Examples

```
ATA
VOICE CALL: BEGIN

OK
```

2.2.4 ATH Disconnect existing call

This command is used to disconnect existing call. Before using ATH command to hang up a voice call, it must set AT+CVHU=0. Otherwise, ATH command will be ignored and “OK” response is given only. This command is also used to disconnect PS data call, and in this case it doesn’t depend on the value of

AT+CVHU.

ATH Disconnect existing call

Execution Command ATH	Response If AT+CVHU=0: VOICE CALL: END: <time> OK
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Examples

```

AT+CVHU=0
OK
ATH
VOICE CALL:END:000017

OK

```

2.2.5 ATSO Automatic answer incoming call

The S-parameter command controls the automatic answering feature of the Module. If set to 000, automatic answering is disabled, otherwise it causes the Module to answer when the incoming call indication (RING) has occurred the number of times indicated by the specified value; and the setting will not be stored upon power-off, i.e. the default value will be restored after restart.

ATSO Automatic answer incoming call

Read Command ATSO?	Response 1) <n> OK 2) ERROR
Write Command ATSO=<n>	Response 1) OK 2) ERROR

Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	-

Defined Values

<n>	<u>000</u>	Automatic answering mode is disable. (default value when power-on)
	001–255	Enable automatic answering on the ring number specified.

Examples

ATS0=003

OK

ATS0?

000

OK

NOTE

The S-parameter command is effective on voice call and data call. If <n> is set too high, the remote party may hang up before the call can be answered automatically.

2.2.6 +++ Switch from data mode to command mode

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

+++ Switch from data mode to command mode

Execution Command	Response
+++	OK
Parameter Saving Mode	-
Max Response Time	-

Reference -

Examples

+++

OK

NOTE

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

2.2.7 ATO Switch from command mode to data mode

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

ATO Switch from command mode to data mode

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

Examples

ATO

CONNECT 115200

2.2.8 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	-
Max Response Time	120000ms
Reference	-

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: SIMCOM_A7600C
Revision: A7600C_V1.0

```
IMEI: 351602000330570
+GCAP: +CGSM,+FCLASS,+DS

OK
```

2.2.9 ATE Enable command echo

This command sets whether or not the TA echoes characters.

ATE Enable command echo

Execution Command ATE [<value>]	Response 1)if format is right OK 2) ERROR
Parameter Saving Mode	AT&W_SAVE
Max Response Time	120000ms
Reference	-

Defined Values

<value>	0 – Echo mode off <u>1</u> – Echo mode on
---------	--

Examples

```
ATE1
OK
ATE0
OK
```

2.2.10 AT&V Display current configuration

This command returns some of the base configuration parameters settings.

AT&V Display current configuration

Execution Command AT&V	Response 1) <TEXT> OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<TEXT>	All relative configuration information.
--------	---

Examples

AT&V

```
&C: 0; &D: 0; &F: 0; &W: 0; E: 1; Q: 0; V: 1; X: 0;
Z: 0; S0: 0; S2: 43; S3: 13; S4: 10; S5: 8; S6: 2;
S7: 1; S8: 2; S9: 6; S10: 7; S11: 63; S30: 10;
+FCLASS: 0; +IPR: 115200; +IPREX: 115200;
+CSCS: IRA; +CREG: 0; +CGREG: 0; +CEREG:
0; +CGDCONT:
(1,"IP","ctnet.mnc011.mcc460.gprs","10.13.20
4.244",0,0,,,,),(2,"IP","CMNET");
+CGDSCONT: ; +CGEQMIN:
(1,0,256000,256000,256000,256000,2,1520,"0E0
,6E8",,3,150,0,0,0);
+CGQMIN:(1,3,4,5,1,1),(2,3,4,5,1,1); +CGEREP:
(2,0); +CGCLASS: "A"; +CGACT: (1,1),(2,0);
+CGAUTH: (1,0),(2,0); +CPBS: "SM"; +CMEE:
2; +CFUN: 1; +CMGF: 0; +CSCA:
("+316540942000",145); +CSMP: 33,167,0,0;
+CSDH: 0; +CPMS:
"SM",0,50,"SM",0,50,"SM",0,50;
```

OK

2.2.11 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
Parameter Saving Mode	-
Max Response Time	-
Reference	-

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.

2.2.12 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	-
Max Response Time	-
Reference	-

Defined Values

<value>	0 — Set some temporary TA parameters to manufacturer defaults. The setting after power on or reset is same as value 0.
default values	
TA parameters	VALUE
AT+CATR	0
AT+CNMP	2
AT+CTZU	0
AT+CVAUXV	2850

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>].

2.2.13 ATQ Set Result Code Presentation Mode

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

ATQ Set Result Code Presentation Mode

Write Command ATQ<n>	Response 1) If <n>=0: OK 2) If <n>=1: No Responses
--------------------------------------	---

Execution Command ATQ	Response 1) Set default value:0 OK 2) No Responses
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

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

Examples

```
ATQ0
OK
ATQ1
OK
```

2.2.14 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	-
Max Response Time	-
Reference	-

Defined Values

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

Examples

```
ATX1
OK
ATX
OK
```

2.2.15 AT&W Save the user setting to ME

This command will save the user settings to ME which set by ATE, ATQ, ATV, ATX, AT&C, AT&D, AT+IFC and AT&S0. After restarted, the value saved by AT&W must be restored by ATZ.

AT&W Save the user setting to ME

Write Command AT&W<value>	Response 1) OK 2) ERROR
Execution Command AT&W	Response 1) Set default value:0 OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<value>	0 – Save
---------	----------

Examples

AT&W0

OK

AT&W

OK

2.2.16 ATZ Restore the user setting from ME

This command will restore the user setting from ME which set by ATE, ATQ, ATV, ATX, AT&C, AT&D and ATSO.

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	-
Max Response Time	-
Reference	-

Defined Values

<value>	0 – Restore
---------	-------------

Examples

ATZ0

OK
ATZ
OK

2.2.17 AT+CGMI Request manufacturer identification

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

AT+CGMI Request manufacturer identification

Test Command AT+CGMI=?	Response OK
Execution Command AT+CGMI	Response <manufacturer> OK
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<manufacturer>	INCORPORATED OK
----------------	--------------------

Examples

```
AT+CGMI
INCORPORATED

OK
AT+CGMI=?
OK
```

2.2.18 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	-

Defined Values

<model>	The identification of model.
----------------------	------------------------------

Examples

AT+CGMM

A7600E

OK

AT+CGMM=?

OK

2.2.19 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	-

Defined Values

<revision>	The revision identification of firmware.
------------	--

Examples

```
AT+CGMR
+CGMR: A35B01A7600C

OK
AT+CGMR=?
OK
```

2.2.20 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	Response
AT+CGSN=?	OK
Execution Command	Response
AT+CGSN	<sn>
	OK
Parameter Saving Mode	
Max Response Time	
Reference	

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

351602000330570

OK

AT+CGSN=?

OK

2.2.21 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 OK or ERROR
Execution Command AT+CSCS	Response Set subparameters as default value(IRA): OK
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<chest>	Character set, the definition as following:
---------	---

	<p>“IRA” International reference alphabet.</p> <p>“GSM” GSM default alphabet; this setting causes easily software flow control (XON /XOFF) problems.</p> <p>“UCS2” 16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF.</p>
--	---

Examples

```
AT+CSCS="IRA"
```

```
OK
```

```
AT+CSCS?
```

```
+CSCS:"IRA"
```

```
OK
```

```
AT+CSCS=?
```

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

```
OK
```

```
AT+CSCS
```

```
OK
```

2.2.22 AT+GCAP Request overall capabilities

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

AT+GCAP Request overall capabilities

<p>Test Command</p> <pre>AT+GCAP=?</pre>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p>
<p>Execution Command</p> <pre>AT+GCAP</pre>	<p>Response</p> <p>1) +GCAP: (list of <name>s)</p> <p>OK</p> <p>2) ERROR</p>
<p>Parameter Saving Mode</p>	-

Max Response Time	-
Reference	-

Defined Values

<name>	<p>List of additional capabilities.</p> <ul style="list-style-type: none"> +CGSM GSM function is supported +FCLASS FAX function is supported +DS Data compression is supported +ES Synchronous data mode is supported. +CIS707-A CDMA data service command set +CIS-856 EVDO data service command set +MS Mobile Specific command set
---------------------	--

Examples

AT+GCAP

+GCAP: +CGSM,+FCLASS,+DS

OK

AT+GCAP=?

OK

3 AT Commands for Status Control

3.1 Overview of AT Commands for Status Control

Command	Description
AT+CFUN	Set phone functionality
AT+CSQ	Query signal quality
AT+AUTOCSQ	Set CSQ report
AT+CSQDELTA	Set RSSI delta change threshold
AT+CPOF	Power down the module
AT+CRESET	Reset the module
AT+CACM	Accumulated call meter
AT+CAMM	Accumulated call meter maximum
AT+CPUC	Price per unit and currency table
AT+CCLK	Real time clock management
AT+CMEE	Report mobile equipment error
AT+CPAS	Phone activity status
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	Response
AT+CFUN=?	+CFUN: (rang of supported <fun>s), (rang of supported <rst>s)

	<p>OK</p>
<p>Read Command AT+CFUN?</p>	<p>Response 1) +CFUN: <fun></p> <p>OK 2) ERROR 3) +CME ERROR: <err></p>
<p>Write Command AT+CFUN=<fun>[,<rst>]</p>	<p>Response 1) OK 2) ERROR 3) +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<fun>	<p>0 – minimum functionality <u>1</u> – full functionality, online mode 4 – disable phone both transmit and receive RF circuits 5 – Factory Test Mode (The A7600's 5 and 1 have the same function) 6 – Reset 7 – Offline Mode</p>
<rst>	<p>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.</p>

Examples

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

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

```
OK
```

AT+CFUN=1

OK

NOTE

AT+CFUN=6 must be used after setting AT+CFUN=7. If module in offline mode, must execute AT+CFUN=6 or restart module to online mode.

3.2.2 AT+CSQ Query signal quality

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

AT+CSQ Query signal quality

Test Command AT+CSQ=?	Response +CSQ: (range of supported <rssi>s),(range of supported <ber>s) OK
Read Command AT+CSQ	Response 1) +CSQ: <rssi>,<ber> OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<rssi>	0	-	-113 dBm or less
	1	-	-111 dBm
	2...30	-	-109... -53 dBm
	31	-	-51 dBm or greater
	99	-	not known or not detectable
<ber>	(in percent)		
	0	-	<0.01%
	1	-	0.01% --- 0.1%

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

Examples

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

```
OK
AT+CSQ
+CSQ: 31,99
```

```
OK
```

3.2.3 AT+AUTOCSQ Set CSQ report

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

AT+AUTOCSQ Set CSQ report

Test Command AT+AUTOCSQ=?	Response +AUTOCSQ: (range of supported<auto>s),(range of supported<mode>s)
-------------------------------------	--

OK

Read Command AT+AUTOCSQ?	Response +AUTOCSQ: <auto>,<mode>
------------------------------------	--

OK

Write Command AT+AUTOCSQ=<auto>[,<mode>]	Response 1) OK 2) ERROR
--	---

Parameter Saving Mode	NO_SAVE
-----------------------	---------

Max Response Time	9S
-------------------	----

Reference	Vendor
-----------	--------

Defined Values

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

Examples

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

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

```
OK
AT+AUTOCSQ =1
OK
```

3.2.4 AT+CSQDELTA Set RSSI delta change threshold

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

AT+CSQDELTA Set RSSI delta change threshold

Test Command AT+CSQDELTA=?	Response 1) +CSQDELTA: (list of supported <delta>s) OK
Read Command AT+CSQDELTA?	Response 1) +CSQDELTA: <delta> OK 2) ERROR

Write Command AT+CSQDELTA =<delta>	Response 1) OK 2) ERROR
Execution Command AT+CSQDELTA	Response OK Note: Set default value (<delta>=5)
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	Vendor

Defined Values

<delta>	Range: from 0 to 5.
---------	---------------------

Examples

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

```
OK
AT+CSQDELTA?
+CSQDELTA: 5
```

```
OK
AT+CSQDELTA
OK
```

3.2.5 AT+CPOF Power down the module

This command is used to power off the module. Once the AT+CPOF command is executed, The module will store user data and deactivate from network, and then shutdown.

AT+CPOF Power down the module

Test Command AT+CPOF=?	Response 1) OK
Read Command AT+CPOF	Response 1) OK

Parameter Saving Mode	-
Max Response Time	9S
Reference	Vendor

Examples

```
AT+CPOF=?
OK
AT+CPOF
OK
```

3.2.6 AT+CRESET Reset the module

This command is used to reset the module.

AT+CRESET Reset the module

Write Command	Response
AT+CRESET	OK
Test Command	Response
AT+CRESET=?	OK
Parameter Saving Mode	-
Max Response Time	9S
Reference	Vendor

Examples

```
AT+CRESET=?
OK
AT+CRESET
OK
```

3.2.7 AT+CACM Accumulated call meter

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

AT+CACM Accumulated call meter

Test Command AT+CACM=?	Response 1) OK 2) ERROR
Read Command AT+CACM?	Response 1) +CACM: <acm> OK 2) ERROR 3) +CME ERROR:<err>
Write Command AT+CACM=<passwd>	Response 1) OK 2) ERROR 3) +CME ERROR:<err>
Execution Command AT+CACM	Response 1) OK 2) ERROR 3) +CME ERROR:<err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

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

Examples

```

AT+CACM=?
OK
AT+CACM?
+CACM: "000000"

OK

```

AT+CACM="000000"

+CME ERROR: SIM PUK2 required

AT+CACM

+CME ERROR: SIM PIN required

3.2.8 AT+CAMM Accumulated call meter maximum

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

AT+CAMM Accumulated call meter maximum

Test Command AT+CAMM=?	Response 1) OK 2) ERROR
Read Command AT+CAMM?	1) +CAMM: <acmmax> OK 2) ERROR 3) +CME ERROR:<ERR>
Write Command AT+CAMM=<acmmax>[,<passwd>]	Response 1) OK 2) ERROR 3) +CME ERROR:<ERR>
Execution Command AT+CAMM	1) OK 2) ERROR 3) +CME ERROR:<ERR>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

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

Examples

```

AT+CAMM=?
OK
AT+CAMM?
+CAMM: "000000"

OK
AT+CAMM="000000"
+CME ERROR: SIM PIN required
AT+CAMM
+CME ERROR: SIM PIN required

```

3.2.9 AT+CPUC Price per unit and currency table

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

AT+ CPUC Price per unit and currency table

Test Command AT+CPUC=?	Response 1) OK 2) ERROR
Read Command AT+CPUC?	Response 1) +CPUC: [<currency>,<ppu>] 2) OK 3) ERROR 4) +CME ERROR:<ERR>
Write Command AT+CPUC=<currency>,<ppu> >[,<passwd>]	Response 1) OK

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

Defined Values

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

Examples

```

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

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

```

3.2.10 AT+CCLK Real time clock management

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

AT+ CCLK Real time clock management

Test Command AT+CCLK=?	Response OK
Read Command AT+CCLK?	Response +CCLK: <time>
Write Command AT+CCLK=<time>	Response 1)

	OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<time>	<p>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”.</p> <p>NOTE: 1. Time zone is nonvolatile, and the factory value is invalid time zone.</p> <p>2. 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”.</p>
--------	--

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

3.2.11 AT+CMEE Report mobile equipment error

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

AT+CMEE Report mobile equipment error

Test Command

AT+CMEE=?

Response

+CMEE: (list of supported <n>s)

	OK
Read Command AT+CMEE?	Response +CMEE: <n>
	OK
Write Command AT+CMEE=<n>	Response 1) OK 2) ERROR
Execution Command AT+CMEE	Response OK Note: Set default value
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
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. <u>2</u> – Enable error result code with string values.
-----	---

Examples

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

OK
AT+CMEE=2
OK
```

3.2.12 AT+CPAS Phone activity status

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

AT+CTZR Time and time zone reporting

Test Command AT+CPAS=?	Response +CPAS: (list of supported <pas>s) OK
Read Command AT+CPAS	Response +CPAS: <pas> OK
Parameter Saving Mode	-
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<pas>	<ul style="list-style-type: none"> 0 – ready (ME allows commands from TA/TE) 3 – ringing (ME is ready for commands from TA/TE, but the ringer is active) 4 – call in progress (ME is ready for commands from TA/TE, but a call is in progress)
--------------------	---

Examples

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

```
OK
AT+CPAS
+CPAS: 0
```

```
OK
```

NOTE

This command is same as AT+CLCC, but AT+CLCC is more commonly used. So AT+CLCC is recommended to use.

3.2.13 AT+SIMEI Set IMEI for the module

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

AT+SIMEI Time and time zone reporting

Test Command AT+SIMEI=?	Response OK
Read Command AT+SIMEI?	Response +SIMEI: <imei> OK
Write Command AT+SIMEI=<imei>	Response 1) OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	Vendor

Defined Values

<imei>	The 15-digit IMEI value.
--------	--------------------------

Examples

```

AT+SIMEI=?
OK
AT+SIMEI?
+SIMEI: 357396012183175

OK
AT+SIMEI=357396012183175
OK
  
```

4 AT Commands for Network

4.1 Overview of AT Commands for Network

Command	Description
AT+CREG	Network registration
AT+COPS	Operator selection
AT+CUSD	Unstructured supplementary service data
AT+CSSN	Supplementary service notifications
AT+CPOL	Preferred operator list
AT+COPN	Read operator names
AT+CNMP	Preferred mode selection
AT+CNBP	Preferred band selection
AT+CPSI	Inquiring UE system information
AT+CNSMOD	Show network system mode
AT+CTZU	Automatic time and time zone update
AT+CTZR	Time and time zone reporting

NOTE

A7600E-LNSE ,A7670X and A7600C1-XXXX does not support WCDMA.
A7620 only supports LTE.
A5360E does not support LTE.

4.2 Detailed Description of AT Commands for Network

4.2.1 AT+CREG Network registration

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

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

AT+CREG Network registration	
Test Command AT+CREG=?	Response +CREG: (range of supported <n>s) OK
Read Command AT+CREG?	Response 1) +CREG: <n>,<stat>[,<lac>,<ci>] OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CREG=<n>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CREG	Response Set default value(<n>=0): 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 +CREG: <stat>. 2 – enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>].
<stat>	0 – not registered, ME is not currently searching a new operator to register to. 1 – registered, home network. 2 – not registered, but ME is currently searching a new operator to register to.

	<p>3 – registration denied.</p> <p>4 – unknown.</p> <p>5 – registered, roaming.</p>
<lac>	Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal).
<ci>	Cell Identify in hexadecimal format. GSM : Maximum is two byte. WCDMA : Maximum is four byte.

Examples

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

```
OK
```

```
AT+CREG?
+CREG: 0,1
```

```
OK
```

```
AT+CREG=1
```

```
OK
```

```
AT+CREG
```

```
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)] 2) OK 3) ERROR +CME ERROR: <err>
Read Command AT+COPS?	Response 1) +COPS: <mode>[,<format>,<oper>[,<AcT>]] 2) OK 3) ERROR +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 NOTE: if <mode> is set to 1, 4 in write command, the <oper> is
--------	---

	needed.
<format>	<ul style="list-style-type: none"> 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>	<ul style="list-style-type: none"> 0 – unknown 1 – available 2 – current 3 – forbidden
<AcT>	<p>Access technology selected</p> <ul style="list-style-type: none"> 0 – GSM 1 – GSM Compact 2 – UTRAN 3 – GSM w/EGPRS 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

4.2.3 AT+CUSD Unstructured supplementary service data

This command allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an unsolicited result code (USSD response from the network, or network initiated operation) +CUSD: <m>[,<str>,<dcs>] to the TE. In addition, value <n>=2 is used to cancel an ongoing USSD session.

AT+CUSD Unstructured supplementary service data	
Test Command AT+CUSD=?	Response +CUSD: (range of supported <n>s) OK
Read Command AT+CUSD?	Response +CUSD: <n> OK
Write Command AT+CUSD=<n>[,<str>[,<dcs>]]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CUSD	Response Set default value (<n>=0): OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	<ul style="list-style-type: none"> <u>0</u> – disable the result code presentation in the TA 1 – enable the result code presentation in the TA 2 – cancel session (not applicable to read command response)
<str>	String type USSD-string.
<dcs>	Cell Broadcast Data Coding Scheme in integer format (default 0).
<m>	<ul style="list-style-type: none"> 0 – no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation) 1 – further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 – USSD terminated by network 4 – operation not supported 5 – network time out

Examples

AT+CUSD=?

+CUSD: (0-2)

OK

AT+CUSD?

+CUSD: 1

OK

AT+CUSD=1,"*99#"

OK

+CUSD:

2,"556e657870656374656420446174612056616c7565",

0

AT+CUSD

OK

4.2.4 AT+CSSN Supplementary service notifications

This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When <n>=1 and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes presented in the present document. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.

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

AT+CSSN Supplementary service notifications

Test Command

AT+CSSN=?

Response

1)

+CSSN: (list of supported <n>s),(list of supported <m>s)

OK

2)

ERROR

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

Defined Values

<n>	Parameter sets/shows the +CSSI result code presentation status in the TA: 0 – disable <u>1</u> – enable
<m>	Parameter sets/shows the +CSSU result code presentation status in the TA: 0 – disable <u>1</u> – enable
<code1>	0 – unconditional call forwarding is active 1 – some of the conditional call forwarding are active 2 – call has been forwarded 3 – call is waiting 5 – outgoing calls are barred
<index>	Refer "Closed user group +CCUG".
<code2>	0 – this is a forwarded call (MT call setup) 2 – call has been put on hold (during a voice call) 3 – call has been retrieved (during a voice call) 5 – call on hold has been released (this is not a SS notification) (during a voice call)
<number>	String type phone number of format specified by <type>.
<type>	Type of address octet in integer format; default 145 when dialing string includes international access code character "+", otherwise 129.
<subaddr>	String type sub address of format specified by <satype>.
<satype>	Type of sub address octet in integer format, default 128.

Examples

```

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

OK
AT+CSSN?
+CSSN: 1,1

OK
AT+CSSN=1,1
OK
    
```

4.2.5 AT+CPOL Preferred operator list

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

AT+CPOL Preferred operator list

<p>Test Command</p> <p>AT+CPOL=?</p>	<p>Response</p> <p>1) +CPOL: (range of supported <index>s), (range of supported <format>s)</p> <p>OK</p> <p>2) ERROR</p>
<p>Read Command</p> <p>AT+CPOL?</p>	<p>Response</p> <p>1) [+CPOL:<index1>,<format>,<oper1>[<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>][<CR><LF><CR><LF>+CPOL:<index2>,<format>,<oper2>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>][...]]]</p> <p>OK</p> <p>2) ERROR</p>
<p>Write Command</p> <p>AT+CPOL=<index>[,<format>[,<oper>]][,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>]</p>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p>

T1>]]	3)
NOTE: If using USIM card, the last four parameters must set.	+CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CPOL=?

+CPOL: (1-8),(0-2)

OK

AT+CPOL?

+CPOL: 1,2,"46001"

+CPOL: 2,2,"46001"

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

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

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

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

OK

AT+CPOL=1,2,"46001"

OK

4.2.6 AT+COPN Read operator names

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

AT+COPN Read operator names

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

Defined Values

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

Examples

```

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

+COPN: "46001","UNICOM"
.....
OK
    
```

4.2.7 AT+CNMP Preferred mode selection

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

AT+CNMP Preferred mode selection

Test Command AT+CNMP=?	Response +CNMP: (list of supported <mode>s) OK
Read Command AT+CNMP?	Response +CNMP: <mode> OK
Write Command AT+CNMP=<mode>	Response 1) OK 2) If <mode> not supported by module, this command will return ERROR. ERROR
Parameter Saving Mode	SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	<u>2</u> – Automatic 13 – GSM Only 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

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

4.2.8 AT+CNBP Preferred band selection

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

AT+CNBP Preferred band selection

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

Defined Values

<mode>	64bit number, the value is "1" << "<pos>", then or by bit.
<pos>	Value: 0xFFFFFFFF7FFFFFFF Any (any value) 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. NOTE: FDD(band1 ~ band32), TDD(band33 ~ band42)	
<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)

12 746-756)	EUTRAN_BAND13(UL: 777-787; DL:
13 758-768)	EUTRAN_BAND14(UL: 788-798; DL:
16 734-746)	EUTRAN_BAND17(UL: 704-716; DL:
17 860-875)	EUTRAN_BAND18(UL: 815-830; DL:
18 875-890)	EUTRAN_BAND19(UL: 830-845; DL:
19 791-821)	EUTRAN_BAND20(UL: 832-862; DL:
20 1447.9-1462.9; DL: 1495.9-1510.9)	EUTRAN_BAND21(UL:
22 DL: 2180-2200)	EUTRAN_BAND23(UL: 2000-2020;
23 1626.5-1660.5; DL: 1525 -1559)	EUTRAN_BAND24(UL:
24 DL: 1930 -1995)	EUTRAN_BAND25(UL: 1850-1915;
25 859 -894)	EUTRAN_BAND26(UL: 814-849; DL:
26 DL: 852 -869)	EUTRAN_BAND27(UL: 807.5-824;
27 758-803)	EUTRAN_BAND28(703-748; DL:
28 1710-1755; DL:716-728)	EUTRAN_BAND29(UL:1850-1910 or
29 DL: 2350 - 2360)	EUTRAN_BAND30(UL: 2305-2315 ;
32 DL: 1900-1920)	EUTRAN_BAND33(UL: 1900-1920;
33 DL: 2010-2025)	EUTRAN_BAND34(UL: 2010-2025;
34 DL: 1850-1910)	EUTRAN_BAND35(UL: 1850-1910;
35 DL: 1930-1990)	EUTRAN_BAND36(UL: 1930-1990;
36 DL: 1910-1930)	EUTRAN_BAND37(UL: 1910-1930;
37 DL: 2570-2620)	EUTRAN_BAND38(UL: 2570-2620;
38 DL: 1880-1920)	EUTRAN_BAND39(UL: 1880-1920;
39 DL: 2300-2400)	EUTRAN_BAND40(UL: 2300-2400;

40 DL: 2496-2690)	EUTRAN_BAND41(UL: 2496-2690;
41 DL: 3400-3600)	EUTRAN_BAND42(UL: 3400-3600;
42 3600-3800)	EUTRAN_BAND43(UL: 3600-3800; DL:

Examples

AT+CNBP=?

+CNBP: 0x,0x

OK

AT+CNBP?

+CNBP: 0X0002000000400180,0X000001E200000095

OK

AT+CNBP=0X0002000000400180,0X000001E200000095

OK

4.2.9 AT+CPSI Inquiring UE system information

This command is used to return the UE system information.

AT+CPSI Inquiring UE system information

Read Command

AT+CPSI?

Response

1) If camping on a gsm cell:

+CPSI:<System Mode>,<Operation Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Absolute RF Ch Num>,<RxLev>,<Track LO Adjust>,<C1-C2>

OK

2) 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

3) If camping on a lte cell:

+CPSI: <System Mode>,<Operation

	<p>Mode>[,<MCC>-<MNC>,<TAC>,<SCellID>,<PCellID>,<Frequency Band>,<earfcn>,<dlbw>,<ulbw>,<RSRQ>,<RSRP>,<RSSI>,<RSS NR>]</p> <p>OK</p> <p>4) If no service: +CPSI: NO SERVICE, Online</p> <p>OK</p> <p>5) ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

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

	downlink
<ulbw>	Transmission bandwidth configuration of the serving cell on the uplink
<RSRP>	Current reference signal received power in -1/10 dBm. Available for LTE
<RSRQ>	Current reference signal receive quality as measured by L1.
<RSSNR>	Average reference signal signal-to-noise ratio of the serving cell

Examples

AT+CPSI?

+CPSI:

LTE,Online,460-01,0x230A,175499523,318,EUTRAN-BAND3,1650,5,0,21,67,255,19

OK

4.2.10 AT+CNSMOD Show network system mode

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

AT+CNSMOD Show network system mode

Test Command AT+CNSMOD=?	Response +CNSMOD: (list of supported <n>s) OK
Read Command AT+CNSMOD?	Response 1) +CNSMOD: <n>,<stat> OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CNSMOD=<n>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE

Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	<p><u>0</u> – disable auto report the network system mode information</p> <p>1 – auto report the network system mode information, command: +CNSMOD:<stat></p>
<stat>	<p>0 – no service</p> <p>1 – GSM</p> <p>2 – GPRS</p> <p>3 – EGPRS (EDGE)</p> <p>4 – WCDMA</p> <p>5 – HSDPA only(WCDMA)</p> <p>6 – HSUPA only(WCDMA)</p> <p>7 – HSPA (HSDPA and HSUPA, WCDMA)</p> <p>8 – LTE</p>

Examples

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

OK

```
AT+CNSMOD?
+CNSMOD: 0,8
```

OK

```
AT+CNSMOD=0
OK
```

4.2.11 AT+CTZU Automatic time and time zone update

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

AT+CTZU Automatic time and time zone update

Test Command AT+CTZU=?	<p>Response</p> <p>+CTZU: (range of supported <on/off>s)</p> <p>OK</p>
Read Command AT+CTZU?	<p>Response</p> <p>+CTZU: <on/off></p>

	OK
Write Command AT+CTZU=<on/off>	Response 1) OK 2) ERROR
Parameter Saving Mode	SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<on/off>	<p>Integer type value indicating:</p> <ul style="list-style-type: none"> <u>0</u> – Disable automatic time zone update via NITZ (default). 1 – Enable automatic time zone update via NITZ. <p>NOTE: 1. The value of <on/off> is nonvolatile, and factory value is 0. 2. 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.</p>
-----------------------	---

Examples

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

```
OK
AT+CTZU?
+CTZU: 0
```

```
OK
AT+CTZU=0
OK
```

4.2.12 AT+CTZR Time and time zone 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 time zone 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
Execution Command AT+CTZR	Response Set default value: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<on/off>	Integer type value indicating: <u>0</u> – Disable time zone change event reporting (default). 1 – Enable time zone change event reporting.
+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.

- <tz> Local time zone received from network.
- <time> Universal time received from network, and the format is “yy/MM/dd, hh:mm:ss”, where characters indicate year (two last digits), month, day, hour, minutes and seconds.
- <dst> Network daylight saving time, and if it is received from network, it indicates the value that has been used to adjust the local time zone. The values as following:
 - 0 – No adjustment for Daylight Saving Time.
 - 1 – +1 hour adjustment for Daylight Saving Time.
 - 2 – +2 hours adjustment for Daylight Saving Time.

NOTE: Herein, <time> is Universal Time or NITZ time, but not local time.

Examples

```
AT+CTZR=?
```

```
+CTZR: (0-1)
```

```
OK
```

```
AT+CTZR?
```

```
+CTZR: 0
```

```
OK
```

```
AT+CTZR=0
```

```
OK
```

```
AT+CTZR
```

```
OK
```

NOTE

The time zone reporting is not affected by the Automatic Time and Time Zone command AT+CTZU.

5 AT Commands for Packet Domain

5.1 Overview of AT Commands for Packet Domain

Command	Description
AT+CGERG	Network registration status
AT+CEREG	EPS network registration status
AT+CGATT	Packet domain attach or detach
AT+CGACT	PDP context activate or deactivate
AT+CGDCONT	Define PDP context
AT+CGDSCONT	Define Secondary PDP Context
AT+CGTFT	Traffic Flow Template
AT+CGQREQ	Quality of service profile (requested)
AT+CGEQREQ	3G quality of service profile (requested)
AT+CGQMIN	Quality of service profile (minimum acceptable)
AT+CGEQMIN	3G quality of service profile (minimum acceptable)
AT+CGDATA	Enter data state
AT+CGPADDR	Show PDP address
AT+CGCLASS	GPRS mobile station class
AT+CGEREP	GPRS event reporting
AT+CGAUTH	Set type of authentication for PDP-IP connections of GPRS
AT+CPING	Ping destination address

NOTE

A7600E-LNSE, A7670X and A7600C1-XXXX does not support WCDMA.
A7620 only supports LTE.
A5360E does not support LTE.

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 code “+CGREG: <stat>” when <n>=1 and there is a change in the MT's GPRS network registration status.

