



SIM767XX Series_AT Command Manual

LTE Module

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Contents

Version History	2
Contents	3
1 Introduction	11
1.1 Scope of the document	11
1.2 Related documents	11
1.3 Terms and Abbreviations	11
1.4 Definitions and Conventions	13
1.5 AT Interface Synopsis	14
1.5.1 Interface Settings	14
1.5.2 AT Commands Syntax	14
1.5.3 Supported character sets	16
2 AT Commands According to V.25TER	17
2.1 Overview of AT Commands According to V.25TER	17
2.2 Detailed Description of AT Commands for V.25TER	17
2.2.1 ATD Mobile originated call to dial a number	17
2.2.2 ATH Disconnect existing call (reserve)	19
2.2.3 +++ Switch from data mode to command mode	19
2.2.4 ATO Switch from command mode to data mode	20
2.2.5 ATI Display product identification information	21
2.2.6 ATE Enable command echo	22
2.2.7 AT&V Display current configuration	22
2.2.8 ATV Set result code format mode	23
2.2.9 AT&F Set all current parameters to manufacturer defaults	24
2.2.10 ATQ Set Result Code Presentation Mode	25
2.2.11 AT&W Save the user setting to ME	26
2.2.12 ATZ Restore the user setting from ME	27
2.2.13 AT+CGMI Request manufacturer identification	28
2.2.14 AT+CGMM Request model identification	29
2.2.15 AT+CGMR Request revision identification	29
2.2.16 AT+CGSN Request product serial number identification	30
2.2.17 AT+CSCS Select TE character set	31
3 AT Commands for Status Control	33
3.1 Overview of AT Commands for Status Control	33
3.2 Detailed Description of AT Commands for Status Control	33
3.2.1 AT+CFUN Set phone functionality	33
3.2.2 AT+CSQ Query signal quality	35

3.2.3	AT+CPOF	Power down the module	36
3.2.4	AT+CRESET	Reset the module	37
3.2.5	AT+CACM	Accumulated call meter	37
3.2.6	AT+CAMM	Accumulated call meter maximum	39
3.2.7	AT+CCLK	Real time clock management	40
3.2.8	AT+CMEE	Report mobile equipment error	41
3.2.9	AT+CPAS	Phone activity status (reserve)	42
3.2.10	AT+SIMEI	Set the IMEI for the module	43
4 AT Commands for Network			45
4.1	Overview of AT Commands for Network		45
4.2	Detailed Description of AT Commands for Network		45
4.2.1	AT+CREG	Network registration	45
4.2.2	AT+COPS	Operator selection	47
4.2.3	AT+CPOL	Preferred operator list	49
4.2.4	AT+COPN	Read operator names	51
4.2.5	AT+CNBP	Preferred band selection	52
4.2.6	AT+CPSI	Inquiring UE system information	54
4.2.7	AT+CNSMOD	Show network system mode	56
4.2.8	AT+CTZU	Automatic time and time zone update	58
4.2.9	AT+CTZR	Time and time zone reporting	59
4.2.10	AT+CEDRXS	Extended-DRX Setting	61
4.2.11	AT+CEDRXRDP	eDRX Read Dynamic Parameters	62
5 AT Commands for Packet Domain			64
5.1	Overview of AT Commands for Packet Domain		64
5.2	Detailed Description of AT Commands for Packet Domain		64
5.2.1	AT+CEREG	EPS network registration status	64
5.2.2	AT+CGATT	Packet domain attach or detach	66
5.2.3	AT+CGACT	PDP context activate or deactivate	68
5.2.4	AT+CGDCONT	Define PDP context	69
5.2.5	AT+CGDSCONT	Define Secondary PDP Context	72
5.2.6	AT+CGTFT	Traffic Flow Template	74
5.2.7	AT+CGDATA	Enter data state	78
5.2.8	AT+CGPADDR	Show PDP address	79
5.2.9	AT+CGEREP	GPRS event reporting	81
5.2.10	AT+CGAUTH	Set type of authentication for PDP-IP connections of GPRS	88
5.2.11	AT+CPING	Ping destination address	90
6 AT Commands for SIM Card			92
6.1	Overview of AT Commands for SIM Card		92
6.2	Detailed Description of AT Commands for SIM Card		92
6.2.1	AT+CICCID	Read ICCID from SIM card	92
6.2.2	AT+CPIN	Enter PIN	93
6.2.3	AT+CLCK	Facility lock	95
6.2.4	AT+CPWD	Change password	96
6.2.5	AT+CIMI	Request international mobile subscriber identity	97

6.2.6	AT+CSIM	Generic SIM access	98
6.2.7	AT+CRSM	Restricted SIM access	99
6.2.8	AT+CSIMSLEEP	Set UE to Allow SIM Card Sleep for Power Consumption	104
6.2.9	AT+SPIC	Times remain to input SIM PIN/PUK	105
6.2.10	AT+CSPN	Get service provider name from SIM	106
6.2.11	AT+UIMHOTSWAPON	Set UIM Hotswap Function On	107
6.2.12	AT+UIMHOTSWAPLEVEL	Set UIM Card Detection Level	108
7 AT Commands for SMS			110
7.1	Overview of AT Commands for SMS		110
7.2	Detailed Description of AT Commands for SMS		111
7.2.1	AT+CSMS	Select message service	111
7.2.2	AT+CPMS	Preferred message storage	112
7.2.3	AT+CMGF	Select SMS message format	114
7.2.4	AT+CSCA	SMS service centre address	115
7.2.5	AT+CSCB	Select cell broadcast message indication	116
7.2.6	AT+CSMP	Set text mode parameters	118
7.2.7	AT+CSDH	Show text mode parameters	119
7.2.8	AT+CNMA	New message acknowledgement to ME/TA	120
7.2.9	AT+CNMI	New message indications to TE	122
7.2.10	AT+CMGL	List SMS messages from preferred store	124
7.2.11	AT+CMGR	Read message	128
7.2.12	AT+CMGS	Send message	132
7.2.13	AT+CMSS	Send message from storage	134
7.2.14	AT+CMGW	Write message to memory	135
7.2.15	AT+CMGD	Delete message	137
7.2.16	AT+CMGMT	Change message status	139
7.2.17	AT+CMVP	Set message valid period	139
7.2.18	AT+CMGRD	Read and delete message	141
7.2.19	AT+CMGSEX	Send message	142
7.2.20	AT+CMSSEX	Send multi messages from storage	144
8 AT Commands for Serial Interface			146
8.1	Overview of AT Commands for Serial Interface		146
8.2	Detailed Description of AT Commands for Serial Interface		146
8.2.1	AT&D	Set DTR function mode	146
8.2.2	AT&C	Set DCD function mode	147
8.2.3	AT+IPR	Set local baud rate temporarily	148
8.2.4	AT+IPREX	Set local baud rate permanently	149
8.2.5	AT+ICF	Set control character framing	150
8.2.6	AT+IFC	Set local data flow control	151
8.2.7	AT+CSCLK	Control UART Sleep	152
8.2.8	AT+CMUX	Enable the multiplexer over the UART	154
8.2.9	AT+CATR	Configure URC destination interface	155
8.2.10	AT+CFGRI	Configure RI pin	156
8.2.11	AT+CURCD	Configure the delay time and number of URC	157

9 AT Commands for Hardware	159
9.1 Overview of AT Commands for Hardware	159
9.2 Detailed Description of AT Commands for Hardware	159
9.2.1 AT+CVALARM Low and high voltage Alarm	159
9.2.2 AT+CADC Read ADC value	160
9.2.3 AT+CADC2 Read ADC2 value	161
9.2.4 AT+CMTE Control the module critical temperature URC alarm	162
9.2.5 AT+CPMVT Low and high voltage Power Off	163
9.2.6 AT+CRVIC Read values from register of IIC device nau8810	165
9.2.7 AT+CWVIC Write values to register of IIC device nau8810	166
9.2.8 AT+CBC Read the voltage value of the power supply	166
9.2.9 AT+CPMUTEMP Read the temperature of the module	167
9.2.10 AT+CGDRT Set the direction of specified GPIO	168
9.2.11 AT+CGSETV Set the value of specified GPIO	169
9.2.12 AT+CGGETV Get the value of specified GPIO	170
9.3 Unsolicited Result Codes	171
10 AT Commands for File System	172
10.1 Overview of AT Commands for File System	172
10.2 Detailed Description of AT Commands for File System	172
10.2.1 AT+FSCD Select directory as current directory	173
10.2.2 AT+FSMKDIR Make new directory in current directory	174
10.2.3 AT+FSRMDIR Delete directory in current directory	175
10.2.4 AT+FSLS List directories/files in current directory	176
10.2.5 AT+FSDEL Delete file in current directory	177
10.2.6 AT+FSRENAME Rename file in current directory	178
10.2.7 AT+FSATTRI Request file attributes	179
10.2.8 AT+FSMEM Check the size of available memory	180
10.2.9 AT+FSCOPY Copy an appointed file	181
10.2.10 AT+FSPRESET Moves the location of a file	183
11 AT Commands for File Transmission	185
11.1 Overview of AT Commands for File Transmission	185
11.2 Detailed Description of AT Commands for File Transmission	185
11.2.1 AT+CFTRANRX Transfer a file to EFS	185
11.2.2 AT+CFTRANTX Transfer a file from EFS to host	186
12 AT Commands for Internet Service	189
12.1 Overview of AT Commands for Internet Service	189
12.2 Detailed Description of AT Commands for Internet Service	189
12.2.1 AT+CHTPSERV Set HTP server information	189
12.2.2 AT+CHTUPDATE Updating date time using HTP protocol	190
12.2.3 AT+CNTP Update system time	191
12.3 Command Result Codes	192
12.3.1 Description of <err> of HTP	192
12.3.2 Description of <err> of NTP	193
13 AT Commands for TCP/IP	194

13.1 Overview of AT Commands for TCP/IP	194
13.2 Detailed Description of AT Commands for TCP/IP	194
13.2.1 AT+NETOPEN Start Socket Service	194
13.2.2 AT+NETCLOSE Stop Socket Service	196
13.2.3 AT+CIOPEN Establish Connection in Multi-Socket Mode	197
13.2.4 AT+CIPSEND Send data through TCP or UDP Connection	200
13.2.5 AT+CIPRXGET Set the Mode to Retrieve Data	203
13.2.6 AT+CIPCLOSE Close TCP or UDP Socket	206
13.2.7 AT+IPADDR Inquire Socket PDP address	208
13.2.8 AT+CIPHEAD Add an IP Header When Receiving Data	209
13.2.9 AT+CIPSRIP Show Remote IP Address and Port	210
13.2.10 AT+CIPMODE Set TCP/IP Application Mode	211
13.2.11 AT+CIPTIMEOUT Set TCP/IP Timeout Value	212
13.2.12 AT+CIPCCFG Configure Parameters of Socket	213
13.2.13 AT+SERVERSTART Startup TCP Sever	215
13.2.14 AT+SERVERSTOP Stop TCP Sever	216
13.2.15 AT+CIPACK Query TCP Connection Data Transmitting Status	217
13.2.16 AT+CDNSGIP Query the IP Address of Given Domain Name	218
13.2.17 AT+C SOCKSETPN Set active PDP context's profile	219
13.2.18 AT+CTCPKA Conigure TCP heartbeat	221
13.2.19 AT+CDNSCFG Configure Domain Name Server	222
13.3 Command Result Codes	223
13.3.1 Description of <err_info>	223
13.3.2 Description of <err>	224
13.4 Unsolicited Result Codes	224
14 AT Commands for HTTP(S)	226
14.1 Overview of AT Commands for HTTP(S)	226
14.2 Detailed Description of AT Commands for HTTP(S)	226
14.2.1 AT+HTTPINIT Start HTTP Service	226
14.2.2 AT+HTTPTERM Stop HTTP Service	227
14.2.3 AT+HTTPPARA Set HTTP Parameters value	228
14.2.4 AT+HTTPACTION HTTP Method Action	230
14.2.5 AT+HTTPHEAD Read the HTTP Header Information of Server Response	231
14.2.6 AT+HTTPREAD Read the response information of HTTP Server	232
14.2.7 AT+HTTPDATA Input HTTP Data	234
14.2.8 AT+HTTPPOSTFILE Send HTTP Request to HTTP(S)server by File	235
14.2.9 AT+HTTPREADFILE Receive HTTP Response Content to a file	237
14.3 Command Result Codes	238
14.3.1 Description of <statuscode>	238
14.3.2 Description of <errcode>	239
14.4 Unsolicited Result Codes	240
15 AT Commands for FTP(S)	241
15.1 Overview of AT Commands for FTP(S)	241
15.2 Detailed Description of AT Commands for FTP(S)	241
15.2.1 AT+CFTPSSTART Start FTP(S)service	241

15.2.2	AT+CFTPSSTOP	Stop FTP(S)Service	242
15.2.3	AT+CFTPSLOGIN	Login to a FTP(S)server	243
15.2.4	AT+CFTPSLOGOUT	Logout a FTP(S)server	245
15.2.5	AT+CFTPSLIST	List the items in the directory on FTP(S)server	246
15.2.6	AT+CFTPSMKD	Create a new directory on FTP(S)server	247
15.2.7	AT+CFTPSRMD	Delete a directory on FTP(S)server	248
15.2.8	AT+CFTPSCWD	Change the current directory on FTP(S)server	249
15.2.9	AT+CFTPSPWD	Get the current directory on FTP(S)server	251
15.2.10	AT+CFTPSDELE	Delete a file on FTP(S)server	252
15.2.11	AT+CFTPSGETFILE	Download a file from FTP(S)server to module	253
15.2.12	AT+CFTPSPUTFILE	Upload a file from module to FTP(S)server	254
15.2.13	AT+CFTPSGET	Get a file from FTP(S)server to serial port	255
15.2.14	AT+CFTPSPUT	Put a file to FTP(S)server through serial port	257
15.2.15	AT+CFTPSSINGLEIP	Set FTP(S)data socket address type	258
15.2.16	AT+CFTPSSIZE	Get the file size on FTP(S)server	259
15.2.17	AT+CFTPSTYPE	Set the transfer type on FTP(S)server	260
15.2.18	AT+CFTPSSLCFG	Set the SSL context id for FTPS session	262
15.3	Command Result Codes		263
15.3.1	Description of <errcode>		263
15.4	Unsolicited Result codes		263
16	AT Commands for MQTT(S)		265
16.1	Overview of AT Commands for MQTT(S)		265
16.2	Detailed Description of AT Commands for MQTT(S)		265
16.2.1	AT+CMQTTSTART	Start MQTT service	265
16.2.2	AT+CMQTTSTOP	Stop MQTT service	266
16.2.3	AT+CMQTTACCQ	Acquire a client	267
16.2.4	AT+CMQTTREL	Release a client	269
16.2.5	AT+CMQTTSSLCFG	Set the SSL context (only for SSL/TLS MQTT)	270
16.2.6	AT+CMQTTWILLTOPIC	Input the topic of will message	271
16.2.7	AT+CMQTTWILLMSG	Input the will message	272
16.2.8	AT+CMQTTCONNECT	Connect to MQTT server	273
16.2.9	AT+CMQTTDISC	Disconnect from server	275
16.2.10	AT+CMQTTTOPIC	Input the topic of publish message	277
16.2.11	AT+CMQTTPAYLOAD	Input the publish message	278
16.2.12	AT+CMQTT PUB	Publish a message to server	279
16.2.13	AT+CMQTT SUB	Subscribe a message to server	280
16.2.14	AT+CMQTT UNSUB	Unsubscribe a message to server	282
16.2.15	AT+CMQTT CFG	Configure the MQTT Context	283
16.3	Command Result Codes		285
16.3.1	Description of <err>		285
16.4	Unsolicited Result Codes		286
17	AT Commands for SSL		289
17.1	Overview of AT Commands for SSL		289
17.2	Detailed Description of AT Commands for SSL		289
17.2.1	AT+CSSL CFG	Configure the SSL Context	289