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: (list of supported <n>s) OK
Read Command AT+CGREG?	Response +CGREG: <n>,<stat>[,<lac>,<ci>] OK
Write Command AT+CGREG=<n>	Response OK
Execution Command AT+CGREG	Response Set default value:0 OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	<p>0 – disable network registration unsolicited result code</p> <p>1 – enable network registration unsolicited result code +CGREG: <stat></p> <p>2 – there is a change in the ME network registration status or a change of the network cell: +CGREG: <stat>[,<lac>,<ci>]</p>
<stat>	<p>0 – not registered, ME is not currently searching an operator to register to</p> <p>1 – registered, home network</p> <p>2 – not registered, but ME is currently trying to attach or searching an operator to register to</p> <p>3 – registration denied</p> <p>4 – unknown</p> <p>5 – registered, roaming</p>
<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: 0,1
```

OK

```
AT+CGREG=1
OK
AT+CGREG
OK
```

5.2.2 AT+CEREG EPS network registration status

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

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

AT+CEREG EPS network registration status

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

	OK 2) ERROR
Write Command AT+CEREG=[<n>]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CEREG	Response 1) Set default value (<n>=0): OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 24.008 [8]

Defined Values

<n>	<u>0</u> – disable network registration unsolicited result code 1 – enable network registration unsolicited result code +CEREG: <stat> 2 – enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>,<ci>[,<AcT>]]
<stat>	0 – not registered, MT is not currently searching an operator to register to 1 – registered, home network 2 – not registered, but MT is currently trying to attach or searching an operator to register to 3 – registration denied 4 – unknown (e.g. out of E-UTRAN coverage) 5 – registered, roaming 6 – registered for "SMS only", home network (not applicable) 7 – registered for "SMS only", roaming (not applicable) 8 – attached for emergency bearer services only (See NOTE 2)
<tac>	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 NOTE 3) (not applicable) |
| 4 | UTRAN w/HSDPA (see NOTE 4) (not applicable) |
| 5 | UTRAN w/HSUPA (see NOTE 4) (not applicable) |
| 6 | UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) |
| 7 | E-UTRAN |

Examples

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

OK

```
AT+CEREG?
+CEREG: 0,1
```

OK

```
AT+CEREG=1
```

OK

```
AT+CEREG
```

OK

NOTE

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

5.2.3 AT+CGATT Packet domain attach or detach

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

AT+CGATT Packet domain attach or detach

```
Test Command
AT+CGATT=?
```

Response

1)

+CGATT: (list of supported <state>s)

OK

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

Defined Values

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

Examples

```

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

OK
AT+CGACT?
+CGACT: 1

```

OK
AT+CGACT
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

<p>Test Command AT+CGDCONT=?</p>	<p>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</p>
<p>Read Command AT+CGDCONT?</p>	<p>Response 1) +CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_disc over>,<IM_CN_Signalling_Flag_Ind>]<CR><LF> +CGDCONT: <cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_disc over>,<IM_CN_Signalling_Flag_Ind>] OK 2) ERROR</p>
<p>Write Command AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>][,<ipv4_ctrl>[,<request_type>]]]]]]]</p>	<p>Response 1) OK 2) ERROR</p>
<p>Execution Command AT+CGDCONT</p>	<p>Response 1)</p>

	OK 2)
	ERROR
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. 1...15
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol PPP Point to Point Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack
<APN>	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network.
<PDP_addr>	A string parameter that identifies the MT in the address space applicable to the PDP. This parameter will be omitted when PDP_type is PPP type. Read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using command AT+CGPADDR.
<d_comp>	A numeric parameter that controls PDP data compression, this value may depend on platform: 0 – off (default if value is omitted) 1 – on 2 – V.42bis
<h_comp>	A numeric parameter that controls PDP header compression, this value may depend on platform: 0 – off (default if value is omitted) 1 – RFC1144
<ipv4_ctrl>	Parameter that controls how the MT/TA requests to get the IPv4 address information: 0 – Address Allocation through NAS Signaling 1 – on
<request_type>	integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is

	<p>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.</p> <p>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.</p> <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment
<p><P-CSCF_discovery></p>	<p>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.</p> <ul style="list-style-type: none"> 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
<p><IM_CN_Signalling_Flag_Ind></p>	<p>integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.</p> <ul style="list-style-type: none"> 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only

Examples

AT+CGDCONT=?

+CGDCONT: (1-15),"IP",,,(0-2),(0-1),(0-1),(0-2)

+CGDCONT: (1-15),"PPP",,,(0-2),(0-1),(0-1),(0-2)

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

+CGDCONT:

(1-15),"IPV4V6",,,(0-2),(0-1),(0-1),(0-2)

OK

AT+CGDCONT?

+CGDCONT: 1,"IP",""

OK

AT+CGDCONT=1,"IP","cnet"

OK

AT+CGDCONT

OK

5.2.6 AT+CGDCONT Define Secondary PDP Context

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

AT+CPOL Preferred operator list

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

Defined Values

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

Examples

AT+CGDSCONT=?

+CGDSCONT:

(2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IP",(0-2),(0-1)

+CGDSCONT:

(2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"PPP",(0-2),(0-1)

+CGDSCONT:

(2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV6",(0-2),(0-1)

+CGDSCONT:

(2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV4V6",(0-2),(0-1)

OK

AT+CGDSCONT?

+CGDSCONT:

OK

AT+CGDSCONT=4,2

+CME ERROR: operation not supported

5.2.7 AT+CGTFT Traffic Flow Template

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

AT+CGTFT Traffic Flow Template

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

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

Defined Values

<cid>	a numeric parameter which specifies a particular PDP context definition (see the AT+CGDCONT and AT+CGDSCONT commands).
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.

	<p>IP Internet Protocol</p> <p>PPP Point to Point Protocol</p> <p>IPV6 Internet Protocol Version 6</p> <p>IPV4V6 Dual PDN Stack</p>
<packet filter identifier>	a numeric parameter, value range from 1 to 15.
<evaluation precedence index>	a numeric parameter. The value range is from 0 to 255.
<source address and subnet mask>	<p>string type The string is given as dot-separated numeric (0-255) parameters on the form:</p> <p>"a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or</p> <p>"a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6.</p> <p>NOTE: subnet mask can't be 0.0.0.0</p>
<protocol number (ipv4) / next header (ipv6)>	a numeric parameter, value range from 0 to 255.
<destination port range>	string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<source port range>	string type. The string is given as dot-separated numeric (0-65535) parameters on the form "f.t".
<ipsec security parameter index (spi)>	numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF.
<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>	string type. The string is given as dot-separated numeric (0-255) parameters on the form "t.m".
<flow label (ipv6)>	numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only.
<direction>	<p>integer type. Specifies the transmission direction in which the packet filter shall be applied.</p> <p>0 Pre-Release 7 TFT filter</p> <p>1 Uplink</p> <p>2 Downlink</p> <p>3 up & downlink</p>

Examples

AT+CGTFT=?

+CGTFT:

"IP",(1-15),(0-255),(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFF)

+CGTFT:

"PPP",(1-15),(0-255),(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFF)

+CGTFT:

"IPV6",(1-15),(0-255),(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFF)

```
+CGTFT:
"IPV4V6",(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFF),(0-255.0-255),(0-FFFFF)

OK
AT+CGTFT?
+CGTFT:

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

NOTE

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

5.2.8 AT+CGQREQ Quality of service profile (requested)

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.. A special form of the set command (AT+CGQREQ=<cid>) causes the requested profile for context number <cid> to become undefined.

AT+CGQREQ Quality of service profile (requested)

Test Command AT+CGQREQ=?	Response 1) +CGQREQ: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s) OK 2) ERROR
Read Command AT+CGQREQ?	Response 1) +CGQREQ: [<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>

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

Defined Values

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

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

Examples

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

```
OK
```

AT+CGQREQ?

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

OK

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

OK

AT+CGQREQ

OK

5.2.9 AT+CGEQREQ 3G quality of service profile (requested)

The test command returns values supported as a compound value.

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

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

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

AT+CGEQREQ 3G quality of service profile (requested)

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

	parameter is also used in other PDP context-related commands. The range is from 1 to 15
<Traffic class>	<ul style="list-style-type: none"> 0 – conversational 1 – streaming 2 – interactive 3 – background 4 – subscribed value
<Maximum bitrate UL>	<p>This parameter indicates the maximum number of kbits/s delivered to UMTS(up-link traffic)at a SAP. As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Maximum bitrate DL>	<p>This parameter indicates the maximum number of kbits/s delivered to UMTS(down-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.3600-3800)</p>
<Guaranteed bitrate UL>	<p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Guaranteed bitrate DL>	<p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64</p>

	<p>and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Delivery order>	<p>This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <p>0 – no 1 – yes 2 – subscribed value</p>
<Maximum SDU size>	<p>This parameter indicates the maximum allowed SDU size in octets. The range is 0, 10 to 1500, 1510, 1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<SDU error ratio>	<p>This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. As an Examples a target SDU error ratio of $5 \cdot 10^{-3}$ would be specified as "5E3"(e.g. AT+CGEQREQ=...,"5E3",...).</p> <p>"0E0" – subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"</p>
<Residual bit error ratio>	<p>This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. As an Examples a target residual bit error ratio of $5 \cdot 10^{-3}$ would be specified as "5E3"(e.g. AT+CGEQREQ=...,"5E3",...).</p> <p>"0E0" – subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"</p>

<Delivery of erroneous SDUs>	<p>This parameter indicates whether SDUs detected as erroneous shall be delivered or not.</p> <p>0 – no 1 – yes 2 – no detect 3 – subscribed value</p>
<Transfer delay>	<p>This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. The range is 0 to 950. When the parameter is between 10 and 150, it should be an integer multiple of 10. When the parameter is between 150 and 950, it should be an integer multiple of 50. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Traffic handling priority>	<p>This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS Bearer compared to the SDUs of the other bearers. The range is from 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Source statistics descriptor>	<p>This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Signaling indication flag>	<p>This parameter indicates Signaling flag. The range is from 0 to 1 The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<PDP_type>	<p>(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol.</p> <p>IP Internet Protocol</p>

Examples

AT+CGEQREQ=?

+CGEQREQ:

"IP",(0-4),(0-256000),(0-256000),(0-256000),(0-256000),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0-950),(0-3),(0-1),(0-1)

OK

AT+CGEQREQ?

+CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

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

OK

AT+CGEQREQ

OK

5.2.10 AT+CGQMIN Quality of service profile (minimum acceptable)

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

AT+CGQMIN Quality of service profile (minimum acceptable)

<p>Test Command AT+CGQMIN=?</p>	<p>Response 1) +CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s) [<CR><LF> +CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s) , (list of supported <peak>s), (list of supported <mean>s)[...]</p> <p>OK 2) ERROR</p>
<p>Read Command AT+CGQMIN?</p>	<p>Response 1) +CGQMIN: [<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF> +CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean> [...]]]</p> <p>OK 2) ERROR</p>
<p>Write Command AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]</p>	<p>Response 1) OK 2) ERROR</p>
<p>Execution Command AT+CGQMIN</p>	<p>Response 1) OK</p>

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

Defined Values

<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15
<PDP_type>	(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol
<precedence>	A numeric parameter which specifies the precedence class: 0 – network subscribed value 1 – high priority 2 – normal priority 3 – low priority
<delay>	A numeric parameter which specifies the delay class: 0 – network subscribed value 1 – delay class 1 2 – delay class 2 3 – delay class 3 4 – delay class 4
<reliability>	A numeric parameter which specifies the reliability class: 0 – network subscribed value 1 – Non real-time traffic, error-sensitive application that cannot cope with data loss 2 – Non real-time traffic, error-sensitive application that can cope with infrequent data loss 3 – Non real-time traffic, error-sensitive application that can cope with data loss, GMM/-SM, and SMS 4 – Real-time traffic, error-sensitive application that can cope with data loss 5 – Real-time traffic error non-sensitive application that can cope with data loss
<peak>	A numeric parameter which specifies the peak throughput class: 0 – network subscribed value 1 – Up to 1000 (8 kbit/s) 2 – Up to 2000 (16 kbit/s) 3 – Up to 4000 (32 kbit/s) 4 – Up to 8000 (64 kbit/s) 5 – Up to 16000 (128 kbit/s) 6 – Up to 32000 (256 kbit/s)

	<ul style="list-style-type: none"> 7 – Up to 64000 (512 kbit/s) 8 – Up to 128000 (1024 kbit/s) 9 – Up to 256000 (2048 kbit/s)
<mean>	<p>A numeric parameter which specifies the mean throughput class:</p> <ul style="list-style-type: none"> 0 – network subscribed value 1 – 100 (~0.22 bit/s) 2 – 200 (~0.44 bit/s) 3 – 500 (~1.11 bit/s) 4 – 1000 (~2.2 bit/s) 5 – 2000 (~4.4 bit/s) 6 – 5000 (~11.1 bit/s) 7 – 10000 (~22 bit/s) 8 – 20000 (~44 bit/s) 9 – 50000 (~111 bit/s) 10 – 100000 (~0.22 kbit/s) 11 – 200000 (~0.44 kbit/s) 12 – 500000 (~1.11 kbit/s) 13 – 1000000 (~2.2 kbit/s) 14 – 2000000 (~4.4 kbit/s) 15 – 5000000 (~11.1 kbit/s) 16 – 10000000 (~22 kbit/s) 17 – 20000000 (~44 kbit/s) 18 – 50000000 (~111 kbit/s) 31 – optimization

Examples

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

```
OK
AT+CGQMIN?
+CGQMIN: 1,3,4,5,1,1
```

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

5.2.11 AT+CGEQMIN 3G quality of service profile (minimum acceptable)

The test command returns values supported as a compound value.

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

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

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

AT+CGEQMIN 3G quality of service profile (minimum acceptable)

Test Command
AT+CGEQMIN=?

Response

1)

+CGEQMIN: <PDP_type>,(list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s,(list of supported<Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error Ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of Supported <Transfer delay>s),(list of supported <Traffic handlingpriority>s),(list of supported <Source statistics descriptor>s),(list of supported <Signaling indication flag>s)

OK

2)

ERROR

Read Command
AT+CGEQMIN?

Response

1)

+CGEQMIN: [<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,< Signaling indication flag>][<CR><LF>+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>[...]]

	<p>8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Maximum bitrate DL>	<p>This parameter indicates the maximum number of kbits/s delivered to UMTS(down-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Guaranteed bitrate UL>	<p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Guaranteed bitrate DL>	<p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Delivery order>	<p>This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <ul style="list-style-type: none"> 0 – no 1 – yes 2 – subscribed value

<p><Maximum SDU size></p>	<p>This parameter indicates the maximum allowed SDU size in octets. The range is 0, 10 to 1500, 1510, 1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<p><SDU error ratio></p>	<p>This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. As an Examples a target SDU error ratio of 5×10^{-3} would be specified as "5E3"(e.g. AT+CGEQMIN=..., "5E3", ...). "0E0" – subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"</p>
<p><Residual bit error ratio></p>	<p>This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. As an Examples a target residual bit error ratio of 5×10^{-3} would be specified as "5E3"(e.g. AT+CGEQMIN=..., "5E3", ..). "0E0" – subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8"</p>
<p><Delivery of erroneous SDUs></p>	<p>This parameter indicates whether SDUs detected as erroneous shall be delivered or not. 0 – no 1 – yes 2 – no detect 3 – subscribed value</p>
<p><Transfer delay></p>	<p>This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. The range is from 0 to 950, and the parameter is an integer of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<p><Traffic handling priority></p>	<p>This parameter specifies the relative importance for handling of all</p>

	<p>SDUs belonging to the UMTS. Bearer compared to the SDUs of the other bearers. The range is 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Source statistics descriptor>	<p>This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<Signaling indication flag>	<p>This parameter indicates Signaling flag. The range is from 0 to 1 The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p>
<PDP_type>	<p>(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol</p>

Examples

AT+CGEQMIN=?

+CGEQMIN:

"IP",(0-4),(0-256000),(0-256000),(0-256000),(0-256000),(0-2),(0-1520),("0E0","1E1","1E2","7E3","1E3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0-950),(0-3),(0-1),(0-1)

OK

AT+CGEQMIN?

+CGEQMIN: 1,4,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

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

OK

AT+CGEQMIN

OK

5.2.12 AT+CGDATA Enter data state

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

AT+CGDATA Enter data state

Test Command	Response
AT+CGDATA=?	1)

	+CGDATA: (list of supported <L2P>s) OK 2) ERROR
Write Command AT+CGDATA=[<L2P>,<cid>]]	Response 1) CONNECT [<text>] 2) NO CARRIER 3) OK 4) ERROR 5) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<L2P>	A string parameter that indicates the layer 2 protocol to be used between the TE and MT. NULL
<text>	CONNECT result code string; the string formats please refer ATX command.
<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1...15

Examples

```

AT+CGDATA=?
+CGDATA: ""

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

5.2.13 AT+CGPADDR Show PDP address

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

AT+CGPADDR Show PDP address	
Test Command AT+CGPADDR=?	<p>Response</p> <p>1) [+CGPADDR: (list of defined <cid>s)]</p> <p>OK</p> <p>2) ERROR</p>
Write Command AT+CGPADDR=<cid>[,<cid>[,...]]	<p>Response</p> <p>1) [+CGPADDR:<cid>,<PDP_addr>[<CR><LF> +CGPADDR: <cid>,<PDP_addr>[...]]]</p> <p>OK</p> <p>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> [...]]]</p> <p>OK</p> <p>3) ERROR</p>
Execution Command AT+CGPADDR	<p>Response</p> <p>1) [+CGPADDR: <cid>,<PDP_addr>] +CGPADDR: <cid>,<PDP_addr>[...]]]</p> <p>OK</p> <p>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> [...]]]</p> <p>OK</p> <p>3) ERROR</p> <p>4) +CME ERROR: <err></p>
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...16
<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)

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

OK
AT+CGPADDR
+CGPADDR: 1,10.83.214.110

OK

```

5.2.14 AT+CGCLASS GPRS mobile station class

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

AT+CGCLASS GPRS mobile station class

Test Command AT+CGCLASS=?	Response 1) +CGCLASS: (list of supported <class>s)
-------------------------------------	---

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

Defined Values

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

Examples

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

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

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

OK

5.2.15 AT+CGEREP GPRS event reporting

The write command enables or disables sending of unsolicited result codes, "+CGEV" from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

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

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

AT+CGEREP GPRS event reporting

Test Command AT+CGEREP=?	Response 1) +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK 2) ERROR
Read Command AT+CGEREP?	Response 1) +CGEREP: <mode>,<bfr> OK 2) ERROR
Write Command AT+CGEREP=<mode>[,<bfr>]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CGEREP	Response 1) Set default value (<mode>=2,<bfr>=0): OK 2) ERROR

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

Defined Values

<mode>	<p>0 – buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE.</p> <p>1 – discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.</p> <p>2 – buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE.</p>
<bfr>	<p>0 – MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered.</p> <p>1 – MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).</p>

The events are valid for GPRS/UMTS and LTE unless explicitly mentioned.

For network attachment, the following unsolicited result codes and the corresponding events are defined:

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

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

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

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

+CGEV: NW PDN ACT <cid> [,<WLAN_Offload>]	The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.
--	--

<WLAN_Offload>: integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value) and bit 2 (UTRAN offload acceptability value) in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.

- 0 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is not acceptable.
- 1 offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in lu mode.
- 2 offloading the traffic of the PDN connection via a WLAN when in lu mode is acceptable, but not acceptable in S1 mode.
- 3 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in lu mode is acceptable.

NOTE

This event is not applicable for EPS.

+CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]][,<WLAN_Offload>]

The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above.

<reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6.

- 0 IPv4 only allowed
- 1 IPv6 only allowed
- 2 single address bearers only allowed.
- 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful.

<cid_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid_other>.

NOTE

For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid_other> returned to TE.

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

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

<p>+CGEV: NW DEACT <PDP_t ype>,<PDP_addr>,<cid>]</p>	<p>The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.</p>
<p>+CGEV: ME DEACT <PDP_t ype>,<PDP_addr>,<cid>]</p>	<p>The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.</p>
<p>+CGEV: NW PDN DEACT <c id>[,<WLAN_Offload>]</p>	<p>The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The</p>

associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above.

NOTE

Occurrence of this event replaces usage of the event
+CGEV: NW DEACT <PDP_type>,<PDP_addr>,<cid>].

+CGEV: ME PDN DEACT <cid>

The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.

NOTE

Occurrence of this event replaces usage of the event
+CGEV: ME DEACT <PDP_type>,<PDP_addr>,<cid>].

+CGEV: NW DEACT <p_cid>,<cid>,<event_type> [,<WLAN_Offload>]

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

NOTE

Occurrence of this event replaces usage of the event
+CGEV: NW DEACT <PDP_type>,<PDP_addr>,<cid>].

+CGEV: ME DEACT <p_cid>,<cid>,<event_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

NOTE

Occurrence of this event replaces usage of the event
+CGEV: ME DEACT <PDP_type>,<PDP_addr>,<cid>].

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

+CGEV: NW MODIFY <cid>, <change_reason>, <event_type>[, <WLAN_Offload>]	<p>The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type>, and <WLAN_Offload> are defined above.</p> <p><change_reason>: integer type; a bitmap that indicates what kind of change occurred. The <change_reason> value is determined by summing all the applicable bits. For Examples if both the values of QoS changed (Bit 2) and <WLAN_Offload> changed (Bit 3) have changed, then the <change_reason> value is 6.</p>
--	--

NOTE

The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN_Offload> defined above.

- Bit 1 TFT changed
- Bit 2 Qos changed
- Bit 3 WLAN Offload changed

+CGEV: ME MODIFY <cid>, <change_reason>, <event_type>[, <WLAN_Offload>]	<p>The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>, <event_type> and <WLAN_Offload> are defined above.</p>
--	---

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

+CGEV: REJECT <PDP_type>, <PDP_addr>	<p>A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type> and <PDP_addr> are found in command +CGDCONT.</p>
---	--

NOTE

This event is not applicable for EPS.

+CGEV: NW REACT	The network has requested a context reactivation. The <cid> that was
------------------------	--

<p><PDP_type>,<PDP_addr>,<cid>]</p>	<p>used to reactivate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT.</p>
---	--

NOTE

This event is not applicable for EPS.

Examples

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

```
OK
AT+CGEREP?
+CGEREP: 2,0
```

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

5.2.16 AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

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

AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

<p>Test Command AT+CGAUTH=?</p>	<p>Response 1) +CGAUTH: (range of supported <cid>s),(list of supported <auth_ - type> s),50,50</p>
--	---

<p>Test Command AT+CGAUTH=?</p>	<p>OK 2) ERROR 3) +CME ERROR: <err></p>
--	---

<p>Read Command AT+CGAUTH?</p>	<p>Response 1) +CGAUTH: [<cid>,<auth_type>[,<user>,<passwd>]]<CR><LF></p>
---	--

	<p>...</p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CGAUTH=<cid>[,<auth_t ype>[,<passwd>[,<user>]]]</p>	<p>Response</p> <p>1)</p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
<p>Execution Command</p> <p>AT+CGAUTH</p>	<p>Response</p> <p>1)</p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<cid>	<p>Parameter specifies a particular PDP context definition. This is also used in other PDP context-related commands.</p> <p>1...15</p>
<auth_type>	<p>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 be specified.</p> <p>0 – none</p> <p>1 – PAP</p> <p>2 – CHAP</p>
<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
AT+CGAUTH
OK
```

5.2.17 AT+CPING Ping destination address

This command is used to ping destination address.

AT+CPING Ping destination address

Test Command
AT+CPING=?

Response
1)
+CPING: IP address, (list of supported
<dest_addr_type>s),(1-100),(4-188),(1000-10000),(10000-100000),
(16-255)

OK
2)
ERROR

Write Command
**AT+CPING=<dest_addr>,<dest_addr_type>
[,<num_pings>[,<data_packet_size>[,<interval_time>[,<wait_time> [,<TTL>]]]]]**

Response
1)
OK

If ping's result_type = 1
+CPING:
<result_type>,<resolved_ip_addr>,<data_packet_size>,<rtt>,<TTL>

If ping's result_type = 2
+CPING: <result_type>

If ping's result_type = 3
+CPING:
<result_type>,<num_pkts_sent>,<num_pkts_recvd>,<num_pkts_lost>,<min_rtt>,<max_rtt>,<avg_rtt>

2)
ERROR

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

Defined Values

<dest_addr>	The destination is to be pinged; it can be an IP address or a domain name.
<dest_addr_type>	Integer type. Address family type of the destination address 1 – IPv4. 2 – IPv6(reserved)
<num_pings>	Integer type. The num_pings specifies the number of times the ping request (1-100) is to be sent. The default value is 5. NOTE: It's actually an invalid parameter, The num_pings specifies the number of times is 5.
<data_packet_size>	Integer type. Data byte size of the ping packet (4-188). The default value is 64 bytes.
<interval_time>	Integer type. Interval between each ping. Value is specified in milliseconds (1000ms-10000ms). The default value is 2000ms.
<wait_time>	Integer type. Wait time for ping response. An ping response received after the timeout shall not be processed. Value specified in milliseconds (10000ms-100000ms). The default value is 10000ms.
<TTL>	Integer type. TTL(Time-To-Live) value for the IP packet over which the ping(ICMP ECHO Request message) is sent (16-255), the default value is 255.
<result_type>	1 – Ping success 2 – Ping time out 3 – Ping result
<num_pkts_sent>	Indicates the number of ping requests that were sent out.
<num_pkts_rcvd>	Indicates the number of ping responses that were received.
<num_pkts_lost>	Indicates the number of ping requests for which no response was received.
<min_rtt>	Indicates the minimum Round Trip Time(RTT).
<max_rtt>	Indicates the maximum RTT.
<avg_rtt>	Indicates the average RTT.
<resolved_ip_addr>	Indicates the resolved ip address.
< rtt>	Round Trip Time.

Examples

```
AT+CPING=?
+CPING: IP
address,(1,2),(1-100),(4-188),(1000-10000),(10000-100000),(16-255)
```

```
OK
AT+CPING="www.baidu.com",1,4,64,1000,10000,255
OK

+CPING: 2

+CPING: 2

+CPING: 2

+CPING: 2

+CPING: 3,4,0,4,0,0,0
```

SIMCom
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6 AT Commands for SIM Card

6.1 Overview of AT Commands for SIM Card

Command	Description
AT+CICCID	Read ICCID from SIM card
AT+CPIN	Enter PIN
AT+CLCK	Facility lock
AT+CPWD	Change password
AT+CIMI	Request international mobile subscriber identity
AT+CSIM	Generic SIM access
AT+CRSM	Restricted SIM access
AT+SPIC	Times remain to input SIM PIN/PUK
AT+CSPN	Get service provider name from SIM
AT+UIMHOTSWAPON	Set UIM hotswap function on
AT+UIMHOTSWAPLEVEL	Set UIM card detection level

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	9s
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 Operator selection

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	9s
Reference	3GPP TS 27.007

Defined Values

<pin>	String type values.
<newpin>	String type values.
<code>	Values reserved by the present document: READY – ME is not pending for any password SIM PIN – ME is waiting SIM PIN to be given SIM PUK – ME is waiting SIM PUK to be given PH-SIM PIN – ME is waiting phone-to-SIM card password to be given SIM PIN2 – ME is waiting SIM PIN2 to be given SIM PUK2 – ME is waiting SIM PUK2 to be given PH-NET PIN – ME is waiting network personalization password to be given

Examples

```

AT+CPIN=?
OK
AT+CPIN?
+CPIN: READY
OK
AT+CPIN=1234
OK
    
```


6.2.3 AT+CLCK Facility lock

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

AT+CLCK Facility lock	
Test Command AT+CLCK=?	Response +CLCK: (list of supported <fac>s) OK
Write Command AT+CLCK=<fac>,<mode> [,<passwd>,<class>]	Response 1) OK 2) When <mode>=2 and command successful: +CLCK: <status>[,<class1>[<CR><LF> +CLCK: <status>,<class2> [...]] OK 3) ERROR 4) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	9s
Reference	3GPP TS 27.007

Defined Values

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

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

Examples

```

AT+CLCK="SC",2
+CLCK: 0
OK
AT+CLCK=?
+CLCK:
("PF","SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PN","PU","PP","PC")
OK

```

6.2.4 AT+CPWD Change password

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

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

AT+CPWD Change password

Test Command AT+CPWD=?	Response 1) +CPWD: (list of supported (<fac>,<pwdlength>)s) OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CPWD=<fac>,<oldpwd>,<newpwd>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	9s
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CPWD=?

+CPWD:

("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("IR",4),("OI",4),("OX",4),

```
"SC",8),("P2",8)
```

```
OK
```

```
AT+CPWD="SC",1234,4321
```

```
OK
```

6.2.5 AT+CIMI Request international mobile subscriber identity

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

AT+CIMI Request international mobile subscriber identity

Test Command AT+CIMI=?	Response 1) OK 2) ERROR
Execution Command AT+CIMI	Response 1) <IMSI> OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	3GPP TS 27.007

Defined Values

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

Examples

```
AT+CIMI=?
```

```
OK
```

```
AT+CIMI
```

```
460010222028133
```

```
OK
```

NOTE

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

6.2.6 AT+CSIM Generic SIM access

This command is used to control the SIM card directly.

Compared to restricted SIM access command AT+CRSM, AT+CSIM allows the ME to take more control over the SIM interface.

For SIM–ME interface please refer 3GPP TS 11.11.

AT+CSIM Generic SIM access

Test Command AT+CSIM=?	Response OK
Write Command AT+CSIM=<length>,<command>	Response 1) +CSIM: <length>, <response> 2) OK 3) ERROR 4) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	3GPP TS 27.007

Defined Values

<length>	Integer type; length of characters that are sent to TE in <command> or <response>
<command>	Command passed from MT to SIM card.
<response>	Response to the command passed from SIM card to MT.

Examples

AT+CSIM=?
OK

AT+CSIM=10,"A0F2000016"

+CSIM:4,"6E00"

OK

NOTE

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

6.2.7 AT+CRSM Restricted SIM access

By using AT+CRSM instead of Generic SIM Access AT+CSIM, TE application has easier but more limited access to the SIM database.

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

AT+CRSM Restricted SIM access

Test Command AT+CRSM=?	Response OK
Write Command AT+CRSM=<command>[,<fileID>[,<p1>,<p2>,<p3>[,<data>]]]	Response 1) +CRSM: <sw1>,<sw2>[,<response>] 2) OK 3) ERROR +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	3GPP TS 27.007

Defined Values

<command>	<p>Command passed on by the MT to the SIM:</p> <ul style="list-style-type: none"> 176 – READ BINARY 178 – READ RECORD 192 – GET RESPONSE 214 – UPDATE BINARY 220 – UPDATE RECORD 242 – STATUS 203 – RETRIEVE DATA 219 – SET DATA
<fileID>	<p>Identifier for an elementary data file on SIM, if used by <command>. The following list the fileID hex value, user needs to convert them to decimal.</p> <p>EFs under MF</p> <ul style="list-style-type: none"> 0x2FE2 ICCID 0x2F05 Extended Language Preferences 0x2F00 EF DIR 0x2F06 Access Rule Reference <p>EFs under USIM ADF</p> <ul style="list-style-type: none"> 0x6F05 Language Indication 0x6F07 IMSI 0x6F08 Ciphering and Integrity keys 0x6F09 C and I keys for pkt switched domain 0x6F60 User controlled PLMN selector w/Acc Tech 0x6F30 User controlled PLMN selector 0x6F31 HPLMN search period 0x6F37 ACM maximum value 0x6F38 USIM Service table 0x6F39 Accumulated Call meter 0x6F3E Group Identifier Level 0x6F3F Group Identifier Level 2 0x6F46 Service Provider Name 0x6F41 Price Per Unit and Currency table 0x6F45 Cell Bcast Msg identifier selection 0x6F78 Access control class 0x6F7B Forbidden PLMNs 0x6F7E Location information 0x6FAD Administrative data 0x6F48 Cell Bcast msg id for data download 0x6FB7 Emergency call codes 0x6F50 Cell bcast msg id range selection 0x6F73 Packet switched location information 0x6F3B Fixed dialling numbers 0x6F3C Short messages 0x6F40 MSISDN 0x6F42 SMS parameters

0x6F43	SMS Status
0x6F49	Service dialling numbers
0x6F4B	Extension 2
0x6F4C	Extension 3
0x6F47	SMS reports
0x6F80	Incoming call information
0x6F81	Outgoing call information
0x6F82	Incoming call timer
0x6F83	Outgoing call timer
0x6F4E	Extension 5
0x6F4F	Capability Config Parameters 2
0x6FB5	Enh Multi Level Precedence and Pri
0x6FB6	Automatic answer for eMLPP service
0x6FC2	Group identity
0x6FC3	Key for hidden phonebook entries
0x6F4D	Barred dialling numbers
0x6F55	Extension 4
0x6F58	Comparison Method information
0x6F56	Enabled services table
0x6F57	Access Point Name Control List
0x6F2C	De-personalization Control Keys
0x6F32	Co-operative network list
0x6F5B	Hyperframe number
0x6F5C	Maximum value of Hyperframe number
0x6F61	OPLMN selector with access tech
0x6F5D	OPLMN selector
0x6F62	HPLMN selector with access technology
0x6F06	Access Rule reference
0x6F65	RPLMN last used access tech
0x6FC4	Network Parameters
0x6F11	CPHS: Voice Mail Waiting Indicator
0x6F12,	CPHS: Service String Table
0x6F13	CPHS: Call Forwarding Flag
0x6F14	CPHS: Operator Name String
0x6F15	CPHS: Customer Service Profile
0x6F16	CPHS: CPHS Information
0x6F17	CPHS: Mailbox Number
0x6FC5	PLMN Network Name
0x6FC6	Operator PLMN List
0x6F9F	Dynamic Flags Status
0x6F92	Dynamic2 Flag Setting
0x6F98	Customer Service Profile Line2
0x6F9B	EF PARAMS - Welcome Message
0x4F30	Phone book reference file
0x4F22	Phone book synchronization center
0x4F23	Change counter

0x4F24	Previous Unique Identifier
0x4F20	GSM ciphering key Kc
0x4F52	GPRS ciphering key
0x4F63	CPBCCCH information
0x4F64	Investigation scan
0x4F40	MExE Service table
0x4F41	Operator Root Public Key
0x4F42	Administrator Root Public Key
0x4F43	Third party Root public key
0x6FC7	Mail Box Dialing Number
0x6FC8	Extension 6
0x6FC9	Mailbox Identifier
0x6FCA	Message Waiting Indication Status
0x6FCD	Service Provider Display Information
0x6FD2	UIM_USIM_SPT_TABLE
0x6FD9	Equivalent HPLMN
0x6FCB	Call Forwarding Indicator Status
0x6FD6	GBA Bootstrapping parameters
0x6FDA	GBA NAF List
0x6FD7	MBMS Service Key
0x6FD8	MBMS User Key
0x6FCE	MMS Notification
0x6FD0	MMS Issuer connectivity parameters
0x6FD1	MMS User Preferences
0x6FD2	MMS User connectivity parameters
0x6FCF	Extension 8
0x5031	Object Directory File
0x5032	Token Information File
0x5033	Unused space Information File
EFs under Telecom DF	
0x6F3A	Abbreviated Dialing Numbers
0x6F3B	Fixed dialling numbers
0x6F3C	Short messages
0x6F3D	Capability Configuration Parameters
0x6F4F	Extended CCP
0x6F40	MSISDN
0x6F42	SMS parameters
0x6F43	SMS Status
0x6F44	Last number dialled
0x6F49	Service Dialling numbers
0x6F4A	Extension 1
0x6F4B	Extension 2
0x6F4C	Extension 3
0x6F4D	Barred Dialing Numbers
0x6F4E	Extension 4
0x6F47	SMS reports

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

Examples

```

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

```

6.2.8 AT+SPIC Times remain to input SIM PIN/PUK

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

AT+SPIC Times remain to input SIM PIN/PUK

Test Command	Response
AT+SPIC=?	OK
Execution Command	Response

AT+SPIC	+SPIC: <pin1>,<puk1>,<pin2>,<puk2> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

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

Examples

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

6.2.9 AT+CSPN Get service provider name from SIM

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

AT+CSPN Get service provider name from SIM	
Test Command AT+CSPN=?	Response 1) OK 2) ERROR
Read Command AT+CSPN?	Response 1) +CSPN: <spn>,<display mode> OK 2) OK 3) ERROR 4) +CME ERROR:<err>

Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	Vendor

Defined Values

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

Examples

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

6.2.10 AT+UIMHOTSWAPON Set UIM Hotswap Function On

AT+UIMHOTSWAPON Set UIM hotswap function on

Test Command AT+UIMHOTSWAPON=?	Response 1) +UIMHOTSWAPON: (0-1) OK 2) ERROR
Read Command AT+UIMHOTSWAPON?	Response 1) +UIMHOTSWAPON:<onoff> OK 2) ERROR
Write Command AT+UIMHOTSWAPON=<onoff> f>	Response 1) OK 2) ERROR

Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	Vendor

Defined Values

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

Examples

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

```
OK
AT+UIMHOTSWAPON?
+UIMHOTSWAPON: 0
```

```
OK
AT+UIMHOTSWAPON=1
OK
```

NOTE

Modules should be reset to take effect.

6.2.11 AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level

AT+UIMHOTSWAPLEVEL Set UIM card detection level

Test Command AT+UIMHOTSWAPLEVEL=?	Response 1) +UIMHOTSWAPLEVEL: (0-1) OK 2) ERROR
Read Command AT+UIMHOTSWAPLEVEL?	Response 1) +UIMHOTSWAPLEVEL: <level>

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

Defined Values

<level>	0 ACTIVE LOW 1 ACTIVE HIGH
---------	-------------------------------

Examples

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

```
OK
AT+UIMHOTSWAPLEVEL?
+UIMHOTSWAPLEVEL: 0
```

```
OK
AT+UIMHOTSWAPLEVEL=1
OK
```

7 AT Commands for Call Control

7.1 Overview of AT Commands for Call Control

Command	Description
AT+CVHU	Voice hang up control
AT+CHUP	Hang up call
AT+CBST	Select bearer service type
AT+CRLP	Radio link protocol
AT+CRC	Cellular result codes
AT+CLCC	List current calls
AT+CEER	Extended error report
AT+CCWA	Call waiting
AT+CCFC	Call forwarding number and conditions
AT+CLIP	Calling line identification presentation
AT+CLIR	Calling line identification restriction
AT+COLP	Connected line identification presentation
AT+VTS	DTMF and tone generation
AT+VTD	Tone duration
AT+CSTA	Select type of address
AT+CMOD	Call mode
AT+VMUE	Speaker mute contro
AT+CMUT	Microphone mute control
AT+CSDVC	Switch voice channel device
AT+CMICGAIN	Adjust mic gain
AT+COUGAIN	Adjust out gain

7.2 Detailed Description of AT Commands for Call Control

7.2.1 AT+CVHU Voice hang up control

Write command selects whether ATH or “drop DTR” shall cause a voice connection to be disconnected or not. By voice connection is also meant alternating mode calls that are currently in voice mode.

AT+CVHU Voice hang up control	
Test Command AT+CVHU=?	Response +CVHU: (range of supported <mode>s) OK
Read Command AT+CVHU?	Response +CVHU: <mode> OK
Write Command AT+CVHU=<mode>	Response 1) OK 2) ERROR
Execution Command AT+CVHU	Set default value Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	0 – “Drop DTR” ignored but OK response given. ATH disconnects. 1 – “Drop DTR” and ATH ignored but OK response given.
--------	---

Examples

AT+CVHU=?

+CVHU: (0-1)

OK

AT+CVHU?

+CVHU: 1

OK

AT+CVHU=0

OK

AT+CVHU

OK

7.2.2 AT+CHUP Hang up call

This command is used to cancel voice calls. If there is no call, it will do nothing but OK response is given. After running AT+CHUP, multiple "VOICE CALL END: " may be reported which relies on how many calls exist before calling this command.

AT+CHUP Hang up cal

Test Command AT+CHUP=?	Response OK
Execution Command AT+CHUP	Response 1) VOICE CALL: END: <time> OK 2)No Call OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<time>	Voice call connection time. Format – HHMMSS (HH: hour, MM: minute, SS: second)
--------	---

Examples

```
AT+CHUP=?
OK
AT+CHUP
VOICE CALL: END: 000033

OK
```

7.2.3 AT+CBST Select bearer service type

Write command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated. Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls.

AT+ CBST Select bearer service type	
Test Command AT+CBST=?	Response +CBST: (list of supported <speed>s), (list of supported <name>s), (list of supported <ce>s) OK
Read Command AT+CBST?	Response +CBST: <speed>,<name>,<ce> OK
Write Command AT+CBST=<speed>[,<name>[,<ce>]]	Response 1) +CBST: <speed>,<name>,<ce> OK 2) ERROR
Execution Command AT+CBST	Set default value Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<speed>	<ul style="list-style-type: none"> 0 – autobaoding(automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service) 1 – 300 bps (V.21) 2 – 1200 bps (V.22) 3 – 1200/75 bps (V.23) 4 – 2400 bps (V.22bis) 5 – 2400 bps (V.26ter) 6 – 4800 bps (V.32) <u>7</u> – 9600 bps (V.32) 12 – 9600 bps (V.34)
----------------------	--

	<ul style="list-style-type: none"> 14 – 14400 bps (V.34) 15 – 19200 bps (V.34) 16 – 28800 bps (V.34) 17 – 33600 bps (V.34) 34 – 1200 bps (V.120) 36 – 2400 bps (V.120) 38 – 4800 bps (V.120) 39 – 9600 bps (V.120) 43 – 14400 bps (V.120) 47 – 19200 bps (V.120) 48 – 28800 bps (V.120) 49 – 38400 bps (V.120) 50 – 48000 bps (V.120) 51 – 56000 bps (V.120) 65 – 300 bps (V.110) 66 – 1200 bps (V.110) 68 – 2400 bps (V.110 or X.31 flag stuffing) 70 – 4800 bps (V.110 or X.31 flag stuffing) 71 – 9600 bps (V.110 or X.31 flag stuffing) 75 – 14400 bps (V.110 or X.31 flag stuffing) 79 – 19200 bps (V.110 or X.31 flag stuffing) 80 – 28800 bps (V.110 or X.31 flag stuffing) 81 – 38400 bps (V.110 or X.31 flag stuffing) 82 – 48000 bps (V.110 or X.31 flag stuffing) 83 – 56000 bps (V.110 or X.31 flag stuffing) 84 – 64000 bps (X.31 flag stuffing) 115 – 56000 bps (bit transparent) 116 – 64000 bps (bit transparent) 120 – 32000 bps (PIAFS32K) 121 – 64000 bps (PIAFS64K) 130 – 28800 bps (multimedia) 131 – 32000 bps (multimedia) 132 – 33600 bps (multimedia) 133 – 56000 bps (multimedia) 134 – 64000 bps (multimedia)
<name>	<ul style="list-style-type: none"> <u>0</u> – Asynchronous modem 1 – Synchronous modem 2 – PAD Access (asynchronous)(UDI) 3 – Packet Access (synchronous)(UDI) 4 – data circuit asynchronous (RDI) 5 – data circuit synchronous (RDI) 6 – PAD Access (asynchronous)(RDI) 7 – Packet Access (synchronous)(RDI)
<ce>	<ul style="list-style-type: none"> 0 – transparent <u>1</u> – non-transparent

- | | |
|--|-------------------------------------|
| | 2 – both, transparent preferred |
| | 3 – both, non-transparent preferred |

Examples

AT+CBST=?

+CBST:

(0,1,2,3,4,5,6,7,12,14,15,16,17,34,36,38,39,43,47,48,49,50,51,65,66,68,70,71,75,79,80,81,82,83,84,115,116,120,121,130,131,132,133,134),(0-7),(0-3)

OK

AT+CBST?

+CBST: 0,0,1

OK

AT+CBST=0,2,1

OK

AT+CBST

OK

7.2.4 AT+CRLP Radio link protocol

Radio Link Protocol(RLP) parameters used when non-transparent data calls are originated may be altered with write command.

AT+CRLP Radio link protocol

Test Command AT+CRLP=?	Response +CRLP: (range of supported <iws>s), (range of supported <mws>s), (range of supported <T1>s), (range of supported <N2>s) [,<ver> [, (range of supported <T4>s)]]
----------------------------------	--

OK

Read Command AT+CRLP?	Response +CRLP: <iws>, <mws>, <T1>, <N2> [,<ver> [, <T4>]]
---------------------------------	--

OK

Write Command AT+CRLP=<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]]	Response 1) OK
--	----------------------

	2) ERROR
Execution Command AT+CRLP	Set default value Response OK
Parameter Saving Mode	AT&W_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<ver>	RLP version number in integer format, and it can be 0 or 1; when version indication is not present it shall equal 1.
<iws>	IWF to MS window size.
<mws>	MS to IWF window size.
<T1>	Acknowledgement timer.
<N2>	Retransmission attempts.
<T4>	Re-sequencing period in integer format.

Examples

AT+CRLP=?

+CRLP:(0-61),(0-61),(39-255),(1-255),(0-1),(3-255)

OK

AT+CRLP?

+CRLP:61,61,128,255,1,3

OK

AT+CRLP= 61,61,128,255,1,3

OK

AT+CRLP

OK

NOTE

<T1> and <T4> are in units of 10 ms.

7.2.5 AT+CRC Cellular result codes

Write command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation is used. When enabled, an incoming call is indicated to the TE with unsolicited result code “+CRING: <type>” instead of the normal RING.

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

AT+ CRC Cellular result codes	
Test Command AT+CRC=?	Response +CRC: (list of supported <mode>s) OK
Read Command AT+CRC?	Response +CRC: <mode> OK
Write Command AT+CRC=<mode>	Response OK
Execution Command AT+CRC	Set default value Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	0 – disables reporting 1 – enables reporting
<type>	ASYNC asynchronous transparent SYNC synchronous transparent REL ASYNC asynchronous non-transparent REL SYNC synchronous non-transparent FAX facsimile VOICE normal voice VOICE/XXX voice followed by data(XXX is ASYNC, SYNC, REL ASYNC or REL SYNC) ALT VOICE/XXX alternating voice/data, voice first ALT XXX/VOICE alternating voice/data, data first ALT FAX/VOICE alternating voice/fax, fax first

Examples

AT+CRC=?

+CRC: (0,1)

OK

AT+CRC?

+CRC: 0

OK

AT+CRC=1

OK

AT+CRC

OK

7.2.6 AT+CLCC List current calls

This command is used to return list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.

AT+ CLCC List current calls

Test Command AT+CLCC=?	Response +CLCC: (range of supported <n>s) OK
Read Command AT+CLCC?	Response +CLCC: <n> OK
Write Command AT+CLCC=<n>	Response 1) OK 2) ERROR
Execution Command AT+CLCC	Response 1) +CLCC:<id1>,<dir>,<stat>,<mode>,<empty>[,<number>,<type>[,<alpha>]] OK 2) OK
Parameter Saving Mode	NO_SAVE

Max Response Time	9S
Reference	3GPP TS 27.007

URC

Note: This can be an indication to list the current call information when <n> set to 1.

+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]][<CR><LF>
+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]]

Defined Values

<n>	<p>0 – Don't report a list of current calls of ME automatically when the current call status changes.</p> <p><u>1</u> – Report a list of current calls of ME automatically when the current call status changes.</p>
<idX>	Integer type, call identification number.
<dir>	<p>0 – mobile originated (MO) call</p> <p>1 – mobile terminated (MT) call</p>
<stat>	<p>State of the call:</p> <p>0 – active</p> <p>1 – held</p> <p>2 – dialing (MO call)</p> <p>3 – alerting (MO call)</p> <p>4 – incoming (MT call)</p> <p>5 – waiting (MT call)</p> <p>6 – disconnect</p>
<mode>	<p>bearer/teleservice:</p> <p>0 – voice</p> <p>1 – data</p> <p>2 – fax</p> <p>9 – unknown</p>
<mpty>	<p>0 – call is not one of multiparty (conference) call parties</p> <p>1 – call is one of multiparty (conference) call parties</p>
<number>	String type phone number in format specified by <type>.
<type>	<p>Type of address octet in integer format;</p> <p>128 – Restricted number type includes unknown type and format</p> <p>145 – International number type</p> <p>161 – national number. The network support for this type is optional</p> <p>177 – network specific number, ISDN format</p> <p>129 – Otherwise</p>
<alpha>	String type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set AT+CSCS.

Examples

```

AT+CLCC=?
+CLCC: (0-1)

OK
AT+CLCC?
+CLCC: 1

OK
AT+CLCC=1
OK
AT+CLCC
OK
AT+CLCC
+CLCC: 1, 0, 0, 0, 0, "13883113271", 129

OK

```

7.2.7 AT+CEER Extended error report

Execution command causes the TA to return the information text <report>, which should offer the user of the TA an extended report of the reason for:

1. The failure in the last unsuccessful call setup(originating or answering) or in-call modification.
2. The last call release.
3. The last unsuccessful GPRS attach or unsuccessful PDP context activation.
4. The last GPRS detach or PDP context deactivation.

AT+ CEER Extended error report

Test Command AT+CEER=?	Response OK
Execution Command AT+CEER	Response +CEER:<report> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<report>	Wrong information which is possibly occurred.
----------	---

Examples

AT+CEER=?

OK

AT+CEER

+CEER: "31 Normal: unspecified"

OK

7.2.8 AT+CCWA Call waiting

This command allows control of the Call Waiting supplementary service. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>,<type>,<class> to the TE when call waiting service is enabled. Command should be abortable when network is interrogated.

AT+ CCWA Call waiting	
Test Command AT+CCWA=?	Response +CCWA: (range of supported <n>s), (range of supported <mode>s), (range of supported <class>s) OK
Read Command AT+CCWA?	Response +CCWA: <n> OK
Write Command AT+CCWA=<n>[,<mode>[,<class>]]	Response 1) When <mode>=2 and command successful: +CCWA:<status>,<class>[<CR><LF> +CCWA: <status>, <class>[...]] OK 2) OK 3) +CME ERROR: <err>

Execution Command AT+CCWA	Set default value Response OK
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<n>	Sets/shows the result code presentation status in the TA 0 – disable <u>1</u> – enable
<mode>	When <mode> parameter is not given, network is not interrogated: 0 – disable 1 – enable 2 – query status
<class>	It is a sum of integers each representing a class of information (default 7) 1 – voice (telephony) 2 – data (refers to all bearer services) 4 – fax (facsimile services) 7 – voice,data and fax(1+2+4) 8 – short message service 16 – data circuit sync 32 – data circuit async 64 – dedicated packet access 128 – dedicated PAD access 255 – The value 255 covers all classes
<status>	0 – not active 1 – active
<number>	String type phone number of calling address in format specified by <type>.
<type>	Type of address octet in integer format; 128 – Restricted number type includes unknown type and format 145 – International number type 129 – Otherwise

Examples

AT+CCWA=?

+CCWA: (0-1), (0-2), (1-255)

OK

AT+CCWA?

+CCWA: 1

OK

AT+CCWA=1

OK

AT+CCWA=1,2,7

+CCWA: 1,1

+CCWA: 0,2

+CCWA: 0,4

OK

AT+CCWA

OK

7.2.9 AT+CCFC Call forwarding number and conditions

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

AT+ CCFC Call forwarding number and conditions

Test Command AT+CCFC=?	Response +CCFC: (list of supported <reason>s) OK
Write Command AT+CCFC=<reason>,<mode>,<number>,<type>,<class>,<subaddr>,<satype>,<time>]]]]]]	Response 1) When <mode>=2 and command successful: +CCFC: <status>,<class1>,<number>,<type>,<subaddr>,<satype>,<time>]]]]]]<CR><LF> +CCFC: <status>,<class2>,<number>,<type>,<subaddr>,<satype>,<time>]]]]]] [...]]]]] OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<reason>	<ul style="list-style-type: none"> 0 – unconditional 1 – mobile busy 2 – no reply 3 – not reachable 4 – all call forwarding 5 – all conditional call forwarding
<mode>	<ul style="list-style-type: none"> 0 – disable 1 – enable 2 – query status 3 – registration 4 – erasure
<number>	String type phone number of forwarding address in format specified by <type>.
<type>	Type of address octet in integer format: <ul style="list-style-type: none"> 145 – dialing string <number> includes international access code character '+' 129 – otherwise
<subaddr>	String type sub address of format specified by <satype>.
<satype>	Type of sub address octet in integer format, default 128.
<classX>	It is a sum of integers each representing a class of information (default 7): <ul style="list-style-type: none"> 1 – voice (telephony) 2 – data (refers to all bearer services) 4 – fax (facsimile services) 16 – data circuit sync 32 – data circuit async 64 – dedicated packet access 128 – dedicated PAD access 255 – The value 255 covers all classes
<time>	1...30 – when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20.
<status>	<ul style="list-style-type: none"> 0 – not active 1 – active

Examples

```
AT+CCFC=?
+CCFC: (0,1,2,3,4,5)

OK
AT+CCFC=0,2
+CCFC: 0,7
```

OK

7.2.10 AT+CLIP Calling line identification presentation

This command refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

Write command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network.

When the presentation of the CLI at the TE is enabled (and calling subscriber allows), +CLIP: <number>,<type>,,[,<alpha>][,<CLI validity>]] response is returned after every RING (or +CRING: <type>; refer sub clause "Cellular result codes +CRC") result code sent from TA to TE. It is manufacturer specific if this response is used when normal voice call is answered.

AT+CLIP Calling line identification presentation

Test Command AT+CLIP=?	Response +CLIP: (range of supported <n>s) OK
Read Command AT+CLIP?	Response 1) +CLIP: <n>,<m> OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CLIP=<n>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CLIP	Set default value Response OK
Parameter Saving Mode	AT&W_SAVE
Max Response Time	9S

Reference	3GPP TS 27.007
-----------	----------------

Defined Values

<n>	Parameter sets/shows the result code presentation status in the TA: <ul style="list-style-type: none"> 0 – disable 1 – enable
<m>	<ul style="list-style-type: none"> 0 – CLIP not provisioned 1 – CLIP provisioned 2 – unknown (e.g. no network, etc.)
<number>	String type phone number of calling address in format specified by <type>.
<type>	Type of address octet in integer format; <ul style="list-style-type: none"> 128 – Restricted number type includes unknown type and format 145 – International number type 161 – national number. The network support for this type is optional 177 – network specific number, ISDN format 129 – Otherwise
<alpha>	String type alphanumeric representation of <number> corresponding to the entry found in phone book.
<CLI validity>	<ul style="list-style-type: none"> 0 – CLI valid 1 – CLI has been withheld by the originator 2 – CLI is not available due to interworking problems or limitations of originating network

Examples

```
AT+CLIP=?
```

```
+CLIP: (0-1)
```

```
OK
```

```
AT+CLIP?
```

```
+CLIP: 1,1
```

```
OK
```

```
AT+CLIP=0
```

```
OK
```

```
AT+CLIP
```

```
OK
```

7.2.11 AT+CLIR Calling line identification restriction

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

Write command overrides the CLIR subscription (default is restricted or allowed) when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command.. If this command is used by a subscriber without provision of CLIR in permanent mode the network will act.

Read command gives the default adjustment for all outgoing calls (given in <n>), and also triggers an interrogation of the provision status of the CLIR service (given in <m>).

Test command returns values supported as a compound value.

AT+CLIR Calling line identification restriction

Test Command AT+CLIR=?	Response +CLIR: (range of supported <n>s) OK
Read Command AT+CLIR?	Response 1) +CLIR: <n>,<m> OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+CLIR=<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 – presentation indicator is used according to the subscription of the CLIR service 1 – CLIR invocation
-----	---

	2 – CLIR suppression
<m>	0 – CLIR not provisioned 1 – CLIR provisioned in permanent mode 2 – unknown (e.g. no network, etc.) 3 – CLIR temporary mode presentation restricted 4 – CLIR temporary mode presentation allowed

Examples

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

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

```
OK
AT+CLIR=1
OK
```

7.2.12 AT+COLP Connected line identification presentation

This command refers to the GSM/UMTS supplementary service COLP(Connected Line Identification Presentation) that enables a calling subscriber to get the connected line identity (COL) of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.

When enabled (and called subscriber allows), +COLP:<number>, <type> [,<subaddr>, <satype> [,<alpha>]] intermediate result code is returned from TA to TE before any +CR responses. It is manufacturer specific if this response is used when normal voice call is established.

When the AT+COLP=1 is set, any data input immediately after the launching of “ATDXXX;” will stop the execution of the ATD command, which may cancel the establishing of the call.

AT+COLP Connected line identification presentation

Test Command AT+COLP=?	Response +COLP: (list of supported <n>s) OK
Read Command AT+COLP?	Response 1) +COLP: <n>,<m>

	OK 2) ERROR 3) +CME ERROR: <err>
Write Command AT+COLP =<n>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+COLP	Set default value Response OK
Parameter Saving Mode	AT&W_SAVE
Max Response Time	20S
Reference	3GPP TS 27.007

Defined Values

<n>	Parameter sets/shows the result code presentation status in the TA: 0 – disable 1 – enable
<m>	0 – COLP not provisioned 1 – COLP provisioned 2 – unknown (e.g. no network, etc.)

Examples

AT+COLP=?

+COLP: (0-1)

OK

AT+COLP?

+COLP: 1, 0

OK

AT+COLP=1

OK

AT+COLP

OK

7.2.13 AT+VTS DTMF and tone generation

This command allows the transmission of DTMF tones and arbitrary tones which cause the Mobile Switching Center (MSC) to transmit tones to a remote subscriber. The command can only be used in voice mode of operation (active voice call).

NOTE

The END event of voice call will terminate the transmission of tones, and as an operator option, the tone may be ceased after a pre-determined time whether or not tone duration has been reached.

AT+VTS DTMF and tone generation

Test Command AT+VTS=?	Response +VTS: (list of supported<dtmf>s) OK
Write Command AT+VTS=<dtmf>[,<duration>] AT+VTS=<dtmf-string>	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

<dtmf>	A single ASCII character in the set 0-9, *, #, A, B, C, D.
<duration>	Tone duration in milliseconds, from 300 to 600. This is interpreted as a DTMF tone of different duration from that mandated by the AT+VTD command, otherwise, the duration which be set the AT+VTD command will be used for the tone (<duration> is omitted).
<dtmf-string>	A sequence of ASCII character in the set 0-9, *, #, A, B, C, D, and maximal length of the string is 29. The string must be enclosed in double quotes (""), and separated by commas between the ASCII characters (e.g. "1,3,5,7,9,*"). Each of the tones with a duration which is set by the AT+VTD command.

Examples

AT+VTS=?

+VTS: (0-9,*,#,A,B,C,D)

OK

AT+VTS=1,600

OK

AT+VTS="135",600

OK

7.2.14 AT+VTD Tone duration

This refers to an integer <n> that defines the length of tones emitted as a result of the AT+VTS command. A value different than zero causes a tone of duration <n>/10 seconds.

AT+VTD Tone duration

Test Command AT+VTD=?	Response +VTD: (range of supported <n>s) OK
Read Command AT+VTD?	Response +VTD: <n> OK
Write Command AT+VTD=<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>	Tone duration in integer format, from 300 to 600 milliseconds.
-----	--

Examples

AT+VTD=?

+VTD: (300-600)

OK

AT+VTD?

+VTD: 300

OK

AT+VTD=400

OK

7.2.15 AT+CSTA Select type of address

Write command is used to select the type of number for further dialing commands (ATD) according to GSM/UMTS specifications.

Read command returns the current type of number.

Test command returns values supported by the Module as a compound value.

AT+CSTA Select type of address

Test Command AT+CSTA=?	Response +CSTA:(list of supported <type>s) OK
Read Command AT+CSTA?	Response +CSTA:<type> OK
Write Command AT+CSTA=<type>	Response 1) OK 2) ERROR
Execution Command AT+CSTA	Set default value Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<type>	Type of address octet in integer format: 145 – when dialling string includes international access code character “+” 161 – national number.The network support for this type is optional 177 – network specific number,ISDN format <u>129</u> – otherwise
--------	---

NOTE

Because the type of address is automatically detected on the dial string of dialing command, command AT+CSTA has really no effect.

Examples

```

AT+CSTA=?
+CSTA: (129,145,161,177)

OK
AT+CSTA?
+CSTA: 129

OK
AT+CSTA=145
OK
AT+CSTA
OK
  
```

7.2.16 AT+CMOD Call mode

Write command selects the call mode of further dialing commands (ATD) or for next answering command (ATA). Mode can be either single or alternating.
 Test command returns values supported by the TA as a compound value.

AT+CMOD Call mode	
Test Command AT+CMOD=?	Response +CMOD: (list of supported <mode>s) OK
Read Command	Response

AT+CMOD?	+CMOD: <mode>
	OK
Write Command AT+CMOD=<mode>	Response 1) OK 2) ERROR
Execution Command AT+CMOD	Set default value: Response OK
Parameter Saving Mode	-
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	<u>0</u> – single mode(only supported)
---------------------	--

NOTE

The value of <mode> shall be set to zero after a successfully completed alternating mode call. It shall be set to zero also after a failed answering. The power-on, factory and user resets shall also set the value to zero. This reduces the possibility that alternating mode calls are originated or answered accidentally.

Examples

AT+CMOD=?

+CMOD: (0)

OK

AT+CMOD?

+CMOD: 0

OK

AT+CMOD=0

OK

AT+CMOD

OK

7.2.17 AT+VMUTE Speaker mute control

This command is used to control the loudspeaker to mute and unmute during a voice call or a video call which is connected. If there is not a connected call, write command can't be used. When all calls are disconnected, the Module sets the subparameter as 0 automatically.

AT+VMUTE Speaker mute control

Test Command AT+VMUTE=?	Response +VMUTE: (list of supported <mode>s) OK
Read Command AT+VMUTE?	Response +VMUTE: <mode> OK
Write Command AT+VMUTE=<mode>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	0 – mute off 1 – mute on
--------	-----------------------------

Examples

AT+VMUTE=?

+VMUTE: (0-1)

OK

AT+VMUTE?

+VMUTE: 0

OK

AT+VMUTE=1

OK

7.2.18 AT+CMUT Microphone mute control

This command is used to enable and disable the uplink voice muting during a voice call or a video call which is connected. If there is not a connected call, write command can't be used. When all calls are disconnected, the Module sets the subparameter as 0 automatically.

AT+CMUT Microphone mute control

Test Command AT+CMUT=?	Response +CMUT: (list of supported <mode>s) OK
Read Command AT+CMUT?	Response +CMUT: <mode> OK
Write Command AT+CMUT=<mode>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	0 – mute off 1 – mute on
--------	-----------------------------

Examples

AT+CMUT=?

+CMUT: (0-1)

OK

AT+CMUT?

+CMUT: 0

OK

AT+CMUT=1

OK

7.2.19 AT+CSDVC Switch voice channel device

This command is used to switch voice channel device. After changing current voice channel device and if there is a connecting voice call, it will use the settings of previous device (loudspeaker volume level, mute state of loudspeaker and microphone, refer to AT+VMUTE, and AT+CMUT).

AT+CSDVC Switch voice channel device

Test Command AT+CSDVC=?	Response +CSDVC: (list of supported <dev>s) OK
Read Command AT+CSDVC?	Response +CSDVC: <dev> OK
Write Command AT+CSDVC=<dev>	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<dev>	1 – handset 3 – speaker phone
-------	----------------------------------

Examples

AT+CSDVC=?

+CSDVC: (1,3)

OK

AT+CSDVC?

+CSDVC: 1

OK

AT+CSDVC=3

OK

7.2.20 AT+CMICGAIN Adjust mic gain

This command is used to adjust mic gain. If this command was used during call, it will take immediate effect. Otherwise, it will take effect in next call.

AT+CMICGAIN Adjust mic gain

Test Command AT+CMICGAIN=?	Response +CMICGAIN: (range of supported <value>s) OK
Read Command AT+CMICGAIN?	Response +CMICGAIN: <value> OK
Write Command AT+CMICGAIN=<value>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<value>	Gain value from 0-7, 7 is the max. 4 is the default value. This value will be reset to default value after Module reset.
---------	--

Examples

```
AT+CMICGAIN=?
+CMICGAIN: (0,7)

OK
AT+CMICGAIN?
+CMICGAIN: 4

OK
AT+CMICGAIN=7
OK
```

7.2.21 AT+COUGAIN Adjust out gain

This command is used to adjust out(speaker/handset) gain. If this command was used during call, it will take immediate effect . Otherwise, it will take effect in next call.

AT+COUGAIN Adjust out gain	
Test Command AT+COUGAIN=?	Response +COUGAIN: (range of supported <value>s) OK
Read Command AT+COUGAIN?	Response +COUGAIN: <value> OK
Write Command AT+COUGAIN=<value>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<mode>	Gain value from 0-7, 7 is the max. 4 is the default value. This value will be reset to default value after Module reset.
--------	--

Examples

```
AT+COUGAIN=?
+COUGAIN: (0,7)

OK
AT+COUGAIN?
+COUGAIN: 4

OK
AT+COUGAIN=7
OK
```

8 AT Commands for Phonebook

8.1 Overview of AT Commands for Phonebook

Command	Description
AT+CPBS	Set phone functionality
AT+CPBR	Read phonebook entries
AT+CPBF	Find phonebook entries
AT+CPBW	Write phonebook entry
AT+CNUM	Subscriber number

8.2 Detailed Description of AT Commands for Phonebook

8.2.1 AT+CPBS Select phonebook memory storage

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

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

AT+CPBS=<storage>	1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CPBS	Set default value "SM" Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<storage>	<p>Values reserved by the present document:</p> <p>"FD" SIM/USIM fix dialing phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the information in EFFDN under DFTelecom is selected. If a UICC with an active USIM application is present, the information in EFFDN under ADFUSIM is selected.</p> <p>"ON" SIM (or MT) own numbers (MSISDNs) list (reading of this storage may be available through +CNUM also). When storing information in the SIM/UICC, if a SIM card is present or if a UICC with an active GSM application is present, the information in EFMSISDN under DFTelecom is selected. If a UICC with an active USIM application is present, the information in EFMSISDN under ADFUSIM is selected.</p> <p>"SM" SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the EFADN under DFTelecom is selected. If a UICC with an active USIM application is present, the global phonebook, DFPHONEBOOK under DFTelecom is selected.</p> <p>"AP" Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DFPHONEBOOK under ADFUSIM is selected.</p>
<used>	Integer type value indicating the number of used locations in selected memory.
<total>	Integer type value indicating the total number of locations in selected memory.

Examples

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

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

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

8.2.2 AT+CPBR Read phonebook entries

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

AT+CPBR Read phonebook entries

Test Command AT+CPBR=?	Response 1) +CPBR: (<minIndex>-<maxIndex>), [<nlength>], [<tlength>] OK 2) +CME ERROR: <err>
Write Command AT+CPBR=<index1>[,<index2>]	Response 1) [+CPBR: <index>,<number>,<type>,<text>[<CR><LF>+CPBR: <index>,<number>,<type>,<text>[...]]] OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<index1>	Integer type value in the range of location numbers of phonebook memory.
<index2>	Integer type value in the range of location numbers of phonebook memory.
<index>	Integer type.the current position number of the Phonebook index.
<minIndex>	Integer type the minimum <index> number.
<maxIndex>	Integer type the maximum <index> number
<number>	String type, phone number of format <type>, the maximum length is <nlength>.
<type>	Type of phone number octet in integer format, default 145 when dialing string includes international access code character "+", otherwise 129.
<text>	String type field of maximum length <tlength>; often this value is set as name.
<nlength>	Integer type value indicating the maximum length of field <number>.
<tlength>	Integer type value indicating the maximum length of field <text>.

Examples

```

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

OK
AT+CPBR=3
+CPBR:
3,"1234567890123456789012345678901234567890",129,
""

OK

```

8.2.3 AT+CPBF Find phonebook entries

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

AT+ CPBF Find phonebook entries

Response	
1)	
Test Command	+CPBF: [<nlength>],[<tlength>]
AT+CPBF=?	
OK	

	2) +CME ERROR: <err>
Write Command AT+CPBF=[<findtext>]	Response 1) [+CPBF: <index1>,<number>,<type>,<text>[<CR><LF>+CPBF: <indexN>,<number>,<type>,<text>[...]]] OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CPBF=?

+CPBF: 40,14

OK

AT+CPBF="Ily"

+CPBF: 500,"1234567890123456789012345678901234567890",129,"Ily"

OK

8.2.4 AT+CPBW Write phonebook entry

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

AT+CPBW Write phonebook entry	
Test Command AT+CPBW=?	Response 1) +CPBW: (list of supported <index>s),[<nlength>], (list of supported <type>s),[<tlength>] OK 2) +CME ERROR: <err>
Write Command AT+CPBW=[<index>],[<number >[,<type>],[<text>]]]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.007

Defined Values

<index>	Integer type values in the range of location numbers of phonebook memory. If <index> is not given, the first free entry will be used. If <index> is given as the only parameter, the phonebook entry specified by <index> is deleted. If record number <index> already exists, it will be overwritten.
<number>	String type, phone number of format <type>, the maximum length is <nlength>.It must be a non-empty string.
<type>	Type of address octet in integer format, The range of value is from 129 to 255. If <number> contains a leading "+" <type> = 145 (international) is used. Supported value are: 145 – when dialling string includes international access code character "+" 161 – national number. The network support for this type is optional

	<p>177 – network specific number, ISDN format 129 – otherwise</p> <p>NOTE: Other value refer TS 24.008 [8] subclause 10.5.4.7.</p>
<text>	String type field of maximum length <tlength>; character set as specified by command Select TE Character Set AT+CSCS.
<nlength>	Integer type value indicating the maximum length of field <number>.
<tlength>	Integer type value indicating the maximum length of field <text>. NOTE: If the parameters of <type> and <text> are omitted and the first character of <number> is '+', it will specify <type> as 145(129 if the first character isn't '+') and <text> as NULL.

Examples

```

AT+CPBW=?
+CPBW: (1-500),40,(129,145,161,177),14

OK
AT+CPBW=493,"12345678901234567890",129,"Ily
1"
OK

```

8.2.5 AT+CNUM Subscriber number

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

AT+ CNUM Subscriber number	
Test Command AT+CNUM=?	Response 1) OK
Write Command AT+CNUM=<index>[,<number>[,<type>[,<text>]]]	Response 1) OK 2) +CME ERROR: <err>
Execution Command AT+CNUM	Response 1) [+CNUM: <text>,<number>,<type> +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 (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.
<number>	String type phone number of format specified by <type>.
<type>	Type of address octet in integer format. Refer to the CPBW <type>.
<text>	String type field of maximum length <tlength>; character set as specified by command Select TE Character Set AT+CSCS.

Examples

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

NOTE

A7600E-LNSE, A7670X and A7600C1-XXXX do not support Write Command.

9 AT Commands for SMS

9.1 Overview of AT Commands for SMS

Command	Description
AT+CSMS	Select message service
AT+CPMS	Preferred message storage
AT+CMGF	Select SMS message format
AT+CSCA	SMS service centre address
AT+CSCB	Select cell broadcast message indication
AT+CSMP	Set text mode parameters
AT+CSDH	Show text mode parameters
AT+CNMA	New message acknowledgement to ME/TA
AT+CNMI	New message indications to TE
AT+CGSMS	Select service for MO SMS messages
AT+CMGL	List SMS messages from preferred store
AT+CMGR	Read message
AT+CMGS	Send message
AT+CMSS	Send message from storages
AT+CMGW	Write message to memory
AT+CMGD	Delete message
AT+CMGMT	Change message status
AT+CMVP	Set message valid period
AT+CMGRD	Read and delete message
AT+CMGSEX	Send message
AT+CMSSEX	Send multi messages from storage

9.2 Detailed Description of AT Commands for SMS

9.2.1 AT+CSMS Select message service

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

AT+CSMS Select message service	
Test Command AT+CSMS=?	Response +CSMS: (Range of supported <service>s) OK
Read Command AT+CSMS?	Response +CSMS: <service>,<mt>,<mo>,<bm> OK
Write Command AT+CSMS=<service>	Response 1) +CSMS: <mt>,<mo>,<bm> 2) OK 3) ERROR 4) +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

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

Examples

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

```
OK
```

AT+CSMS?

+CSMS: 0,1,1,1

OK

AT+CSMS=?

+CSMS: (0-1)

OK

9.2.2 AT+CPMS Preferred message storage

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

AT+CPMS Preferred message storage

Test Command

AT+CPMS=?

Response

+CPMS: (list of supported <mem1>s),(list of supported <mem2>s), (list of supported <mem3>s)

OK

Read Command

AT+CPMS?

Response

+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>

OK

Write Command

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

Response

1)

+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

OK

2)

ERROR

3)

+CMS ERROR: <err>

Execution Command

AT+CPMS

Response

1)Set default value (<mem1>="SM", <mem2>="SM", <mem3>="SM"):

+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

OK

	2) ERROR 3) +CMS ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<mem1>	String type, memory from which messages are read and deleted (commands List Messages AT+CMGL, Read Message AT+CMGR and Delete Message AT+CMGD). "ME" FLASH message storage <u>"SM"</u> 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 <u>"SM"</u> 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 <u>"SM"</u> SIM message storage
<bm>s	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

AT+CPMS

+CPMS: 3,50,3,50,3,50

OK

9.2.3 AT+CMGF Select SMS message format

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

AT+CMGF Select SMS message format

Test Command AT+CMGF=?	Response 1) +CMGF: (Range 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
Execution Command AT+CMGF	Response 1) Set default value (<mode>=0): OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<mode>	0 – PDU mode
--------	--------------

Examples

AT+CMGF?

+CMGF: 0

OK

AT+CMGF=?

+CMGF: (0-1)

OK

AT+CMGF=1

OK

AT+CMGF

OK

9.2.4 AT+CSCA SMS service centre address

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

AT+CSCA SMS service centre address

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

Defined Values

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

Examples

```

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

```

9.2.5 AT+CSCB Select cell broadcast message indication

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

The read command displays the accepted message types.

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

AT+CSCB Select cell broadcast message indication

Test Command AT+CSCB=?	Response 1) +CSCB: (Range of supported <mode>s) OK 2) ERROR
Read Command AT+CSCB?	Response 1) +CSCB: <mode>,<mids>,<dcss>

	<p>OK</p> <p>2)</p> <p>ERROR</p>
<p>Write Command</p> <p>AT+CSCB=<mode>[,<mids>[,<dcss>]]</p>	<p>Response</p> <p>1)</p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CMS ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

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

Examples

AT+CSCB=?

+CSCB: (0-1)

OK

AT+CSCB?

+CSCB: 1,(),()

OK

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

OK

9.2.6 AT+CSMP Set text mode parameters

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

placed in storage when text format message mode is selected.

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

Defined Values

<fo>	Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<vp>	Depending on SMS-SUBMIT <fo> setting: GSM 03.40,TP-Validity-Period either in integer format (default 167), in time-string format, or if is supported, in enhanced format (hexadecimal coded string with quotes), (<vp> is in range 0... 255).
<pid>	GSM 03.40 TP-Protocol-Identifier in integer format (default 0).
<dcS>	GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code.

Examples

```
AT+CSMP=17,23,64,244
```

```
OK
```

```
AT+CSMP?
```

```
+CSMP: 17,23,64,244
```

```
OK
```

AT+CSMP=?

OK

9.2.7 AT+CSDH Show text mode parameters

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

AT+CSDH Show text mode parameters

Test Command AT+CSDH=?	Response +CSDH: (Range of supported <show>s) OK
Read Command AT+CSDH?	Response +CSDH: <show> OK
Write Command AT+CSDH=<show>	Response 1) OK 2) ERROR
Execution Command AT+CSDH	Set default value (<show>=0): 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<show>	<p><u>0</u> – do not show header values defined in commands AT+CSCA and AT+CSMP (<sca>, <tosca>, <fo>, <vp>, <pid> and <dcs>) nor <length>, <toda> or <toa> 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></p> <p>1 – show the values in result codes</p>
---------------------	---

Examples

AT+CSDH=?

+CSDH: (0-1)

OK

AT+CSDH?

+CSDH: 0

OK

AT+CSDH=1

OK

AT+CSDH

OK

9.2.8 AT+CNMA New message acknowledgement to ME/TA

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

AT+CNMA New message acknowledgement to ME/TA

Test Command AT+CNMA=?	Response if text mode(AT+CMGF=1): OK if PDU mode (AT+CMGF=0): +CNMA: (Range of supported <n>s) OK
Write Command AT+CNMA=<n>	Response 1) OK 2) ERROR 3) +CMS ERROR: <err>
Execution Command AT+CNMA	1) OK 2) ERROR 3) +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S

Reference	3GPP TS 27.005
-----------	----------------

Defined Values

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

Examples

```

AT+CNMI=1,2,0,0,0
OK

+CMT:"1380022xxxx", "", "02/04/03,11 :06 :38
+32" <CR><LF>
Testing // receive new short message

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

NOTE

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

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

9.2.9 AT+CNMI New message indications to TE

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

AT+CNMI New message indications to TE	
Test Command AT+CNMI=?	Response +CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s) OK
Read Command AT+CNMI?	Response +CNMI: <mode>,<mt>,<bm>,<ds>,<bfr> OK
Write Command AT+CNMI=<mode>[,<mt>[,<bm>[,<ds> [,<bfr>]]]]	Response 1) OK 2) ERROR 3) +CMS ERROR: <err>
Execution Command AT+CNMI	Set default value: OK
Parameter Saving Mode	AUTO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<mode>	<p>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.</p> <p>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.</p> <p>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.</p>
<mt>	<p>The rules for storing received SMS depend on its data coding scheme, preferred memory storage (AT+CPMS) setting and this value:</p> <p>0 – No SMS-DELIVER indications are routed to the TE.</p> <p>1 – If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem3>,<index>.</p> <p>2 – SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store</p>

	<p>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>,<dc>,<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.</p>
<bm>	<p>The rules for storing received CBMs depend on its data coding scheme, the setting of Select CBM Types (AT+CSCB) and this value: <u>0</u> – 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>,<dc>,<page>,<pages><CR><LF><data> (text mode enabled)</p>
<ds>	<p><u>0</u> – 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>.</p>
<bfr>	<p><u>0</u> – 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.</p>

Examples

AT+CNMI?