17.2.2	AT+CCERTDOWN	Download certificate into the module	294
17.2.3	AT+CCERTLIST	List certificates	295
17.2.4	AT+CCERTDELE	Delete certificates	296
17.2.5	AT+CCHSET	Configure the report mode of sending and receiving data	296
17.2.6	AT+CCHMODE	Configure the mode of sending and receiving data	297
17.2.7	AT+CCHSTART	Start SSL service	299
17.2.8	AT+CCHSTOP	Stop SSL service	299
17.2.9	AT+CCHADDR	Get the IPv4 address	300
17.2.10	AT+CCHSSLCFG	Set the SSL context	301
17.2.11	AT+CCHCFG	Configure the Client Context	302
17.2.12	AT+CCHOPEN	Connect to server	304
17.2.13	AT+CCHCLOSE	Disconnect from server	305
17.2.14	AT+CCHSEND	Send data to server	306
17.2.15	AT+CCHRECV	Read the cached data that received from the server	308
17.2.16	AT+CCERTMOVE	Move the cert from file system to cert content	310
17.3	Command Result Codes		311
17.3.1	Description of <err>		311
17.4	Unsolicited Result Codes		312
18	AT Commands for FOTA		313
18.1	Overview of AT Command for FOTA		313
18.2	Detailed Description of AT Command for FOTA		313
18.2.1	AT+CFOTA	Start FOTA service	313
18.3	Unsolicited Result Codes		314
19	AT Commands for CTBURST		316
19.1	Overview of AT Commands for CTBURST		316
19.2	Detailed Description of AT Commands for CTBURST(CAT1)		316
19.2.1	AT+CTBURST	The TX/RX Burst Test	316
20	AT Commands for WIFI		319
20.1	Overview of AT Commands for WIFI		319
20.2	Detailed Description of AT Commands for WIFI		319
20.2.1	AT+CWSTASCAN	Scan WIFI network	319
20.2.2	AT+CWSTASCANEX	Scan WIFI network extension command	321
20.2.3	AT+CWSTASCANSYN	Asynchronous control command of scan wifi network	322
21	AT Commands for GNSS		325
21.1	Overview of AT Commands for GNSS		325
21.2	Detailed Description of AT Commands for GNSS		325
21.2.1	AT+CGNSSPWR	GNSS power control	325
21.2.2	AT+CGNSSTST	Send data received from UART to NMEA port	326
21.2.3	AT+CGPSCOLD	Cold start GPS	327
21.2.4	AT+CGPSWARM	Warm start GPS	328
21.2.5	AT+CGPSHOT	Hot start GPS	328
21.2.6	AT+CGNSSIPR	Configure the baud rate of UART3 and GPS module	329
21.2.7	AT+CGNSSMODE	Configure GNSS support mode	330
21.2.8	AT+CGNSSNMEA	Configure NMEA sentence type	331

21.2.9	AT+CGNSSNMEARATE	Set NMEA output rate	332
21.2.10	AT+CGNSSPORTSWITCH	Select the output port of data	333
21.2.11	AT+CGNSSCMD	Send command to GNSS	334
21.2.12	AT+CGNSSRTC	Configure GNSS RTC mode	335
21.2.13	AT+CGNSSSLEEP	Set GNSS UART into Sleep	336
21.2.14	AT+CGNSSWAKEUP	Set GNSS UART Wakeup form Sleep	337
21.2.15	AT+CGNSSFTM	Start GNSS test mode	337
21.2.16	AT+CGPSINFO	Get GPS fixed position information	338
21.2.17	AT+CGNSSINFO	Get GNSS fixed position information	340
21.2.18	AT+CGNSSPROD	Get the product information of GNSS	342
22 AT Commands for SMTPS			343
22.1	Overview of AT Commands for SMTPS		343
22.2	Detailed Description of AT Commands for SMTPS		343
22.2.1	AT+CSMTPSCFG	Config the SMTP context	343
22.2.2	AT+CSMTPSSRV	Set SMTP server address and port number	345
22.2.3	AT+CSMTPSAUTH	SMTP server authentication	346
22.2.4	AT+CSMTPSFROM	Sender address and name	347
22.2.5	AT+CSMTPSRCPT	Recipient address and name (TO/CC/BCC)	348
22.2.6	AT+CSMTPSSUB	E-mail subject	350
22.2.7	AT+CSMTPSBODY	E-mail body	351
22.2.8	AT+CSMTPSBCH	E-mail body character set	352
22.2.9	AT+CSMTPSFILE	Select attachment	353
22.2.10	AT+CSMTPSEND	Initiate session and send e-mail	354
22.2.11	AT+CSMTPSSTOP	Force to stop sending e-mail	355
22.2.12	AT+CSMTPSCLEAN	Clean mail content and setting	355
22.3	Summary of result codes for SMTPS		356
23 Summary of ERROR Codes			357
23.1	Verbose Codes and Numeric Codes		357
23.2	Response String of AT+CEER		357
23.3	Summary of CME ERROR Codes		358
23.4	Summary of CMS ERROR Codes		362

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 QCX216 SIM76XX Series.

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] SIM767XX_Series_Hardware_Design

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

1.3 Terms and Abbreviations

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

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

1.4 Definitions and Conventions

1. 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.
 - ◆ **AT&W_SAVE:** The parameter of the current AT command will be kept in user setting_save.nvm by sending the command of "AT&W".
- ◆ **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 SIM767XX 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 SIM767XX Series AT Command interface defaults to the IRA character set. The SIM767XX 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
ATD	Mobile originated call to dial a number
ATH	Disconnect existing 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
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

2.2 Detailed Description of AT Commands for V.25TER

2.2.1 ATD Mobile originated call to dial a number

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

supplementary services.

ATD Mobile originated call to dial a number

Execution Command ATD<n>[<mgs>];;	Response
	Originate a voice call successfully: OK
	VOICE CALL: BEGIN
	Originate a data call successfully: CONNECT
	Originate a call unsuccessfully during command execution: ERROR
	Originate a call unsuccessfully for failed connection recovery: NO CARRIER
	Originate a call unsuccessfully for error related to the MT: +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	50s
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,@
<n>	Standardized emergency number 112 (no SIM needed)
<mgs>	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.
<err>	Service failure result code string; the string formats please refer +CME ERROR result code and AT+CME command.

Examples

ATD*99#
CONNECT

NOTE

1. Only data call is supported currently.

2.2.2 ATH Disconnect existing call (reserve)

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	Response
ATH	If AT+CVHU=0: OK VOICE CALL: END: <time>
Parameter Saving Mode	-
Max Response Time	50s
Reference	-

Examples

```
AT+CVHU=0
OK
ATH
OK

VOICE CALL: END: 000017
```

2.2.3 +++ Switch from data mode to command mode

This command is only available during a connecting PS data call. The +++ character sequence causes the

TA to cancel the data flow over the AT interface and switch to Command Mode. This allows to enter AT commands while maintaining the data connection to the remote device.

+++ Switch from data mode to command mode

Execution Command +++	Response OK or ERROR
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.

2.2.4 ATO Switch from command mode to data mode

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

ATO Switch from command mode to data mode

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

Examples

ATO
CONNECT

2.2.5 ATI Display product identification information

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

ATI Display product identification information

Execution Command ATI	Response Manufacturer: <manufacturer> Model: <model> Revision: <revision> IMEI: <sn> OK
Parameter Saving Mode	-
Max Response Time	5000ms
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.

Examples

ATI
Manufacturer: SIMCOM INCORPORATED
Model: SIM767XX-XXXX
Revision: V1.9.01
IMEI: 351602000330570

OK

2.2.6 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 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	-

Defined Values

<value>	0 Echo mode off 1 Echo mode on
---------	-----------------------------------

Examples

```
ATE1
OK
ATE0
OK
```

2.2.7 AT&V Display current configuration

This command returns some of the base configuration parameters settings.

AT&V Display current configuration

Execution Command AT&V	Response 1) <TEXT> OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

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

Examples

AT&V

```
&F: 0; &W: 0; E: 1; Q: 0; &C: 1; &D: 0; V: 1; Z: 0; +IPR: 115200; +IPREX: 115200; +CSCS: IRA;
+CREG: 0; +CEREG: 1; +CSMP: 17, 167, 0, 241; +CGEREP: (1,0); +CMEE: 2; +CFUN: 1;
+CMGF: 0; +CSDH: 0; +CSCA: "+8613800230500",145; +CPMS:
"ME",2,10,"ME",2,10,"ME",2,10; +CGAUTH: 1,0,"",""; +CGACT: 1,1;
+CGDCONT: 1,"IP","cmnet","10.161.250.60",,,,,,,,,;
```

OK

2.2.8 ATV Set result code format mode

This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses. Not yet supported ATV0 .

ATV Set result code format mode

Write Command ATV[<value>]	Response 1)If <value>=1 OK 2) ERROR 3)
--	---

	+CME ERROR: <err>
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	-

Defined Values

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

Examples

ATV1

OK

NOTE

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

2.2.9 AT&F Set all current parameters to manufacturer defaults

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

AT&F Set all current parameters to manufacturer defaults

	Response
	1)
	OK
	2)
	ERROR
	3)
	+CME ERROR: <err>
Execution Command	
AT&F[<value>]	
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+CTZU	0

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>].

2.2.10 ATQ Set Result Code Presentation Mode

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

ATQ Set Result Code Presentation Mode

Write Command ATQ<n>	Response 1)If <n>=0: OK 2)If <n>=1: No Responses 3) +CME ERROR: <err>
Execution Command ATQ	Response 1)Set default value:0 OK 2)

	No Responses
Parameter Saving Mode	AT&W_SAVE
Max Response Time	-
Reference	-

Defined Values

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

Examples

```
ATQ0
OK
ATQ
OK
```

2.2.11 AT&W Save the user setting to ME

This command will save the user settings to ME which set by ATE, ATQ, ATV, AT&C, AT&D, AT+IFC .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 3) +CME ERROR: <err>
Execution Command AT&W	Response 1)Set default value: 0 OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	-

Reference -

Defined Values

<value> 0 Save

Examples

AT&W0

OK

AT&W

OK

2.2.12 ATZ Restore the user setting from ME

This command will restore the user setting from ME which set by ATE, ATQ, ATV, AT&C, AT&D and AT+IFC. AT&W must be executed once, then ATZ can be executed correctly.

ATZ Restore the user setting from ME

Write Command ATZ<value>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command ATZ	Response 1)Set default value: 0 OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<value> 0 Restore

Examples

```
ATZ0
OK
ATZ
OK
```

2.2.13 AT+CGMI Request manufacturer identification

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

AT+CGMI Request manufacturer identification

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

Defined Values

<manufacturer> The identification of manufacturer.

Examples

```
AT+CGMI
INCORPORATED

OK
AT+CGMI=?
OK
```

2.2.14 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>
Parameter Saving Mode	OK
Max Response Time	-
Reference	-

Defined Values

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

Examples

```

AT+CGMM
SIM767XX-XXXX

OK
AT+CGMM=?
OK

```

2.2.15 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: 2348B01SIM767XM5A

OK
AT+CGMR=?
OK

```

2.2.16 AT+CGSN Request product serial number identification

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

AT+CGSN Request product serial number identification

Test Command AT+CGSN=?	Response OK
Execution Command AT+CGSN	Response <sn> OK If there is any error, response ERROR or

	+CME ERROR :<err>
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
```

2.2.17 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	AUTO_SAVE
Max Response Time	-
Reference	-

Defined Values

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

Examples

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

```
OK
```

```
AT+CSCS?
```

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

```
OK
```

```
AT+CSCS=?
```

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

```
OK
```

```
AT+CSCS
```

```
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+CPOF	Power down the module
AT+CRESET	Reset the module
AT+CACM	Accumulated call meter
AT+CAMM	Accumulated call meter maximum
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 AT+CFUN=?	Response +CFUN: (range of supported <fun>s),(range of supported <rst>s)
Read Command AT+CFUN?	Response 1)

	<p>+CFUN: <fun></p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CFUN=<fun>[,<rst>]</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	25s
Reference	3GPP TS 27.007

Defined Values

<fun>	<p>0 minimum functionality</p> <p>1 full functionality, online mode</p> <p>4 disable phone both transmit and receive RF circuits</p> <p>5 Factory Test Mode (The 5 and 1 have the same function)</p> <p>6 Reset</p> <p>7 Offline Mode</p>
<rst>	<p>0 do not reset the ME before setting it to <fun> power level</p> <p>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 <rss> and channel bit error rate <ber> from the ME. Test command returns values supported by the TA as compound values.

AT+CSQ Query signal quality

Test Command AT+CSQ=?	Response +CSQ: (range of supported <rss>),(range of supported <ber>) OK
Execution Command AT+CSQ	Response 1) +CSQ: <rss>,<ber> 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<rss>	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+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	Response
AT+CPOF=?	OK
Execution Command	Response
AT+CPOF	OK
Parameter Saving Mode	-
Max Response Time	5000ms
Reference	Vendor

Examples

```

AT+CPOF=?
OK
AT+CPOF
OK

```

3.2.4 AT+CRESET Reset the module

This command is used to reset the module.

AT+CRESET Reset the module

Execution Command AT+CRESET	Response OK
Test Command AT+CRESET=?	Response OK
Parameter Saving Mode	-
Max Response Time	5000ms
Reference	Vendor

Examples

AT+CRESET=?

OK

AT+CRESET

OK

3.2.5 AT+CACM Accumulated call meter

This command is used to reset the Advice of Charge related accumulated call meter value in SIM file EFACM.

The SIM sleep (power off) shall be disabled by AT+CSIMSLEEP=0 (refer to 6.2.8) before enter AT+CACM.

AT+CACM Accumulated call meter

Test Command AT+CACM=?	Response 1) OK 2) ERROR
Read Command AT+CACM?	Response 1) +CACM: <acm> 2) OK 3) ERROR

	+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	5000ms
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

3.2.6 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 EFACMmax.

The SIM sleep(power off) shall be disabled by AT+CSIMSLEEP=0 (refer to 6.2.8) before enter AT+CAMM.

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	5000ms
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

```

3.2.7 AT+CCLK Real time clock management

This command is used to manage Real Time Clock of the module. Hibernate mode will auto save time, power off won't. Manual setting time is not supported when AT+CTZU equals 3.

AT+CCLK Real time clock management

Test Command AT+CCLK=?	Response OK
Read Command AT+CCLK?	Response +CCLK: <time> OK
Write Command AT+CCLK=<time>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE NOTE: timezone not save
Maximum Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<time>	String type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two digits ,range 00 to 99), 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 to 96). E.g. 6th of May 2008, 14:28:10 GMT+8 equals to "08/05/06,14:28:10+32".

NOTE: 1. Time zone is nonvolatile, and the factory value is invalid time zone.

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".

Examples

AT+CCLK=?

OK

AT+CCLK?

+CCLK: "14/01/01,04:14:36+08"

OK

AT+CCLK="14/01/01,04:14:36+08"

OK

3.2.8 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
---	-------------------------------------

	3) +CME ERROR: <err>
Execution Command AT+CMEE	Response OK Note: Set default value
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CMEE=?

+CMEE: (0-2)

OK

AT+CMEE?

+CMEE: 2

OK

AT+CMEE=2

OK

3.2.9 AT+CPAS Phone activity status (reserve)

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+CPAS Phone activity status

Test Command AT+CPAS=?	Response +CPAS: (list of supported <pas>s) OK
Execution Command AT+CPAS	Response +CPAS: <pas>

	OK
Parameter Saving Mode	-
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<pas>	<p>0 ready (ME allows commands from TA/TE)</p> <p>3 ringing (ME is ready for commands from TA/TE, but the ringer is active)</p> <p>4 call in progress (ME is ready for commands from TA/TE, but a call is in progress)</p>
--------------------	--

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.

3.2.10 AT+SIMEI Set the IMEI for the module

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

AT+SIMEI Set the IMEI for the module

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

	+SIMEI: <imei>
	OK
	2)
	ERROR
Write Command AT+SIMEI=<imei>	Response 1) OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
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+CPOL	Preferred operator list
AT+COPN	Read operator names
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
AT+CEDRXS	Extended-DRX Setting
AT+CEDRXRDP	eDRX Read Dynamic Parameters

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>, <AcT>] when <n>=2 and there is a change of the network cell.

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

AT+CREG Network registration

Test Command	Response
AT+CREG=?	+CREG: (range of supported <n> s)

	<p>OK</p> <p>Response</p> <p>1)</p> <p>+CREG: <n>,<stat>[,<lac>,<ci>,<AcT>]</p>
<p>Read Command</p> <p>AT+CREG?</p>	<p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CREG=<n></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+CREG</p>	<p>Response</p> <p>Set default value(<n>=0):</p> <p>OK</p>
<p>Parameter Saving Mode</p>	NO_SAVE
<p>Max Response Time</p>	5000ms
<p>Reference</p>	3GPP TS 27.007

Defined Values

<n>	<p>0 disable network registration unsolicited result code.</p> <p>1 enable network registration unsolicited result code +CREG: <stat>.</p> <p>2 enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>,<AcT>].</p>
<stat>	<p>0 not registered, ME is not currently searching a new operator to register to.</p> <p>1 registered, home network.</p> <p>2 not registered, but ME is currently searching a new operator to register to.</p> <p>3 registration denied.</p> <p>4 unknown.</p> <p>5 registered, roaming.</p> <p>6 registered for "SMS only", home network (applicable only when E-UTRAN)</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.
<AcT>	Integer type; access technology of the serving cell 7 E-UTRAN

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.

AT+COPS Operator selection

<p>Test Command AT+COPS=?</p>	<p>Response</p> <p>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)]</p> <p>2) OK</p> <p>3) ERROR</p> <p>3) +CME ERROR: <err></p>
<p>Read Command AT+COPS?</p>	<p>Response</p> <p>1) +COPS: <mode>[,<format>,<oper>[,<Act>]]</p> <p>2) OK</p> <p>3) ERROR</p> <p>3) +CME ERROR: <err></p>
<p>Write Command AT+COPS=<mode>[,<format> >[,<oper>[,<Act>]]]</p>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p> <p>3) +CME ERROR: <err></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	60S
Reference	3GPP TS 27.007

Defined Values

<mode>	<p>0 automatic</p> <p>1 manual</p> <p>2 force deregister</p> <p>3 set only <format></p> <p>4 manual/automatic</p> <p>NOTE: if <mode> is set to 1, 4 in write command, the <oper> is needed. Set <mode> to 0,1,4 will save to NVM</p>
<format>	<p>0 long format alphanumeric <oper></p> <p>1 short format alphanumeric <oper></p> <p>2 numeric <oper></p>

<oper>	string type,<format> indicates if the format is alphanumeric or numeric.
<stat>	0 unknown 1 available 2 current 3 forbidden
<Act>	Access technology selected 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,"CHINA MOBILE","CMCC","46000",7),(3,"460 15","460 15","46015",7),(0,"CHN-CT","CT","46011",7),(3,"CHN-UNICOM","UNICOM","46001",7),,(0,1,2,3,4),(0,1,2)
```

OK

AT+COPS?

```
+COPS: 0,2,"46001",7
```

OK

```
AT+COPS=1,2,"46001",7
```

OK

AT+COPS=0

OK

4.2.3 AT+CPOL Preferred operator list

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

AT+CPOL Preferred operator list

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

AT+CPOL=?	1) OK 2) ERROR
Read Command AT+CPOL?	Response 1) [+CPOL: <index1>,<format>,<oper1>[<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>][<CR><LF><CR><LF> +CPOL: <index2>,<format>,<oper2>[,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>] [.]]] OK 2) ERROR
Write Command AT+CPOL=<index>[,<format>][,<oper>][,<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>]] NOTE: If using USIM card, the last four parameters must set.	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
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=?

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

4.2.4 AT+COPN Read operator names

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

AT+COPN Read operator names

Test Command AT+COPN=?	Response 1) OK 2) ERROR
Execution Command AT+COPN	Response 1) +COPN: <numeric1>,<alpha1>[<CR><LF><CR><LF> +COPN: <numeric2>,<alpha2> [..] OK

	2) ERROR
	3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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

```

4.2.5 AT+CNBP Preferred band selection

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

AT+CNBP Preferred band selection

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

Write Command AT+CNBP=<lte_mode>	Response 1) OK 2) ERROR
Parameter Saving Mode	AUTO_SAVE
Max Response Time	25s
Reference	3GPP TS 27.007

Defined Values

<band>	Band list in decimal number, the default value is decided by RF Calibration table
<lte_mode>	64 bit 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) 13 EUTRAN_BAND13(UL: 777-787; DL: 746-756) 13 EUTRAN_BAND14(UL: 788-798; DL: 758-768) 16 EUTRAN_BAND17(UL: 704-716; DL: 734-746) 17 EUTRAN_BAND18(UL: 815-830; DL: 860-875) 18 EUTRAN_BAND19(UL: 830-845; DL: 875-890) 19 EUTRAN_BAND20(UL: 832-862; DL: 791-821) 20 EUTRAN_BAND21(UL:1447.9-1462.9; DL: 1495.9-1510.9) 22 EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200) 23 EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559) 24 EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995) 25 EUTRAN_BAND26(UL: 814-849; DL: 859 -894) 26 EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869) 27 EUTRAN_BAND28(703-748; DL: 758-803) 28 EUTRAN_BAND29(UL:1850-1910 or 1710-1755; DL:716-728)

29	EUTRAN_BAND30(UL: 2305-2315 ; DL: 2350 - 2360)
32	EUTRAN_BAND33(UL: 1900-1920; DL: 1900-1920)
33	EUTRAN_BAND34(UL: 2010-2025; DL: 2010-2025)
34	EUTRAN_BAND35(UL: 1850-1910; DL: 1850-1910)
35	EUTRAN_BAND36(UL: 1930-1990; DL: 1930-1990)
36	EUTRAN_BAND37(UL: 1910-1930; DL: 1910-1930)
37	EUTRAN_BAND38(UL: 2570-2620; DL: 2570-2620)
38	EUTRAN_BAND39(UL: 1880-1920; DL: 1880-1920)
39	EUTRAN_BAND40(UL: 2300-2400; DL: 2300-2400)
40	EUTRAN_BAND41(UL: 2496-2690; DL: 2496-2690)
41	EUTRAN_BAND42(UL: 3400-3600; DL: 3400-3600)
42	EUTRAN_BAND43(UL: 3600-3800; DL: 3600-3800)

Examples

AT+CNBP=?

+CNBP: (1,3,5,8,38,40,41)

OK

AT+CNBP?

+CNBP: 0x000001A000000095

OK

AT+CNBP= 0x000001A000000095

OK

4.2.6 AT+CPSI Inquiring UE system information

This command is used to return the UE system information.

AT+CPSI Inquiring UE system information

Test Command AT+CPSI=?	Response 1) OK 2) ERROR
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 Mode>[,<MCC>-<MNC>,<TAC>,<SCellID>,<PCellID>,<Frequency Band>,<earfcn>,<dlbw>,<ulbw>,<RSRQ>,<RSRP>,<RSSI>,<RSSNR>]

OK

4)If no service:

+CPSI: NO SERVICE, Low Power Mode

OK

5)

ERROR

Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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", "Flight 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
<SCellID>	String type. cell ID in decimal format for serving cell
<RSSI>	Number format. Received signal strength indication.

Examples

AT+CPSI?

+CPSI:

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

OK

4.2.7 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	5000ms
Reference	3GPP TS 27.007

Defined Values

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

Examples

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

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

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


4.2.8 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=?	Response +CTZU: (range of supported <on/off>s) OK
Read Command AT+CTZU?	Response +CTZU: <on/off> OK
Write Command AT+CTZU=<on/off>	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<on/off>	Integer type value indicating: 0 Disable automatic time zone update via NITZ <u>1</u> Enable automatic time zone update via NITZ and update GMT time to RTC((default).). 3 Enable automatic time zone update via NITZ and update LOCAL time to RTC
----------	---

Examples

```
AT+CTZU=?
+CTZU: (0,1,3)
```

```
OK
```

AT+CTZU?

+CTZU: 0

OK

AT+CTZU=0

OK

4.2.9 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> /+CTZEU: <tz>,<dst>,[<utime>] whenever the time zone is changed. The MT also provides the time zone upon network registration if provided by the network.

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 OK
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<on/off>	Integer type value indicating: <u>0</u> Disable time zone change event reporting. 1 Enable time zone change event reporting by unsolicited result code +CTZV: <tz>. 3 Enable extended time zone and universal time reporting by
-----------------------	--

	unsolicited result code +CTZEU: <tz>,<dst>,[<utime>]
<tz>	String type, representing the sum of the local time zone (difference between the local time and GMT expressed in quarters of an hour) plus daylight saving time. The format is "±zz", expressed as a fixed width, two digit integer with the range -48 ... +56. To maintain a fixed width, numbers in the range -9 ... +9 are expressed with a leading zero, e.g. "-09", "+00" and "+09
<dst>	Integer type, indicating whether <tz> includes daylight savings adjustment. 0 <tz> includes no adjustment for Daylight Saving Time 1 <tz> includes +1 hour (equals 4 quarters in <tz>) adjustment for daylight saving time 2 <tz> includes +2 hours (equals 8 quarters in <tz>) adjustment for daylight saving time
<utime>	String type, Value representing the universal time. The format is "YYYY/MM/DD,hh:mm:ss", expressed as integers representing year (YYYY), month (MM), date (DD), hour (hh), minute (mm) and second (ss). The universal time can be provided by the network at the time of delivering time zone information and will be present in the unsolicited result code for extended time zone and universal time reporting if provided by the network.

Examples

```
AT+CTZR=?
+CTZR: (0,1,3)
```

```
OK
AT+CTZR?
+CTZR: 3
```

```
OK
AT+CTZR=3
OK
```

NOTE

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

4.2.10 AT+CEDRXS Extended-DRX Setting

AT+CEDRXS Extended-DRX Setting	
Description	<p>The set command controls the setting of the UEs eDRX parameters. The command controls whether the UE wants to apply eDRX or not, as well as the requested eDRX value for each specified type of access technology.</p> <p>The set command also controls the presentation of an unsolicited result code</p> <p>+CEDRXP: <AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] when<n>=2 and there is a change in the eDRX parameters provided by the network.</p> <p>A special form of the command can be given as +CEDRXS=3. In this form, eDRX will be disabled and data for all parameters in the command +CEDRXS will be removed or, if available, set to the manufacturer specific default values.</p> <p>The read command returns the current settings for each defined value of <AcT-type>.</p> <p>The test command returns the supported <mode>s and the value ranges for the access technology and the requested eDRX value as compound values.</p>
Test Command AT+CEDRXS=?	<p>Response</p> <p>+CEDRXS: (list of supported <mode>s),(list of supported<AcT-type>s),(list of supported<Requested_eDRX_value>s)</p> <p>OK</p>
Read Command AT+CEDRXS?	<p>Response</p> <p>+CEDRXS:<AcT-type>,<Requested_eDRX_value></p> <p>OK</p>
Write Command AT+CEDRXS=[<mode>[,<AcT-type>[,<Requested_eDRX_value>]]]	<p>Response</p> <p>OK</p> <p>If failed: +CME ERROR: <err></p>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	<p>Integer type, indicates to disable or enable the use of eDRX in the UE. This parameter is applicable to all specified types of access technology, i.e. the most recent setting of <mode> will take effect for all specified values of <AcT>.</p> <p>0 Disable the use of eDRX 1 Enable the use of eDRX 2 Enable the use of eDRX and enable the unsolicited result code +CEDRXP:<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] 3 Disable the use of eDRX and discard all parameters for eDRX or, if available, reset to the manufacturer specific default values.</p>
<AcT-type>	<p>Integer type, indicates the type of access technology. This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value.</p> <p>5 E-UTRAN (NB-S1 mode)</p>
<Requested_eDRX_value>	<p>String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008. The default value, if available, is manufacturer specific.</p>
<NW-provided_eDRX_value>	<p>String type; half a byte in a 4 bit format. The eDRX value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p>
<Paging_time_window>	<p>String type; half a byte in a 4 bit format. The paging time window refers to bit 8 to 5 of octet 3 of the Extended DRX parameters information element (see subclause 10.5.5.32 of 3GPP TS 24.008 [8]). For the coding and the value range, see the Extended DRX parameters information element in 3GPP TS 24.008 [8] Table 10.5.5.32/3GPP TS 24.008.</p>

4.2.11 AT+CEDRXP eDRX Read Dynamic Parameters

AT+CEDRXP eDRX Read Dynamic Parameters	
Description	<p>The execution command returns <AcT-type> and <Requested_eDRX_value>, <NW-provided_eDRX_value> and <Paging_time_window> if eDRX is used for the cell that the MS is currently registered to. If the cell that the MS is currently registered to is not using eDRX, AcT-type=0 is returned.</p>

Test Command AT+CEDRXRDP=?	Response OK
Execution Command AT+CEDRXRDP	Response +CEDRXRDP:<AcT-type>[,<Requested_eDRX_value>[,<NW-provided_eDRX_value>[,<Paging_time_window>]]] OK If error is related to ME functionality: +CME ERROR:<err>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<AcT-type>	Integer type,indicates the type of access technology.This AT-command is used to specify the relationship between the type of access technology and the requested eDRX value 0 Access technology is not using eDRX 5 E-UTRAN(NB-S1 mode)
<Requested_Edrx_value>	String type;half a byte in a 4-bit format.The Edrx value refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008).For the coding and the value range,see Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<NW-provided_eDRX_value>	String type;half a byte in a 4-bit format.The eDRX value Refers to bit 4 to 1 of octet 3 of the Extended DRX parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008).For the coding and the value range,see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.
<Paging_time_window>	String type;half a byte in a 4-bit format.The paging time window refers to bit 8 to 5 octet 3of the Extended DRX. Parameters information element (see sub-clause 10.5.5.32 of 3GPP TS 24.008).For the coding and the value range,see the Extended DRX parameters information element in 3GPP TS 24.008 Table 10.5.5.32/3GPP TS 24.008.