OK

AT+CNMI=?

+CNMI: (0,1,2),(0,1,2,3),(0,2),(0,1,2),(0,1)

OK

AT+CNMI=2,1 (unsolicited result codes after received messages.)

OK
AT+CNMI
OK

9.2.10 AT+CGSMS Select service for MO SMS messages

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

The test command is used for requesting information on which services and service preferences can be set by using the AT+CGSMS write command

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

AT+CGSMS Select service for MO SMS messages

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

Defined Values

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

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

Examples

```
AT+CGSMS?  
+CGSMS: 3
```

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

```
OK  
AT+CGSMS=3  
OK
```

9.2.11 AT+CMGL List SMS messages from preferred store

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

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

AT+CMGL List SMS messages from preferred store

Test Command
AT+CMGL=?

Response
+CMGL: (list of supported <stat>s)

OK

Write Command
AT+CMGL=<stat>

Response
1)
If text mode (AT+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:
+CMGL:
<index>,<stat>,<oa>/<da>,<alpha>,<scts>,<tooa>/<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length><CR><LF><data><CR><LF>
+CMGL:
<index>,<stat>,<oa>/<da>,<alpha>,<scts>,<tooa>/<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length><CR><LF><data>[...]

OK

2)

If text mode (AT+CMGF=1), command successful and SMS-STATUS-REPORTs:

+CMGL:

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF>

+CMGL:

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]]

OK

3)

If text mode (AT+CMGF=1), command successful and SMS-COMMANDs:

+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>

+CMGL: <index>,<stat>,<fo>,<ct>[...]]

OK

4)

If text mode (AT+CMGF=1), command successful and CBM storage:

+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>

<CR><LF><data>[<CR><LF>

+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>

<CR><LF><data>[...]]

OK

5)

If PDU mode (AT+CMGF=0) and Command successful:

+CMGL:

<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>

+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>

[...]]

OK

6)

+CMS ERROR: <err>

Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	3GPP TS 27.005

Defined Values

<stat>	1. Text Mode: "REC UNREAD" received unread message (i.e. new message) "REC READ" received read message
--------	--

	<p>"STO UNSENT" stored unsent message "STO SENT" stored sent message "ALL" all messages</p> <p>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</p>
<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set AT+CSCS.
<scts>	TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.
<length>	Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length)
<data>	<p>In the case of SMS: TP-User-Data in text mode responses; format:</p> <ol style="list-style-type: none"> 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set: <ol style="list-style-type: none"> 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))

	<p>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))</p> <p>3. If <dc> indicates that GSM 7 bit default alphabet is used:</p> <p>a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set.</p> <p>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.</p> <p>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.</p>
<fo>	<p>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.</p>
<mr>	<p>Message Reference GSM 03.40 TP-Message-Reference in integer format.</p>
<ra>	<p>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></p>
<tora>	<p>Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)</p>
<dt>	<p>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.</p>
<st>	<p>Status GSM 03.40 TP-Status in integer format 0...255</p>
<ct>	<p>Status GSM 03.40 TP-Status in integer format 0...255</p>
<ct>	<p>Command Type GSM 03.40 TP-Command-Type in integer format 0...255</p>
<sn>	<p>Serial Number GSM 03.41 CBM Serial Number in integer format</p>

<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

9.2.12 AT+CMGR Read message

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

AT+CMGR Read message

Test Command

AT+CMGR=?

Response

OK

Write Command

AT+CMGR=<index>

Response

1)

If text mode (AT+CMGF=1), command successful and SMS-

DELIVER:

+CMGR:

<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcsc>,<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>,<dc>,<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

If text mode (AT+CMGF=1), command successful and SMS-COMMAND:

+CMGR:

<stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR><LF><data>

OK

4)

If text mode (AT+CMGF=1), command successful and CBM storage:

+CMGR:

<stat>,<sn>,<mid>,<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)

+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)

	<p>"REC READ" received read message "STO UNSENT" stored unsent message "STO SENT" stored sent message</p> <p>2. PDU Mode:</p> <p>0 – received unread message (i.e. new message) 1 – received read message 2 – stored unsent message 3 – stored sent message</p>
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set AT+CSCS.
<scts>	TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<fo>	Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<pid>	Protocol Identifier GSM 03.40 TP-Protocol-Identifier in integer format 0...255
<dcsc>	Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<sca>	RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tosca>.
<tosca>	RP SC address Type-of-Address octet in integer format (default refer <toda>).
<length>	Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length)
<data>	In the case of SMS: TP-User-Data in text mode responses; format: 1. If <dcsc> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set:

	<p>a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set.</p> <p>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))</p> <p>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))</p> <p>3. If <dc> indicates that GSM 7 bit default alphabet is used:</p> <p>a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set.</p> <p>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.</p> <p>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.</p>
<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>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default 167) or in time-string format (refer <dt>).
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set(refer to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time GSM 03.40 TP-Discharge-Time in time-string format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone.

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

Examples

```

AT+CMGR=?
OK
AT+CMGR=1
+CMGR: "STO
UNSENT", "+10011", 145, 17, 0, 0, 167, "+86138
00100500", 145, 11
Hello World

OK

```

9.2.13 AT+CMGS Send message

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

AT+CMGS Send message

Test Command AT+CMGS=?	Response OK
Write Command If text mode(AT+CMGF=1)	Response 1)

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

Defined Values

<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.
<length>	integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length)
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.

Examples

```

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

OK

```

NOTE

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

9.2.14 AT+CMSS Send message from storage

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

AT+CMSS Send message from storage

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

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.

Examples

AT+CMSS=?

OK

AT+CMSS=3

+CMSS: 0

OK

AT+CMSS=3,"13012345678"

+CMSS: 55

OK

NOTE

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

9.2.15 AT+CMGW Write message to memory

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

AT+CMGW Write message to memory

Test Command

AT+CMGW=?

Response

OK

Write Command

If text mode(AT+CMGF=1)

AT+CMGW=<oa>/<da>[,<toa>/<toda>[,<stat>]]

Text is entered.

<CTRL-Z/ESC>

If PDU mode(AT+CMGF=0):

AT+CMGW=<length>[,<stat>]

PDU is entered.

<CTRL-Z/ESC>

Response

1)

If write successfully:

+CMGW: <index>

OK

2)

If write fails:

ERROR

3)

If write fails:

+CMS ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toa>.
<toa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <tda>).
<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).
<stat>	<p>1. Text Mode:</p> <p>"STO UNSENT" stored unsent message</p> <p>"STO SENT" stored sent message</p> <p>2. PDU Mode:</p> <p>2 – stored unsent message</p> <p>3 – stored sent message</p>

Examples

```

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

OK

```

NOTE

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

the 7 bit GSM coding scheme is used.

9.2.16 AT+CMGD Delete message

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

AT+CMGD Delete message

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

Defined Values

<index>	Integer type; value in the range of location numbers supported by the associated memory and start with one.
<delflag>	<ul style="list-style-type: none"> 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),(1-4)
```

```
OK
AT+CMGD=1
OK
```

9.2.17 AT+CMGMT Change message status

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

AT+CMGMT Change message status

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

Defined Values

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

Examples

```
AT+CMGMT=?
```

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

9.2.18 AT+CMVP Set message valid period

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

AT+CMVP Set message valid period

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

Defined Values

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

Examples

```
AT+CMVP=?
+CMVP: (0-255)

OK
```

AT+CMVP=167

OK

AT+CMVP?

+CMVP: 167

OK

9.2.19 AT+CMGRD Read and delete message

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

AT+CMGRD Read and delete message

Test Command

AT+CMGRD=?

Response

OK

Response

1)

If text mode(AT+CMGF=1),command successful and SMS-DE-LIVER:

+CMGRD:

<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data>

OK

2)

If text mode(AT+CMGF=1),command successful and SMS-SUBMIT:

+CMGRD:

<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dc>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>

OK

3)

If text mode(AT+CMGF=1),command successful and SMS-STATUS-REPORT:

+CMGRD: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

OK

4)

If text mode(AT+CMGF=1),command successful and

Write Command

AT+CMGRD=<index>

SMS-CO-MMAND:

+CMGRD:

<stat>,<fo>,<ct>[,<pid>,<mn>,<da>,<toda>],<length><CR><LF><data>]

OK

5)

If text mode(AT+CMGF=1),command successful and CBM storage:

+CMGRD:

<stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data>

OK

6)

If PDU mode(AT+CMGF=0) and command successful:

+CMGRD: <stat>,<alpha>,<length><CR><LF><pdu>

OK

7)

ERROR

8)

+CMS ERROR: <err>

Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

Refer to command AT+CMGR.

Examples

AT+CMGRD=?

OK

AT+CMGRD=6

+CMGRD: "REC

READ", "+8613917787249", "06/07/10,12:09:

38+32",145,4,0,0, "+86138002105 00",145,4

How do you do

OK

9.2.20 AT+CMGSEX Send message

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

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

Defined Values

<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <todo>.
<todo>	TP-Destination-Address, Type-of-Address octet in integer format. (When first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<msg_seg>	The segment number for long sms
<msg_total>	The segment number for long sms

Examples

```

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

```

AT+CMGSEX="13012832788",190,2, 2

> EFGH<ctrl-Z/ESC>

+CMGSEX: 190

OK

NOTE

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

9.2.21 AT+CMSSEX Send multi messages from storage

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

AT+CMSSEX Send multi messages from storage

Test Command AT+CMSSEX=?	Response OK
Write Command AT+CMSSEX=<index> [,<index>[,...]]	Response 1) OK 2) ERROR 3) If sending fails: [+CMSSEX: <mr>[,<mr>[,...]]] +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	40S
Reference	3GPP TS 27.005

Defined Values

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

<mr>

Message Reference

Examples

```
AT+CMSSEX=?
```

```
OK
```

```
AT+CMSSEX=0,1
```

```
+CMSSEX: 239,240
```

```
OK
```

```
AT+CMSSEX=0,1
```

```
+CMSSEX: 238
```

```
+CMS ERROR: Invalid memory index
```

NOTE

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

10 AT Commands for Serial Interface

10.1 Overview of AT Commands for Serial Interface

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

10.2 Detailed Description of AT Commands for Serial Interface

10.2.1 AT&D Set DTR function mode

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

AT&D Set DTR function mode	
Execution Command AT&D[<value>]	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE

Max Response Time	9s
Reference	-

Defined Values

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

Examples

```
AT&D1
OK
```

10.2.2 AT&C Set DCD function mode

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

AT&C Set DCD function mode

Execution Command AT&C[<value>]	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

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

Examples

```
AT&C1
```

OK

10.2.3 AT+IPR Set local baud rate temporarily

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

AT+IPR Set local baud rate temporarily

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

Defined Values

<speed>	Baud rate per second: 0, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, <u>115200</u> , 230400, 460800, 921600, 1842000, 3686400.
----------------------	---

Examples

AT+IPR?
+IPR: 115200

OK
AT+IPR=?

+IPR:(0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1842000,3686400)

OK

AT+IPR=115200

OK

AT+IPR=0

Autobaud support: (9600,19200,38400,57600,115200)

OK

10.2.4 AT+IPREX Set local baud rate permanently

This command sets the baud rate of module's serial interface permanently, after reboot the baud rate is also valid, if set to 0, then support auto-baud, and the value of the IPR will be changed to current baud rate when the auto-baud is successful.

AT+IPREX Set local baud rate permanently

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

Defined Values

<speed>	Baud rate per second:
---------	-----------------------

0, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200,
230400, 460800, 921600, 1842000, 3686400.

Examples

AT+IPREX?

+IPREX: 115200

OK

AT+IPREX=?

+IPREX:(0,300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1842000,3686400)

OK

AT+IPREX=115200

OK

AT+IPREX=0

Autobaud support: (9600,19200,38400,57600,115200)

OK

10.2.5 AT+ICF Set control character framing

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

AT+ICF Set control character framing

Test Command AT+ICF=?	Response +ICF: (list of supported<format>s), (list of supported<parity>s) OK
Read Command AT+ICF?	Response +ICF: <format>,<parity> OK
Write Command AT+ICF=<format>[,<parity>]	Response 1) OK 2) ERROR
Execution Command AT+ICF	Response Set default value:

	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

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

Examples

```

AT+ICF?
+ICF: 2,2

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

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

10.2.6 AT+IFC Set local data flow control

The command sets the flow control mode of the module.

AT+IFC Set local data flow control

Test Command AT+IFC=?	<p>Response</p> <p>+IFC: (list of supported<DCE>s), (list of supported<DTE>s)</p> <p>OK</p>
Read Command AT+IFC?	<p>Response</p> <p>+IFC: <DCE>,<DTE></p>

	OK
Write Command AT+IFC=<DCE>[,<DTE>]	Response 1) OK 2) ERROR
Execution Command AT+IFC	Response Set default value: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<DCE>	0 – none (default) 2 – RTS hardware flow control
<DTE>	0 – none (default) 2 – CTS hardware flow control

Examples

```

AT+IFC?
+ICF: 0,0

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

OK
AT+IFC=2,2
OK
AT+IFC
OK

```

10.2.7 AT+CSCLK Control UART Sleep

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

AT+CSCLK Control UART Sleep

Test Command AT+CSCLK=?	Response +CSCLK: (range of supported <status>s) OK
Read Command AT+CSCLK?	Response +CSCLK: <status> OK
Write Command AT+CSCLK=<status>	Response 1) OK 2) ERROR
Execution Command AT+CSCLK	Response Set <status>=0: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<status>	0 – off 1 – on
----------	-------------------

Examples

```

AT+CSCLK?
+CSCLK: 0

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

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


10.2.8 AT+CMUX Enable the multiplexer over the UART

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

AT+CMUX Enable the multiplexer over the UART

Test Command AT+CMUX=?	Response +CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000) OK
Read Command AT+CMUX?	Response +CMUX:<value>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2> OK
Write Command AT+CMUX=<value>[,<subset>][,<port_speed>][,<N1>][,<T1>][,<N2>][,<T2>]]]]]	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

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

Examples

AT+CMUX?

+CMUX: 0,0,5,1500,0,0,600

OK

AT+CMUX=?

+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)

```
OK
AT+CMUX=0
OK
```

10.2.9 AT+CATR Configure URC destination interface

This command is used to configure the serial port which will be used to output URCs. We recommend configure a destination port for receiving URC in the system initialization phase, in particular, in the case that transmitting large amounts of data, e.g. use TCP/UDP and MT SMS related AT command.

AT+CATR Configure URC destination interface

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

Defined Values

<port>	<ul style="list-style-type: none"> <u>0</u> – all ports 1 – use UART port to output URCs 2 – use MODEM port to output URCs 3 – use ATCOM port to output URCs 4 – use cmux virtual port1 to output URCs 5 – use cmux virtual port2 to output URCs 6 – use cmux virtual port3 to output URCs 7 – use cmux virtual port4 to output URCs
---------------------	--

Examples

AT+CATR?

+CATR: 0

OK

AT+CATR=?

+CATR: (0-7)

OK

AT+CATR=1

OK

10.2.10 AT+CFGRI Configure RI pin

This command configures the time of pulling RI down. These places are going to use it, for Examples: SMS, FTP, NETWORK, PB, CM, OS and so on.

AT+CFGRI Configure RI pin

Test Command AT+CFGRI=?	Response +CFGRI: (list of supported<status>), (list of supported<time1>ms) , (list of supported<time2>ms) OK
Read Command AT+CFGRI?	Response +ICF: <status><time1>,<time2> OK
Write Command AT+CFGRI=<status>[,<time1>][,<time2>]	Response 1) OK 2) ERROR
Execution Command AT+CFGRI	Response Set default value: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

<status>	0 – open function (just for NETWORK, PB, CM, OS).
----------	---

	1 – close function (just for NETWORK, PB, CM, OS).
<time1>	10 – 6000 (The default value is 60ms, generally for FTP, NETWORK, PB, CM, OS)
<time2>	20 – 6000 (The default value is 120ms, generally for SMS)

Examples

AT+CFGRI?

+CFGRI: 0,60,120

OK

AT+CFGRI=?

+CFGRI:(0-1),(10-6000),(20-6000)

OK

AT+CFGRI=0,60,120

OK

AT+CFGRI

OK

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

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

AT+CURCD Configure the delay time and number of URC

Test Command AT+CURCD=?	Response +CURCD: (range of supported <delay_time>ms),(1) OK
Read Command AT+CURCD?	Response +CURCD: <delay_time>, 1 OK
Write Command AT+CURCD=<delay_time>,<cache_size>	Response 1) OK 2) ERROR

Parameter Saving Mode	NO_SAVE
Max Response Time	9s
Reference	-

Defined Values

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

Examples

AT+CURCD?

+CURCD: 0,1

OK

AT+CURCD=?

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

OK

AT+CURCD=100,1

OK

NOTE

Currently only support delay time setting, the default cache size for URC is one. This command applies to platform 1601 related projects, such as A7600E, A7600C-C1SE etc.

11 AT Commands for Hardware

11.1 Overview of AT Commands for Hardware

Command	Description
AT+CVALARM	Open or close the low voltage alarm
AT+CVAUXS	Operator selection
AT+CVAUXV	Set voltage value of the pin named VDD_AUX
AT+CADC	Read ADC value
AT+CADC2	Read ADC2 value
AT+CMTE	Control the module whether power shutdown when the module's temperature upon the critical temperature
AT+CPMVT	Low and high voltage Power Off
AT+CRIIC	Read values from register of IIC device nau8810
AT+CWIIC	Write values to register of IIC device nau8810
AT+CBC	Read the voltage value of the power supply
AT+CPMUTEMP	Read the temperature of the module
AT+CGDRT	Set the direction of specified GPIO
AT+CGSETV	Set the value of specified GPIO
AT+CGGETV	Get the value of specified GPIO

11.2 Detailed Description of AT Commands for Hardware

11.2.1 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), (list of supported <low voltage>s), (list of supported high <high voltage>s)

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

Defined Values

<enable>	<u>0</u> – Close 1 – Open. If voltage less than <low voltage>, it will report “UNDER-VOLTAGE WARNNING” every 10s. If 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=1,3400,4300
```

```
OK
```

```
AT+CVALARM?
```

```
+CVALARM: 1,3400,4300
```

```
OK
```

```
AT+CVALARM=?
```

```
+CVALARM: (0,1),(3300-4000),(4001-4300)
```

```
OK
```

11.2.2 AT+CVAUXS Set state of the pin named VDD_AUX

This command is used to set state of the pin which is named VDD_AUX.

AT+CVAUXS Set state of the pin named VDD_AUX

Test Command AT+CVAUXS=?	Response 1) +CVAUXS: (list of supported <state>s) OK
Read Command AT+CVAUXS?	Response +CVAUXS: <state> OK
Write Command AT+CVAUXS=<state>	Response 1) OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<state>	0 – output of the pin disabled. 1 – output of the pin enabled.
----------------------	---

Examples

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

```
OK
AT+CVAUXS=1
OK
AT+CVAUXS?
+CVAUXS: 1
```

```
OK
```

11.2.3 AT+CVAUXV Set voltage value of the pin named VDD_AUX

This command is used to set the voltage value of the pin which is named VDD_AUX.

AT+CVAUXV Set voltage value of the pin named VDD_AUX

Test Command AT+CVAUXV=?	Response +CVAUXV: (list of supported <voltage>s) OK
Read Command AT+CVAUXV?	Response +CVAUXV: <voltage> OK
Write Command AT+CVAUXV=<voltage>	Response 1) OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<voltage>	Voltage value of the pin which is named VDD_AUX. The unit is in mv.
------------------------	---

Examples

```

AT+CVAUXV=?
+CVAUXV:
(1200,1250,1700,1800,1850,1900,2500,2600,2700,2750,2800,2850,2900,3000,3100,3300)

OK
AT+CVAUXV=3000
OK
AT+CVAUXV?
+CVAUXV: 3000

OK

```

11.2.4 AT+CADC Read ADC value

This command is used to read the ADC value from modem. ME supports 2 types of ADC, which are raw type and voltage type.

AT+CADC Read ADC value

Test Command AT+CADC=?	Response +CADC: (range of supported <adc>s) OK
Write Command AT+CADC=<adc>	Response 1) +CADC: <value> 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<adc>	ADC type: 0 – raw type. 2 – voltage type(mv).
<value>	Integer type value of the ADC.

Examples

AT+CADC=?

+CADC: (0,2)

OK

AT+CADC=2

+CADC: 908

OK

11.2.5 AT+CADC2 Read ADC2 value

This command is used to read the ADC2 value from modem. ME supports 2 types of ADC, which are raw type and voltage type.

AT+CADC2 Read ADC2 value

Test Command AT+CADC2=?	Response 1) +CADC2: (range of supported <adc>s) OK
Write Command AT+CADC2=<adc>	Response 1) +CADC2: <value> OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<adc>	ADC2 type: 0 – raw type. 2 – voltage type(mv)
<value>	Integer type value of the ADC2.

Examples

```
AT+CADC2=?
+CADC2: (0,2)
```

```
OK
AT+CADC2=2
+CADC2: 473
```

```
OK
```

11.2.6 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	Response
--------------	----------

AT+CMTE=?	+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

```

11.2.7 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 Low and high voltage Power Off

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

AT+CPMVT=?	+CPMVT: (list of supported <enable>s), (list of supported <low voltage>s), (list 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	-
Max Response Time	-
Reference	-

Defined Values

<enable>	<u>0</u> – Close 1 – Open. If voltage less than <low voltage>, it will report “UNDER-VOLTAGE WARNNING POWER DOWN” and power off the module. If voltage greater than <high voltage>, it will report “OVER-VOLTAGE WARNNING POWER DOWN” and power off the module
-----------------------	---

Examples

```

AT+CPMVT=1,3400,4300
OK
AT+CPMVT?
+CPMVT: 1,3400,4300

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

OK

```

11.2.8 AT+CR1IC Read values from register of IIC device nau8810

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

AT+CR IIC Read values from register of IIC device nau8810

Read Command AT+CR IIC=?	Response OK
Write Command AT+CR IIC=<addr>,<reg>,<len>	Response 1) +CR IIC: <data> 2) OK 3) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<addr>	Device address. Input format must be hex, such as FF (do not input "0x").
<reg>	Register address. Input format must be hex, such as FF (do not input "0x").
<len>	Read length. Range:2; unit:byte.
<data>	Data read. Input format must be hex, such as 0xFFFF.

Examples

```
AT+CR IIC=34,f,2
+CR IIC: 0xff
```

```
OK
AT+CR IIC=34,6,2
+CR IIC: 0x140
```

```
OK
```

11.2.9 AT+CW IIC Write values to register of IIC device nau8810

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

AT+CW IIC Write values to register of IIC device nau8810

Read Command	Response
--------------	----------

AT+CWIIC=?	OK
Write Command AT+CWIIC=<addr>,<reg>,<d ata>,<len>	1) OK 2) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<System Mode>	System mode, values: "NO SERVICE", "GSM", "WCDMA", "LTE"
<addr>	Device address. Input format must be hex, such as FF (do not input "0x").
<reg>	Register address. Input format must be hex, such as FF(do not input "0x").
<len>	Read length. Range: 2; unit: byte.
<data>	Data written. Input format must be hex, such as 0xFFFF

Examples

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

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

Defined Values

<vol>	The voltage value, such as 3.8.
-------	---------------------------------

Examples

```
AT+CBC
+CBC: 3.749V

OK
```

11.2.11 AT+CPMUTEMP Read the temperature of the module

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

AT+CPMUTEMP Read the temperature of the module

Execution Command	Response
AT+CPMUTEMP	+CPMUTEMP: <temp>
	OK
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<temp>	The Temperature value, such as 29.
--------	------------------------------------

Examples

```
AT+CPMUTEMP
+CPMUTEMP: 15

OK
```

11.2.12 AT+CGDRT Set the direction of specified GPIO

This command is used to set the specified GPIO to input or output state. If setting to input state, then this

GPIO can not be set to high or low value.

AT+CGDRT Set the direction of specified GPIO

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

Defined Values

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

Examples

```

AT+CGDRT=?
+CGDRT:
(1,2,3,6,12,14,16,18,22,41,43,63,77),(0-1)

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

OK
  
```

11.2.13 AT+CGSETV Set the value of specified GPIO

This command is used to set the value of the specified GPIO to high or low.

The direction of specified GPIO must be set as OUT direction by using AT+CGDRT before this AT command, otherwise an error will be returned.

AT+CGSETV Set the value of specified GPIO

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

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.
<gpio_hl>	0 – low 1 – high

Examples

```

AT+CGSETV=?
+CGSETV:
(1,2,3,6,12,14,16,18,22,41,43,63,77),(0-1)

OK
AT+CGSETV=6,0
OK

```

11.2.14 AT+CGGETV Get the value of specified GPIO

This command is used to get the value (high or low) of the specified GPIO.

The direction of specified GPIO must be set as IN direction by using AT+CGDRT before this AT command, otherwise an error will be returned.

AT+CGSETV Get the value of specified GPIO

Test Command AT+CGGETV=?	Response +CGGETV: (list of supported <GPIO>s) OK
Write Command AT+CGGETV=<GPIO>	Response 1) +CGGETV: <GPIO>,<gpio_hl> 2) OK 3) ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<GPIO>	The value is GPIO ID, different hardware versions have different values.
<gpio_hl>	0 – low 1 – high

Examples

```
AT+CGGETV=?
+CGGETV: (1,2,3,6,12,14,16,18,22,41,43,63,77)

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

OK
```

11.2.15 Unsolicited result codes

URC	Description	AT Command
CMTE: <temp_level>	While module's temperature over the high threshold and below the low threshold, the URC will occur.	AT+CMTE

Defined Values

<temp_level>	<ul style="list-style-type: none"> -2 – below -45 celsius degree. -1 – (-45,-30] celsius degree. 1 – (80,85] celsius degree. 2 – over 85 celsius degree.
--------------	--

URC	Description	AT Command
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

12 AT Commands for File System

12.1 Overview of AT Commands for File System

Command	Description
AT+FSCD	Select directory as current directory
AT+FSMKDIR	Make new directory in current directory
AT+FSRMDIR	Delete directory in current directory
AT+FSLS	List directories/files in current directory
AT+FSDEL	Delete file in current directory
AT+FSRENAME	Rename file in current directory
AT+FSATTRI	Request file attributes
AT+FSMEM	Check the size of available memory
AT+FSCOPY	Copy an appointed file

Command	Description	Supported Project
AT+FSRENAME	D:/ directory file rename	A7600C1-XXXX A7600E-LNSE A7620 A7670X
AT+FSDEL AT+FSATTRI	Non ASCII characters in file path	A7600XX-XXXX(except A7600C1-XXXX) A5360E
AT+FSATTRI	Get creating date and time message	A7600XX-XXXX(except A7600C1-XXXX) A5360E

12.2 Detailed Description of AT Commands for File System

The file system is used to store files in a hierarchical (tree) structure, and there are some definitions and conventions to use the AT commands.

Local storage space is mapped to "C:", "D:" for SD card.

NOTE: General rules for naming (both directories and files):

- The length of actual fully qualified names of files(C:/) can not exceed 112.
- The length of actual fully qualified names of directories and files(D:/) can not exceed 250.
- Directory and file names can not include the following characters: \ : * ? " < > | , ;

d) Between directory name and file/directory name, use character “/” as list separator, so it can not appear in directory name or file name.

If the last character of names is period “.”; the flash (C:/) will auto delete this character; the SD card can support this character, but the compatibility is not good.

12.2.1 AT+FSCD Select directory as current directory

This command is used to select a directory. The Module supports absolute path and relative path.

AT+FSCD Select directory as current directory	
Test Command AT+FSCD=?	Response OK
Read Command AT+FSCD?	Response +FSCD: <curr_path> OK
Write Command AT+FSCD=<path>	Response a) If set current directory successfully: +FSCD: <curr_path> OK b) If set current directory failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<path>	String without double quotes, directory for selection.
<curr_path>	String without double quotes, current directory.

Examples

AT+FSCD=C:

+FSCD: C:/

OK

AT+FSCD=C:/

+FSCD: C:/

OK

AT+FSCD?

+FSCD: C:/

OK

AT+FSCD=D:

+FSCD: D:/

OK

NOTE

If <path> is “..”, it will go back to previous level of directory.
<path> string without double quotes.

12.2.2 AT+FSMKDIR Make new directory in current directory

This command is used to create a new directory in current directory. Support “D:”.

AT+FSMKDIR Make new directory in current directory

Test Command AT+FSMKDIR=?	Response OK
Write Command AT+FSMKDIR=<dir>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<dir>	Directory name which does not already exist in current directory.
-------	---

Examples

AT+FSMKDIR=SIMTech

OK

AT+FSCD?

+FSCD: D:/

```
OK
AT+FSLs
+FSLs: SUBDIRECTORIES:
SIMTech
OK
```

NOTE

<dir> string without double quotes.
Only support "D:".

12.2.3 AT+FSRMDIR Delete directory in current directory

This command is used to delete existing directory in current directory. Support "D:".

AT+FSRMDIR Delete directory in current directory

Test Command AT+FSRMDIR=?	Response OK
Write Command AT+FSRMDIR=<dir>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<dir>	The directory name which already exists in current directory.
-------	---

Examples

```
AT+FSRMDIR=SIMTech
OK
AT+FSCD?
+FSCD: D:/
OK
```


AT+FSLs

+FSLs: SUBDIRECTORIES:

OK

NOTE

<dir> string without double quotes.
Only support "D:".

12.2.4 AT+FSLs List directories/files in current directory

This command is used to list informations of directories and/or files in current directory. Support "C:", "D:".

AT+FSLs List directories/files in current directory

Test Command AT+FSLs=?	Response +FSLs: (list of supported <type>s) OK
Read Command AT+FSLs?	Response +FSLs: SUBDIRECTORIES:<dir_num>,FILES:<file_num> OK
Write Command AT+FSLs=<type>	Response [+FSLs: SUBDIRECTORIES: <list of subdirectories>] [+FSLs: FILES: <list of files>] OK
Execution Command AT+FSLs	Response [+FSLs: SUBDIRECTORIES: <list of subdirectories>] [+FSLs: FILES: <list of files>] OK
Parameter Saving Mode	-
Max Response Time	-

Reference

Defined Values

<dir_num>	Integer type, the number of subdirectories in current directory.
<file_num>	Integer type, the number of files in current directory.
<type>	<ul style="list-style-type: none"> 0 – list both subdirectories and files 1 – list subdirectories only 2 – list files only

Examples

AT+FSLs?

+FSLs: SUBDIRECTORIES:2,FILES:2

OK

AT+FSLs

+FSLs: SUBDIRECTORIES:

FirstDir

SecondDir

+FSLs: FILES:

image_0.jpg

image_1.jpg

OK

AT+FSLs=2

+FSLs: FILES:

image_0.jpg

image_1.jpg

OK

12.2.5 AT+FSDEL Delete file in current directory

This command is used to delete a file in current directory. Before do that, it needs to use AT+FSCD select the father directory as current directory. Support "C:", "D:".

AT+FSDEL Delete file in current directory

Test Command	Response
AT+FSDEL=?	OK

Write Command AT+FSDEL=<filename>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	String with or without double quotes, file name which is relative and already existing.
------------	---

Examples

AT+FSDEL=image_0.jpg
OK

NOTE

If <filename> is *.* , it means delete all files in current directory.

12.2.6 AT+FSRENAME Rename file in current directory

This command is used to rename a file in current directory. Support "C:" , "D:".

AT+FSRENAME Rename file in current directory

Test Command AT+FSRENAME=?	Response OK
Write Command AT+FSRENAME=<old_name>,<new_name>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<old_name>	String with or without double quotes, file name which is existed in current directory.
<new_name>	New name of specified file, string with or without double quotes.

Examples

AT+FSRENAME=image_0.jpg, image_1.jpg

OK

NOTE

<old_name>/<new_name> string without double quotes.

12.2.7 AT+FSATTRI Request file attributes

This command is used to request the attributes of file which exists in current directory. Support "C:", "D:".

AT+FSATTRI Request file attributes

Test Command AT+FSATTRI=?	Response OK
Write Command AT+FSATTRI=<filename>	Response a)If successfully: +FSATTRI: <file_size> OK +FSATTRI: <file_size> b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	String with or without double quotes, file name which is in current directory.
-------------------------	--

<file_size>	The size of specified file, and the unit is in Byte.
-------------	--

Examples

```
AT+FSATTRI=image_0.jpg
```

```
+FSATTRI: 8604
```

```
OK
```

12.2.8 AT+FSMEM Check the size of available memory

This command is used to check the size of available memory. The response will list total size and used size of local storage space if present and mounted. Support "C:", "D:".

AT+FSMEM Check the size of available memory

Test Command AT+FSMEM=?	Response: OK
Execution Command AT+FSMEM	Response: a)If successfully, currently C:/ : +FSMEM: C:(<total>, <used>) OK b)If successfully, currently D:/ : +FSMEM: D:(<total>, <used>) OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<total>	The total size of local storage space.
<used>	The used size of local storage space.

Examples

```
AT+FSMEM
```

```
+FSMEM: C:(11348480, 2201600)
```

OK

NOTE

The unit of storage space size is in Byte.

12.2.9 AT+FSCOPY Copy an appointed file

This command is used to copy an appointed file on C:/ to an appointed directory on C:/, the new file name should give in parameter. Support "C:", "D:".

AT+FSCOPY Copy an appointed file

Test Command

AT+FSCOPY=?

Response

OK

Write Command

AT+FSCOPY=<file1>,<file2>[<sync_mode>]

Response

a)If successfully, synchronous mode:

+FSCOPY: <percent>

[+FSCOPY: <percent>]

OK

b)If successfully, asynchronous mode:

OK

+FSCOPY: <percent>

[+FSCOPY: <percent>]

+FSCOPY: END

c)If any error:

SD CARD NOT PLUGGED IN

FILE IS EXISTING

FILE NOT EXISTING

DIRECTORY IS EXISTED

DIRECTORY NOT EXISTED

INVALID PATH NAME

INVALID FILE NAME

SD CARD HAVE NO ENOUGH MEMORY

EFS HAVE NO ENOUGH MEMORY

FILE CREATE ERROR

	READ FILE ERROR WRITE FILE ERROR ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<file1>	The sources file name or the whole path name with sources file name.
<file2>	The destination file name or the whole path name with destination file name.
<percent>	The percent of copy done. The range is 0.0 to 100.0
<sync_mode>	The execution mode of the command: 0 – synchronous mode 1 – asynchronous mode

Examples

AT+FSCOPY=C:/TESTFILE,COPYFILE (Copy file TESTFILE on C:/ to C:/COPYFILE)

+FSCOPY: 0.0

+FSCOPY: 9.7

+FSCOPY: 19.4

...

+FSCOPY: 100.0

OK

NOTE

The <file1> and <file2> should give the whole path and name, if only given file name, it will refer to current path (AT+FSCD) and check the file's validity.

If <file2> is a whole path and name, make sure the directory exists, make sure that the file name does not exist or the file name is not the same name as the sub folder name, otherwise return error.

<percent> report refer to the copy file size. The big file maybe report many times, and little file report less.

If <sync_mode> is 1, the command will return OK immediately, and report final result with +FSCOPY: END.

13 AT Commands for File Transmission

13.1 Overview of AT Commands for File Transmission

Command	Description
AT+CFTRANRX	Transfer a file to EFS
AT+CFFRANTX	Transfer a file from EFS to host

Command	Description	Supported Project
AT+CFTRANRX	Non ASCII characters in file path	A7600XX-XXXX(except A7600C1-XXXX) A5360E

13.2 Detailed Description of AT Commands for File Transmission

13.2.1 AT+CFTRANRX Transfer a file to EFS

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

AT+CFTRANRX Transfer a file to EFS	
Test Command AT+CFTRANRX=?	Response +CFTRANRX: [{non-ascii}]"FILEPATH" OK
Write Command AT+CFTRANRX="<filepath>" <len>	Response a)If successfully: > OK b)If failed: > ERROR

	c)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

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

Examples

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

NOTE

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

13.2.2 AT+CFTRANRX Transfer a file from EFS to host

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

AT+CFTRANRX Transfer a file from EFS to host

Test Command AT+CFTRANRX=?	Response +CFTRANRX: [{non-ascii}]"FILEPATH"
Write Command AT+CFTRANRX="<filepath> "	Response a)If successfully:

[,<location>][,<size>]	<p>[+CFTRANTX: DATA,<len> ... +CFTRANTX: DATA,<len>] +CFTRANTX: 0</p> <p>OK b)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

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

Examples

AT+CFTRANTX="c:/t1.txt"

+CFTRANTX: DATA, 11

Testcontent

+CFTRANTX: 0

OK

AT+CFTRANTX="d:/MyDir/t1.txt"

+CFTRANTX: DATA, 11

Testcontent

+CFTRANTX: 0

OK

AT+CFTRANTX="d:/MyDir/t1.txt",1,4

+CFTRANTX: DATA, 4

estc

+CFTRANTX: 0

OK

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

If not set the size, it means range from location to the end of the file.

If the (size + location) larger than the file size, it means range from location to the end of the file.

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14 AT Commands for Internet Service

14.1 Overview of AT Commands for HTP and NTP

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

14.2 Detailed Description of AT Commands for HTP and NTP

14.2.1 AT+CHTPSERV Set HTP server information

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

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

port>]]	ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

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

Examples

```
AT+CHTTPSERV="ADD","www.google.com",80,1
OK
```

14.2.2 AT+CHTTPUPDATE Updating date time using HTP protocol

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

AT+CHTTPUPDATE Updating date time using HTP protocol

Test Command AT+CHTTPUPDATE=?	Response OK
Read Command AT+CHTTPUPDATE?	Response +CHTTPUPDATE: <status> OK
Execute Command AT+CHTTPUPDATE	Response a)If successfully:

	<p>OK</p> <p>+CHTPUPDATE: <err> b)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

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

Examples

```
AT+CHTPUPDATE
OK
+CHTPUPDATE: 0
```

14.2.3 AT+CNTP Update system time

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

AT+CNTP Update system time	
<p>Test Command</p> <p>AT+CNTP=?</p>	<p>Response</p> <p>+CNTP: "HOST",(-47~48)</p> <p>OK</p>
<p>Read Command</p> <p>AT+CNTP?</p>	<p>Response</p> <p>+CNTP: <host>,<timezone></p> <p>OK</p>
<p>Write Command</p> <p>AT+CNTP="<host>"[,<timezo ne>]</p>	<p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>

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

Defined Values

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

Examples

```
AT+CNTP="202.120.2.101",32
OK
AT+CNTP
OK
+CNTP: 0
```

14.3 Command result codes

14.3.1 Unsolicited HTP Codes

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

14.3.2 Unsolicited NTP Codes

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

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15 AT Commands for TCP/IP

15.1 Overview of AT Commands for TCP/IP

Command	Description
AT+NETOPEN	Start Socket Service
AT+NETCLOSE	Stop Socket Service
AT+CIOPEN	Establish Connection in Multi-Socket Mode
AT+CIPSEND	Send data through TCP or UDP Connection
AT+CIPRXGET	Set the Mode to Retrieve Data
AT+CIPCLOSE	Close TCP or UDP Socket
AT+IPADDR	Inquire Socket PDP address
AT+CIPHEAD	Add an IP Header When Receiving Data
AT+CIPSRIP	Show Remote IP Address and Port
AT+CIPMODE	Set TCP/IP Application Mode
AT+CIPSENDMODE	Set Sending Mode
AT+CIPTIMEOUT	Set TCP/IP Timeout Value
AT+CIPCCFG	Configure Parameters of Socket
AT+SERVERSTART	Startup TCP Sever
AT+SERVERSTOP	Stop TCP Sever
AT+CIPACK	Query TCP Connection Data Transmitting Status
AT+CDNSGIP	Query the IP Address of Given Domain Name

15.2 Detailed Description of AT Commands for TCP/IP

15.2.1 AT+NETOPEN Start Socket Service

AT+NETOPEN is used to start service by activating PDP context. You must execute AT+NETOPEN before any other TCP/UDP related operations.

AT+NETOPEN Start Socket Service

Read Command AT+NETOPEN?	Response +NETOPEN: <net_state> OK
Execute Command AT+NETOPEN	Response 1) If the PDP context has not been activated or the network closed abnormally, response: OK +NETOPEN: <err> 2) When the PDP context has been activated successfully, if you execute AT+NETOPEN again, response: +IP ERROR: Network is already opened ERROR 3) other: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT)
Reference	3GPP TS 27.005

Defined Values

<net_state>	Integer type, indicates the state of PDP context activation. <u>0</u> network close (deactivated) 1 network open(activated)
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details

Examples

AT+NETOPEN?

+NETOPEN: 1

OK

AT+NETOPEN

OK

+NETOPEN: 0

15.2.2 AT+NETCLOSE Stop Socket Service

AT+NETCLOSE is used to stop service by deactivating PDP context. It can also close all the opened socket connections when you didn't close these connections by AT+CIPCLOSE.

AT+NETCLOSE Stop Socket Service

<p>Execute Command AT+NETCLOSE</p>	<p>Response</p> <p>1) If the PDP context has been activated, response: OK</p> <p>+NETCLOSE: <err></p> <p>2) If the PDP context has been activated and one connection is in transparent mode, response:</p> <p>OK</p> <p>CLOSED</p> <p>+CIPCLOSE: <link_num>,<err></p> <p>+NETCLOSE: <err></p> <p>3) If the PDP context has not been activated, response: +NETCLOSE: <err></p> <p>ERROR</p> <p>4) other: ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT)</p>
<p>Reference</p>	

Defined Values

<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details
--------------------	---

Examples

AT+ NETCLOSE

OK

+NETCLOSE: 0

15.2.3 AT+CIOPEN Establish Connection in Multi-Socket Mode

You can use AT+CIOPEN to establish a connection with TCP server and UDP server, the maximum of the connections is 10.

AT+CIOPEN Establish Connection in Multi-Socket Mode

Test Command AT+CIOPEN=?	Response +CIOPEN: (0-9),("TCP", "UDP") OK
Read Command AT+CIOPEN?	Response +CIOPEN:<link_num>[,<type>,<serverIP>,<serverPort>,<index>] +CIOPEN:<link_num>[,<type>,<serverIP>,<serverPort>,<index>] [...] OK If a connection identified by <link_num> has not been established successfully, only +CIOPEN: <link_num> will be returned.
Write Command TCP connection AT+CIOPEN=<link_num>,"TCP",<serverIP>,<serverPort>[,<localPort>]	Response 1) if PDP context has been activated successfully, response: OK +CIOPEN: <link_num>,<err> 2) when the <link_num> is greater than 10, or when AT+CIPMODE=1 is set, the <link_num> is greater than 0, response: +IP ERROR: Invalid parameter

	<p>ERROR</p> <p>3) If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR</p> <p>4) Transparent mode for TCP connection: When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. if success CONNECT [<text>] if failure CONNECT FAIL</p> <p>5) other: ERROR</p>
<p>Write Command UDP Connection AT+CIOPEN=<link_num>,"UDP",,,<localPort></p>	<p>1) If PDP context has been activated successfully, response: +CIOPEN: <link_num>,0</p> <p>OK</p> <p>2) When the <link_num> is greater than 10, response: +IP ERROR: Invalid parameter</p> <p>ERROR If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR</p> <p>3) other: ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT)</p>
<p>Reference</p>	

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-9. If AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0.0 is success, other value is failure, please refer to Chapter 4 for details
<type>	String type, identifies the type of transmission protocol. TCP Transmission Control Protocol UDP User Datagram Protocol
<serverIP>	String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here.
<serverPort>	Integer type, identifies the port of TCP server, range is 0-65535. NOTE: When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port.
<localPort>	Integer type, identifies the port of local socket, range is 0-65535.
<index>	Integer type, indicates whether the module is used as a client or server. When used as server, the range is 0-3, <index> is the server index to which the client is linked. -1 -- TCP client 0-3 -- TCP server index
<text>	String type, indicates CONNECT result code.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details

Examples

AT+CIOPEN=?

+CIOPEN: (0-9),("TCP","UDP")

OK

AT+CIOPEN?

+CIOPEN: 0

+CIOPEN: 1,"TCP","183.230.174.137",6031,-1

+CIOPEN: 2

+CIOPEN: 3

+CIOPEN: 4

+CIOPEN: 5,"UDP","183.230.174.137",6031,-1

+CIOPEN: 6

+CIOPEN: 7

+CIOPEN: 8

+CIOPEN: 9

OK

AT+NETCLOSE

//TCP connection

OK

```

+NETCLOSE: 0
AT+CIPOPEN=0,"TCP","183.230.174.137",6031
OK

+CIPOPEN: 0,0

AT+CIPOPEN=5,"UDP",,,6031
+CIPOPEN: 5,0 // UDP Connection

OK

```

15.2.4 AT+CIPSEND Send data through TCP or UDP Connection

AT+CIPSEND is used to send data to remote side. If service type is TCP, the data is firstly sent to the module's internal TCP/IP stack, and then sent to server by protocol stack. The <length> field may be empty. While it is empty, each <Ctrl+Z> character present in the data should be coded as <ETX><Ctrl+Z>. Each <ESC> character present in the data should be coded as <ETX><ESC>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the input data. Single <ESC> is used to cancel the sending.

<ETX> is 0x03, and <Ctrl+Z> is 0x1A, <ESC> is 0x1B.

AT+CIPSEND Send data through TCP or UDP Connection

<p>Test Command</p> <p>AT+CIPSEND=?</p>	<p>Response</p> <p>AT+CIPSEND: (0-9),(1-1500)</p> <p>OK</p>
<p>Write Command</p> <p>If service type is "TCP", send data with changeable length</p> <p>AT+CIPSEND=<link_num></p> <p>Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation</p>	<p>Response</p> <p>1)</p> <p>If the connection identified by <link_num> has been established successfully, response:</p> <p>></p> <p><input data></p> <p>CTRL+Z</p> <p>OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)</p> <p>If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.</p> <p>3)</p>

	<p>If the connection has not been established, abnormally closed, or parameter is incorrect, response:</p> <p>+CIPERROR: <err></p> <p>ERROR</p> <p>4)</p> <p>other:</p> <p>ERROR</p>
<p>Write Command</p> <p>If service type is "TCP", send data with fixed length</p> <p>AT+CIPSEND=<link_num>,<length></p>	<p>Response</p> <p>1)</p> <p>If the connection identified by <link_num> has been established successfully, response:</p> <p>></p> <p><input data with specified length></p> <p>OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)</p> <p>If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.</p> <p>3)</p> <p>If the connection has not been established, abnormally closed, or parameter is incorrect, response:</p> <p>+CIPERROR: <err></p> <p>ERROR</p> <p>4)</p> <p>other:</p> <p>ERROR</p>
<p>Write Command</p> <p>If service type is "UDP", send data with changeable length</p> <p>AT+CIPSEND=<link_num>,,<serverIP>,<serverPort></p> <p>Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation</p>	<p>Response</p> <p>1)</p> <p>If the connection identified by <link_num> has been established successfully, response:</p> <p>></p> <p><input data></p> <p>CTRL+Z</p> <p>OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)</p> <p>If the connection has not been established, abnormally closed, or parameter is incorrect, response:</p> <p>+CIPERROR: <err></p>

	<p>ERROR</p> <p>3)</p> <p>Other:</p> <p>ERROR</p>
<p>Write Command</p> <p>If service type is "UDP", send data with fixed length</p> <p>AT+CIPSEND=<link_num>,<length>,<serverIP>,<serverPort></p> <p>Response ">", type data until the data length is equal to <length></p>	<p>Response</p> <p>1)</p> <p>If the connection identified by <link_num> has been established successfully, response:</p> <p>></p> <p><input data with specified length></p> <p>OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)</p> <p>If the connection has not been established, abnormally closed, or parameter is incorrect, response:</p> <p>+CIPERROR: <err></p> <p>ERROR</p> <p>3)</p> <p>Other:</p> <p>ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	<p>Range: 3000ms-120000ms</p> <p>default: 120000ms</p> <p>(it can be set by AT+CIPTIMEOUT)</p>
Reference	

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-9.
<length>	Integer type, indicates the length of sending data, range is 1-1500.
<serverIP>	String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here.
<serverPort>	<p>Integer type, identifies the port of TCP server, range is 0-65535.</p> <p>NOTE:</p> <p>When open port as TCP, the port must be the opened TCP port;</p> <p>When open port as UDP, the port may be any port.</p>

	But, for Qualcomm, connecting the port 0 is regarded as an invalid operation.
<reqSendLength>	Integer type, the length of the data requested to be sent
<cnfSendLength>	Integer type, the length of the data confirmed to have been sent -1 the connection is disconnected. 0 own send buffer or other side's congestion window are full. Note: If the <cnfSendLength> is not equal to the <reqSendLength>, the socket then cannot be used further.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details

Examples

AT+CIPSEND=?

+CIPSEND: (0-9),(1-1500)

OK

AT+CIPSEND=1,5

>12345

// If service type is "TCP", send data with fixed length

OK

+CIPSEND: 1,5,5

AT+CIPSEND=8,5,"183.230.174.137",6031

>12345

// If service type is "UDP", send data with fixed length

OK

+CIPSEND: 8,1,1

15.2.5 AT+CIPRXGET Set the Mode to Retrieve Data

If set <mode> to 1, after receiving data, the module will buffer it and report a URC as "+CIPRXGET: 1,<link_num>" to notify the host. Then host can retrieve data by AT+CIPRXGET.

If set <mode> to 0, the received data will be outputted to COM port directly by URC as "RCV FROM:<IP ADDRESS>:<PORT><CR><LF>+IPD(data length)<CR><LF><data>".

The default value of <mode> is 0.

AT+CIPRXGET Set the Mode to Retrieve Data

Test Command	Response
AT+CIPRXGET=?	+CIPRXGET: (0-4),(0-9),(1-1500)
	OK
Read Command	Response

<p>AT+CIPRXGET?</p>	<p>+CIPRXGET: <mode></p> <p>OK</p>
<p>Write Command AT+CIPRXGET=<mode> In this case, <mode> can only be 0 or 1</p>	<p>Response</p> <p>1) If the parameter is correct, response: OK</p> <p>2) ERROR</p>
<p>Write Command AT+CIPRXGET=2,<link_num>[,<len>] Retrieve data in ACSII form</p>	<p>1) If <len> field is empty, the default value to read is 1500. If the buffer is not empty, response: +CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len> <data>ACSII form</p> <p>OK</p> <p>2) If the buffer is empty, response: +IP ERROR: No data</p> <p>ERROR</p> <p>3) If the parameter is incorrect or other error, response: +IP ERROR: <err_info></p> <p>ERROR</p> <p>4) Other ERROR</p>
<p>Write Command AT+CIPRXGET=3,<link_num>[,<len>] Retrieve data in hex form</p>	<p>Response</p> <p>1) If <length> field is empty, the default value to read is 750. If the buffer is not empty, response: +CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len> <data> hex form</p> <p>OK</p> <p>2) If the buffer is empty, response: +IP ERROR: No data</p> <p>ERROR</p> <p>3) If the parameter is incorrect or other error, response:</p>

	<p>+IP ERROR: <err_info></p> <p>ERROR</p> <p>4)</p> <p>other:</p> <p>ERROR</p>
<p>Write Command</p> <p>AT+CIPRXGET=4,<link_num></p>	<p>Response</p> <p>1)</p> <p>If the parameter is correct, response:</p> <p>+CIPRXGET: 4,<link_num>,<rest_len></p> <p>OK</p> <p>2)</p> <p>If the parameter is incorrect or other error, response:</p> <p>+IP ERROR: <err_info></p> <p>ERROR</p> <p>3)</p> <p>Other:</p> <p>ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	8
Reference	

Defined Values

<mode>	<p>Integer type, sets the mode to retrieve data</p> <p><u>0</u> – set the way to get the network data automatically</p> <p>1 – set the way to get the network data manually</p> <p>2 – read data, the max read length is 1500</p> <p>3 – read data in HEX form, the max read length is 750</p> <p>4 – get the rest data length</p>
<link_num>	<p>Integer type, identifies a connection. Range is 0-9.</p>
<len>	<p>Integer type, the data length to be read.</p> <p>Not required, the default value is 1500 when <mode>=2, and 750 when <mode>=3.</p>
<read_len>	<p>Integer type, the length of data that has been read.</p>
<rest_len>	<p>Integer type, the length of data which has not been read in the buffer.</p>
<err_info>	<p>String type, displays the cause of occurring error, please refer to Chapter 15.3.1 for more details.</p>

Examples

AT+CIPRXGET=?

+CIPRXGET: (0-4),(0-9),(1-1500)

OK

AT+CIPRXGET?

+CIPRXGET: 1

OK

AT+CIPRXGET=1

OK

AT+CIPRXGET=2,0

+CIPRXGET: 2,0,6,0

123456

OK

AT+CIPRXGET=3,0

+CIPRXGET: 3,0,6,0

313233343536

OK

AT+CIPRXGET=4,0

+CIPRXGET: 4,0,18

OK

15.2.6 AT+CIPCLOSE Close TCP or UDP Socket

AT+CIPCLOSE is used to close a TCP or UDP Socket

AT+CIPCLOSE Close TCP or UDP Socket

Test Command

AT+CIPCLOSE=?

Response

+CIPCLOSE: (0-9)

OK

Read Command

AT+CIPCLOSE?

Response

+CIPCLOSE:<link0_state>,<link1_state>,<link2_state>,

	<p><link3_state>,<link4_state>,<link5_state>,<link6_state>,<link7_state>,<link8_state>,<link9_state></p> <p>OK</p>
Write Command AT+CIPCLOSE=<link_num>	<p>Response</p> <p>1) If service type is TCP and the connection identified by <link_num> has been established, response OK</p> <p>+CIPCLOSE: <link_num>,<err></p> <p>2) If service type is TCP and the access mode is transparent mode, response: OK</p> <p>CLOSED</p> <p>+CIPCLOSE: <link_num>,<err></p> <p>3) If service type is UDP and the connection identified by <link_num> has been established and closed successfully, response: +CIPCLOSE: <link_num>,0</p> <p>OK</p> <p>4) If service type is UDP and access mode is transparent mode, response: CLOSED</p> <p>+CIPCLOSE: <link_num>,<err></p> <p>OK</p> <p>5) If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPCLOSE: <link_num>,<err></p> <p>ERROR</p> <p>6) Other: ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms

	(it can be set by AT+CIPTIMEOUT)
Reference	

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-9.
<linkX_state>	Integer type, indicates state of connection identified by <link_num>. Range is 0-1. 0 -- disconnected 1 -- connected
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details

Examples

```

AT+CIPCLOSE=?
+CIPCLOSE: (0-9)

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

OK
AT+CIPCLOSE=0
OK

+CIPCLOSE: 0,0

```

15.2.7 AT+IPADDR Inquire Socket PDP address

AT+IPADDR is used to get active PDP address.

AT+IPADDR Inquire Socket PDP Address

Execute Command AT+IPADDR	<p>Response</p> <p>1) If PDP context has been activated successfully, response +IPADDR: <ip_address></p> <p>OK</p> <p>2) +IP ERROR: Network not opened</p>
-------------------------------------	---

	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<ip_address>	String type, identifies the IP address of current active socket PDP.
--------------	--

Examples

AT+IPADDR

```
+IPADDR: 10.84.17.161
```

```
OK
```

15.2.8 AT+CIPHEAD Add an IP Header When Receiving Data

AT+CIPHEAD is used to add an IP header when receiving data.

AT+CIPHEAD Add an IP Header When Receiving Data

Test Command AT+CIPHEAD=?	Response +CIPHEAD: (0-1) OK
Read Command AT+CIPHEAD?	Response +CIPHEAD: <mode> OK
Write Command AT+CIPHEAD=<mode>	Response 1) If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPHEAD	Response Set default value:(<mode>=1) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms

Reference	-
-----------	---

Defined Values

<mode>	Integer type, indicates whether adding an IP header or not when receiving data 0 – not add IP header 1 – add IP header, the format is “+IPD(data length)”
--------	---

Examples

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

```
OK
AT+CIPHEAD?
+CIPHEAD: 1
```

```
OK
AT+CIPHEAD=1
OK
AT+CIPHEAD
OK
```

15.2.9 AT+CIPSRIP Show Remote IP Address and Port

AT+CIPSRIP is used to set whether to display IP address and port of server when receiving data.

AT+CIPSRIP Show Remote IP Address and Port

Test Command AT+CIPSRIP=?	Response +CIPSRIP: (0-1) OK
Read Command AT+CIPSRIP?	Response +CIPSRIP: <mode> OK
Write Command AT+CIPSRIP=<mode>	Response 1) If the parameter is correct, response: OK

	2) ERROR
Execute Command AT+CIPSRIP	Response Set default value:(<mode>=1) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, indicates whether to show IP address and port of server or not when receiving data. 0 – not show <u>1</u> – show, the format is as follows: “RECV FROM:<IP ADDRESS>:<PORT>”
--------	--

Examples

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

```
OK
AT+CIPSRIP?
+CIPSRIP: 1
```

```
OK
AT+CIPSRIP=0
OK
AT+CIPSRIP
OK
```

15.2.10 AT+CIPMODE Set TCP/IP Application Mode

AT+CIPMODE is used to select transparent mode (data mode) or non-transparent mode (command mode).The default mode is non-transparent mode.

AT+CIPMODE Set TCP/IP Application Mode

Test Command AT+CIPMODE=?	Response +CIPMODE: (0-1)
-------------------------------------	------------------------------------

	OK
Read Command AT+CIPMODE?	Response +CIPMODE: <mode>
	OK
Write Command AT+CIPMODE=<mode>	Response 1) If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPMODE	Response Set default value:(<mode>=0) OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, sets TCP/IP application mode <u>0</u> – Non transparent mode 1 – Transparent mode
---------------------	---

Examples

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

```
OK
AT+CIPMODE?
+CIPMODE: 0
```

```
OK
AT+CIPMODE=1
OK
AT+CIPMODE
OK
```

NOTE

When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN.

15.2.11 AT+CIPSENDMODE Set Sending Mode

AT+CIPSENDMODE is used to select sending mode when service type is "TCP".

If set <mode> to 1, when sending data by AT+CIPSEND, the URC "+CIPSEND:

<link_num>,<reqSendLength>, <cnfSendLength>" will not be returned until module receives the server's ACK message to the sent data last time.

If set <mode> to 0, the URC "+CIPSEND: <link_num>,<reqSendLength>, <cnfSendLength>" will be returned If the data has been sent to module's internal TCP/IP protocol stack. In this case, the module doesn't need to wait for the server's ACK message.

The default mode is sending without waiting peer TCP ACK mode.

AT+CIPSENDMODE Set Sending Mode	
Test Command AT+CIPSENDMODE=?	Response +CIPSENDMODE: (0-1) OK
Read Command AT+CIPSENDMODE?	Response +CIPSENDMODE: <mode> OK
Write Command AT+CIPSENDMODE=<mode>	Response 1) If the parameter is correct, response: OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<mode>	Integer type, sets sending mode <u>0</u> – sending without waiting peer TCP ACK mode 1 – sending wait peer TCP ACK mode
--------	---

Examples

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

```
OK
```

AT+CIPSENDMODE=1

OK

AT+CIPSENDMODE?

+CIPSENDMODE: 1

OK

15.2.12 AT+CIPTIMEOUT Set TCP/IP Timeout Value

AT+CIPTIMEOUT is used to set timeout value for AT+NETOPEN/AT+CIPOPEN/AT+CIPSEND.

AT+CIPTIMEOUT Set TCP/IP Timeout Value

Read Command AT+CIPTIMEOUT?	Response +CIPTIMEOUT: <netopen_timeout>,<cipopen_timeout>,<cipsend_timeout> OK
Write Command AT+CIPTIMEOUT=[<netopen_timeout>],[<cipopen_timeout>],[<cipsend_timeout>]]	Response 1) If the parameter is correct, response: OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<netopen_timeout>	Integer type, timeout value for AT+NETOPEN. default is 120000ms. Range is 3000ms-120000ms.
<cipopen_timeout>	Integer type, timeout value for AT+CIPOPEN. default is 120000ms. Range is 3000ms-120000ms.
<cipsend_timeout>	Integer type, timeout value for AT+CIPSEND. default is 120000ms. Range is 3000ms-120000ms.

Examples

AT+CIPTIMEOUT?

+CIPTIMEOUT: 120000,120000,120000

OK

AT+CIPTIMEOUT=3000,3000,3000

OK

15.2.13 AT+CIPCCFG Configure Parameters of Socket

AT+CIPCCFG is used to configure parameters of socket.

AT+CIPCCFG Configure Parameters of Socket

Test Command AT+CIPCCFG=?	Response +CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000) OK
Read Command AT+CIPCCFG?	Response +CIPCCFG:<NmRetry>,<DelayTm>,<Ack>,<errMode>,<HeaderType>,<AsyncMode>,<TimeoutVal> OK
Write Command AT+CIPCCFG=[<NmRetry>][,<DelayTm>][,<Ack>][,<errMode>][,<HeaderType>][,<AsyncMode>][,<TimeoutVal>]]]]]]]	Response 1) If the parameter is correct, response: OK 2) ERROR
Execute Command AT+CIPCCFG	Response Set default value: OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<NmRetry>	Integer type, number of retransmission to be made for an IP packet. Range is 0-10. The default value is 10.
<DelayTm>	Integer type, number of milliseconds to delay to output data of Receiving. Range is 0-1000. The default value is 0.
<Ack>	Integer type, it can only be set to 0.It's used to be compatible with old TCP/IP command set.

<errMode>	Integer type, sets mode of reporting <err_info>, default value is 1. 0 error result code with numeric values 1 error result code with string values
<HeaderType>	Integer type, select which data header is used when receiving data, it only takes effect in multi-client mode. Default value is 0. 0 add data header, the format is "+IPD<data length>" 1 add data header, the format is "+RECEIVE,<link num>,<data length>"
<AsyncMode>	Integer type, range is 0-1. Default value is 0. It's used to be compatible with old TCP/IP command set.
<TimeoutVal>	Integer type, set the minimum retransmission timeout value for TCP connection. Range is 500ms-120000ms. Default is 500ms.

Examples

```
AT+CIPCCFG=?
+CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000)
```

```
OK
AT+CIPCCFG?
+CIPCCFG: 10,0,0,1,0,0,500
```

```
OK
AT+CIPCCFG=2
OK
AT+CIPCCFG
OK
```

15.2.14 AT+SERVERSTART Startup TCP Sever

AT+SERVERSTART is used to startup a TCP server, and the server can receive the request of TCP client. After the command executes successfully, an unsolicited result code is returned when a client tries to connect with module and module accepts request. The unsolicited result code is+CLIENT: <link_num>,<server_index>,<client_IP>:<port>.

AT+SERVERSTART Startup TCP Sever

Test Command AT+SERVERSTART=?	Response +SERVERSTART: (0-65535),(0-3) OK
Read Command	Response

AT+SERVERSTART?	<p>1) If the PDP context has not been activated successfully, response: +CIPERROR: <err></p> <p>ERROR</p> <p>2) If there exists opened server, response: [+SERVERSTART: <server_index>,<port> ...]</p> <p>OK</p> <p>3) Other: ERROR</p>
<p>Write Command AT+SERVERSTART=<port>,<server_index>[,<backlog>]</p>	<p>Response</p> <p>1) If there is no error, response: OK</p> <p>2) If the PDP context has not been activated, or the server identified by <server_index> has been opened, or the parameter is not correct, or other errors, response: +CIPERROR: <err></p> <p>ERROR</p> <p>3) Other: ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<port>	Integer type, identifies the listening port of module when used as a TCP server. Range is 0-65535.
<server_index>	Integer type, the TCP server index, range is 0-3.
<backlog>	Integer type, the maximum connections can be queued in listening queue. Range is 1-3. Default is 3.

Examples

AT+SERVERSTART=?
+SERVERSTART: (0-65535),(0-3)