5 AT Commands for Packet Domain

5.1 Overview of AT Commands for Packet Domain

Command	Description
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+CGDATA	Enter data state
AT+CGPADDR	Show PDP address
AT+CGEREP	GPRS event reporting
AT+CGAUTH	Set type of authentication for PDP-IP connections of GPRS
AT+CPING	Ping destination address

5.2 Detailed Description of AT Commands for Packet Domain

5.2.1 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	Response
--------------	----------

AT+CEREG=?	<p>1) +CEREG: (range of supported <n>s)</p> <p>OK</p> <p>2) ERROR</p>
Read Command AT+CEREG?	<p>Response</p> <p>1) +CEREG: <n>,<stat>[,<tac>,<ci>[,<AcT>]]</p> <p>OK</p> <p>2) ERROR</p>
Write Command AT+CEREG=<n>	<p>Response</p> <p>1) OK</p> <p>2) ERROR</p> <p>3) +CME ERROR: <err></p>
Execution Command AT+CEREG	<p>Response</p> <p>1) Set default value (<n>=0):</p> <p>OK</p> <p>2) ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 24.008 [8]

Defined Values

<n>	<p>0 disable network registration unsolicited result code</p> <p>1 enable network registration unsolicited result code +CEREG: <stat></p> <p>2 enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>,<ci>[,<AcT>]]</p>
<stat>	<p>0 not registered, MT is not currently searching an operator to register to</p> <p>1 registered, home network</p> <p>2 not registered, but MT is currently trying to attach or searching an operator to register to</p> <p>3 registration denied</p> <p>4 unknown (e.g. out of E-UTRAN coverage)</p>

	<ul style="list-style-type: none"> 5 registered, roaming 6 registered for "SMS only", home network (not applicable) 7 registered for "SMS only", roaming (not applicable) 11 attached for emergency bearer services only
<ta>	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>	<p>A numeric parameter that indicates the access technology of serving cell</p> <ul style="list-style-type: none"> 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

5.2.2 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	Response
AT+CGATT=?	1)

	<p>+CGATT: (list of supported <state>s)</p> <p>OK</p> <p>2)</p> <p>ERROR</p>
Read Command AT+CGATT?	<p>Response</p> <p>1)</p> <p>+CGATT: <state></p> <p>OK</p> <p>2)</p> <p>ERROR</p>
Write Command AT+CGATT=<state>	<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	45s
Reference	3GPP TS 27.007

Defined Values

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

Examples

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

```
OK
AT+CGATT?
+CGATT: 1
```

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

5.2.3 AT+CGACT PDP context activate or deactivate

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

AT+CGACT PDP context activate or deactivate	
Test Command AT+CGACT=?	Response +CGACT: (list of supported <state>s) OK
Read Command AT+CGACT?	Response +CGACT: [<cid>,<state>[<CR><LF> +CGACT: <cid>,<state>[<CR><LF> [.]]] OK
Write Command AT+CGACT=<state>[,<cid>]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	45s
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CGACT=?

+CGACT: (0,1)

OK

AT+CGACT?

+CGACT: 1,1

OK
AT+CGACT=1,1
OK

5.2.4 AT+CGDCONT Define PDP context

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

AT+CGDCONT Define PDP context

Test Command
AT+CGDCONT=?

Response
1)
+CGDCONT: (range of supported<cid>s),<PDP_type>,,,(list of supported<d_comp>s),(list of supported<h_comp>s),(list of <ipv4_ctrl>s),(list of <request_type>s),(list of supported<PCSCF_discovery>s),(list of supported<IM_CN_Signalling_Flag_Ind>s),(list of supported <NSLPI>s),(list of supported<securePCO>s),(list of supported<IPv4_MTU_discovery>s),(list of supported<Local_Addr_Ind>s)

OK
2)
ERROR

Read Command
AT+CGDCONT?

Response
1)
+CGDCONT:
<cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>[<NSLPI>,<securePCO>[,<IPv4_MTU_discovery>]]]]<CR><LF>
+CGDCONT:
<cid>,<PDP_type>,<APN>[[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>[<NSLPI>,<securePCO>[,<IPv4_MTU_discovery>]]]]
...

	<p>OK</p> <p>2)</p> <p>ERROR</p>
<p>Write Command</p> <p>AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>][,<ip v4_ctrl>[,<request_type>[,<PCSCF_discovery>[,<IM_CN_Signalling_Flag_Ind>[,<NS_LPI>[,<securePCO>[,<IPv4_MTU_discovery>]]]]]]]]]]]</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+CGDCONT</p>	<p>Response</p> <p>1)</p> <p>OK</p> <p>2)</p> <p>ERROR</p>
<p>Parameter Saving Mode</p>	AUTO_SAVE
<p>Max Response Time</p>	5000ms
<p>Reference</p>	3GPP TS 27.007

Defined Values

<cid>	<p>(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.</p> <p>1...15</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> <p>IPV6 Internet Protocol Version 6</p> <p>IPV4V6 Dual PDN Stack</p> <p>Non-IP Transfer of Non-IP data to external packet data network</p>
<APN>	<p>(Access Point Name)a string parameter which is a logical name that is used to select the GGSN or the external packet data network.</p>
<PDP_addr>	<p>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.</p> <p>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.</p>
<d_comp>	<p>A numeric parameter that controls PDP data compression, this value</p>

	<p>may depend on platform:</p> <ul style="list-style-type: none"> 0 off (default if value is omitted) 1 on 2 V.42bis
<h_comp>	<p>A numeric parameter that controls PDP header compression, this value may depend on platform:</p> <ul style="list-style-type: none"> 0 off (default if value is omitted) 1 RFC1144
<ipv4_ctrl>	<p>Parameter that controls how the MT/TA requests to get the IPv4 address information:</p> <ul style="list-style-type: none"> 0 Address Allocation through NAS Signaling 1 on
<request_type>	<p>integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2) and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0) it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4) and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services.</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) 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment
<P-CSCF_discovery>	<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
<IM_CN_Signalling_Flag_Ind>	<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
<NSLPI>	<p>integer type; indicates the NAS signaling priority requested for this PDP context</p> <ul style="list-style-type: none"> 0 indicates that this PDP context is to be activated with the

	<p>value for the low priority indicator configured in the MT.</p> <p>1 indicates that this PDP context is to be activated with the value for the low priority indicator set to "MS is not configured for NAS signaling low priority"</p>
<securePCO>	<p>integer type; specifies if security protected transmission of PCO is requested or not</p> <p>0 Security protected transmission of PCO is not requested</p> <p>1 Security protected transmission of PCO is requested (Not support)</p>
<IPv4_MTU_discovery>	<p>Integer type; influences how the MT/TA requests to get the IPv4 MTU size</p> <p>0 Preference of IPv4 MTU size discovery not influenced by +CGDCONT</p> <p>1 Preference of IPv4 MTU size discovery through NAS signalling</p>
<Local_Addr_Ind>	<p>integer type; indicates to the network whether or not the MS supports local IP address in TFTs</p> <p>0 Indicates that the MS does not support local IP address in TFTs</p> <p>1 Indicates that the MS supports local IP address in TFTs (Not support)</p>

Examples

AT+CGDCONT=?

```
+CGDCONT: (1-15),"IP",,,,,(0),(0,2),(0),(0),(0,1),(0),(0,1),(0)
+CGDCONT: (1-15),"IPV6",,,,,(0),(0,2),(0),(0),(0,1),(0),(0),(0)
+CGDCONT: (1-15),"IPV4V6",,,,,(0),(0,2),(0),(0),(0,1),(0),(0,1),(0)
+CGDCONT: (1-15),"Non-IP",,,,,(0),(0,2),(0),(0),(0,1),(0),(0),(0),(0,1)
```

OK

AT+CGDCONT?

```
+CGDCONT: 1,"IP", ""
```

OK

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

OK

AT+CGDCONT

OK

5.2.5 AT+CGDSCONT Define Secondary PDP Context

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

AT+CGDSCONT Define Secondary PDP Context

<p>Test Command AT+CGDSCONT=?</p>	<p>Response 1) +CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts) OK 2) ERROR</p>
<p>Read Command AT+CGDSCONT?</p>	<p>Response 1) +CGDSCONT: [<cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind> nd> [<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<IM_CN_Signalling_Flag_Ind> d> [.]]] OK 2) ERROR 3) +CME ERROR: <err></p>
<p>Write Command AT+CGDSCONT=<cid>[,<p_cid>,<d_comp>,<h_comp>][,<IM_CN_Signalling_Flag_Ind>]]]</p>	<p>Response 1) OK 2) ERROR 3) +CME ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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
-------	---

	<p>other PDP context-related commands. The range of permitted values (minimum value=1) is returned by the test form of the command.</p> <p>NOTE: The <cid>s for network-initiated PDP contexts have values outside the ranges activated by the +CGACT.</p>
<p_cid>	<p>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.</p>
<d_comp>	<p>a numeric parameter that controls PDP data compression (applicable for SDCPOnly)(refer 3GPP TS 44.065 [61])</p> <ul style="list-style-type: none"> 0 off 1 on (manufacturer preferred compression) 2 V.42bis <p>Other values are reserved.</p>
<h_comp>	<p>a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62])</p> <ul style="list-style-type: none"> 0 off 1 RFC1144 <p>Other values are reserved.</p>
<IM_CN_Signalling_Flag_In d>	<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+CGDSCONT=?
+CGDSCONT: (1-15),(1-15)
```

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

```
OK
AT+CGDSCONT?
+CGDSCONT: 2,1,,0
```

```
OK
```

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

	<p>(ipv6)>,<direction> [<CR><LF>+CGTFT: <cid>,<packet filter identifier>,<evaluation precedence index>,<remote address and subnet mask>,<protocol number (ipv4) / next header (ipv6)>,<local port range>,<remote 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>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	<p>Response OK</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<cid>	a numeric parameter which specifies a particular PDP context definition (see the AT+CGDCONT and AT+CGDSCONT commands).
<PDP_type>	(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6
<packet filter identifier>	a numeric parameter, value range from 1 to 16.
<evaluation precedence>	a numeric parameter. The value range is from 0 to 255.

OK

NOTE

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

5.2.7 AT+CGDATA Enter data state

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

AT+CGDATA Enter data state

Test Command AT+CGDATA=?	Response 1) +CGDATA: (list of supported <L2P>s) OK 2) ERROR
Write Command AT+CGDATA=[<L2P>],[<cid>]]	Response 1) CONNECT 2) NO CARRIER 3) OK 4) ERROR 5) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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. M-PT Eigencomm specified protocol – PDP Type, such as IP/IPV6/IPV4V6/Non-IP
<cid>	A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1...15

Examples

```
AT+CGDATA=?
+CGDATA: ("M-PT")

OK
AT+CGDATA="M-PT",1
OK
```

NOTE

- 1) This AT command is not fully followed the 3GPP 27.007, execution command just trigger MT to activate a PDP context, just same as: +CGACT=1,<cid>.
- 2) If PDP activation success, MT issues the result code: OK, not: CONNECT, as not support V.250 online data state now.

5.2.8 AT+CGPADDR Show PDP address

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

AT+CGPADDR Show PDP address

Test Command AT+CGPADDR=?	Response 1) [+CGPADDR: (list of defined <cid>s)] OK 2) ERROR
Write Command AT+CGPADDR=<cid>	Response 1) +CGPADDR: <cid>,<PDP_addr> OK 2)

	<p>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></p> <p>OK 3)</p> <p>ERROR</p>
<p>Execution Command AT+CGPADDR</p>	<p>Response 1) [+CGPADDR: <cid>,<PDP_addr>] +CGPADDR: <cid>,<PDP_addr>[..]</p> <p>OK 2) SIM card supports IPV4V6 type and the PDP_type of the command "at+cgdcont" defined is ipv4v6: [+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>] +CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>[..]</p> <p>OK 3) ERROR 4) +CME ERROR: <err></p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>
<p>Max Response Time</p>	<p>5000ms</p>
<p>Reference</p>	<p>3GPP TS 27.007</p>

Defined Values

<p><cid></p>	<p>A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. 1...15</p>
<p><PDP_addr></p>	<p>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.</p>
<p><PDP_addr_IPV4></p>	<p>A string parameter that identifies the MT in the address space applicable to the PDP.</p>
<p><PDP_addr_IPV6></p>	<p>A string parameter that identifies the MT in the address space applicable to the PDP when the sim_card supports ipv6. The pdp type</p>

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

5.2.9 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 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

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

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

AT+CGEREP GPRS event reporting

Test Command AT+CGEREP=?	Response 1) +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) OK 2) ERROR
Read Command AT+CGEREP?	Response 1) +CGEREP: <mode>,<bfr> OK

	2) ERROR
Write Command AT+CGEREP=<mode>[,<bfr>]	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Execution Command AT+CGEREP	Response 1)Set default value (<mode>=0,<bfr>=0): OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<mode>	0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE.
<bfr>	0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 ; Only it now

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>]	<p>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.</p> <p><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.</p> <ul style="list-style-type: none"> 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>]	<p>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.</p> <p><reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This</p>
--	---

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.
- 4 CI_PS_PDP_INVALID_REASON

<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.

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

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

<event_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.

- 0 Informational event
- 1 Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.

+CGEV: ME ACT
<p_cid>,<cid>,<event_type>
[,<WLAN_Offload>]

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

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

<p>+CGEV: NW DEACT <PDP_type>,<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_type>,<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 <cid>[,<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 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.</p>

NOTE

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

<p>+CGEV: ME PDN DEACT <cid></p>	<p>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.</p>
---	---

NOTE

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

<p>+CGEV: NW DEACT <p_cid>,<cid>,<event_type> [,<WLAN_Offload>]</p>	<p>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.</p>
--	--

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>]

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>,<event_type>, and <WLAN_Offload> are defined above.

<change_reason>: integer type; a bitmap that indicates what kind of change occurred. The <change_reason> value is determined by summing all the applicable bits. For Examples if both the values of QoS changed (Bit 2)and <WLAN_Offload> changed (Bit 3)have changed, then the <change_reason> value is 6.

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>]

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

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

+CGEV: REJECT
<PDP_type>,<PDP_addr>

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.

NOTE

This event is not applicable for EPS.

+CGEV: NW REACT
<PDP_type>,<PDP_addr>[,<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters <PDP_type>,<PDP_addr> and <cid> are found in command +CGDCONT.

NOTE

This event is not applicable for EPS.

Examples

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

OK

AT+CGEREP?

+CGEREP: 0,0

OK

AT+CGEREP=1

OK

AT+CGEREP

OK

5.2.10 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

Response
1)
+CGAUTH: (range of supported **<cid>s**),(list of supported **<auth_type> s**),(range of supported **<user>s**),(range of supported **<password>s**)

Test Command

AT+CGAUTH=?

OK

2)

ERROR

3)

+CME ERROR: <err>

Read Command

AT+CGAUTH?

Response

1)

+CGAUTH: [**<cid>**,**<auth_type>**],[**<user>**,**<passwd>**]]

...

OK

2)

ERROR

3)

+CME ERROR: <err>

Write Command

**AT+CGAUTH=<cid>[,<auth_t
ype>[,<passwd>[,<user>]]]**

Response

1)

OK

2)

ERROR

3)

	+CME ERROR: <err>
Execution Command AT+CGAUTH	Response 1) OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

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

Examples

AT+CGAUTH=?

+CGAUTH: (1-15),(0-2),(64),(64)

OK

AT+CGAUTH?

+CGAUTH: 1,0 ,"" ,""

OK

AT+CGAUTH=1,0

OK

AT+CGAUTH

OK

5.2.11 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),(1-5),(4-188),(1000-10000),(10000-100000),(1 6-255) OK 2) ERROR
Write Command AT+CPING=<dest_addr>,<de st_addr_type>[,<num_pings >[,<data_packet_size>[,<inte rval_time>[,<wait_time>[,<T TL>]]]]]	Response 1) OK If ping's result_type=1 +CPING: <result_type>,<resolved_ip_addr>,<data_packet_size>,<rtt>,<TT L> 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	5000ms
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 (1-5) is to be sent. The default value is 4.
<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. A 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_recvd>	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),(1-5),(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

```

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+CSIMSLEEP	Set UE to Allow SIM Card Sleep for Power Consumption
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	5000ms
Reference	Vendor

Defined Values

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

Examples

AT+CICCID

+ICCID: 89860318760238610932

OK

AT+CICCID=?

OK

6.2.2 AT+CPIN Enter PIN

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

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

AT+CPIN Enter PIN

Test Command	Response
AT+CPIN=?	OK
Read Command	Response
AT+CPIN?	1) +CPIN: <code>

	<p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p>
<p>Write Command</p> <p>AT+CPIN=<pin>[,<newpin>]</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	AUTO_SAVE_REBOOT
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

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

Examples

```

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

OK
AT+CPIN=1234
OK

```

6.2.3 AT+CLCK Facility lock

Execute command is used to lock, unlock or interrogate a MT or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2) the response line for 'not active' case (<status>=0) should be returned only if service is not active for any <class>. This command should be abortable when network facilities are set or interrogated. Test command returns facility values supported as a compound value.

AT+CLCK Facility lock	
Test Command AT+CLCK=?	Response +CLCK: (list of supported <fac>s) OK
Write Command AT+CLCK=<fac>,<mode>[,<passwd>]	Response 1) OK 2) When <mode>=2 and command successful: +CLCK: <status>[,<class1>[+CLCK: <status>,<class2> [.]] OK 3) ERROR 4) +CME ERROR: <err>
Parameter Saving Mode	AUTO_SAVE_REBOOT
Max Response Time	5000ms
Reference	3GPP TS 27.007

Defined Values

<fac>	"SC" SIM (lock SIM/UICC card installed in the currently selected cardslot) (SIM/UICC asks password in MT power-up and when this lock command issued)
<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

Examples

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

```
+CLCK: 0
```

```
OK
```

```
AT+CLCK=?
```

```
+CLCK:("SC")
```

```
OK
```

6.2.4 AT+CPWD Change password

Command sets a new password for the facility lock function defined by command Facility Lock +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	5000ms
Reference	3GPP TS 27.007

Defined Values

<fac>	Refer Facility Lock +CLCK for other values: "SC" SIM (lock SIM/UICC card installed in the currently selected card slot) (SIM/UICC asks password in MT power-up and when this lock command issued)
<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: ("SC",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> 2) OK 3) ERROR

Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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.

The SIM sleep (power off) shall be disabled by AT+CSIMSLEEP=0 (refer to 6.2.8) before enter AT+CSIM.

AT+CSIM Generic SIM access

Test Command	Response
AT+CSIM=?	OK
Write Command	Response
AT+CSIM=<length>,<comma<br b="" nd><=""/>	1) +CSIM: <length>,<response>

	OK 2) ERROR 3) +CME ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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. The SIM sleep (power off) shall be disabled by AT+CSIMSLEEP=0 (refer to 6.2.8) before enter AT+CRSM.

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>	Command passed on by the MT to the SIM: 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 203 RETRIEVE DATA 219 SET DATA
<fileID>	Identifier for an elementary data file on SIM, if used by <command>. The following list the fileID hex value, user needs to convert them to decimal. EFs under MF 0x2FE2 ICCID 0x2F05 Extended Language Preferences 0x2F00 EF DIR 0x2F06 Access Rule Reference EFs under USIM ADF 0x6F05 Language Indication 0x6F07 IMSI 0x6F08 Cipherring and Integrity keys 0x6F09 C and I keys for pkt switched domain

0x6F60	User controlled PLMN selector w/Acc Tech
0x6F30	User controlled PLMN selector
0x6F31	HPLMN search period
0x6F37	ACM maximum value
0x6F38	USIM Service table
0x6F39	Accumulated Call meter
0x6F3E	Group Identifier Level
0x6F3F	Group Identifier Level 2
0x6F46	Service Provider Name
0x6F41	Price Per Unit and Currency table
0x6F45	Cell Bcast Msg identifier selection
0x6F78	Access control class
0x6F7B	Forbidden PLMNs
0x6F7E	Location information
0x6FAD	Administrative data
0x6F48	Cell Bcast msg id for data download
0x6FB7	Emergency call codes
0x6F50	Cell bcast msg id range selection
0x6F73	Packet switched location information
0x6F3B	Fixed dialling numbers
0x6F3C	Short messages
0x6F40	MSISDN
0x6F42	SMS parameters
0x6F43	SMS Status
0x6F49	Service dialling numbers
0x6F4B	Extension 2
0x6F4C	Extension 3
0x6F47	SMS reports
0x6F80	Incoming call information
0x6F81	Outgoing call information
0x6F82	Incoming call timer
0x6F83	Outgoing call timer
0x6F4E	Extension 5
0x6F4F	Capability Config Parameters 2
0x6FB5	Enh Multi Level Precedence and Pri
0x6FB6	Automatic answer for eMLPP service
0x6FC2	Group identity
0x6FC3	Key for hidden phonebook entries
0x6F4D	Barred dialling numbers
0x6F55	Extension 4
0x6F58	Comparison Method information
0x6F56	Enabled services table
0x6F57	Access Point Name Control List
0x6F2C	De-personalization Control Keys
0x6F32	Co-operative network list
0x6F5B	Hyperframe number

0x6F5C	Maximum value of Hyperframe number
0x6F61	OPLMN selector with access tech
0x6F5D	OPLMN selector
0x6F62	HPLMN selector with access technology
0x6F06	Access Rule reference
0x6F65	RPLMN last used access tech
0x6FC4	Network Parameters
0x6F11	CPHS: Voice Mail Waiting Indicator
0x6F12	CPHS: Service String Table
0x6F13	CPHS: Call Forwarding Flag
0x6F14	CPHS: Operator Name String
0x6F15	CPHS: Customer Service Profile
0x6F16	CPHS: CPHS Information
0x6F17	CPHS: Mailbox Number
0x6FC5	PLMN Network Name
0x6FC6	Operator PLMN List
0x6F9F	Dynamic Flags Status
0x6F92	Dynamic2 Flag Setting
0x6F98	Customer Service Profile Line2
0x6F9B	EF PARAMS - Welcome Message
0x4F30	Phone book reference file
0x4F22	Phone book synchronization center
0x4F23	Change counter
0x4F24	Previous Unique Identifier
0x4F20	GSM ciphering key Kc
0x4F52	GPRS ciphering key
0x4F63	CPBCCH information
0x4F64	Investigation scan
0x4F40	MExE Service table
0x4F41	Operator Root Public Key
0x4F42	Administrator Root Public Key
0x4F43	Third party Root public key
0x6FC7	Mail Box Dialing Number
0x6FC8	Extension 6
0x6FC9	Mailbox Identifier
0x6FCA	Message Waiting Indication Status
0x6FCD	Service Provider Display Information
0x6FD2	UIM_USIM_SPT_TABLE
0x6FD9	Equivalent HPLMN
0x6FCB	Call Forwarding Indicator Status
0x6FD6	GBA Bootstrapping parameters
0x6FDA	GBA NAF List
0x6FD7	MBMS Service Key
0x6FD8	MBMS User Key
0x6FCE	MMS Notification
0x6FD0	MMS Issuer connectivity parameters

	<p>0x6FD1 MMS User Preferences</p> <p>0x6FD2 MMS User connectivity parameters</p> <p>0x6FCF Extension 8</p> <p>0x5031 Object Directory File</p> <p>0x5032 Token Information File</p> <p>0x5033 Unused space Information File EFs under Telecom DF</p> <p>0x6F3A Abbreviated Dialing Numbers</p> <p>0x6F3B Fixed dialling numbers</p> <p>0x6F3C Short messages</p> <p>0x6F3D Capability Configuration Parameters</p> <p>0x6F4F Extended CCP</p> <p>0x6F40 MSISDN</p> <p>0x6F42 SMS parameters</p> <p>0x6F43 SMS Status</p> <p>0x6F44 Last number dialled</p> <p>0x6F49 Service Dialling numbers</p> <p>0x6F4A Extension 1</p> <p>0x6F4B Extension 2</p> <p>0x6F4C Extension 3</p> <p>0x6F4D Barred Dialing Numbers</p> <p>0x6F4E Extension 4</p> <p>0x6F47 SMS reports</p> <p>0x6F58 Comparison Method Information</p> <p>0x6F54 Setup Menu elements</p> <p>0x6F06 Access Rule reference</p> <p>0x4F20 Image</p> <p>0x4F30 Phone book reference file</p> <p>0x4F22 Phone book synchronization center</p> <p>0x4F23 Change counter</p> <p>0x4F24 Previous Unique Identifier</p>
<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+CSIMSLEEP Set UE to Allow SIM Card Sleep for Power Consumption

The write command set UE to allow SIM card sleep (power off SIM) or not (power on SIM) for **AT+CSIM** and **AT+CRSM,AT+CAMM,AT+CACM**. Must shall set SIM sleep not allowed (power on SIM) before use **AT+CSIM** or **AT+CRSM ,AT+CAMM,AT+CACM**, then set SIM sleep allowed (power off SIM) to save power after finish all commands of **AT+CSIM** or **AT+CRSM ,AT+CAMM,AT+CACM**.

The read command return current setting of each parameters.

The test command returns values supported as a compound value.

AT+CSIMSLEEP Set UE to Allow SIM Card Sleep for Power Consumption

Test Command AT+CSIMSLEEP=?	Response +CSIMSLEEP: (0,1) OK
Read Command AT+CSIMSLEEP?	Response +CSIMSLEEP: <mode> OK
Write Command AT+CSIMSLEEP=<mode>	Response OK or +CME ERROR: <err> or ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	0 Not allowed SIM sleep
	1 Allowed SIM sleep

Examples

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

OK
AT+CSIMSLEEP=0
OK
```

6.2.9 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>
Parameter Saving Mode	OK
	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

6.2.10 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

6.2.11 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	5000ms
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

6.2.12 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	5000ms
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
```

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7 AT Commands for SMS

7.1 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+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

Command	Description	Supported Modules
AT+CSCB=<mode>,<mi ds>,<dcss>	Parameters are not allowed to be omitted	Only CAT1 Modules
AT+CMGS AT+CMGW	Allow deleting input SMS data in data mode	Only CAT1 Modules
AT+CMGSEX	No SMS send URC report, just report a OK before last SMS input.	Only CAT1 Modules

7.2 Detailed Description of AT Commands for SMS

7.2.1 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) ERROR 3) +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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>	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
```

7.2.2 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>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.005

Defined Values

<mem1>	String type, memory from which messages are read and deleted (commands List Messages AT+CMGL, Read Message AT+CMGR and Delete Message AT+CMGD). "ME" FLASH message storage "SM" SIM message storage
<mem2>	String type, memory to which writing and sending operations are made (commands Send Message from Storage AT+CMSS and Write Message to Memory AT+CMGW). "ME" FLASH message storage "SM" SIM message storage
<mem3>	String type, memory to which received SMS is preferred to be stored (unless forwarded directly to TE; refer command New Message Indications AT+CNMI). "ME" FLASH message storage "SM" SIM message storage
<bm>	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, 10,"ME", 0, 10,"ME", 0, 10

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

OK
AT+CPMS
+CPMS: 3,50,3,50,3,50

OK

7.2.3 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
 3)
+CMS ERROR: <err>

Execution Command

AT+CMGF

Response

1)
Set default value (<mode>=0):

OK

2)

ERROR

Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.005

Defined Values

<mode>	0 PDU mode 1 Text mode
--------	---------------------------

Examples

AT+CMGF?

+CMGF: 0

OK

AT+CMGF=?

+CMGF: (0-1)

OK

AT+CMGF=1

OK

AT+CMGF

OK

7.2.4 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>
Write Command AT+CSCA=<sca>[,<tosca>]	Response 1) OK 2) ERROR

	OK 2) ERROR 3) +CMS ERROR: <err>
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
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
    
```

7.2.5 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	Response
AT+CSCB=?	1) +CSCB: (range of supported <mode>s)

	<p>OK</p> <p>2)</p> <p>ERROR</p>
<p>Read Command</p> <p>AT+CSCB?</p>	<p>Response</p> <p>1)</p> <p>+CSCB: <mode>,<mids>,<dcss></p>
	<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	AUTO_SAVE
Max Response Time	5000ms
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.