```
OK
AT+SERVERSTART?
OK
AT+SERVERSTART=8080,0
OK
```

15.2.15 AT+SERVERSTOP Stop TCP Sever

AT+SERVERSTOP is used to stop TCP server. Before stopping a TCP server, all sockets <server_index> of which equals to the closing TCP server index must be closed first.

AT+SERVERSTOP Stop TCP Sever

<p>Write Command</p> <p>AT+SERVERSTOP=<server_index></p>	<p>Response</p> <p>1)</p> <p>If there exists open connection with the server identified by <server_index>, or the server identified by <server_index> has not been opened, or the parameter is incorrect, response:</p> <p>+SERVERSTOP: <server_index>,<err></p> <p>ERROR</p> <p>2)</p> <p>If the server socket is closed immediately, response:</p> <p>+SERVERSTOP: <server_index>,0</p> <p>OK</p> <p>(In general, the result is shown as below.)</p> <p>3)</p> <p>If the server socket starts to close, response:</p> <p>OK</p> <p>+SERVERSTOP: <server_index>,<err></p> <p>4)</p> <p>Other:</p> <p>ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<server_index>	Integer type, the TCP server index, range is 0-3.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details

Examples

AT+SERVERSTOP=0

OK

+SERVERSTOP: 0,0

15.2.16 AT+CIPACK Query TCP Connection Data Transmitting Status

AT+CIPACK is used to query TCP connection data transmitting status.

AT+CIPACK Query Connection Data Transmitting State

Test Command AT+CIPACK=?	Response +CIPACK: (0-9) OK
Write Command AT+CIPACK=<link_num>	Response 1) If the PDP context has not been activated, or the connection identified by <link_num> has not been established, abnormally closed, or the parameter is incorrect, or other errors, response: +IP ERROR: <err_info> ERROR 2) If the connection has been established, and the service type is "TCP", response: +CIPACK: <sent_data_size>,<ack_data_size>,<recv_data_size> OK
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-9.
<sent_data_size>	Integer type, the total length of sent data
<ack_data_size>	Integer type, the total length of acknowledged data.
<recv_data_size>	Integer type, the total length of received data
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 4 for details
<err_info>	String type, displays the cause of occurring error, please refer to Chapter 3 for details.

Examples

AT+CIPACK=?

+CIPACK: (0-9)

OK

AT+CIPACK=<link_num>

+CIPACK: 10,10,5

OK

15.2.17 AT+CDNSGIP Query the IP Address of Given Domain Name

AT+CDNSGIP is used to query the IP address of given domain name.

AT+CDNSGIP Query the IP Address of Given Domain Name

Test Command	Response
AT+CDNSGIP=?	OK
	Response 1) If the given domain name has related IP, response: +CDNSGIP: 1,<domain name>,<IP address>
Write Command AT+CDNSGIP=<domain name>	OK 2) If the given name has no related IP, response: +CDNSGIP: 0,<dns error code>
	ERROR 3)

	Other: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 9000ms
Reference	-

Defined Values

<domain name>	String type (string should be included in quotation marks), indicates the domain name. The maximum length of domain name is 254. Valid characters allowed in the domain name area include a-z, A-Z, 0-9, “-” (hyphen) and “.”. A domain name is made up of one label name or more label names separated by “.” (eg: AT+CDNSGIP=”aa.bb.cc”). For label names separated by “.”, length of each label must be no more than 63 characters. The beginning character of the domain name and of labels should be an alphanumeric character.
<IP address>	String type, indicates the IP address corresponding to the domain name.
<dns error code>	Integer type, indicates the error code. 10 DNS GENERAL ERROR

Examples

```

AT+CDNSGIP=?
OK
AT+CDNSGIP="www.baidu.com"
+CDNSGIP: 1,"www.baidu.com","61.135.169.121"
OK

```

15.3 Command result codes

15.3.1 Description of <err_info>

The fourth parameter <errMode> of AT+CIPCCFG (TODO) is used to determine how <err_info> is displayed.

If <errMode> is set to 0, the <err_info> is displayed with numeric value.

If <errMode> is set to 1, the <err_info> is displayed with string value.

The default is displayed with string value.

Numeric Value	String Value
0	Connection time out
1	Bind port failed
2	Port overflow
3	Create socket failed
4	Network is already opened
5	Network is already closed
6	No clients connected
7	No active client
8	Network not opened
9	Client index overflow
10	Connection is already created
11	Connection is not created
12	Invalid parameter
13	Operation not supported
14	DNS query failed
15	TCP busy
16	Net close failed for socket opened
17	Sending time out
18	Sending failure for network error
19	Open failure for network error
20	Server is already listening
21	Operation failed
22	No data

15.3.2 Description of <err>

<err>	Description of <err>
0	operation succeeded
1	Network failure
2	Network not opened
3	Wrong parameter
4	Operation not supported
5	Failed to create socket
6	Failed to bind socket
7	TCP server is already listening
8	Busy

9	Sockets opened
10	Timeout
11	DNS parse failed for AT+CIOPEN
12	Unknown error

15.3.3 Information Elements related to TCP/IP

Information	Description
+CIPEVENT: NETWORK CLOSED UNEXPECTEDLY	Network is closed for network error(Out of service, etc). When this event happens, user's application needs to check and close all opened sockets, and then uses AT+NETCLOSE to release the network library if AT+NETOPEN? shows the network library is still opened.
+IPCLOSE: <client_index>,<close_reason>	Socket is closed passively. <client_index> is the link number. <close_reason>: 0 - Closed by local, active 1 - Closed by remote, passive 2 - Closed for sending timeout or DTR off
+CLIENT: <link_num>,<server_index> ,<client_IP>:<port>	TCP server accepted a new socket client, the index is<link_num>, the TCP server index is <server_index>. The peer IP address is <client_IP>, the peer port is <port>.

16 AT Commands for HTTP(S)

16.1 Overview of AT Commands for HTTP(S)

Command	Description
AT+HTTPIPINIT	Start HTTP service
AT+HTTPTERM	Stop HTTP Service
AT+HTTPPARA	Set HTTP Parameters value
AT+HTTPACTION	HTTP Method Action
AT+HTTPHEAD	Read the HTTP Header Information of Server Response
AT+HTTPREAD	Read the response information of HTTP Server
AT+HTTPDATA	Input HTTP Data
AT+HTTPPOSTFILE	Send HTTP Request to HTTP(S) server by File
AT+HTTPREADFILE	Receive HTTP Response Content to a file

16.2 Detailed Description of AT Commands for HTTP(S)

16.2.1 AT+HTTPIPINIT Start HTTP service

AT+HTTPIPINIT is used to start HTTP service by activating PDP context. You must execute AT+HTTPIPINIT before any other HTTP related operations.

AT+HTTPIPINIT Start HTTP service	
Execute Command AT+HTTPIPINIT	Response a) If start HTTP service successfully: OK b) If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<err>	The type of error please refer to the
-------	---------------------------------------

Examples

```
AT+HTTPIPINIT
OK
```

16.2.2 AT+HTTPTERM Stop HTTP Service

AT+HTTPTERM is used to stop HTTP service.

AT+HTTPTERM Stop HTTP Service

Execute Command AT+HTTPTERM	Response a)If stop HTTP service successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Examples

```
AT+HTTPTERM
OK
```

16.2.3 AT+HTTPPARA Set HTTP Parameters value

AT+HTTPPARA is used to set HTTP parameters value. When you want to access to a HTTP server, you should input <value> like http://server'/path':tcpPort'. In addition, https://server'/path':tcpPort' is used to access to a HTTPS server.

AT+HTTPPARA Set HTTP Parameters value

Write Command	Response
---------------	----------

<p>AT+HTTTPARA="URL", "<url>"</p>	<p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="CONNECTTO", <conn_timeout></p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="RCVTO", <recv_timeout></p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="CONTENT", "<content_type>"</p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="ACCEPT", "<accept-type>"</p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="SSLCFG", <sslcfg_id></p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="USERDATA", "<user_data>"</p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Write Command AT+HTTTPARA="READMODE", <readmode></p>	<p>Response</p> <p>a) If parameter format is right: OK</p> <p>b) If parameter format is not right or other errors occur: ERROR</p>
<p>Parameter Saving Mode</p>	<p>-</p>
<p>Max Response Time</p>	<p>120000ms</p>
<p>Reference</p>	<p>-</p>

Defined Values

<url>	URL of network resource.String,start with “http://” or”https://” a)http://’server’/’path’:’tcpPort’. b)https://’server’/’path’:’tcpPort’ “server”: DNS domain name or IP address “path”: path to a file or directory of a server “tcpPort”: http default value is 80,https default value is 443.(can be omitted)
<conn_timeout>	Timeout for accessing server, Numeric type, range is 20-120s, default is 120s.
<recv_timeout>	Timeout for receiving data from server, Numeric type range is 2s-120s, default is 20s.
<content_type>	This is for HTTP “Content-Type” tag, String type, max length is 256, default is “text/plain”.
<accept-type>	This is for HTTP “Accept-type” tag, String type, max length is 256, default is “*/”.
<sslcfg_id>	This is setting SSL context id, Numeric type, range is 0-9. Default is 0.Please refer to Chapter 19 of this document.
<user_data>	The customized HTTP header information. String type, max length is 256.
<readmode>	For HTTPREAD, Numeric type, it can be set to 0 or 1. If set to 1, you can read the response content data from the same position repeatly. The limit is that the size of HTTP server response content should be shorter than 1M.Default is 0.

Examples

```
AT+HTTTPARA="URL","http://www.baidu.com"
OK
```

16.2.4 AT+HTTPACTION HTTP Method Action

AT+HTTPACTION is used to perform a HTTP Method. You can use HTTPACTION to send a get/post request to a HTTP/HTTPS server.

AT+HTTPACTION HTTP Method Action

Test Command AT+HTTPACTION=?	Response +HTTPACTION: (0-3) OK
--	--

Write Command AT+HTTPACTION=<method>	<p>Response</p> <p>a) If parameter format is right : OK</p> <p>+HTTPACTION: <method>,<statuscode>,<datalen></p> <p>b) If parameter format is right but server connected unsuccessfully: OK</p> <p>+HTTPACTION: <method>,<errcode>,<datalen></p> <p>c) If parameter format is not right or other errors occur: ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<method>	HTTP method specification: 0: GET 1: POST 2: HEAD 3: DELETE
<statuscode>	Please refer to the end of this chapter
<datalen>	The length of data received

Examples

```

AT+HTTPACTION=?
+HTTPACTION: (0-3)

OK
AT+HTTPACTION=0
OK

+HTTPACTION: 0,200,104220

```

16.2.5 AT+HTTPHEAD Read the HTTP Header Information of Server Respons

AT+HTTPHEAD is used to read the HTTP header information of server response when module receives the response data from server.

AT+HTTPHEAD Read the HTTP Header Information of Server Respons

Execute Command AT+HTTPHEAD	Response a) If read the header information successfully: +HTTPHEAD: <data_len> <data> OK b)If read failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<dat_len>	The length of HTTP header
<data>	The header information of HTTP response

Examples

```

AT+ HTTPHEAD
+HTTPHEAD: 653
HTTP/1.1 200 OK
Content-Type: text/html
Connection: keep-alive
X-Cache: MISS from PDcache-04 :opinion.people.com.cn
Date: Tue, 24 Mar 2020 03:12:09 GMT
Powered-By-ChinaCache: HIT from CNC-WB-b-D24
Powered-By-ChinaCache: HIT from CNC-WV-b-D1C
ETag: W/"5b7379f5-57e9"
x-cc-via: CNC-WB-b-D24[H,1], CNC-WV-b-D1C[H,62]
d-cc-upstream: CNC-WV-b-D1C
CACHE: TCP_HIT
Vary: Accept-Encoding
Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT
Expires: Tue, 24 Mar 2020 03:17:09 GMT
x-cc-req-id: f4b9e1793697d1ef2950f530aeec4519
Content-Length: 22505
Age: 0
Accept-Ranges: bytes
Server: nginx
X-Frame-Options: ALLOW-FROM .*
CC_CACHE: TCP_REFRESH_HIT

```

OK

16.2.6 AT+HTTPREAD Read the response information of HTTP Server

After sending HTTP(S) GET/POST requests, you can retrieve HTTP(S) response information from HTTP(S) server via UART/USB port by AT+HTTPREAD. When the <datalen> of "+HTTPACTION: <method>, <statuscode>, <datalen>" is not equal to 0, You can execute AT+HTTPREAD=<start_offset>,<byte_size> to read out data to port. If parameter <byte_size> is set greater than the size of data saved in buffer, all data in cache will output to port.

AT+HTTPREAD Read the response information of HTTP Server

Read Command AT+HTTPREAD?	Response 1) If check successfully: +HTTPREAD: LEN,<len> OK 2) If failed (no more data other error): ERROR
Write Command AT+HTTPREAD=[<start_offset>,<byte_size>	Response 1) If read the response info successfully: OK +HTTPREAD: <data_len> <data> +HTTPREAD: 0 If <byte_size> is bigger than the data size received, module will only return actual data size. 2) If read failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<start_offset>	The start position of reading
<byte_size>	The length of data to read
<datalen>	The actual length of read data
<data>	Response content from HTTP server
<len>	Total size of data saved in buffer.

Examples

AT+ HTTPREAD?

+HTTPREAD: LEN,22505

OK

AT+HTTPREAD=0,500

OK

+HTTPREAD: 500

```

\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0\0<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="content-type" content="text/html;charset=GB2312"/>
<meta http-equiv="Content-Language" content="utf-8" />
<meta content="all" name="robots" />
<title>人民日报钟声：牢记历史是为了更好开创未来--观点--人民网 </title>
<meta name="keywords" content="" />
<meta name="description" content="    日方应在正确对待历史?

```

+HTTPREAD: 0

NOTE

The response content received from server will be saved in cache, and would not be cleaned up by AT+HTTPREAD.

16.2.7 AT+HTTPDATA Input HTTP Data

You can use AT+HTTPDATA to input data to post when you send a HTTP/HTTPS POST request.

AT+HTTPDATA Input HTTP Data

Write Command

AT+HTTPDATA=<size>,<time>

Response

1)if parameter format is right:

DOWNLOAD

<input data here>

When the total size of the inputted data reaches <size>, TA will report the following code. Otherwise, the serial port will be blocked.

OK

2)If parameter format is wrong or other errors occur:

	ERROR
Parameter Saving Mode	
Max Response Time	
Reference	

Defined Values

<size>	Size in bytes of the data to post. range is 1- 153600 (bytes)
<time>	Maximum time in milliseconds to input data.

Examples

```
AT+HTTPDATA=18,1000
DOWNLOAD
Message=helloworld
OK
```

16.2.8 AT+HTTPPOSTFILE Send HTTP Request to HTTP(S) server by File

You also can send HTTP request in a file via AT+HTTPPOSTFILE command. The URL must be set by AT+HTTPPARA before executing AT+HTTPPOSTFILE command. The parameter <path> can be used to set the file directory. When modem has received response from HTTP server, it will report the following URC:

+HTTPPOSTFILE: <httpstatuscode>,<content_length>

AT+HTTPPOSTFILE Send HTTP Request to HTTP(S) server by File

Test Command AT+HTTPPOSTFILE=?	Response +HTTPPOSTFILE: <filename>[(1-2)]
Write Command AT+HTTPPOSTFILE=<filename> [,<path>]	Response 1) if parameter format is right and server connected successfully: OK +HTTPPOSTFILE: <httpstatuscode>,<content_len> 2) if parameter format is right but server connected unsuccessfully: OK +HTTPPOSTFILE: <errcode>,0 3) if parameter format is not right or any other error occurs: ERROR
Parameter Saving Mode	
Max Response Time	

Reference

URC

AT+HTTPPOSTFILE Send HTTP Request to HTTP(S) server by File

URC

Description

+CMQTTCONNLOST:
<client_index>,<cause>

When client disconnect passively, URC “+CMQTTCONNLOST” will be reported, then user need to connect MQTT server again.

Defined Values

<filename>	String type, filename, the max length is 112.unit:byte.
<path>	The directory where the sent file saved. Numeric type, range is 1-2 1 – C:/ (local storage) 2 – D:/(sd card)

Examples

```
AT+HTTPPOSTFILE=?
+HTTPPOSTFILE: <filename>[, (1-2)]
AT+HTTPPOSTFILE="getbaidu.txt",1
OK
+HTTPPOSTFILE: 200,14615
```

16.2.9 AT+HTTPREADFILE Receive HTTP Response Content to a file

After execute AT+HTTPACTION/AT+HTTPPOSTFILE command. You can receive the HTTP server response content to a file via AT+HTTPREADFILE.

Before AT+HTTPREADFILE executed, "+HTTPACTION:<method>,<httpstatuscode>,<content_len>" or "+HTTPPOSTFILE: <httpstatuscode>,<content_len>" must be received. The parameter <path> can be used to set the directory where to save the file. If omit parameter <path>, the file will be save to local storage.

AT+HTTPREADFILE Receive HTTP Response Content to a File

Test Command
AT+HTTPREADFILE=?

Response
+HTTPREADFILE: <filename>[, (1-2)]

OK

Write Command AT+HTTPREADFILE=<filename>[,<path>]	Response 1)if parameter format is right : OK +HTTPREADFILE: <errcode> 2)if failed: OK +HTTPREADFILE: <errcode> 3)if parameter format is not right or any other error occurs: ERROR
Parameter Saving Mode	
Max Response Time	
Reference	

Defined Values

<filename>	String type, filename, the max length is 112.unit:byte.
<path>	The directory where the read file saved. Numeric type, range is 1-2. 1 – C:/ (local storage) 2 – D:/(sd card)

Examples

```
AT+HTTPREADFILE=?
+HTTPREADFILE: <filename>[(1-2)]

OK
AT+HTTPREADFILE="readbaidu.dat"
OK

+HTTPREADFILE: 0
```

16.3 Summary of HTTP Response Code

<statuscode>	Meaning
100	Continue
101	Switching Protocols
200	OK
201	Created

202	Accepted
203	Non-Authoritative Information
204	No Content
205	Reset Content
206	Partial Content
300	Multiple Choices
301	Moved Permanently
302	Found
303	See Other
304	Not Modified
305	Use Proxy
307	Temporary Redirect
400	Bad Request
401	Unauthorized
402	Payment Required
403	Forbidden
404	Not Found
405	Method Not Allowed
406	Not Acceptable
407	Proxy Authentication Required
408	Request Timeout
409	Conflict
410	Gone
411	Length Required
412	Precondition Failed
413	Request Entity Too Large
414	Request-URI Too Large
415	Unsupported Media Type
416	Requested range not satisfiable
417	Expectation Failed
500	Internal Server Error
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway timeout
505	HTTP Version not supported
600	Not HTTP PDU
601	Network Error
602	No memory
603	DNS Error
604	Stack Busy

16.4 Summary of HTTP error Code

URC	Meaning
+HTTP_PEER_CLOSED	It's a notification message. While received, it means the connection has been closed by server.
+HTTP_NONET_EVENT	It's a notification message. While received, it means now the network is unavailable.

<errcode>	Meaning
0	Success
701	Alert state
702	Unknown error
703	Busy
704	Connection closed error
705	Timeout
706	Receive/send socket data failed
707	File not exists or other memory error
708	Invalid parameter
709	Network error
710	start a new ssl session failed
711	Wrong state
712	Failed to create socket
713	Get DNS failed
714	Connect socket failed
715	Handshake failed
716	Close socket failed
717	No network error
718	Send data timeout
719	CA missed

17 AT Commands for FTP(S)

17.1 Overview of AT Commands for FTP(S)

Command	Description
AT+CFTPSSTART	Start FTP(S) service
AT+CFTPSSTOP	Stop FTP(S) Service
AT+CFTPSLOGIN	Login to a FTP(S)server
AT+CFTPSLOGOUT	Logout a FTP(S) server
AT+CFTPSLIST	List the items in the directory on FTP(S) server
AT+CFTPSMKD	Create a new directory on FTP(S) server
AT+CFTPSRMD	Delete a directory on FTP(S) server
AT+CFTPSCWD	Change the current directory on FTP(S) server
AT+CFTPSPWD	Get the current directory on FTP(S) server
AT+CFTPSDELE	Delete a file on FTP(S) server
AT+CFTPSGETFILE	Download a file from FTP(S) server to module
AT+CFTPSPUTFILE	Upload a file from module to FTP(S) server
AT+CFTPSGET	Get a file from FTP(S) server to serial port
AT+CFTPSPUT	Put a file to FTP(S) server through serial port
AT+CFTPSSIZE	Get the file size on FTP(S) server
AT+CFTPSSINGLEIP	Set FTP(S) data socket address type
AT+CFTPSTYPE	Set the transfer type on FTP(S) server
AT+CFTPSSLCFG	Set the SSL context id for FTPS session

17.2 Detailed Description of AT Commands for FTP(S)

17.2.1 AT+CFTPSSTART Start FTP(S) service

AT+CFTPSSTART is used to start FTP(S) service by activating PDP context. You must execute AT+CFTPSSTART before any other FTP(S) related operations.

AT+CFTPSSTART Start FTP(S) service

Execution Command AT+CFTPSSTART	Response 1) OK +CFTPSSTART: 0 2) OK +CFTPSSTART: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<errcode>	The result of start FTP(S) service, 0 is success, others are failure. Please refer to errcode list.
-----------	---

Examples

```
AT+CFTPSSTART
OK

+CFTPSSTART: 0
```

17.2.2 AT+CFTPSSTOP Stop FTP(S) Service

AT+CFTPSSTOP is used to stop FTP(S) service by deactivating PDP context. When you are no longer using the FTP(S) service, use this command.

AT+CFTPSSTOP Stop FTP(S) Service

Execution Command AT+CFTPSSTOP	Response 1) OK +CFTPSSTOP: 0 2) OK
--	--

	+CFTPSSTOP: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<errcode>	The result of start FTP(S) service, 0 is success, others are failure. Please refer to errcode list.
------------------------	---

Examples

AT+CFTPSSTOP

OK

+CFTPSSTOP: 0

17.2.3 AT+CFTPSLOGIN Login to a FTP(S)server

AT+CFTPSLOGIN is used to login to a FTP(S) server, you can login to a FTP server by set parameter <server_type> to 0, login to an implicit FTPS server by set <server_type> to 3 and login to an explicit FTPS server by set <server_type> to 1 or 2. About <server_type>, more details please refer to defined values <server_type>.

AT+CFTPSLOGIN Login to a FTP(S) server

Test Command AT+CFTPSLOGIN=?	Response +CFTPSLOGIN: "ADDRESS",(1-65535),"USERNAME","PASSWORD"[(,0-3)] OK
Write Command AT+CFTPSLOGIN="<host>",<port>,"<username>","<password>"[<server_type>]	Response 1) OK +CFTPSLOGIN: 0 2) OK

	+CFTPSLOGIN: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<host>	Host address, string type, maximum length is 128
<port>	The host listening port for FTP(S), the range is from 1 to 65535
<username>	FTP(S) user name, string type, maximum length is 128
<password>	The user password, string type, maximum length is 128
<servet_type>	FTP(S) server type, numeric, from 0-3, default is 3 0 – FTP server. 1 – Explicit FTPS server with AUTH SSL. 2 – Explicit FTPS server with AUTH TLS. <u>3</u> – Implicit FTPS server.
<errcode>	The result code of the FTP/FTPS login. 0 is success. Others are failure, please refer to chapter 4.

Examples

```

AT+CFTPSLOGIN=?
+CFTPSLOGIN:
"ADDRESS",(1-65535),"USERNAME","PASSWORD"[(,)(0-3)]

OK
AT+CFTPSLOGIN="serveraddr",21,"username","password",0
OK

+CFTPSLOGIN: 0
  
```

17.2.4 AT+CFTPSLOGOUT Logout a FTP(S) server

AT+CFTPSLOGOUT is used to logout a FTP(S) sever, make sure you login a FTP(S) sever before you execute AT+CFTPSLOGOUT command.

AT+CFTPSLOGOUT Logout a FTP(S) server

Test Command	Response
AT+CFTPSLOGOUT=?	OK

Execute Command AT+CFTPSLOGOUT	Response
	1) OK
	+CFTPSLOGOUT: <0>
	2) OK
	+CFTPSLOGOUT: <errcode>
	3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<errcode>	The result code of the FTP/FTPS logout. 0 is success. Others are failure, please refer to chapter 4.
------------------------	--

Examples

```
AT+CFTPSLOGOUT=?
OK
AT+CFTPSLOGOUT
OK

+CFTPSLOGOUT: 0
```

NOTE

When you want to stop the FTP(S) service, please use AT+CFTPSLOGOUT to log out of the FTP(S) server, then use AT+CFTPSSTOP to stop FTP, if you only use AT+CFTPSSTOP, it will report ERROR.

17.2.5 AT+CFTPSLIST List the items in the directory on FTP(S) server

This command is used to list the items in the specified directory on FTP(S) server. Module will output the items to serial port when list items successfully. Make sure that you have login to FTP(S) server successfully.

AT+CFTPSLIST List the items in the directory on FTP(S) server

Write Command AT+CFTPSLIST=<dir>	<p>Response</p> <p>1) OK</p> <p>+CFTPSLIST: DATA,<len></p> <p>...</p> <p>+CFTPSLIST: 0</p> <p>2) OK</p> <p>+CFTPSLIST: <errcode></p> <p>3) ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be created, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```

AT+CFTPSLIST="/"
OK

+CFTPSLIST: DATA,175
-rw-r--r-- 1 ftp ftp      121 Mar 11 16:24
124.txt
drwxr-xr-x 1 ftp ftp      0 Jan 13
2020 TEST113
drwxr-xr-x 1 ftp ftp      0 Jan 19
2020 TEST1155

+CFTPSLIST: 0

```

17.2.6 AT+CFTPSMKD Create a new directory on FTP(S) server

AT+CFTPSMKD is used to create a new directory on a FTP(S) server. Please make sure login to the FTP(S) server successfully before create a directory.

AT+CFTPSLOGIN Login to a FTP(S) server

Test Command AT+CFTPSMKD=?	Response +CFTPSMKD: "DIR" OK
Write Command AT+CFTPSMKD="<dir>"	Response 1) OK +CFTPSMKD: 0 2) OK +CFTPSMKD: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be created, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```

AT+CFTPSMKD=?
+CFTPSMKD: "DIR"

OK
AT+CFTPSMKD="test"
OK

+CFTPSMKD: 0

```

17.2.7 AT+CFTPSRMD Delete a directory on FTP(S) server

AT+CFTPSRMD is used to delete a directory on FTP(S) server, please make sure login to the FTP(S)server successfully before delete a directory.

AT+CFTPSRMD Delete a directory on FTP(S) server

Test Command AT+CFTPSRMD=?	Response +CFTPSRMD: "DIR" OK
Write Command AT+CFTPSRMD="<dir>"	Response 1) OK +CFTPSRMD: 0 2) OK +CFTPSRMD: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be deleted, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```
AT+CFTPSRMD=?
+CFTPSRMD: "DIR"

OK
AT+CFTPSRMD="test"
OK

+CFTPSRMD: 0
```

17.2.8 AT+CFTPSCWD Change the current directory on FTP(S) server

You can use this command to change the current directory on FTP(S) sever. Make sure you have login to FTP(S) server successfully before AT+CFTPSCWD

AT+CFTPSCWD Change the current directory on FTP(S) server

Test Command AT+CFTPSCWD=?	Response +CFTPSCWD: "DIR" OK
Write Command AT+CFTPSCWD="<dir>"	Response 1) OK +CFTPSCWD: 0 2) OK +CFTPSCWD: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be changed, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```
AT+CFTPSCWD=?
+CFTPSCWD: "DIR"

OK
AT+CFTPSCWD="test"
OK

+CFTPSCWD: 0
```

17.2.9 AT+CFTPSPWD Get the current directory on FTP(S) server

This command is used to get the current directory on FTP(S) server. Before AT+CFTPSPWD, please make sure you have login to FTP(S) server successfully

AT+CFTPSPWD Get the current directory on FTP(S) server	
Execute Command AT+CFTPSPWD	Response 1) OK +CFTPSPWD: "<dir>" 2) +CFTPSPWD: <errcode> ERROR 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<dir>	The directory to be got, string type, maximum length is 112.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```
AT+CFTPSPWD
OK

+CFTPSPWD: 0
```

17.2.10 AT+CFTPSDELE Delete a file on FTP(S) server

You can use AT+CFTPSDELE delete a file on FTP(S) server, please make sure login to the FTP(S) server successfully before delete a file.

AT+CFTPSDELE Delete a file on FTP(S) server

Test Command AT+CFTPSDELE=?	Response +CFTPSDELE: "FILENAME" OK
Write Command AT+CFTPSDELE="<filename>"	Response 1) OK +CFTPSDELE: 0 2) OK +CFTPSDELE: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<filename>	The name of the file to be deleted. String type, the maximum length is 112
<errcode>	The result of create directory, 0 is success, others are failure, please refer to chapter 4

Examples

```
AT+CFTPSDELE=?
+CFTPSDELE="FILENAME"

OK
AT+CFTPSDELE="testfile"
OK

+CFTPSDELE: 0
```

17.2.11 AT+CFTPSGETFILE Download a file from FTP(S) server to module

You can download a file from FTP(S) server to module, by setting parameter <dir>, you can select the directory where to save the downloaded file. Default the downloaded file will be saved to local storage.

Make sure that you have login to FTP(S) server successfully before AT+CFTPSGETFILE.

AT+CFTPSGETFILE Download a file from FTP(S) server to module

Test Command AT+CFTPSGETFILE=?	Response +CFTPSGETFILE: "FILEPATH"[, (1-2)] OK
Write Command AT+CFTPSGETFILE="<filepath> " [, <dir>]	Response 1) OK +CFTPSGETFILE: 0 2) OK +CFTPSGETFILE: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 112
<dir>	The directory to save the downloaded file. Numeric type, range is 1-2, default is 1(local storage) 1 – C:/ (local storage) 2 – D:/(sd card)
<errcode>	The result code of download file from FTP(s) server. 0 is success, others are failure, please refer to chapter 4.

Examples

```
AT+CFTPSGETFILE=?
+CFTPSGETFILE: "FILEPATH"[, (1-2)]

OK
AT+CFTPSGETFILE="test.txt",1
OK

+CFTPSGETFILE: 0
```

17.2.12 AT+CFTPSPUTFILE Upload a file from module to FTP(S) server

You can use this command to upload a file to FTP(S) server from module. By setting parameter <dir> you can select the directory that contains the file to be uploaded. Make sure that you have login to the FTP(S) server successfully before AT+CFTPSPUTFILE.

AT+CFTPSPUTFILE Upload a file from module to FTP(S) server

Test Command AT+CFTPSPUTFILE=?	Response +CFTPSPUTFILE: "FILEPATH"[(1-2),(0-2147483647)] OK
Write Command AT+CFTPSPUTFILE="<filepath> [<dir>[,<rest_size>]]	Response 1) OK +CFTPSPUTFILE: 0 2) OK +CFTPSPUTFILE: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 112
<dir>	The directory to save the downloaded file. Numeric type, range is 1-2, default is 1(local storage) 1 – C:/ (local storage) 2 – D:/(sd card)
<rest_size>	The value for FTP “REST” command which is used for broken transfer when transferring failed last time. Numeric type, the range is from 0 to 2147483647.
<errcode>	The result code of download file from FTP(s) server. 0 is success, others are failure, please refer to chapter 4.

Examples

```
AT+CFTPSPUTFILE=?
+CFTPSPUTFILE:
```



```
"FILEPATH"[,(1-2),(0-2147483647)]
```

OK

```
AT+CFTPSPUTFILE="test.txt",1
```

OK

```
+CFTPSPUTFILE: 0
```

17.2.13 AT+CFTPSET Get a file from FTP(S) server to serial port

You can use this command to get a file from FTP(S) server to serial port.

AT+CFTPSET Get a file from FTP(S) server to serial port

Test Command AT+CFTPSET=?	Response +CFTPSET: "FILEPATH"[,<rest_size>] OK
Write Command AT+CFTPSET="<filepath>"[,<rest_size>]	Response 1) OK +CFTPSET:DATA,<len> ... +CFTPSET:DATA,<len> ... +CFTPSET:0 2) OK +CFTPSET: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 112.
<rest_size>	The value for FTP "REST" command which is used for broken transfer when transferring failed last time. Numeric type, the range is from 0

	to 2147483647
<errcode>	The result code of download file from FTP(s) server. 0 is success, others are failure, please refer to chapter 4.

Examples

```

AT+CFTPSGET=?
+CFTPSGET: "FILEPATH",<rest_size>

OK
AT+CFTPSGET="test.txt"
OK

+CFTPSGET: DATA,3
321
+CFTPSGET: 0
  
```

17.2.14 AT+CFTPSPUT Put a file to FTP(S) server through serial port

You can put a file to FTP(S) server through serial port. Make sure that you have login to FTP(S) server successfully.

AT+CFTPSPUT Put a file to FTP(S) server through serial port

Test Command AT+CFTPSPUT=?	Response +CFTPSPUT: "FILEPATH",<data_len>,<rest_size>]] OK
Write Command AT+CFTPSPUT="<filepath>"[,<data_len>,<rest_size>]]	Response 1) if upload file through serial port successfully: OK +CFTPSPUT: 0 2) if failed before input data: ERROR +CFTPSPUT: <errcode> 3) if failed after input data: OK +CFTPSPUT: <errcode> 4) ERROR

Parameter Saving Mode	NO_SAVE
Max Response Time	120000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 112.
<data_len>	Numeric type, The length of the data to send, the maximum length is 2048.if parameter <data_len> is omitted, Each <Ctrl+Z>character present in the data flow of serial port when downloading FTP data will be coded as <ETX><Ctrl+Z>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the FTP data. <ETX> is 0x03, and <Ctrl+Z> is 0x1A.
<rest_size>	The value for FTP “REST” command which is used for broken transfer when transferring failed last time. Numeric type, the range is from 0 to 2147483647
<errcode>	The result code of download file from FTP(s) server. 0 is success, others are failure, please refer to chapter 4.

Examples

```

AT+CFTPSPUT=?
+CFTPSPUT:
"FILEPATH"[,<data_len>[,<rest_size>]]

OK
AT+CFTPSPUT="test.txt"
OK

+CFTPSPUT: 0
  
```

17.2.15 AT+CFTPSSINGLEIP Set FTP(S) data socket address type

This command is used to set FTPS server data socket IP address type. For some FTP(S) server, it is needed to set AT+CFTPSSINGLEIP=1.Please make sure to set AT+CFTPSSINGLEIP before AT+CFTPSLOGIN.

AT+CFTPSTYPE Set the transfer type on FTP(S) server

Test Command	Response
AT+CFTPSSINGLEIP=?	+CFTPSSINGLEIP: (0,1)

	OK
Read Command AT+CFTPSSINGLEIP?	+CFTPSSINGLEIP: <singleip>
	OK
Write Command AT+CFTPSSINGLEIP=<singleip> >	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<singleip>	The FTPS data socket IP address type: 0 – decided by PORT response from FTPS server 1 – the same as the control socket.
------------	---

Examples

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

```
OK
AT+CFTPSSINGLEIP?
+CFTPSSINGLEIP: 0
```

```
OK
AT+CFTPSSINGLEIP=0
OK
```

17.2.16 AT+CFTPSSIZE Get the file size on FTP(S) server

You can use this command to get the file size on FTP(S) server. Please make sure you have login to FTP(S) server before AT+CFTPSSIZE.

AT+CFTPSTYPE Set the transfer type on FTP(S) server

Test Command AT+CFTPSSIZE=?	Response +CFTPSSIZE: <FILESIZE>
---------------------------------------	---

	OK
Write Command AT+CFTPSSIZE="<filesize>"	Response 1) OK 2) ERROR +CFTPSSIZE: <filesize> +CFTPSSIZE: <errcode>
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<filepath>	The remote file path on FTP(S) server. String type, max length is 112
<filesize>	Numeric type, size of the remote file on FTP(S) server
<errcode>	The result of set type, 0 is success, others are failure, please refer to chapter 4

Examples

```
AT+CFTPSSIZE=?
+CFTPSSIZE: "<FILEPATH>"

OK
AT+CFTPSSIZE="test"
OK

+CFTPSSIZE: 3
```

17.2.17 AT+CFTPSTYPE Set the transfer type on FTP(S) server

This command is used to set the transfer type on FTP(S) server, please make sure you have login to FTP(S) server before AT+CFTPSTYPE.