NOTE

The Read command for SIM76XX series return a list of available parameters <mids> and <dcss> with <mode> 0. If no parameters are available, return <mode> 1.

Examples

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

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

Examples

```
AT+CSMP=17,23,0,244
```

```
OK
```

```
AT+CSMP?
```

```
+CSMP: 17,23,0,244
```

```
OK
```

```
AT+CSMP=?
```

```
OK
```

7.2.7 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 3) +CMS ERROR: <err>

Execution Command AT+CSDH	Set default value (<show>=0): 1) OK 2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	3GPP TS 27.005

Defined Values

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

7.2.8 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	5000ms
Reference	3GPP TS 27.005

Defined Values

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

Examples

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

OK

+CMT: "1380022xxxx", "", "02/04/03,11:06:38+32" // receive new short message

Testing

AT+CNMA

//send ACK to the network

OK

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;

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

<+CDS> for <ds>=1.

7.2.9 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	5000ms
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 message)) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length><CR> <LF><data> (text mode enabled, about parameters in italics, refer command Show Text Mode Parameters AT+CSDH).</p> <p>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:</p> <p>0 No CBM indications are routed to the TE.</p> <p>1 If CBM is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CBMI: <mem3>,<index>.</p> <p>2 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data></p>

	(text mode enabled)
<ds>	<p>0 No SMS-STATUS-REPORTs are routed to the TE.</p> <p>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)</p> <p>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>0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 to 2 is entered (OK response shall be given before flushing the codes).</p> <p>1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1 to 2 is entered.</p>

Examples

AT+CNMI?

+CNMI: 2,1,0,0,0

OK

AT+CNMI=?

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

OK

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

OK

AT+CNMI

OK

7.2.10 AT+CMGL List SMS messages from preferred store

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

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

AT+CMGL List SMS messages from preferred store

Test Command

AT+CMGL=?

Response

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

OK

Response

1)If text mode (AT+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERs:

+CMGL:

<index>,<stat>,<oa>/<da>,<[alpha]>,<[scts]>,<[tooa]/<[toda]>,<[length]><CR><LF><data>[

+CMGL:

<index>,<stat>,<oa>/<da>,<[alpha]>,<[scts]>,<[tooa]/<[toda]>,<[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]>[

+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>[

+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>

<data>[

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

<data>[..]]

OK

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

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

<pdu>[

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

<pdu>

[...]]

Write Command

AT+CMGL[=<stat>]

	OK 6) +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	30s
Reference	3GPP TS 27.005

Defined Values

<stat>	<p>1. Text Mode: "REC UNREAD" received unread message (i.e. new message) "REC READ" received read message "STO UNSENT" stored unsent message "STO SENT" stored sent message "ALL" all messages</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 zero.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toa>.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <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>).
<toa>	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 <dc> 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)) 2. If <dc> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dc> indicates that GSM 7 bit default alphabet is used: <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 the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. If <dc> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers.
<fo>	Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters) are converted to characters of the currently selected TE character set (refer to command AT+CSCS); type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time GSM 03.40 TP-Discharge-Time in time-string format: "yy/MM/dd,hh:mm:ss+zz", where characters indicate year

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

Examples

```
AT+CMGL=?
```

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

```
OK
```

```
AT+CMGL="ALL"
```

```
+CMGL: 1,"STO UNSENT","+10011",,,145,4
```

```
"Hello World"
```

```
OK
```

7.2.11 AT+CMGR Read message

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

AT+CMGR Read message

Test Command

AT+CMGR=?

Response

OK

Response

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

+CMGR:

<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcscs>,<sca>,<tosca>,<length>]

<data>

OK

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

+CMGR:

<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcscs>,[<vp>],<sca>,<tosca>,<length>]

<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>,<dcscs>,<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>

Write Command

AT+CMGR=<index>

Parameter Saving Mode

NO_SAVE

Max Response Time	5000ms
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 zero.
<stat>	<p>1. Text Mode:</p> <p>"REC UNREAD" received unread message (i.e. new message)</p> <p>"REC READ" received read message</p> <p>"STO UNSENT" stored unsent message</p> <p>"STO SENT" stored sent message</p> <p>2. PDU Mode:</p> <p>0 received unread message (i.e. new message)</p> <p>1 received read message</p> <p>2 stored unsent message</p> <p>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 <toa>.
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set AT+CSCS.
<scts>	TP-Service-Centre-Time-Stamp in time-string format (refer <dt>).
<toa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toa>).
<fo>	Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49.
<pid>	Protocol Identifier GSM 03.40 TP-Protocol-Identifier in integer format 0...255
<dc>	Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.
<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>	<p>In the case of SMS: TP-User-Data in text mode responses; format:</p> <ol style="list-style-type: none"> 1. If <dc> 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)) 2. If <dc> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dc> indicates that GSM 7 bit default alphabet is used: <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 the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. If <dc> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers.
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.
<vp>	Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default 167)or in time-string format (refer <dt>).
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<ra>	Recipient Address GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters)are converted to characters of the currently selected TE character

	set(refer to command AT+CSCS);type of address given by <tora>
<tora>	Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>)
<dt>	Discharge Time GSM 03.40 TP-Discharge-Time in time-string format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone.
<st>	Status GSM 03.40 TP-Status in integer format 0...255
<ct>	Command Type GSM 03.40 TP-Command-Type in integer format 0...255
<mn>	Message Number GSM 03.40 TP-Message-Number in integer format
<sn>	Serial Number GSM 03.41 CBM Serial Number in integer format
<mid>	Message Identifier GSM 03.41 CBM Message Identifier in integer format
<page>	Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format
<pages>	Page parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format
<pdu>	In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (eg. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Examples

AT+CMGR=?

OK

AT+CMGR=1

+CMGR: "STO UNSENT", "+10011",,145,17,0,0,167,"+8613800100500",145,11
"Hello World"

OK

7.2.12 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) 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>	Response 1)If sending successfully: If text mode(AT+CMGF=1) +CMGS: <mr>[,<scts>] OK If PDU mode(AT+CMGF=0) +CMGS: <mr>[,<ackpdu>] OK 2)If cancel sending: +CMS ERROR: <err> 3)If sending fails ERROR 4)If sending fails: +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
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.
<scts>	The sending time of the SMS.
<ackpdu>	RP-User-Data element of RP-ACK PDU.

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.

7.2.13 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	Response
AT+CMSS=?	OK
Write Command AT+CMSS=<index>[,<da>[,<toa>]]	Response 1)If text mode(AT+CMGF=1) +CMSS: <mr>[,<scts>] OK If PDU mode(AT+CMGF=0) +CMSS: <mr>[,<ackpdu>] OK 2) ERROR 3)If sending fails: +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms

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 zero.
<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>.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.
<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.
<scts>	The sending time of the SMS.
<ackpdu>	RP-User-Data element of RP-ACK PDU.

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.

7.2.14 AT+CMGW Write message to memory

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

AT+CMGW Write message to memory

Test Command AT+CMGW=?	Response OK
Write Command If text mode(AT+CMGF=1) AT+CMGW[=<oa>/<da>[,<tooa>/<toda>[,<stat>]]]	Response 1)If write successfully: +CMGW: <index>
Text is entered. <CTRL-Z/ESC>	OK
If PDU mode(AT+CMGF=0): AT+CMGW=<length>[,<stat>]	2)If write fails: ERROR
PDU is entered. <CTRL-Z/ESC>	3)If write fails: +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
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 zero.
<oa>	Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <tooa>.
<tooa>	TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>).
<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.
<length>	Integer type value indicating in the text mode (AT+CMGF=1)the length of the message body <data> > (or <cdata>)in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length).
<stat>	1. Text Mode: "REC UNREAD" received unread message (i.e. new message)

"REC READ" received read message
 "STO UNSENT" stored unsent message
 "STO SENT" stored sent message
 2. PDU Mode:
 0 received unread message (i.e. new message)
 1 received read message
 2 stored unsent message
 3 stored sent message

Examples

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

NOTE

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

7.2.15 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	Response
AT+CMGD=?	+CMGD: (list of supported <index>s)[,(list 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	20s
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 zero.
<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 unsend mobile originated messages untouched. 3 Delete all read messages from preferred message storage, sent and unsend mobile originated messages leaving unread messages untouched. 4 Delete all messages from preferred message storage including unread messages.

Examples

```
AT+CMGD=?
+CMGD: (0-253),(0-4)
```

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

NOTE

If set <delflag>=1, 2, 3 or 4, <index> is omitted, such as AT+CMGD=,1.

7.2.16 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	5000ms
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 zero.
---------	--

Examples

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

7.2.17 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 +CMVP: (list of supported <vp>s) 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	AUTO_SAVE
Max Response Time	5000ms
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

```

7.2.18 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>,<dcsc>,<sca>,<tosca>,<length>]
<data>

OK

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

+CMGRD:

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

Write Command

AT+CMGRD=<index>

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 SMS-COMMAND:

+CMGRD:

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

OK

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

+CMGRD: <stat>,<sn>,<mid>,<dcsc>,<page>,<pages>

<data>

	<p>OK</p> <p>6) If PDU mode(AT+CMGF=0) and command successful:</p> <p>+CMGRD: <stat>,[<alpha>],<length></p> <p><pdu></p>
	<p>OK</p> <p>7)</p> <p>ERROR</p> <p>8)</p> <p>+CMS ERROR: <err></p>
Parameter Saving Mode	NO_SAVE
Max Response Time	20s
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

7.2.19 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	Response
AT+CMGSEX=?	OK

Write Command If text mode(AT+CMGF=1): AT+CMGSEX=<da>[,<toda>][,<mr>,<msg_total >,<msg_seg>] Text is entered. <CTRL-Z/ESC>	Response 1) +CMGSEX: <mr> OK 2) ERROR 3) +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
Reference	3GPP TS 27.005

Defined Values

<da>	Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.
<toda>	TP-Destination-Address, Type-of-Address octet in integer format. (When first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format. The range of value is from 0 to 255.
<msg_seg>	The segment number for long sms
<msg_total>	The segment number for long sms, max value is 255.

Examples

AT+CMGSEX=?

OK //TEXT MODE

AT+CMGSEX="13012832788",129,190,2,1

> ABCD<ctrl-Z/ESC>

+CMGSEX: 52

OK

AT+CMGSEX="13012832788",129,190,2,2 //TEXT MODE

> EFGH<ctrl-Z/ESC>

+CMGSEX: 53

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. If there is only the <da> (<today>) parameter, it is treated as single SMS.

7.2.20 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) [+CMSSEX: <mr>[,<mr>[,...]]] 2) OK 3) If sending fails: ERROR [+CMSSEX: <mr>[,<mr>[,...]]] +CMS ERROR: <err>
Parameter Saving Mode	NO_SAVE
Max Response Time	60s
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 zero.
<mr>	Message Reference GSM 03.40 TP-Message-Reference in integer format.

Examples

AT+CMSSEX=?

OK

AT+CMSSEX=1,2

+CMSSEX: 239,240

OK

AT+CMSSEX=1,2

+CMSSEX: 241

+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.

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8 AT Commands for Serial Interface

8.1 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

8.2 Detailed Description of AT Commands for Serial Interface

8.2.1 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	5000ms

Reference -

Defined Values

<value>	<p>0 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

8.2.2 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	Response
AT&C[<value>]	1) OK
Parameter Saving Mode	2) ERROR
Max Response Time	NO_SAVE
Reference	5000ms
	-

Defined Values

<value>	<p>0 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

8.2.3 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	5000ms
Reference	-

Defined Values

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

Examples

AT+IPR?

+IPR: 115200

OK

AT+IPR=?

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

OK

AT+IPR=115200

OK

8.2.4 AT+IPREX Set local baud rate permanently

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

AT+IPREX Set local baud rate permanently

Test Command AT+IPREX=?	Response +IPREX: (list of supported <speed>s) OK
Read Command AT+IPREX?	Response +IPREX: <speed> OK
Write Command AT+IPREX=<speed>	Response 1) OK 2) ERROR
Execution Command AT+IPREX	Response Set default value 115200: OK
Parameter Saving Mode	AUTO_SAVE
Max Response Time	5000ms
Reference	-

Defined Values

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

Examples

AT+IPREX?

+IPREX: 115200

OK

AT+IPREX=?

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

OK

AT+IPREX=115200

OK

8.2.5 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	5000ms
Reference	-

Defined Values

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

Examples

```

AT+ICF?
+ICF: 2,2

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

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

8.2.6 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=?	Response +IFC: (list of supported<DCE>s),(list of supported<DTE>s) OK
Read Command AT+IFC?	Response +IFC: <DCE>,<DTE> 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	5000ms
Reference	-

Defined Values

<DCE>	0 _none 2 RTS hardware flow control
<DTE>	0 _none 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
  
```

8.2.7 AT+CSCLK Control UART Sleep

This command is used to enable UART Sleep or always work. If set to 0, UART always work. If set to 1, ensure that DTR is pulled high and the module can go to DTR sleep. If set to 2, the module will enter RX sleep. RX wakeup directly sends data through the serial port (for example: AT) to wake up.

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	5000ms
Reference	-

Defined Values

<status>	0	off
	1	DTR sleep
	2	RX sleep

NOTE

The RX sleep is not supported by 1802S.

Examples

```

AT+CSCLK?
+CSCLK: 0

OK
AT+CSCLK=?
+CSCLK: (0-2)

OK
AT+CSCLK=1
OK
AT+CSCLK=2
OK

```


AT+CSCLK

OK

8.2.8 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	5000ms
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

8.2.9 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	5000ms
Reference	-

Defined Values

<port>	0 all ports
	1 use USB1 port to output URCs
	2 use RIL port to output URCs

- 3 use UART port to output URCs
- 4 use USB2 port1 to output URCs

Examples

AT+CATR?

+CATR: 0

OK

AT+CATR=?

+CATR: (0-4)

OK

AT+CATR=1

OK

8.2.10 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<URC_time>ms), (list of supported<SMS_time>ms) OK
Read Command AT+CFGRI?	Response +CFGRI: <status>,<URC_time>,<SMS_time> OK
Write Command AT+CFGRI=<status>[,<URC_time >[,< SMS_time >]]	Response 1) OK 2) ERROR
Execution Command AT+CFGRI	Response Set default value: OK
Parameter Saving Mode	NO_SAVE

Max Response Time	5000ms
Reference	-

Defined Values

<status>	0 off. 1 on.
<URC_time>	a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 10 to 6000, default value is 60ms.
<SMS_time>	a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 20 to 6000, default value is 120ms.

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

8.2.11 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 the number of cached URCs to 1, there is only one URC output after 10ms.

AT+CURCD Configure the delay time and number of URC

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

AT+CURCD?	+CURCD: <delay_time>,1
	OK
Write Command	Response
AT+CURCD=<delay_time>,<cache_size>	1) OK
	2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	-

Defined Values

<delay_time>	0-10000 the unit is ms
<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.

9 AT Commands for Hardware

9.1 Overview of AT Commands for Hardware

Command	Description
AT+CVALARM	Low and high voltage Alarm
AT+CVAUXS	Set state of the pin named VDD_AUX
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 critical temperature URC alarm
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

9.2 Detailed Description of AT Commands for Hardware

9.2.1 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 voltage>s)
-------------------------------------	---

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

Defined Values

<enable>	0 Close 1 Open. If 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 3200mV and 4000mV. Default value is 3200.
<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),(3200-4000),(4001-4300)
```

```
OK
```

9.2.2 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

9.2.3 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 +CADC2: (range of supported <adc>s) OK
Write Command AT+CADC2=<adc>	Response 1) +CADC2: <value> 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: 904

OK

9.2.4 AT+CMTE Control the module critical temperature URC alarm

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

AT+CMTE Control the module critical temperature URC alarm

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

Defined Values

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

Examples

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

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

```
OK
```

9.2.5 AT+CPMVT Low and high voltage 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 AT+CPMVT=?	Response +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	AUTO_SAVE
Max Response Time	-
Reference	-

Defined Values

<enable>	0 Close. 0 is the default value 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
<low voltage>	Between 3200mV and 4000mV. Default value is 3200.
<high voltage>	Between 4001mV and 4300mV. Default value is 4300.

Examples

```
AT+CPMVT=1,3400,4300
```

```
OK
```

```
AT+CPMVT?
```

```
+CPMVT: 1,3400,4300
```

```
OK
```

```
AT+CPMVT=?
```

```
+CPMVT: (0,1),(3200-4000),(4001-4300)
```

OK

9.2.6 AT+CRIIIC Read values from register of IIC device nau8810

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

AT+CRIIIC Read values from register of IIC device nau8810

Test Command AT+CRIIIC=?	Response OK
Write Command AT+CRIIIC=<addr>,<reg>,<len>	Response 1) +CRIIIC: <data> OK 2) 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+CRIIIC=34,f,2
+CRIIIC: 0xff
```

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

OK

9.2.7 AT+CWIIC Write values to register of IIC device nau8810

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

AT+CWIIC Write values to register of IIC device nau8810

Test 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

<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
```

9.2.8 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	Response
AT+CBC	1)

	+CBC: <vol>
	OK
	2)
	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

9.2.9 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

	Response
Execution Command	+CPMUTEMP: <temp>
AT+CPMUTEMP	OK
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<temp>	The Temperature value, such as 29.
---------------------	------------------------------------

Examples

```
AT+CPMUTEMP
+CPMUTEMP: 15

OK
```

9.2.10 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
Write CommandS 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: (1,3,4,5,6,7,8,9,10,11,12),(0-1)

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

OK

```

9.2.11 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: (1,3,4,5,6,7,8,9,10,11,12),(0-1)

OK
AT+CGSETV=6,0
OK
```

9.2.12 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) 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: (1,3,4,5,6,7,8,9,10,11,12)

OK

AT+CGGETV=3

+CGGETV: 3,0

OK

9.3 Unsolicited Result Codes

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

Defined Values

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

10 AT Commands for File System

10.1 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 Modules
AT+FSRENAME	D:/ directory file rename	Only Cat1 modules

10.2 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:".

NOTE: General rules for naming (both directories and files):

- a)The length of actual fully qualified names of files(C:/)can not exceed 55.
- b)The length of actual fully qualified names of directories and files(D:/)can not exceed 55.
- c)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.
- e) File names on "C:/" drive cannot begin with "." .

If the last character of names is period "."; the flash (C:/)will auto delete this character.

10.2.1 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 1)If set current directory successfully: +FSCD: <curr_path> 2)If set current directory failed: OK ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<path>	Directory for selection.
<curr_path>	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.

10.2.2 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
1)If successfully:
OK
2)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+FSL

+FSL: SUBDIRECTORIES:

SIMTech

OK

NOTE

Only support "D:".

10.2.3 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	Response
AT+FSRMDIR=?	OK
Write Command	Response
AT+FSRMDIR=<dir>	1)If successfully: OK 2)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

Only support "D:".

10.2.4 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>,<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>	0 list both subdirectories and files 1 list subdirectories only 2 list files only

Examples

AT+FSL?

```
+FSL: SUBDIRECTORIES:2,FILES:2
```

```
OK
```

AT+FSL

```
+FSL: SUBDIRECTORIES:
```

```
FirstDir
```

```
SecondDir
```

```
+FSL: FILES:
```

```
image_0.jpg
```

```
image_1.jpg
```

```
OK
```

AT+FSL=2

```
+FSL: FILES:
```

```
image_0.jpg
```

```
image_1.jpg
```

```
OK
```

10.2.5 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 AT+FSDEL=?	Response OK
Write Command AT+FSDEL=<filename>	Response 1)If successfully: OK 2)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.

10.2.6 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 1)If successfully: OK 2)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

In Cat 4 modules, "D:" does not support AT+FSRENAME.
Cannot rename files that length is 0.

10.2.7 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 1)If successfully: +FSATTRI: <file_size> 2)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
```

10.2.8 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: 1)If successfully, currently C:/: +FSMEM: C:(<total>,<used>) OK 2)If successfully, currently D:/: +FSMEM: D:(<total>,<used>) OK 3)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.

10.2.9 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

Response

1)If successfully, synchronous mode:

+FSCOPY: <percent>

[+FSCOPY: <percent>]

Write Command

**AT+FSCOPY=<file1>,<file2>[
,<sync_mode>]**

OK

2)If successfully, asynchronous mode:

OK

+FSCOPY: <percent>

[+FSCOPY: <percent>]

+FSCOPY: END

3)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.

10.2.10 AT+FSPRESET Moves the location of a file

This command is used to move an appointed file on C:/ to C:/simdir/, or from C:/simdir to C:/.

AT+FSPRESET Move the location of a file

Test Command AT+FSPRESET=?	Response OK
Write Command AT+ FSPRESET =<fileName>[,<direction>]	Response 1)If successfully OK 2)If error ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<fileName>	The file name to be moved without the path.
<direction>	The direction in which the file was moved 0 from root directory to the user directory 1 from user directory to the root directory

Examples

AT+FSPRESET=test.txt,0

//move file from root directory to the user directory

OK

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11 AT Commands for File Transmission

11.1 Overview of AT Commands for File Transmission

Command	Description
AT+CFTRANRX	Transfer a file to EFS
AT+CFTRANTX	Transfer a file from EFS to host

11.2 Detailed Description of AT Commands for File Transmission

11.2.1 AT+CFTRANRX Transfer a file to EFS

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

AT+CFTRANRX Transfer a file to EFS	
Test Command AT+CFTRANRX=?	Response +CFTRANRX: [{non-ascii}]"FILEPATH"
	OK
Write Command AT+CFTRANRX=<filepath>,<len>[,<location>]	Response 1)If successfully: > OK 2)If failed: > ERROR 3)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-

Reference

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the file data to send. Because of the system resources, The length could not set too large. The actual size could not ensure. Usually it is safer to set a smaller size.
<location>	The position offset from the start of the file.

Examples

```
AT+CFTRANRX="c:/t1.txt",10
>
OK
AT+CFTRANRX="C:/ t2.txt",10,10
>
OK
```

NOTE

- 1.The <filepath> must be a full path with the directory path, make sure that the file name does not exist under the path.
- 2.If sending file fails, increase the delay time between each 256 byte reach to 50ms, and then try to send file again.
- 3.SIM767XX Series do not support Non-ASCII characters in file path.

11.2.2 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" OK
--------------------------------------	--

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

Defined Values

<filepath>	The path of the file on EFS
<len>	The length of the following file data to output.
<location>	The beginning of the file data to output.
<size>	The length of the file data to output.

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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12 AT Commands for Internet Service

12.1 Overview of AT Commands for Internet Service

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

12.2 Detailed Description of AT Commands for Internet Service

12.2.1 AT+CHTPSERV Set HTP server information

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

AT+CHTPSERV Set HTP server information	
Test Command AT+CHTPSERV=?	Response +CHTPSERV: "ADD","HOST",(1-65535),(0-1)[,"PROXY",(1-65535)] +CHTPSERV: "DEL",(0-15) OK
Read Command AT+CHTPSERV?	Response 1) OK 2) +CHTPSERV: <index><host>,<port>,<http_version>[,<proxy>,<proxy_port>] ... +CHTPSERV: <index><host>,<port>[,<proxy>,<proxy_port>] OK
Write Command AT+CHTPSERV=<cmd>,<ho	Response 1)If successfully:

<code>st_or_idx>[,<port>,<http_version>[,<proxy>,<proxy_port>]]</code>	OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<code><cmd></code>	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
<code><host_or_idx></code>	If the <code><cmd></code> is "ADD", this field is the same as <code><host></code> , length is 1-255; If the <code><cmd></code> is "DEL", this field is the index of the HTP server item to be deleted from the list.
<code><host></code>	The HTP server address, length is 1-255.
<code><port></code>	The HTP server port, the range is (1-65535).
<code><http_version></code>	The HTTP version of the HTP server: 0 HTTP 1.0 1 HTTP 1.1
<code><proxy></code>	The proxy address, length is 1-255.
<code><proxy_port></code>	The port of the proxy, the range is (1-65535).
<code><index></code>	The HTP server index.

Examples

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

```
OK
```

12.2.2 AT+CHTPUPDATE Updating date time using HTP protocol

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

AT+CHTPUPDATE Updating date time using HTP protocol

Test Command <code>AT+CHTPUPDATE=?</code>	Response OK
Read Command <code>AT+CHTPUPDATE?</code>	Response +CHTPUPDATE: <status>

Execute Command AT+CHTPUPDATE	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>+CHTPUPDATE: <err></p> <p>2)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

12.2.3 AT+CNTP Update system time

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

AT+CNTP Update system time

Test Command AT+CNTP=?	<p>Response</p> <p>+CNTP: "HOST",(-96~96)</p> <p>OK</p>
Read Command AT+CNTP?	<p>Response</p> <p>+CNTP: <host>,<timezone></p> <p>OK</p>

Write Command AT+CNTP=<host>[,<timezone>]	Response 1)If successfully: OK 2)If failed: ERROR
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 1-255.
<timezone>	Local time zone,the range is (-96 to 96), default value is 32.

Examples

```
AT+CNTP="120.25.115.20",32
OK
AT+CNTP
OK
+CNTP: 0
```

12.3 Command Result Codes

12.3.1 Description of <err> of HTP

<err>	Description
0	Operation succeeded

1	Unknown error
2	Wrong parameter
3	Wrong date and time calculated
4	Network error

12.3.2 Description of <err> of NTP

<err>	Description
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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13 AT Commands for TCP/IP

13.1 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+CIPTIMEOUT	Set TCP/IP Timeout Value
AT+CIPCCFG	Configure Parameters of Socket
AT+SERVERSTART	Startup TCP Sever
AT+SERVERSTOP	Stop TCP Sever
AT+CDNSGIP	Query the IP Address of Given Domain Name
AT+CSOCKETPN	Set active PDP context's profile

13.2 Detailed Description of AT Commands for TCP/IP

13.2.1 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

Response

AT+NETOPEN?	+NETOPEN: <net_state>
	OK
	Response 1)If the PDP context has not been activated or the network closed abnormally, response: OK
Execute Command AT+NETOPEN	+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. 0 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 13.3.2 for details

Examples

AT+NETOPEN?
+NETOPEN: 1
OK
AT+NETOPEN
OK
+NETOPEN: 0

13.2.2 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

Test Command
AT+NETCLOSE=?

Response

OK

Response

1)If the PDP context has been activated, response:

OK

+NETCLOSE: <err>

2)If the PDP context has been activated and one connection is in non-transparent mode and transparent mode, response:

OK

CLOSED

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>

3)If the PDP context has been activated and one connection is in transparent mode when service type is TCP, response:

OK

CLOSED

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>

4)If the PDP context has been activated and one connection is in non-transparent mode when service type is UDP, response:

+CIPCLOSE: <link_num>,<err>

OK

+NETCLOSE: <err>

5)If the PDP context has not been activated, response:

+NETCLOSE: <err>

ERROR

Execute Command
AT+NETCLOSE

	6)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT)
Reference	

Defined Values

<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 13.3.2 for details
-------	--

Examples

AT+NETCLOSE

OK

+NETCLOSE: 0

13.2.3 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 4.

AT+CIOPEN Establish Connection in Multi-Socket Mode

Test Command AT+CIOPEN=?	Response +CIOPEN: (0-3),("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.

<p>Write Command TCP connection AT+CIOPEN=<link_num>,"TCP",<serverIP>,<serverPort>[,<localPort>]</p>	<p>Response 1)if PDP context has been activated successfully, response: OK</p> <p>+CIOPEN: <link_num>,<err></p> <p>2)when the <link_num> is greater than 3, response: +IP ERROR: Invalid parameter</p> <p>ERROR 3)If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or when AT+CIPMODE=1 is set, the <link_num> is greater than 0, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR 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)Others: 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 3, 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 3)Others: 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>

Reference

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-3. If AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0.
<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 0-1 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 13.3.2 for details

Examples

AT+CIOPEN=?

+CIOPEN: (0-3),("TCP","UDP")

OK

AT+CIOPEN?

+CIOPEN: 0

+CIOPEN: 1,"TCP","183.230.174.137",6031,-1

+CIOPEN: 2

+CIOPEN: 3

OK

AT+CIOPEN=0,"TCP","183.230.174.137",6031

//TCP connection

OK