AT+CFTPSTYPE Set the transfer type on FTP(S) server

Test Command AT+CFTPSTYPE=?	Response +CFTPSTYPE: (A,I)
---------------------------------------	--------------------------------------

	OK
Read Command AT+CFTPSTYPE?	+CFTPSTYPE: <type>
	OK
Write Command AT+CFTPSTYPE=<type>	Response 1) OK +CFTPSTYPE: 0 2) OK +CFTPSTYPE: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<type>	The type of transferring: A – ASCII. I – Binary
<errcode>	The result of set type, 0 is success, others are failure, please refer to chapter 4

Examples

AT+CFTPSTYPE=?

+CFTPSTYPE: (A,I)

OK

AT+CFTPSTYPE?

+CFTPSTYPE: I

OK

AT+CFTPSTYPE=A

OK

+CFTPSTYPE: 0

17.2.18 AT+CFTPSSLCFG Set the SSL context id for FTPS session

You can use this command to set the SSL context id for FTPS session.

AT+CFTPSSLCFG Set the SSL context id for FTPS session	
Test Command AT+CFTPSSLCFG=?	Response +CFTPSSLCFG: (0,1),(0-9) OK
Write Command AT+CFTPSSLCFG=<session_id>,<ssl_id>	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9000ms
Reference	

Defined Values

<session_id>	Numeric type, 0 for control session, 1 for data session.
<ssl_id>	Numeric type, SSL context ID during 0-9.

Examples

```
AT+CFTPSSLCFG=?
+CFTPSSLCFG: (0,1),(0-9)

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

17.3 Command result codes

Code of <errcode>	Description
0	Success
1	SSL alert
2	Unknown error
3	Busy
4	Connection closed by server

5	Timeout
6	Transfer failed
7	File not exists or any other memory error
8	Invalid parameter
9	Operation rejected by server
10	Network error
11	State error
12	Failed to parse server name
13	Create socket error
14	Connect socket failed
15	Close socket failed
16	SSL session closed
17	File error, file not exist or other error.
421	Server response connection time out, while received error code 421, you need do AT+CFTPSLOGOUT to logout server then AT+CFTPSLOGIN again for further operations.

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18 AT Commands for MQTT(S)

18.1 Overview of AT Commands for MQTT(S)

Command	Description
AT+CMQTTSTART	Start MQTT service
AT+CMQTTSTOP	Stop MQTT service
AT+CMQTTACCQ	Acquire a client
AT+CMQTTREL	Release a client
AT+CMQTTSSLCFG	Set the SSL context (only for SSL/TLS MQTT)
AT+CMQTTWILLTOPIC	Input the topic of will message
AT+CMQTTWILLMSG	Input the will message
AT+CMQTTCONNECT	Connect to MQTT server
AT+CMQTTDISC	Disconnect from server
AT+CMQTTTOPIC	Input the topic of publish message
AT+CMQTTPAYLOAD	Input the publish message
AT+CMQTT PUB	Publish a message to server
AT+CMQTTSUBTOPIC	Input the topic of subscribe message
AT+CMQTTSUB	Subscribe a message to server
AT+CMQTTUNSUBTOPIC	Input the topic of unsubscribe message
AT+CMQTTUNSUB	Unsubscribe a message to server
AT+CMQTTCFG	Configure the MQTT Context

18.2 Detailed Description of AT Commands for MQTT(S)

18.2.1 AT+CMQTTSTART Start MQTT service

AT+CMQTTSTART is used to start MQTT service by activating PDP context. You must execute this command before any other MQTT related operations.

AT+CMQTTSTART Start MQTT service

Execute Command AT+CMQTTSTART	Response a) If start MQTT service successfully: OK +CMQTTSTART: 0 b) If failed: OK +CMQTTSTART: <errcode> c) If MQTT service have started successfully and you executed AT+CMQTTSTART again: ERROR
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<errcode>	The result code, please refer to Chapter 18.3
-----------	---

Examples

AT+CMQTTSTART

OK

+CMQTTSTART: 0

NOTE

AT+CMQTTSTART is used to start MQTT service by activating PDP context. You must execute this command before any other MQTT related operations.
If you don't execute AT+CMQTTSTART, the Write/Read Command of any other MQTT will return ERROR immediately.

18.2.2 AT+CMQTTSTOP Stop MQTT service

AT+CMQTTSTOP is used to stop MQTT service.

AT+CMQTTSTOP Stop MQTT service

Execute Command
AT+CMQTTSTOP

Response

a) If stop MQTT service successfully:

OK

+CMQTTSTOP: 0

b) If failed:

OK

+CMQTTSTOP: <errcode>

b) If MQTT service have stopped successfully and you executed AT+CMQTTSTOP again:

ERROR

Max Response Time

12000ms

Parameter Saving Mode

-

Reference

Defined Values

<errcode>

The result code, please refer to chapter 18.3

Examples

AT+CMQTTSTOP

OK

+CMQTTSTOP: 0

NOTE

AT+CMQTTSTOP is used to stop MQTT service. You can execute this command after AT+CMQTTDISC and AT+CMQTTREL.

18.2.3 AT+CMQTTACCQ Acquire a client

AT+CMQTTACCQ is used to acquire a MQTT client. It must be called before all commands about MQTT connect and after AT+CMQTTSTART.

AT+CMQTTACCQ Acquire a client

Test Command AT+CMQTTACCQ=?	Response +CMQTTACCQ: (0-1),(1-128)[,(0-1)] OK
Read Command AT+CMQTTACCQ?	Response +CMQTTACCQ: <client_index>, <clientID>,<server_type> +CMQTTACCQ: <client_index>, <clientID>,<server_type> OK
Write Command AT+CMQTTACCQ=<client_index>,<clientID>[<server_type>]	Response a)If successfully: OK b)If failed: +CMQTTACCQ: <client_index>,<err> ERROR c) If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<clientID>	The UTF-encoded string. It specifies a unique identifier for the client. The string length is from 1 to 128 bytes.
<server_type>	A numeric parameter that identifies the server type. The default value is 0. 0 - MQTT server with TCP 1 - MQTT server with SSL/TLS
<errcode>	The result code, please refer to chapter 18.3

Examples

```
AT+CMQTTACCQ=0,"a12mmmm",0
OK
AT+CMQTTACCQ?
+CMQTTACCQ: 0,"a12mmmm",0
+CMQTTACCQ: 1,"",0

OK
AT+CMQTTACCQ=?
+CMQTTACCQ: (0-1),(1-128)[,(0-1)]
```

OK

NOTE

AT+CMQTTACCQ is used to acquire a MQTT client. It must be called before all commands about MQTT connect and after AT+CMQTTSTART.

18.2.4 AT+CMQTTREL Release a client

AT+CMQTTREL is used to release a MQTT client. It must be called after AT+CMQTTDISC and before AT+CMQTTSTOP.

AT+CMQTTREL Release a client

Test Command AT+CMQTTREL=?	Response +CMQTTREL: (0-1) OK
Read Command AT+CMQTTREL?	Response OK
Write Command AT+CMQTTREL=<client_index>	Response a) If successfully: OK b) If failed: +CMQTTREL: <client_index>,<err> ERROR c) If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<errcode>	The result code, please refer to chapter 18.3

Examples

AT+CMQTTREL=?
+CMQTTREL: (0-1)

OK
AT+CMQTTREL=0
OK
AT+CMQTTREL?
OK

NOTE

AT+CMQTTREL is used to release a MQTT client. It must be called after AT+CMQTTDISC and before AT+CMQTTSTOP.

18.2.5 AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)

AT+CMQTTSSLCFG is used to set the SSL context which to be used in the SSL connection when it will connect to a SSL/TLS MQTT server. It must be called before AT+CMQTTCONNECT and after AT+CMQTTSTART. The setting will be cleared after AT+CMQTTCONNECT failed or AT+CMQTTDISC.

AT+CMQTTSSLCFG Set the SSL context

Test Command AT+CMQTTSSLCFG=?	Response +CMQTTSSLCFG: (0,1),(0-9) OK
Read Command AT+CMQTTSSLCFG?	Response +CMQTTSSLCFG: <session_id>,[<ssl_ctx_index >] +CMQTTSSLCFG: <session_id>,[<ssl_ctx_index >] OK
Write Command AT+CMQTTSSLCFG=<session_id>,<ssl_ctx_index>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1
<ssl_ctx_index>	The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG

Examples

AT+CMQTTSSLCFG?

+CMQTTSSLCFG: 0,0

+CMQTTSSLCFG: 1,0

OK

AT+CMQTTREL=?

+CMQTTSSLCFG: (0,1),(0-9)

OK

AT+CMQTTREL?

OK

18.2.6 AT+CMQTTWILLTOPIC Input the topic of will message

AT+CMQTTWILLTOPIC is used to input the topic of will message.

AT+CMQTTREL Release a client

Test Command AT+CMQTTWILLTOPIC=?	Response +CMQTTWILLTOPIC: (0-1),(1-1024) OK
Write Command AT+CMQTTWILLTOPIC=<client_index>,<req_length>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTWILLTOPIC: <client_index>,<err> ERROR c)If failed: ERROR
Parameter Saving Mode	-

Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic. The will topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code, please refer to chapter 18.3

Examples

```
AT+CMQTTWILLTOPIC=0,10
>
OK
```

18.2.7 AT+CMQTTWILLMSG Input the will message

AT+CMQTTWILLMSG is used to input the message body of will message.

AT+CMQTTWILLMSG Input the will message

Test Command AT+CMQTTWILLMSG=?	Response +CMQTTWILLMSG: (0-1),(1-1024),(0-2) OK
Write Command AT+CMQTTWILLMSG=<client_index>,<req_length>,<qos>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTWILLMSG: <client_index>,<err> ERROR c)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input data. The will message should be UTF-encoded string. The range is from 1 to 1024 bytes.
<qos>	The qos value of the will message. The range is from 0 to 2.

Examples

```
AT+CMQTTWILLMSG=0,6,1
>
OK
```

18.2.8 AT+CMQTTCONNECT Connect to MQTT server

AT+CMQTTCONNECT is used to connect to a MQTT server.

AT+CMQTTCONNECT Connect to MQTT server

Test Command AT+CMQTTCONNECT=?	Response +CMQTTCONNECT: (0-1),(9-256),(1-64800),(0-1)[,<user_name>,<pass_word>] OK
Read Command AT+CMQTTCONNECT?	Response +CMQTTCONNECT: 0[,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]] +CMQTTCONNECT: 1[,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]] OK
Write Command AT+CMQTTCONNECT=<client_index>,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]	Response a)If successfully: OK +CMQTTCONNECT: <client_index>,0 b)If failed: OK

	<p>+CMQTTCONNECT: <client_index>,<err> c)If failed: +CMQTTCONNECT: <client_index>,<err></p> <p>ERROR d)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<server_addr>	The string that described the server address and port. The range of the string length is 9 to 256 bytes. The string should be like this "tcp://116.247.119.165:5141", must begin with "tcp://". If the <server_addr> not include the port, the default port is 1883.
<keepalive_time>	The time interval between two messages received from a client. The client will send a keep-alive packet when there is no message sent to server after song long time. The range is from 1s to 64800s (18 hours).
<clean_session>	The clean session flag. The value range is from 0 to 1, and default value is 0. 0 - the server must store the subscriptions of the client after it disconnected. This includes continuing to store QoS 1 and QoS 2 messages for the subscribed topics so that they can be delivered when the client reconnects. The server must also maintain the state of in-flight messages being delivered at the point the connection is lost. This information must be kept until the client reconnects. 1 - the server must discard any previously maintained information about the client and treat the connection as "clean". The server must also discard any state when the client disconnects.
<user_name>	The user name identifies the name of the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes.
< pass_word >	The password corresponding to the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```

AT+CMQTTCONNECT=0,"tcp://120.27.2.154:1883",20,1
OK

+CMQTTCONNECT: 0,0
AT+CMQTTCONNECT?
+CMQTTCONNECT: 0,"tcp://120.27.2.154:1883",20,1
+CMQTTCONNECT: 1

OK

```

NOTE

AT+CMQTTCONNECT is used to connect to a MQTT server.
 If you don't set the SSL context by AT+CMQTTSSLCFG before connecting a SSL/TLS MQTT server by AT+CMQTTCONNECT, it will use the <client_index> (the 1st parameter of AT+CMQTTCONNECT) SSL context when connecting to the server.

18.2.9 AT+CMQTTDISC Disconnect from server

AT+CMQTTDISC is used to disconnect from the server.

AT+CMQTTCONNECT Connect to MQTT server

Test Command AT+CMQTTDIS=?	Response: +CMQTTDISC: (0-1),(0, 60-180) OK
Read Command AT+CMQTTDISC?	Response: +CMQTTDISC: 0,<disc_state> +CMQTTDISC: 1,<disc_state> OK
Write Command AT+CMQTTDISC=<client_index>,<timeout>	Response a)If disconnect successfully: +CMQTTDISC: <client_index>,0 OK b)If disconnect successfully: OK

	<p>+CMQTTDISC: <client_index>,0</p> <p>c)</p> <p>If failed:</p> <p>OK</p> <p>+CMQTTDISC: <client_index>,<err></p> <p>d)If failed:</p> <p>ERROR</p> <p>e)If failed:</p> <p>+CMQTTDISC: <client_index>,<err></p> <p>ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<timeout>	The timeout value for disconnection. The unit is second. The range is 60s to 180s. The default value is 0s (not set the timeout value).
<disc_state>	1 – disconnection 0 – connection
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

AT+CMQTTDISC=0,120

OK

+CMQTTDISC: 0,0

18.2.10 AT+CMQTTTOPIC Input the topic of publish message

AT+CMQTTTOPIC is used to input the topic of a publish message.

AT+CMQTTTOPIC Input the topic of publish message

Test Command	Response
AT+CMQTTTOPIC=?	+CMQTTTOPIC: (0-1),(1-1024)

	OK
Write Command <code>AT+CMQTTTOPIC=<client_index>,<req_length></code>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTTOPIC: <client_index>,<err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+CMQTTTOPIC=0,9
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTTPUB.

18.2.11 AT+CMQTTPAYLOAD Input the publish message

AT+CMQTTPAYLOAD is used to input the message body of a publish message.

AT+CMQTTPAYLOAD Input the publish message

Test Command AT+CMQTTPAYLOAD=?	Response +CMQTTPAYLOAD: (0-1),(1-10240) OK
Write Command AT+CMQTTPAYLOAD=<client_index>,<req_length>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTPAYLOAD: <client_index>,<err> ERROR c)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input message data. The publish message should be UTF-encoded string. The range is from 1 to 10240 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+CMQTTPAYLOAD=0,6
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

18.2.12 AT+CMQTTPUB Publish a message to server

AT+CMQTTPUB is used to publish a message to MQTT server.

AT+CMQTTPUB Publish a message to server

Test Command AT+CMQTTPUB=?	Response +CMQTTPUB: (0-1),(0-2),(60-180),(0-1),(0-1)
Write Command AT+CMQTTPUB=<client_index>,<qos>,<pub_timeout>[,<retained> [,<dup>]]	Response a)If successfully: OK +CMQTTPUB: <client_index>,0 b)If failed: OK +CMQTTPUB: <client_index>,<err> c)If failed: +CMQTTPUB: <client_index>,<err> ERROR d)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<qos>	The publish message's qos. The range is from 0 to 2. 0 – at most once 1 – at least once 2 – exactly once
<pub_timeout>	The publishing timeout interval value. Since the client publish a message to server, it will report failed if the client receive no response from server after the timeout value seconds. The range is from 60s to 180s.
<retained>	The retain flag of the publish message. The value is 0 or 1. The default value is 0. When a client sends a PUBLISH to a server, if the retain flag is set to

	1, the server should hold on to the message after it has been delivered to the current subscribers.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+CMQTTPUB=0,1,60
OK
+CMQTTPUB: 0,0
```

NOTE

The topic and payload will be clean after execute AT+CMQTTPUB.

18.2.13 AT+CMQTTSUBTOPIC Input the topic of subscribe message

AT+CMQTTSUBTOPIC is used to input the topic of a subscribe message.

AT+CMQTTSUBTOPIC Input the topic of subscribe message

Test Command AT+CMQTTSUBTOPIC=?	Response +CMQTTSUBTOPIC: (0-1),(1-1024),(0-2) OK
Write Command AT+CMQTTSUBTOPIC=<client_index>,<req_length>,<qs>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTSUBTOPIC: <client_index>,<err> ERROR c)If failed: ERROR
Parameter Saving Mode	-

Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<qos>	The publish message's qos. The range is from 0 to 2. 0 – at most once 1 – at least once 2 – exactly once
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+CMQTTSUBTOPIC=0,9,1
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

18.2.14 AT+CMQTTSUB Subscribe a message to server

AT+CMQTTSUB is used to subscribe a message to MQTT server.

AT+CMQTTSUB Subscribe a message to server

Test Command AT+CMQTTSUB=?	Response +CMQTTSUB: (0-1),(0-1024),(0-2),(0-1)
Write Command /* subscribe one or more topics which input by AT+CMQTTSUBTOPIC*/	Response a)If successfully: OK

<p>AT+CMQTTSUB=<client_index>[,<dup>]</p>	<p>+CMQTTSUB: <client_index>,0 b)If failed: OK</p> <p>+CMQTTSUB: <client_index>,<err> c)If failed: +CMQTTSUB: <client_index>,<err></p> <p>ERROR d)If failed: ERROR</p>
<p>Write Command /* subscribe one topic*/ AT+CMQTTSUB=<client_index>,<reqLength>,<qos>[,<dup>]</p>	<p>Response a)If successfully: > <input data here> OK</p> <p>+CMQTTSUB: <client_index>,0 b)If failed: OK</p> <p>+CMQTTSUB: <client_index>,<err> c)If failed: +CMQTTSUB: <client_index>,<err></p> <p>ERROR d)If failed: ERROR</p>
<p>Parameter Saving Mode</p>	-
<p>Max Response Time</p>	-
<p>Reference</p>	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<qos>	The publish message's qos. The range is from 0 to 2. 0 – at most once 1 – at least once 2 – exactly once
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a

	message.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+CMQTTSUB=0,9,1
```

```
>
```

```
OK
```

```
+CMQTTSUB: 0,0
```

```
AT+CMQTTSUB=0,1
```

```
OK
```

```
+CMQTTSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

18.2.15 AT+CMQTTUNSUBTOPIC Input the topic of unsubscribe message

AT+CMQTTUNSUBTOPIC is used to input the topic of a unsubscribe message.

AT+CMQTTUNSUBTOPIC Input the topic of unsubscribe message

Test Command AT+CMQTTUNSUBTOPIC=?	Response +CMQTTUNSUBTOPIC: (0-1),(1-1024) OK
Write Command AT+CMQTTUNSUBTOPIC=<client_index>,<req_length>	Response a)If successfully: > <input data here> OK b)If failed: +CMQTTUNSUBTOPIC: <client_index>,<err> ERROR c)If failed:

	ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

```
AT+ CMQTTUNSUBTOPIC =0,9,1
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

18.2.16 AT+CMQTTUNSUB Unsubscribe a message to server

AT+CMQTTUNSUB is used to unsubscribe a message to MQTT server.

AT+CMQTTUNSUB Unsubscribe a message to server

Test Command AT+CMQTTUNSUB=?	Response +CMQTTUNSUB: (0-1),(1-1024),(0-1) OK
Write Command /*unsubscribe one or more topics which input by AT+CMQTTUNSUBTOPIC*/ AT+CMQTTUNSUB=<client_index>,<dup>	Response a)If successfully: OK +CMQTTUNSUB: <client_index>,0 b)If failed:

	<p>OK</p> <p>+CMQTTUNSUB: <client_index>,<err> c)If failed: +CMQTTUNSUB: <client_index>,<err></p> <p>ERROR d)If failed: ERROR</p>
Write Command <i>/* unsubscribe one topic*/ AT+CMQTTUNSUB=<client_index>,<reqLength>,<dup></i>	<p>Response a)If successfully: > <input data here> OK</p> <p>+CMQTTUNSUB: <client_index>,0 b)If failed: OK</p> <p>+CMQTTUNSUB: <client_index>,<err> c)If failed: +CMQTTUNSUB: <client_index>,<err></p> <p>ERROR d)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<req_length>	The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes.
<dup>	The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 18.3.

Examples

AT+CMQTTUNSUB=0,9,1

```
>
OK

+CMQTTUNSUB: 0,0
AT+CMQTTUNSUB=0,1
OK

+CMQTTUNSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

18.2.17 AT+CMQTTCFG Configure the MQTT Context

AT+CMQTTCFG is used to configure the MQTT context. It must be called before AT+CMQTTCONNECT and after AT+CMQTTACCQ. The setting will be cleared after AT+CMQTTREL.

AT+CMQTTCFG Configure the MQTT Context

<p>Test Command AT+CMQTTCFG=?</p>	<p>Response +CMQTTCFG: "checkUTF8",(0-1),(0-1) +CMQTTCFG: "optimeout ",(0-1),(20-120) OK</p>
<p>Read Command AT+CMQTTCFG?</p>	<p>Response +CMQTTCFG: 0,<checkUTF8_flag>,<optimeout_val> +CMQTTCFG: 1,<checkUTF8_flag>,<optimeout_val> OK</p>
<p>Write Command /*Configure the check UTF8 flag of the specified MQTT client context*/ AT+CMQTTCFG="checkUTF8",<index>,<checkUTF8_flag> ></p>	<p>Response a)If successfully: OK b)If failed: ERROR</p>

Write Command /*Configure the max timeout interval of the send or receive data operation */ AT+CMQTTCFG="optimeout",<index>,<optimeout_val>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<checkUTF8_flag>	The flag to indicate whether to check the string is UTF8 coding or not, the default value is 1. 0 – Not check UTF8 coding. <u>1</u> – Check UTF8 coding.
<optimeout_val>	The max timeout interval of sending or receiving data operation. The range is from 20 seconds to 120 seconds, the default value is 120 seconds.

Examples

AT+CMQTTCFG?

+CMQTTCFG: 0,1,120

+CMQTTCFG: 1,1,120

OK

AT+CMQTTCFG="optimeout",0,24

OK

AT+CMQTTCFG="checkUTF8",0,0

OK

AT+CMQTTCFG?

+CMQTTCFG: 0,0,24

+CMQTTCFG: 1,1,120

OK

NOTE

The setting will be cleared after AT+CMQTTREL.

18.3 Command result codes and unsolicited codes

18.3.1 Command result <err> codes

Code of <err>	Meaning
0	operation succeeded
1	failed
2	bad UTF-8 string
3	sock connect fail
4	sock create fail
5	sock close fail
6	message receive fail
7	network open fail
8	network close fail
9	network not opened
10	client index error
11	no connection
12	invalid parameter
13	not supported operation
14	client is busy
15	require connection fail
16	sock sending fail
17	timeout
18	topic is empty
19	client is used
20	client not acquired
21	client not released
22	length out of range
23	network is opened
24	packet fail
25	DNS error
26	socket is closed by server
27	connection refused: unaccepted protocol version
28	connection refused: identifier rejected
29	connection refused: server unavailable
30	connection refused: bad user name or password
31	connection refused: not authorized
32	handshake fail

33	not set certificate
34	Open session failed
35	Disconnect from server failed

18.3.2 Unsolicited result codes

URC	Description	AT Command
+CMQTTCONNLOST: <client_index>,<cause>	When client disconnect passively, URC “+CMQTTCONNLOST” will be reported, then user need to connect MQTT server again.	

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<cause>	The cause of disconnection. 1 – Socket is closed passively. 2 – Socket is reset. 3 – Network is closed.

URC	Description
+CMQTTRXSTART: <client_index>,<topic_total_len>,<payload_total_len> +CMQTTRXTOPIC: <client_index>,<sub_topic_len> <sub_topic> /*for long topic, split to multiple packets to report*/ [<CR><LF>+CMQTTRXTOPIC : <client_index>,<sub_topic_len> <sub_topic>] +CMQTTRXPAYLOAD: <client_index>,<sub_payload_len> <sub_payload> /*for long payload, split to	If a client subscribes to one or more topics, any message published to those topics are sent by the server to the client. The following URC is used for transmitting the message published from server to client. 1)+CMQTTRXSTART: <client_index>,<topic_total_len>,<payload_total_len> At the beginning of receiving published message, the module will report this to user, and indicate client index with <client_index>, the topic total length with <topic_total_len> and the payload total length with <payload_total_len>. 2)+CMQTTRXTOPIC: <client_index>,<sub_topic_len>\r\n<sub_topic> After the command “+CMQTTRXSTART” received, the module will report the second message to user, and indicate client index with <client_index>, the topic packet length with <sub_topic_len> and the topic content with <sub_topic> after “\r\n”. For long topic, it will be split to multiple packets to report and the command “+CMQTTRXTOPIC” will be send more than once with

<p>multiple packets to report*/ [+CMQTTRXPAYLOAD: <client_index>,<sub_payload _len> <sub_payload>] +CMQTTRXEND: <client_index></p>	<p>the rest of topic content. The sum of <sub_topic_len> is equal to <topic_total_len>.</p> <p>3)+CMQTTRXPAYLOAD: <client_index>,<sub_payload_len>\r\n<sub_payload></p> <p>After the command "+CMQTTRXTOPIC" received, the module will send third message to user, and indicate client index with <client_index>, the payload packet length with <sub_payload_len> and the payload content with <sub_payload> after "\r\n".</p> <p>For long payload, the same as "+CMQTTRXTOPIC".</p> <p>4) +CMQTTRXEND: <client_index></p> <p>At last, the module will send fourth message to user and indicate the topic and payload have been transmitted completely.</p>
---	---

Defined Values

<client_index>	A numeric parameter that identifies a client. The range of permitted values is 0 to 1.
<topic_total_len>	The length of message topic received from MQTT server. The range is from 1 to 1024 bytes.
<payload_total_len>	The length of message body received from MQTT server. The range is from 1 to 10240 bytes.
<sub_topic_len>	The sub topic packet length, The sum of <sub_topic_len> is equal to <topic_total_len>.
<sub_topic>	The sub topic content.
<sub_payload_len>	The sub message body packet length, The sum of <sub_payload_len> is equal to <payload_total_len>.
<sub_payload>	The sub message body content.

19 AT Commands for SSL

19.1 Overview of AT Commands for SSL

Command	Description
AT+CSSLCFG	Configure the SSL Context
AT+CCERTDOWN	Download certificate into the module
AT+CCERTLIST	List certificates
AT+CCERTDELETE	Delete certificates
AT+CCHSET	Configure the report mode of sending and receiving data
AT+CCHMODE	Configure the mode of sending and receiving data
AT+CCHSTART	Start SSL service
AT+CCHSTOP	Stop SSL service
AT+CCHADDR	Get the IPv4 address
AT+CCHSSLCFG	Set the SSL context
AT+CCHCFG	Configure the Client Context
AT+CCHOPEN	Connect to server
AT+CCHCLOSE	Disconnect from server
AT+CCHSEND	Send data to server
AT+CCHRCV	Read the cached data that received from the server

19.2 Detailed Description of AT Commands for SSL

19.2.1 AT+CSSLFG Configure the SSL Context

AT+CSSLCFG Configure the SSL Context	
Test Command AT+CSSLCFG=?	Response +CSSLCFG: "sslversion",(0-9),(0-4) +CSSLCFG: "authmode",(0-9),(0-3) +CSSLCFG: "ignorelocaltime",(0-9),(0,1)

	<pre>+CSSLCFG: "negotiatetime",(0-9),(10-300) +CSSLCFG: "cacert",(0-9),(5-108) +CSSLCFG: "clientcert",(0-9),(5-108) +CSSLCFG: "clientkey",(0-9),(5-108) +CSSLCFG: "enableSNI",(0-9),(0,1) OK</pre>
<p>Read Command AT+CSSLCFG?</p>	<pre>Response +CSSLCFG: 0,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 1,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 2,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 3,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 4,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 5,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 6,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 7,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 8,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> +CSSLCFG: 9,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca _file>,<clientcert_file>,<clientkey_file>,<enableSNI> OK</pre>
<p>Write Command /*Query the configuration of the specified SSL context*/ AT+CSSLCFG=<ssl_ctx_index> x></p>	<pre>Response +CSSLCFG: <ssl_ctxindex>,<sslversion>,<authmode>,<ignoreltime>,<nego tiatettime>,<ca_file>,<clientcert_file>,<clientkey_file>,<enableS NI></pre>

	OK
Write Command /*Configure the version of the specified SSL context*/ AT+CSSLCFG="sslversion",<ssl_ctx_index>,<sslversion>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the authentication mode of the specified SSL context*/ AT+CSSLCFG="authmode",<ssl_ctx_index>,<authmode>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the ignore local time flag of the specified SSL context*/ AT+CSSLCFG="ignorelocaltime",<ssl_ctx_index>,<ignorelocaltime>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the negotiate timeout value of the specified SSL context*/ AT+CSSLCFG="negotiatetime",<ssl_ctx_index>,<negotiatetime>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the server root CA of the specified SSL context*/ AT+CSSLCFG="cacert",<ssl_ctx_index>,<ca_file>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the client certificate of the specified SSL context*/ AT+CSSLCFG="clientcert",<ssl_ctx_index>,<clientcert_file>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the client key of the specified SSL context*/ AT+CSSLCFG="clientkey",<ssl_ctx_index>,<clientkey_file>	Response 1)If successfully: OK 2)If failed: ERROR
Write Command /*Configure the enableSNI flag	Response 1)If successfully:

of the specified SSL context */ AT+CSSLCFG="enableSNI",<ssl_ctx_index>,<enableSNI_flag>	OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<ssl_ctx_index>	The SSL context ID. The range is 0-9.
<sslversion>	The SSL version, the default value is 4. 0 – SSL3.0 1 – TLS1.0 2 – TLS1.1 3 – TLS1.2 4 – All The configured version should be support by server. So you should use the default value if you are not sure that the version which the server supported.
<authmode>	The authentication mode, the default value is 0. 0 – no authentication. 1–server authentication. It needs the root CA of the server. 2–server and client authentication. It needs the root CA of the server, the cert and key of the client. 3–client authentication and no server authentication. It needs the cert and key of the client.
<ignoreltime>	The flag to indicate how to deal with expired certificate, the default value is 1. 0 – care about time check for certification. 1 – ignore time check for certification When set the value to 0, it need to set the right current date and time by AT+CCLK when need SSL certification.
<negotiatetime>	The timeout value used in SSL negotiate stage. The range is 10-300 seconds. The default value is 300.
<ca_file>	The root CA file name of SSL context. The file name must have type like “.pem” or “.der”. The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename’s UTF8 code). There are two ways to download certificate files to module:

	<ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<clientcert_file>	<p>The client cert file name of SSL context. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<clientkey_file>	<p>The client key file name of SSL context. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document.
<enableSNI_flag>	<p>The flag to indicate that enable the SNI flag or not, the default value is 0.</p> <p>0 – not enable SNI. 1 – enable SNI.</p>

Examples

AT+CSSLCFG=?

```
+CSSLCFG: "sslversion",(0-9),(0-4)
+CSSLCFG: "authmode",(0-9),(0-3)
+CSSLCFG: "ignorelocaltime",(0-9),(0,1)
+CSSLCFG: "negotiatetime",(0-9),(10-300)
+CSSLCFG: "cacert",(0-9),(5-108)
+CSSLCFG: "clientcert",(0-9),(5-108)
+CSSLCFG: "clientkey",(0-9),(5-108)
+CSSLCFG: "enableSNI",(0-9),(0,1)
```

OK

AT+CSSLCFG?

```
+CSSLCFG: 0,4,0,1,300,"", "", "", 0
+CSSLCFG: 1,4,0,1,300,"", "", "", 0
+CSSLCFG: 2,4,0,1,300,"", "", "", 0
+CSSLCFG: 3,4,0,1,300,"", "", "", 0
+CSSLCFG: 4,4,0,1,300,"", "", "", 0
+CSSLCFG: 5,4,0,1,300,"", "", "", 0
+CSSLCFG: 6,4,0,1,300,"", "", "", 0
+CSSLCFG: 7,4,0,1,300,"", "", "", 0
+CSSLCFG: 8,4,0,1,300,"", "", "", 0
+CSSLCFG: 9,4,0,1,300,"", "", "", 0
```

OK

AT+CSSLCFG="authmode",0,0

OK

AT+CSSLCFG=6

```
+CSSLCFG: 6,4,0,1,300,"", "", "", 0
```

OK

19.2.2 AT+CCERTDOWN Download certificate into the module

AT+CCERTDOWN Download certificate into the module

Test Command AT+CCERTDOWN=?	Response +CCERTDOWN: (5-108),(1-10240) OK
Write Command AT+CCERTDOWN=<filename>,<len>	Response 1)If it can be download: > <input data here> OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	<p>The name of the certificate/key file. The file name must have type like “.pem” or “.der”. The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename’s UTF8 code).</p> <p>For Examples: If you want to download a file with name “中华.pem”, you should convert the “中华.pem” to UTF8 coding (&#x4E2D;&#x534E;.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D) of UTF8 coding.</p>
<len>	<p>The length of the file data to send. The range is from 1 to 10240 bytes. User should note than every packet data should be no larger than 3072 bytes.</p>

Examples

```

AT+CCERTDOWN=?
+CCERTDOWN: (5-108),(1-10240)

OK
AT+CCERTDOWN="ls.pem",1970
>

OK

```

19.2.3 AT+CCERTLIST List certificates

AT+CCERTLIST List certificates

<p>Execute Command</p> <p>AT+CCERTLIST</p>	<p>Response</p> <p>[+CCERTLIST: <file_name></p> <p>[+CCERTLIST: <file_name></p> <p>...</p> <p><CR><LF></p> <p>OK</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The certificate/key files which has been downloaded to the module. If the filename contains non-ASCII characters, it will show the non-ASCII characters as UTF8 code.
------------	---

Examples

```
AT+CCERTLIST
+CCERTLIST: "ls.pem"
```

OK

19.2.4 AT+CCERTDELETE Delete certificates

AT+CCERTDELETE Delete certificate from the module

Write Command AT+CCERTDELETE=<filename>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The name of the certificate/key file. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code). For Examples: If you want to download a file with name "中华.pem", you should convert the "中华.pem" to UTF8 coding (中华.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D) of UTF8 coding.
------------	--

Examples

AT+CCERTDELE="ls.pem"
OK

19.2.5 AT+CCHSET Configure the report mode of sending and receiving data

AT+CCHSET is used to configure the mode of sending and receiving data. It must be called before AT+CCHSTART.

AT+CCHSET Configure the report mode of sending and receiving data

Test Command AT+CCHSET=?	Response +CCHSET: (0,1),(0,1) OK
Read Command AT+CCHSET?	Response +CCHSET: <report_send_result>,<recv_mode> OK
Write Command AT+CCHSET=<report_send_result>[,<recv_mode>]	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<report_send_result>	Whether to report result of CCHSEND, the default value is 0: 0– No. 1–Yes. Module will report +CCHSEND: <session_id>,<err> to MCU when complete sending data.
<recv_mode>	The receiving mode: 0– Output the data to MCU whenever received data. 1 – Module caches the received data and notifies MCU with +CCHEVENT: <session_id>, RECV EVENT. MCU can use AT+CCHRECV to receive the cached data (only in manual receiving mode).

Examples

AT+CCHSET=?

+CCHSET: (0,1),(0,1)

OK

AT+CCHSET?

+CCHSET: 0,0

OK

AT+CCHSET=1,1

OK

19.2.6 AT+CCHMODE Configure the mode of sending and receiving data

AT+CCHMODE is used to select transparent mode (data mode) or non-transparent mode (command mode). The default mode is non-transparent mode. This AT command must be called before calling AT+CCHSTART.

AT+CCHMODE Configure the mode of sending and receiving data

Test Command AT+CCHMODE=?	Response +CCHMODE: (0,1) OK
Read Command AT+CCHMODE?	Response +CCHMODE: <mode> OK
Write Command AT+CCHMODE=<mode>	Response a)If successfully: OK b)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<mode>	The mode value: 0 – Normal. 1 – Transparent mode The default value is 0.
---------------------	---

Examples

```

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

OK
AT+CCHMODE?
+CCHMODE: 0

OK
AT+CCHMODE=1
OK
    
```

NOTE

There is only one session in the transparent mode, it's the first session.

19.2.7 AT+CCHSTART Start SSL service

AT+CCHSTART is used to start SSL service by activating PDP context. You must execute AT+CCHSTART before any other SSL related operations.

AT+CCHSTART Start SSL service

Execute Command AT+CCHSTART	Response
	1)If start SSL service successfully: OK +CCHSTART: 0 2)If failed: ERROR 3)If failed: ERROR +CCHSTART: <err>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<err>	The result code, please refer to the end of this chapter
-------	--

Examples

AT+CCHSTART

OK

19.2.8 AT+CCHSTOP Stop SSL service

AT+CCHSTOP is used to stop SSL service.

AT+CCHSTOP Stop SSL service

Execute Command	Response
AT+CCHSTOP	1)If stop SSL service successfully: OK
	+CCHSTOP: 0
	2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<err>	The result code, please refer to the end of this chapter
-------	--

Examples

AT+CCHSTOP

OK

+CCHSTOP: 0

19.2.9 AT+CCHADDR Get the IPv4 address

AT+CCHADDR is used to get the IPv4 address after calling AT+CCHSTART.

AT+CCHADDR Get the IPv4 address

Execute Command AT+CCHADDR	Response 1) if successfully, response +CCHADDR: <ip_address> OK 2) if pdp has not been activated, response ERROR
Parameter Saving Mode	-
Max Response Time	12000ms
Reference	-

Defined Values

<ip address>	A string parameter that identifies the IPv4 address after PDP activated.
--------------	--

Examples

```
AT+CCHADDR
+CCHADDR: 10.43.71.130

OK
```

19.2.10 AT+CCHSSLCFG Set the SSL context

AT+CCHSSLCFG is used to set the SSL context which to be used in the SSL connection. It must be called before AT+CCHOPEN and after AT+CCHSTART. The setting will be cleared after AT+CCHOPEN failed or AT+CCHCLOSE.

AT+CCHSSLCFG Set the SSL context

Test Command AT+CCHSSLCFG=?	Response +CCHSSLCFG: (0,1),(0-9) OK
---------------------------------------	---

Read Command AT+CCHSSLCFG?	Response +CCHSSLCFG: <session_id>,<ssl_ctx_index > +CCHSSLCFG: <session_id>,<ssl_ctx_index > OK
Write Command AT+CCHSSLCFG=<session_id> ,<ssl_ctx_index>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<ssl_ctx_index>	The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG.

Examples

```
AT+CCHSSLCFG=?  
+CCHSSLCFG: (0,1),(0-9)
```

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

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

NOTE

AT+CCHSSLCFG is used to set the SSL context which to be used in the SSL connection. It must be called before AT+CCHOPEN and after AT+CCHSTART. The setting will be cleared after AT+CCHOPEN failed or AT+CCHCLOSE

If you don't set the SSL context by this command before connecting to SSL/TLS server by AT+CCHOPEN, the CCHOPEN operation will use the SSL context as same as index <session_id> (the 1st parameter of AT+CCHOPEN) when connecting to the server.

19.2.11 AT+CCHCFG Configure the Client Context

AT+CCHCFG is used to set the client session context. It must be called before AT+CCHOPEN and after AT+CCHSTART. The setting will be cleared after AT+CCHOPEN failed or AT+CCHCLOSE.

AT+CCHCFG Configure the Client Context

<p>Test Command AT+CCHCFG=?</p>	<p>Response +CCHCFG: "sendtimeout",(0-1),(60-150) +CCHCFG: "sslctx",(0-1),(0-9)</p> <p>OK</p>
<p>Read Command AT+CCHCFG?</p>	<p>Response +CCHCFG: 0,<sendtimeout_val>,<sslctx_index> +CCHCFG: 1, <sendtimeout_val>,<sslctx_index></p> <p>OK</p>
<p>Write Command /*Configure the timeout value of the specified client when sending data*/ AT+CCHCFG="sendtimeout",<session_id>,<sendtimeout_val></p>	<p>Response 1)If successfully: OK 2)If failed: ERROR</p>
<p>Write Command /*Configure the SSL context index, it's as same as AT+CCHSSLCFG*/ AT+CCHCFG="sslctx",<session_id>,<sslctx_index></p>	<p>Response 1)If successfully: OK 2)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<sendtimeout_val>	The timeout value used in sending data stage. The range is 60-150 seconds. The default value is 150.
<sslctx_index>	The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG.

Examples

AT+CCHCFG=?

+CCHCFG: "sendtimeout",(0-1),(60-150)

+CCHCFG: "sslctx",(0-1),(0-9)

OK

AT+CCHCFG?

+CCHCFG: 0,,

+CCHCFG: 1,,

OK

AT+CCHCFG="sendtimeout",0,120

OK

AT+CCHCFG="sslctx",0,3

OK

19.2.12 AT+CCHOPEN Connect to server

AT+CCHOPEN is used to connect the server.

AT+CCHOPEN Connect to server

Test Command

AT+CCHOPEN=?

Response

+CCHOPEN: (0,1),"ADDRESS",(1-65535)[,(1-2)[,(1-65535)]]

OK

Read Command

AT+CCHOPEN?

Response

If connect to a server, it will show the connected information.

Otherwise, the connected information is empty.

+CCHOPEN: 0,"<host>",<port>,<client_type>,<bind_port>

+CCHOPEN: 1,"<host>",<port>,<client_type>,<bind_port>

OK

Write Command

AT+CCHOPEN=<session_id>,"<host>",<port>[<client_type>,[<bind_port>]]

Response

1)If connect successfully:

OK

+CCHOPEN: <session_id>,0

2)If connect successfully in transparent mode:

CONNECT [<text>]

3)If failed:

OK

	+CCHOPEN: <session_id>,<err> 4)If failed: ERROR 5)If failed in transparent mode: CONNECT FAIL
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session index to operate. It's from 0 to 1.
<host>	The server address, maximum length is 256 bytes.
<port>	The server port which to be connected, the range is from 1 to 65535.
<client_type>	The type of client, default value is 2: 1 – TCP client. 2 – SSL/TLS client.
<bind_port>	The local port for channel, the range is from 1 to 65535.
<text>	CONNECT result code string; the string formats please refer ATX command.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 19.3

Examples

```
AT+CCHOPEN=?
+CCHOPEN: (0,1),"ADDRESS",(1-65535)[,(1-2)[,(1-65535)]]
```

```
OK
AT+CCHOPEN=0,"183.230.174.137",6043,1
OK
```

```
+CCHOPEN: 0,0
AT+CCHOPEN?
+CCHOPEN: 0,"183.230.174.137",6043,1,
+CCHOPEN: 1,"",,,
```

```
OK
```

NOTE

If you don't set the SSL context by AT+CCHSSLCFG before connecting a SSL/TLS server by

AT+CCHOPEN, it will use the <session_id>(the 1'st parameter of AT+CCHOPEN) SSL context when connecting to the server.

19.2.13 AT+CCHCLOSE Disconnect from server

AT+CCHCLOSE is used to disconnect from the server.

AT+CCHCLOSE Disconnect from server

Write Command AT+CCHCLOSE=<session_id>	Response 1)If successfully: OK +CCHCLOSE: <session_id>,0 2)If successfully in transparent mode: OK CLOSED 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session index to operate. It's from 0 to 1.
<err>	The result code: 0 is success. Other values are failure. Please refer to the end of this chapter.

Examples

```
AT+CCHCLOSE=0
OK
+CCHCLOSE: 0,0
```

19.2.14 AT+CCHSEND Send data to server

You can use AT+CCHSEND to send data to server.

AT+CCHSEND Send data to server	
Test Command AT+CCHSEND=?	Response +CCHSEND: (0,1),(1-2048) OK
Read Command AT+CCHSEND?	Response +CCHSEND: 0,<unsent_len_0>,1,<unsent_len_1> OK
Write Command AT+CCHSEND=<session_id>,<len>	Response 1)if parameter is right: > <input data here> When the total size of the inputted data reaches <len>, TA will report the following code. Otherwise, the serial port will be blocked. OK 2)If parameter is wrong or other errors occur: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<session_id>	The session_id to operate. It's from 0 to 1.
<len>	The length of data to send. Its range is from 1 to 2048 bytes.
<unsent_len_0>	The data of connection 0 cached in sending buffer which is waiting to be sent.
<unsent_len_1>	The data of connection 1 cached in sending buffer which is waiting to be sent.

Examples

```
AT+CCHSEND=?
+CCHSEND: (0,1),(1-2048)
```

```
OK
AT+CCHSEND?
```

+CCHSEND: 0,0,1,0

OK

AT+CCHSEND=0,121

> GET / HTTP/1.1

Host: www.baidu.com

User-Agent: MAUI htp User Agent

Proxy-Connection: keep-alive

Content-Length: 0

OK

19.2.15 AT+CCHRECV Read the cached data that received from the server

You can use AT+CCHRECV to read the cached data which received from the server.

AT+CCHRECV Read the cached data that received from the server

<p>Read Command AT+CCHRECV?</p>	<p>Response +CCHRECV: LEN,<cache_len_0>,<cache_len_1></p> <p>OK</p>
<p>Write Command AT+CCHRECV=<session_id>[,<max_rcv_len>]</p>	<p>Response</p> <p>1)if parameter is right and there are cached data: OK</p> <p>[+CCHRECV: DATA, <session_id>,<len> ... +CCHRECV: DATA, <session_id>,<len> ...] +CCHRECV: <session_id>,<err></p> <p>2) if parameter is not right or any other error occurs: +CCHRECV: <session_id>,<err></p> <p>ERROR</p> <p>3) others: ERROR</p>
<p>Parameter Saving Mode</p>	<p>-</p>
<p>Max Response Time</p>	<p>120000ms</p>

Reference -

Defined Values

<session_id>	The session id to operate. It's from 0 to 1.
<max_rcv_len>	Maximum bytes of data to receive in the current AT+CCHRECV calling. It will read all the received data when the value is greater than the length of RX data cached for session <session_id>. 0 means the maximum bytes to receive is 2048 bytes. (But, when 2048 is greater than the length of RX data cached for session <session_id>, 0 means the length of RX data cached for session <session_id>). The default value is the length of RX data cached for session <session_id>. It will be not allowed when there is no data in the cache.
<cache_len_0>	The length of RX data cached for connection 0.
<cache_len_1>	The length of RX data cached for connection 1.
<len>	The length of data followed.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 19.3

Examples

AT+CCHRECV?

+CCHRECV: LEN,3072,0

OK

AT+CCHRECV=0

OK

+CCHRECV: DATA,0,1024

HTTP/1.1 200 OK

Bdpagetype: 1

Bdqid: 0x9821f6dd000060aa

Cache-Control: private

Connection: keep-alive

Content-Type: text/html;charset=utf-8

Date: Tue, 24 Mar 2020 02:27:10 GMT

Expires: Tue, 24 Mar 2020 02:26:31 GMT

P3p: CP=" OTI DSP COR IVA OUR IND COM "

P3p: CP=" OTI DSP COR IVA OUR IND COM "

Server: BWS/1.1

Set-Cookie: BAIDUID=F0CD980BA0927350B147AB1064A3423D:FG=1; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com

```
Set-Cookie: BIDUPSID=F0CD980BA0927350B147AB1064A3423D; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com
Set-Cookie: PSTM=1585016830; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com
Set-Cookie: BAIDUID=F0CD980BA0927350739AA64356C3CB13:FG=1; max-age=31536000; expires=Wed, 24-Mar-21 02:27:10 GMT; domain=.baidu.com; path=/; version=1; comment=bd
Set-Cookie: BDSVRTM=0; path=/
Set-Cookie: BD_HOME=1; path=/
Set-Cookie: H_PS_PSSID=30972_1467_21116_30823; path=/; domain=.baidu.com
Traceid
+CCHRECV: DATA,0,1024
: 1585016830040414772210962314397044727978
Vary: Accept-Encoding
Vary: Accept-Encoding
X-Ua-Compatible: IE=Edge,chrome=1
Transfer-Encoding: chunked
```

b5e

```
<!DOCTYPE html><!--STATUS OK--><html><head><meta http-equiv="Content-Type" content="text/html; charset=utf-8"><meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1"><meta content="always" name="referrer"><meta name="theme-color" content="#2932e1"><link rel="shortcut icon" href="/favicon.ico" type="image/x-icon" /><link rel="search" type="application/opensearchdescription+xml" href="/content-search.xml" title="網惧害罅減儲" /><link rel="icon" sizes="any" mask href="//www.baidu.com/img/baidu_85beaf5496f291521eb75ba38eacbd87.svg"><link rel="dns-prefetch" href="//dss0.bdstatic.com"/><link rel="dns-prefetch" href="//dss1.bdstatic.com"/><link rel="dns-prefetch" href="//sp0.baidu.com"/><link rel="dns-prefetch" href="//sp1.baidu.com"/><link rel="dns-prefetch" href="//sp2.baidu.com"/><title>網惧害涓€涓€?
```

```
+CCHRECV: DATA,0,1024
```

```
紅浣豺氨鑲ラ込</title><style type="text/css" id="css_index" index="index">body,html{height:100%}html{overflow-y:auto}body{font:12px arial;background:#fff}body,form,li,p,ul{margin:0;padding:0;list-style:none}#fm,body,form{position: relative}td{text-align:left}img{border:0}a{text-decoration:none}a:active{color:#f60}input{border:0;padding:0}.clearfix:after{content:'\20';display:block;height:0;clear:both}.clearfix{zoom:1}#wrapper{position: relative;min-height:100%}#head{padding-bottom:100px;text-align:center;*z-index:1}#ftCon{height:50px;position: absolute;text-align:left;width:100%;margin:0 auto;z-index:0;overflow: hidden}#ftConw{display:inline-block;text-align:left;margin-left:33px;line-height:22px;position: relative;top:-2px;*float:right;*margin-left:0;*position: static}#ftConw,#ftConw a{color:#999}#ftConw{text-align:center;margin-left:0}.bg{background-image: url(http://ss.bdimg.com/static/superman/img/icons-5859e577e2.png);background-repeat: no-repeat;_background-image: url(http://ss.bdimg.com/static/superman/img/icon
```

```
+CCHRECV: 0,0
```


+CCHEVENT: 0,RECV EVENT

NOTE

If connection is closed by server, the cached data will not be cleaned.

19.3 Command result codes and unsolicited codes

19.3.1 Command result <err> codes

Result codes	Meaning
0	Operation succeeded
1	Alerting state(reserved)
2	Unknown error
3	Busy
4	Peer closed
5	Operation timeout
6	Transfer failed
7	Memory error
8	Invalid parameter
9	Network error
10	Open session error
11	State error
12	Create socket error
13	Get DNS error
14	Connect socket error
15	Handshake error
16	Close socket error
17	Nonet
18	Send data timeout
19	Not set certificates

19.3.2 Unsolicited result codes

Unsolicited codes	Meaning
+CCHEVENT: <session_id>,RECV EVENT	In manual receiving mode, when new data of a connection arriving to the module, this unsolicited result code will be reported to MCU.
+CCH_RECV_CLOSED: <session_id>,<err>	When receive data occurred any error, this unsolicited result code will be reported to MCU.
+CCH_PEER_CLOSED: <session_id>	The connection is closed by the server.

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20 AT Commands for TTS

20.1 Overview of AT Commands for TTS

Command	Description
AT+CTTS	TTS operation
AT+CTTSPARAM	Set TTS parameters

20.2 Detailed Description of AT Commands for TTS

20.2.1 AT+CTTS TTS operation

The write command is used to play/decode/pause TTS.

AT+CTTS TTS operation	
Test Command AT+CTTS=?	Response OK
Read Command AT+CTTS?	Response +CTTS: <status> OK
Write Command AT+CTTS=<mode>,[<text>],[<filename>]	Response 1) If <mode>is 0, and tts is playing return: +CTTS:0 OK 2) If <mode>is 0, and tts is not playing return: OK 3)

	<p>If <mode>is 1 or 2, return: +CTTS:</p> <p>OK</p> <p>+CTTS:0 //speech synth and play end 4) If <mode>is 3 or 4 return: +CTTS:</p> <p>OK</p> <p>+CTTS:0 // transform end 5) ERROR</p>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<status>	<p>0 NO_WORKING 6 TTS_WORKING</p>
<mode>	<p>0 Stop the speech play 1 Start to synth and play, <text> is in UCS2 coding format. 2 Start to synth and play, <text> is in ASCII coding format, 3 Chinese text is in UCS2 coding format TTS To wav format, <text> is in ASCII coding format, 4 Chinese text is in UCS2 coding format TTS To wav format, <text> is in UCS2 coding format.</p>
<text>	The text which is synthesized to speed to be played, maximum data length is 50 bytes.
<filename>	Enter path and filename, if no path is added, save in C: by default. Maximum filename length is 40 bytes.

Examples

```

AT+CTTS=?
OK
AT+CTTS?
+CTTS:0
  
```

```
OK
AT+CTTS=1,"6B228FCE4F7F75288BED97F3540862107CFB7EDF"
+CTTS:

OK
+CTTS:0
```

20.2.2 AT+CTTSPARAM Set TTS Parameters

The write command is used to Set TTS Parameters

AT+CTTSPARAM Set TTS Parameters

Test Command AT+CTTSPARAM=?	Response OK
Read Command AT+CTTSPARAM?	Response +CTTSPARAM: <volume>,<sysvolume>,<digitmode>,<pitch>,<speed> OK
Write Command AT+CTTSPARAM=<volume>[,<sysvolume>[,<digitmode>[,<pitch>[,<speed>]]]]	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	Ventor

Defined Values

<volume>	0 The mix volume 1 The normal volume 2 The max volume
<sysvolume>	0 The mix system volume 1 The small system volume 2 The normal system volume 3 The max system volume
<digitmode>	0 Auto read digit based on number rule first. 1 Auto read digit bases on telegram rule first. 2 Read digit based on telegram rule. 3 Read digit based on number rule.

<pitch>	0 The mix voice tone. 1 The normal voice tone. 2 The max voice tone.
<speed>	0 The mix speed 1 The normal speed 2 The max speed

Examples

AT+CPBSPARAM=?

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

OK

AT+CTTSPARAM?

+CTTSPARAM:1,3,0,1,1

OK

AT+CTTSPARAM=1,3,0,1,1

OK

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21 AT Commands for TTS

21.1 Overview of AT Commands for TTS

Command	Description
AT+CTTS	TTS operation
AT+CTTSPARAM	Set TTS parameters

21.2 Detailed Description of AT Commands for TTS

21.2.1 AT+CTTS TTS operation

The write command is used to play/decode/pause TTS.

AT+CTTS TTS operation	
Test Command AT+CTTS=?	Response OK
Read Command AT+CTTS?	Response +CTTS: <status> OK
Write Command AT+CTTS=<mode>,[<text>],[<filename>]	Response 1) If <mode>is 0, and tts is playing return: +CTTS: 0 OK 2) If <mode>is 0, and tts is not playing return: OK

3)
If <mode>is 1 or 2,
return:
+CTTS:

OK

+CTTS:0 //speech synth and play end

4)
If <mode>is 3 or 4
return:
+CTTS:

OK

+CTTS:0 // transform end

5)
ERROR

Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<status>	0 NO_WORKING 6 TTS_WORKING
<mode>	0 Stop the speech play 1 Start to synth and play, <text> is in UCS2 coding format. 2 Start to synth and play, <text> is in ASCII coding format, 3 Chinese text is in UCS2 coding format TTS To wav format, <text> is in ASCII coding format, 4 Chinese text is in UCS2 coding format TTS To wav format, <text> is in UCS2 coding format.
<text>	The text which is synthesized to speed to be played, maximum data length is 50 bytes.
<filename>	Enter path and filename, if no path is added, save in C: by default. Maximum filename length is 40 bytes.

Examples

```
AT+CTTS=?
OK
AT+CTTS?
+CTTS:0
```



```
OK
AT+CTTS=1,"6B228FCE4F7F75288BED97F3540862107CFB7EDF"
+CTTS:

OK
+CTTS:0
```

21.2.2 AT+CTTSPARAM Set TTS Parameters

The write command is used to Set TTS Parameters

AT+CTTSPARAM Set TTS Parameters

Test Command AT+CTTSPARAM=?	Response OK
Read Command AT+CTTSPARAM?	Response +CTTSPARAM: <volume>,<sysvolume>,<digitmode>,<pitch>,<speed>
Write Command AT+CTTSPARAM=<volume>[,<sysvolume>[,<digitmode>[,<pitch>[,<speed>]]]	Response 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	Ventor

Defined Values

<volume>	0 The mix volume 1 The normal volume 2 The max volume
<sysvolume>	0 The mix system volume 1 The small system volume 2 The normal system volume 3 The max system volume
<digitmode>	0 Auto read digit based on number rule first. 1 Auto read digit bases on telegram rule first. 2 Read digit based on telegram rule.

	3 Read digit based on number rule.
<pitch>	0 The mix voice tone. 1 The normal voice tone. 2 The max voice tone.
<speed>	0 The mix speed 1 The normal speed 2 The max speed

Examples

AT+CPBSPARAM=?

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

OK

AT+CTTSPARAM?

+CTTSPARAM:1,3,0,1,1

OK

AT+CTTSPARAM=1,3,0,1,1

OK

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22 AT Commands for Audio

22.1 Overview of AT Commands for Audio

Command	Description
AT+CCMXPLAY	play an audio file.
AT+CCMXSTOP	stop playing audio file.
AT+CREC	record wav audio file

22.2 Detailed Description of AT Commands for Audio

22.2.1 AT+CCMXPLAY Play audio file

This command is used to play an audio file(only support amr and wav file now).

AT+CCMXPLAY Play audio file	
Test Command AT+CCMXPLAY=?	Response +CCMXPLAY: (list of supported <play_path>s),(list of supported <repeat>s) OK
Write Command AT+CCMXPLAY=<file_name>,<play_path>,<repeat>	Response 1) +CCMXPLAY: OK +AUDIOSTATE: audio play +AUDIOSTATE: audio play stop 2) ERROR

Parameter Saving Mode	
Max Response Time	
Reference	

Defined Values

<file_name>	The name of audio file. Support audio file format amr and wav.
<play_path>	0 – local path 1 – remote path (just support voice call)
<repeat>	0 – don't play repeat.play only once. 1...255 – play repeat times. E.g. <repeat>=1, audio will play twice.

Examples

```

AT+CCMXPLAY=?
+CCMXPLAY: (0-1),(0-255)

OK
AT+CCMXPLAY="c:/test.amr",0,255
+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop
AT+CCMXPLAY="c:/recording.wav",0,255
+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop

```

22.2.2 AT+CCMXSTOP Stop playing audio file

The command is used to stop playing audio file. Execute this command during audio playing. If audio file was played end in the past, when you execute "AT+CCMXSTOP", there is no "+AUDIOSTATE: audio play stop".

AT+CCMXSTOP Stop playing audio file

Test Command AT+CCMXSTOP=?	Response OK
Execution Command AT+CCMXSTOP	Response 1) +CCMXSTOP: OK +AUDIOSTATE: audio play stop 2) OK
Parameter Saving Mode	
Max Response Time	
Reference	

Examples

```
AT+CCMXSTOP
+CCMXSTOP:
OK

+AUDIOSTATE: audio play stop
```

22.2.3 AT+CREC Record Wav Audio File

This command is used to record a wav audio file. It can record wav file during a call or not, the record file should be put into the "c:/".

AT+CREC record wav audio file

Read Command AT+CREC?	Response +REC: (list current <status>s) OK
Write Command AT+CREC=<record_path>,<file_name>	Response 1) +CREC:1 OK 2) +CREC:2

	OK 3) ERROR
Write Command AT+CREC=<mode>	Response +CREC: 0 OK
Parameter Saving Mode	
Max Response Time	
Reference	

Defined Values

<record_path>	1 – local path 2 – remote path (get voice from cs call)
<file_name>	The name of wav audio file.(the file name has must be recording.wav)
<status>	0 – free 1 – busy
<mode>	0 – stop record

Examples

AT+CREC?

+CREC: 0

OK

AT+CREC=1,"c:/recording.wav"

+CREC: 1

OK

+CREC: file full

AT+CREC=2,"c:/recording.wav"

+CREC: 2

OK

+CREC: file full

AT+CREC=0

+CREC: 0

OK

NOTE

1. When the file is recoding full, Response "+CREC: file full " is displayed.
2. The time of local record is about 40s, and the remote record is about 80s.

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23 AT Commands for SFOTA

23.1 Overview of AT Commands for SFOTA

Command	Description
AT+CAPFOTA	Start / Close FOTA service
AT+CSCFOTA	Configure parameters and download upgrade package

23.2 Detailed Description of AT Commands for SFOTA

23.2.1 AT+CAPFOTA Start / Close FOTA service

AT+CAPFOTA Start / Close FOTA service	
Test Command AT+CAPFOTA=?	Response +CAPFOTA: (0-1) OK
Read Command AT+CAPFOTA?	Response +CAPFOTA: 0/1 OK
Write Command /*Setting FOTA service status*/ AT+CAPFOTA=<on/off>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	-

Defined Values

<on/off>	<p>The service status on/off, the default value is 0.</p> <p>0 – Close FOTA program</p> <p>1 –Active FOTA program</p> <p>The function will take effect immediately.</p>
----------	---

Examples

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

```
OK
AT+CAPFOTA?
+CAPFOTA: 0
```

```
OK
AT+CAPFOTA=1
OK
```

23.2.2 AT+CSCFOTA Configure parameters and download upgrade package

AT+CSCFOTA Configure parameters and download upgrade package

<p>Write Command</p> <pre>AT+CSCFOTA=<OEM>,<models >,<product ID>,<product Secret>,<target version></pre>	<p>Response</p> <p>1)If successfully:</p> <p>OK</p> <p>If it can be downloaded:</p> <p>+CSCFOTA: 2</p> <p>+CSCFOTA: 3</p> <p>If download partial is finished:</p> <p>+CSCFOTA: 4</p> <p>If there is no new version detected:</p> <p>+CSCFOTA: 5</p> <p>If detect version failed:</p> <p>+CSCFOTA: <err> codes number</p> <p>If it cannot be downloaded:</p> <p>+CSCFOTA: <err> codes number</p> <p>2)If failed:</p> <p>ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	9S
Reference	-

Defined Values

<OEM>	The name of project design company. This name must be the same as the OEM created on the cloud platform. Otherwise, it will cause upgrade failed.
<models>	The name of the device model. This name must be the same as the device model created on the cloud platform. Otherwise, it will cause upgrade failed.
<productID>	The product ID that must be the same as the product ID generated on the cloud platform.
<productSecret>	The product secret is used to confirm the identity and usage rights of the user. It must be the same as the product secret generated on the cloud platform.
<target version>	The version that needs to be upgraded to. This version is published by the cloud platform.

Examples

```
AT+CSCFOTA="SIMCom","A7600C","1540907004","f9bbb0d76f894da090b6b69253616561","A7600C_A39_190327_V1.00"
```

```
OK
```

```
+CSCFOTA: 2
```

```
+CSCFOTA: 3
```

```
+CSCFOTA: 0
```

23.3 Command result codes

23.3.1 Command result report codes

Result codes	
2	Check version is finished
3	Download is finished
4	Download partial finished
5	No new version

23.3.2 Command result <err> codes

Result codes	
0	OK
1	unknown error (contact supplier)
301	No enough memory
302	Invalid parameter
303	Invalid operation
304	IO failed
305	IO timeout
306	Download file verification failed
307	got canceled
308	Interface nesting error
401	Invalid device information
402	Invalid platform information
403	Missing device information
404	Version number is not configured
405	Internal error (contact supplier)
501	Invalid URL
502	Unable to resolve domain name
503	cannot connect to the server
504	Invalid request, server returned error
505	Not in range
506	HTTP POST request error
507	Re-download start error
508	Operation is aborted
509	Operation not completed
510	Too many retargeting times
511	Unable to get data from SOCKET
512	Error sending data via SOCKET
513	Error receiving data via SOCKET
514	Invalid SOCKET connection

24 Summary of ERROR Codes

24.1 Verbose code and numeric code

Verbose result code	Numeric (V0 set)	Description
OK	0	Command executed, no errors, Wake up after reset
CONNECT	1	Link established
RING	2	Ring detected
NO CARRIER	3	Link not established or disconnected
ERROR	4	Invalid command or command line too long
NO DIALTONE	6	No dial tone, dialing impossible, wrong mode
BUSY	7	Remote station busy
NO ANSWER	8	Connection completion timeout

24.2 Response string of AT+CEER

Number	Response string
CS internal cause	
0	Phone is offline
21	No service available
25	Network release, no reason given
27	Received incoming call
29	Client ended call
34	UIM not present
35	Access attempt already in progress
36	Access failure, unknown source
38	Concur service not supported by network
29	No response received from network
45	GPS call ended for user call
46	SMS call ended for user call
47	Data call ended for emergency call

48	Rejected during redirect or handoff
100	Lower-layer ended call
101	Call origination request failed
102	Client rejected incoming call
103	Client rejected setup indication
104	Network ended call
105	No funds available
106	No service available
108	Full service not available
109	Maximum packet calls exceeded
301	Video connection lost
302	Video call setup failure
303	Video protocol closed after setup
304	Video protocol setup failure
305	Internal error
CS network cause	
1	Unassigned/unallocated number
3	No route to destination
6	Channel unacceptable
8	Operator determined barring
16	Normal call clearing
17	User busy
18	No user responding
19	User alerting, no answer
21	Call rejected
22	Number changed
26	Non selected user clearing
27	Destination out of order
28	Invalid/incomplete number
29	Facility rejected
30	Response to Status Enquiry
31	Normal, unspecified
34	No circuit/channel available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
43	Access information discarded
44	Requested circuit/channel not available
47	Resources unavailable, unspecified
49	Quality of service unavailable

50	Requested facility not subscribed
55	Incoming calls barred within the CUG
57	Bearer capability not authorized
58	Bearer capability not available
63	Service/option not available
65	Bearer service not implemented
68	ACM \geq ACMmax
69	Requested facility not implemented
70	Only RDI bearer is available
79	Service/option not implemented
81	Invalid transaction identifier value
87	User not member of CUG
88	Incompatible destination
91	Invalid transit network selection
95	Semantically incorrect message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented
100	Conditional IE error
101	Message not compatible with state
102	Recovery on timer expiry
111	Protocol error, unspecified
117	Interworking, unspecified
CS network reject	
2	IMSI unknown in HLR
3	Illegal MS
4	IMSI unknown in VLR
5	IMEI not accepted
6	Illegal ME
7	GPRS services not allowed
8	GPRS & non GPRS services not allowed
9	MS identity cannot be derived
10	Implicitly detached
11	PLMN not allowed
12	Location Area not allowed
13	Roaming not allowed
14	GPRS services not allowed in PLMN
15	No Suitable Cells In Location Area
16	MSC temporarily not reachable

17	Network failure
20	MAC failure
21	Synch failure
22	Congestion
23	GSM authentication unacceptable
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of orde
38	Call cannot be identified
40	No PDP context activated
95	Semantically incorrect message
96	Invalid mandatory information
97	Message type non-existent
98	Message type not compatible with state
99	Information element non-existent
101	Message not compatible with state
161	RR release indication
162	RR random access failure
163	RRC release indication
164	RRC close session indication
165	RRC open session failure
166	Low level failure
167	Low level failure no redial allowed
168	Invalid SIM
169	No service
170	Timer T3230 expired
171	No cell available
172	Wrong state
173	Access class blocked
174	Abort message received
175	Other cause
176	Timer T303 expired
177	No resources
178	Release pending
179	Invalid user data
PS internal cause lookup	
0	Invalid connection identifier
1	Invalid NSAPI
2	Invalid Primary NSAPI
3	Invalid field

4	SNDCP failure
5	RAB setup failure
6	No GPRS context
7	PDP establish timeout
8	PDP activate timeout
9	PDP modify timeout
10	PDP inactive max timeout
11	PDP lowerlayer error
12	PDP duplicate
13	Access technology change
14	PDP unknown reason
PS network cause	
25	LLC or SNDCP failure
26	Insufficient resources
27	Missing or unknown APN
28	Unknown PDP address or PDP type
29	User Aauthentication failed
30	Activation rejected by GGSN
31	Activation rejected, unspecified
32	Service option not supported
33	Requested service option not subscribed
34	Service option temporarily out of order
35	NSAPI already used (not sent)
36	Regular deactivation
37	QoS not accepted
38	Network failure
39	Reactivation required
40	Feature not supported
41	Semantic error in the TFT operation
42	Syntactical error in the TFT operation
43	Unknown PDP context
44	PDP context without TFT already activated
45	Semantic errors in packet filter
46	Syntactical errors in packet filter
81	Invalid transaction identifier
95	Semantically incorrect message
96	Invalid mandatory information
97	Message non-existent/not implemented
98	Message type not compatible with state
99	IE non-existent/not implemented

100	Conditional IE error
101	Message not compatible with state
111	Protocol error, unspecified

24.3 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.

Defined Values

+CME ERROR: <err>	<err>Values (numeric format followed by verbose format):
	0 phone failure
	1 no connection to phone
	2 phone adaptor link reserved
	3 operation not allowed
	4 operation not supported
	5 PH-SIM PIN required
	6 PH-FSIM PIN required
	7 PH-FSIM PUK required
	10 SIM not inserted
	11 SIM PIN required
	12 SIM PUK required
	13 SIM failure
	14 SIM busy
	15 SIM wrong
	16 incorrect password
	17 SIM PIN2 required
	18 SIM PUK2 required
	20 memory full
	21 invalid index
	22 not found
	23 memory failure
	24 text string too long
	25 invalid characters in text string
	26 dial string too long
	27 invalid characters in dial string
	30 no network service
	31 network timeout
	32 network not allowed - emergency calls only
	40 network personalization PIN required
	41 network personalization PUK required

42	network subset personalization PIN required
43	network subset personalization PUK required
44	service provider personalization PIN required
45	service provider personalization PUK required
46	corporate personalization PIN required
47	corporate personalization PUK required
100	Unknown
103	Illegal MESSAGE
106	Illegal ME
107	GPRS services not allowed
111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
132	service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
257	network rejected request
258	retry operation
259	invalid deflected to number
260	deflected to own number
261	unknown subscriber
262	service not available
263	unknown class specified
264	unknown network message
273	minimum TFTS per PDP address violated
274	TFT precedence index not unique
275	invalid parameter combination

Examples

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

24.4 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.

Defined Values

+CMS ERROR: <err>	<err>
	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
```