```
+CIPOPEN: 0,0
AT+CIPOPEN=2,"UDP",,,6031
+CIPOPEN: 2,0 // UDP Connection

OK
```

13.2.4 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>+CIPSEND: (0-3),(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)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)If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.</p> <p>3)If the connection has not been established, abnormally closed, or parameter is incorrect, response:</p> <p>+CIPERROR: <err></p> <p>ERROR</p> <p>4)Others:</p> <p>ERROR</p>
<p>Write Command</p> <p>If service type is "TCP", send data with fixed length</p>	<p>Response</p> <p>1)If the connection identified by <link_num> has been established successfully, response:</p>

<p>AT+CIPSEND=<link_num>,<length></p>	<p>> <input data with specified length> OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength> 2)If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. 3)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR</p> <p>4)Others: ERROR</p>
<p>Write Command 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 1)If the connection identified by <link_num> has been established successfully, response: > <input data> CTRL+Z OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength> 2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p>
<p>Write Command 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 1)If the connection identified by <link_num> has been established successfully, response: > <input data with specified length> OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength> 2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR</p>

	3)Others: ERROR
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 0-3.
<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>	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. 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 13.3.2 for details

Examples

AT+CIPSEND=?

+CIPSEND: (0-3),(1-1500)

OK

AT+CIPSEND=1,5

>12345

OK

// If service type is "TCP", send data with fixed length

+CIPSEND: 1,5,5

AT+CIPSEND=3,5,"183.230.174.137",6031

// If service type is "UDP", send data with

```
>12345                                fixed length
OK

+CIPSEND: 3,5,5
```

NOTE

If you use UDP to send more than 1400 bytes of data when the server does not receive data, this may be the reason for the carrier, in this case please send no more than 1400 bytes of data.

If you use TCP to send data, the instruction can be followed by a comma just like "AT+CIPSEND=0," or "AT+CIPSEND=0,10," without an error, but it doesn't make any sense

13.2.5 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 AT+CIPRXGET=?	Response +CIPRXGET: (0-4),(0-3),(1-1500) OK
Read Command AT+CIPRXGET?	Response +CIPRXGET: <mode> OK
Write Command AT+CIPRXGET=<mode> In this case,<mode> can only be 0 or 1	Response 1)If the parameter is correct, response: OK 2)If the parameter is incorrect or other error, response: +IP ERROR: <err_info> ERROR 3)Others: ERROR

Write Command

AT+CIPRXGET=2,<link_num>[,<len>]

Retrieve data in ACSII form

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

OK

2)If the buffer is empty, response:

+IP ERROR: No data

ERROR

3)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

4)Others:

ERROR

Response

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

OK

2)If the buffer is empty, response:

+IP ERROR: No data

ERROR

3)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

4)Others:

ERROR

Response

1)If the parameter is correct, response:
+CIPRXGET: 4,<link_num>,<rest_len>

OK

2)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

3)Others

Write Command

AT+CIPRXGET=4,<link_num>

	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	8s
Reference	

Defined Values

<mode>	Integer type, sets the mode to retrieve data 0 set the way to get the network data automatically 1 set the way to get the network data manually 2 read data, the max read length is 1500 3 read data in HEX form, the max read length is 750 4 get the rest data length
<link_num>	Integer type, identifies a connection. Range is 0-3.
<len>	Integer type, the data length to be read. Not required, the default value is 1500 when <mode>=2, and 750 when <mode>=3.
<read_len>	Integer type, the length of data that has been read.
<rest_len>	Integer type, the length of data which has not been read in the buffer.
<err_info>	String type, displays the cause of occurring error, please refer to Chapter 13.3.1 for more details.

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
```

NOTE

When data is received and reported, the maximum length of <data length> is 1500 each time.

13.2.6 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: (0-3) OK
Read Command AT+CIPCLOSE?	Response +CIPCLOSE: <link0_state>,<link1_state>,<link2_state>,<link3_state> OK
Write Command AT+CIPCLOSE=<link_num>	Response 1)If service type is TCP and the connection identified by <link_num> has been established, response OK +CIPCLOSE: <link_num>,<err> 2)If service type is TCP and the access mode is transparent mode, response: OK CLOSED +CIPCLOSE: <link_num>,<err> 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>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)Others: 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 0-3.
<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 13.3.2 for details

Examples

```

AT+CIPCLOSE=?
+CIPCLOSE: (0-3)

OK
AT+CIPCLOSE?
+CIPCLOSE: 0,0,0,0

OK

```

AT+CIPCLOSE=0

OK

+CIPCLOSE: 0,0

13.2.7 AT+IPADDR Inquire Socket PDP address

AT+IPADDR is used to get active PDP address.

AT+IPADDR Inquire Socket PDP Address

Test Command AT+IPADDR=?	Response OK
Execute Command AT+IPADDR	Response 1)If PDP context has been activated successfully, response +IPADDR: <ip_address> 2) +IP ERROR: Network not opened ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 5000ms
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

13.2.8 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: 5000ms
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
```

13.2.9 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: 5000ms
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: "RCV FROM:<IP ADDRESS>:<PORT>"
---------------------	---

Examples

```

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

OK
AT+CIPSRIP?
+CIPSRIP: 1

OK
AT+CIPSRIP=0
OK
AT+CIPSRIP
OK
  
```

13.2.10 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 1)If Set default value:(<mode>=0) successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 5000ms
Reference	-

Defined Values

<mode>	Integer type, sets TCP/IP application mode 0 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.

13.2.11 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>],[Response 1)If the parameter is correct, response: OK

[<cipsend_timeout>]]]	2) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 5000ms
Reference	-

Defined Values

<netopen_timeout>	Integer type, timeout value for AT+NETOPEN. default is120000ms. Range is 3000ms-120000ms.
<cipopen_timeout>	Integer type, timeout value for AT+CIPOPEN. default is120000ms. Range is 3000ms-120000ms.
<cipsend_timeout>	Integer type, timeout value for AT+CIPSEND. default is120000ms. Range is 3000ms-120000ms.

Examples

```

AT+CIPTIMEOUT?
+CIPTIMEOUT: 120000,120000,120000

OK
AT+CIPTIMEOUT=3000,3000,3000
OK

```

13.2.12 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)
Read Command AT+CIPCCFG?	Response +CIPCCFG: <NmRetry>,<DelayTm>,<Ack>,<errMode>,<Header-Type>,<AsyncMode>,<TimeoutVal>
Write Command	Response

AT+CIPCCFG=[<NmRetry>[,<DelayTm>[,<Ack>[,<errMode>[,<HeaderType>[,<AsyncMode>[,<TimeoutVal>]]]]]]]]]]	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: 5000ms
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

13.2.13 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

<p>Test Command AT+SERVERSTART=?</p>	<p>Response +SERVERSTART: (10000-10015),(0-1)</p> <p>OK</p>
<p>Read Command AT+SERVERSTART?</p>	<p>Response 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)Others: ERROR</p>
<p>Write Command AT+SERVERSTART=<port>,<server_index>[,<backlog>]</p>	<p>Response 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)Others: ERROR</p>
<p>Parameter Saving Mode</p>	<p>NO_SAVE</p>

Max Response Time	default: 5000ms
Reference	-

Defined Values

<port>	Integer type, identifies the listening port of module when used as a TCP server. Range is 10000-10015.
<server_index>	Integer type, the TCP server index, range is 0-1.
<backlog>	Integer type, the maximum connections can be queued in listening queue. Range is 1-3. Default is 3.

Examples

AT+SERVERSTART=?

+SERVERSTART: (10000-10015),(0-1)

OK

AT+SERVERSTART?

OK

AT+SERVERSTART=10000,0

OK

13.2.14 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

Write Command AT+SERVERSTOP=<server_index>	Response 1)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: +SERVERSTOP: <server_index>,<err> ERROR 2)If the server socket is closed immediately, response: +SERVERSTOP: <server_index>,0 OK (In general, the result is shown as below.)
--	---

	3)If the server socket starts to close, response: OK +SERVERSTOP: <server_index>,<err>
	4)Others: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 5000ms
Reference	-

Defined Values

<server_index>	Integer type, the TCP server index, range is 0-1.
<err>	Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 13.3.2 for details

Examples

AT+SERVERSTOP=0

OK

+SERVERSTOP: 0,0

13.2.15 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: (range of supported <link_num>s) 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: 5000ms
Reference	-

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-3.
<sent_data_size>	Integer type, the total length of sent data
<ack_data_size>	Reserve
<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 13.3.2 for details
<err_info>	String type, displays the cause of occurring error, please refer to Chapter 3 for details.

Examples

AT+CIPACK=?

+CIPACK: (0-3)

OK

AT+CIPACK=0

+CIPACK: 10,10,5

OK

13.2.16 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 AT+CDNSGIP=?	Response OK
Write Command AT+CDNSGIP=<domain name>	Response 1)If the given domain name has related IP, response: +CDNSGIP: 1,<domain name>,<IP address>

	<p>OK</p> <p>2)If the given name has no related IP, response: +CDNSGIP: 0,<dns error code></p> <p>ERROR</p> <p>3)Others: ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	default: 6s
Reference	-

Defined Values

<domain name>	<p>String type (string should be included in quotation marks), indicates the domain name. The maximum length of domain name is 254.</p> <p>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").</p> <p>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.</p>
<IP address>	String type, indicates the IP address corresponding to the domain name.
<dns error code>	<p>Integer type, indicates the error code.</p> <p>10 DNS GENERAL ERROR</p>

Examples

AT+CDNSGIP=?

OK

AT+CDNSGIP="www.baidu.com"

+CDNSGIP: 1,"www.baidu.com","61.135.169.121"

OK

13.2.17 AT+CSOCKSETPN Set active PDP context's profile

This command sets default active PDP context's profile number and type. When we activate PDP by using AT+NETOPEN command, we need use the default profile number and type.,and the context of this profile is set by AT+CGDCONT command.

AT+CSOCKSETPN Set active PDP context's profile

Test Command AT+CSOCKSETPN=?	Response +CSOCKSETPN: 1,(1,6) OK
Read Command AT+CSOCKSETPN?	Response +CSOCKSETPN: <profile_num>,<ip_family> OK
Write Command AT+CSOCKSETPN=<profile_num>[,<ip_family>]	Response 1)If the parameter is correct, response: OK 2)If the parameter is wrong,or NETOPEN is already active, response: ERROR
Parameter Saving Mode	NO_SAVE
Maximum Response Time	default: 5000ms
Reference	-

Defined Values

<profile_num>	Packet Data Protocol context's profile number. Now only 1 is supported for this parameter value.
<ip_family>	Packet Data Protocol type 1 IPV4 6 IPV6

NOTE

This platform <profile_num> can only be set to 1.

Examples

```
AT+CSOCKSETPN=?
+CSOCKSETPN: 1,(1,6)

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

```
OK
AT+CSOCKSETPN=1,6
OK
```

13.2.18 AT+CTCPKA Conigure TCP heartbeat

This command is used to set TCP heartbeat parameters. Set this up after we activate PDP by using AT+NETOPEN command.

AT+CTCPKA Conigure TCP heartbeat

Test Command AT+CTCPKA=?	Response OK
Read Command AT+CTCPKA?	Response +CTCPKA: <keepalive>,<keepidle>,<keepcount>,<keepinterval> OK
Write Command AT+CTCPKA=<keepalive>,<keepidle>,<keepcount>,<keepinterval>	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Maximum Response Time	default: 5000ms
Reference	-

Defined Values

<keepalive >	Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism
<keepidle>	The unit is minute. If there is no data interaction within this period, the probe is performed. (1-120)
<keepcount>	Number of probe retries. If all times out, the connection is considered Invalid.(1-10)
<keepinterval>	The unit is minute. Interval for sending probe packets during probe.

Examples

```
AT+CTCPKA=1,2,5,1
OK
AT+CTCPKA?
+CTCPKA: 1,2,5,1

OK
```

13.2.19 AT+CDNSCFG Configure Domain Name Server

This command is used to configure Domain Name Server.

AT+CDNSCFG Configure Domain Name Server

Test Command AT+CDNSCFG=?	Response +CDNSCFG: ("Primary DNS"),("Secondary DNS"),type OK
Read Command AT+CDNSCFG?	Response Primary IPv4 DNS: <pri_dns>,Secondary IPv4 DNS: <pri_dns> Primary IPv6 DNS: <pri_dns>,Secondary IPv6 DNS: <pri_dns> OK
Write Command AT+CDNSCFG=<pri_dns>[,<sec_dns>][,<type>]	Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Maximum Response Time	default: 5000ms
Reference	-

Defined Values

<pri_dns>	A string parameter which indicates the IP address of the primary domain name server.
<sec_dns>	A string parameter which indicates the IP address of the secondary domain name server.
<type>	<u>0</u> Set the server for the ipv4 network 1 Set the server for the ipv6 network

Examples

AT+CDNSCFG?

Primary IPv4 DNS: 183.230.126.224,Secondary IPv4
DNS: 183.230.126.225

OK

AT+CDNSCFG=183.230.126.224,183.230.126.225,0

OK

NOTE

This platform does not support IPv6 by default. If you want to set the IPv6 DNS server, first use AT+CFUN=0 to shut down, then use AT+CGDCONT to set the APN of IPV4V6, and then use AT+CFUN=1 to start up.

13.3 Command Result Codes

13.3.1 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

13.3.2 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+CIPOPEN
12	Unknown error

13.4 Unsolicited Result Codes

URC	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>.

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14 AT Commands for HTTP(S)

14.1 Overview of AT Commands for HTTP(S)

Command	Description
AT+HTTPINIT	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

14.2 Detailed Description of AT Commands for HTTP(S)

14.2.1 AT+HTTPINIT Start HTTP Service

AT+HTTPINIT is used to start HTTP service by activating PDP context. You must execute AT+HTTPINIT before any other HTTP related operations.

AT+HTTPINIT Start HTTP Service	
Test Command AT+HTTPINIT=?	Response OK
Execute Command AT+HTTPINIT	Response 1)If start HTTP service successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-

Max Response Time	120000ms
Reference	-

Defined Values

<err>	The type of error please refer to the end of this chapter.
-------	--

Examples

```
AT+HTTPIPINIT
OK
```

14.2.2 AT+HTTPTERM Stop HTTP Service

AT+HTTPTERM is used to stop HTTP service.

AT+HTTPTERM Stop HTTP Service

Test Command	Response
AT+HTTPTERM=?	OK
Execute Command	Response
AT+HTTPTERM	1)If stop HTTP service successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Examples

```
AT+HTTPTERM
OK
```

14.2.3 AT+HTTTPARA Set HTTP Parameters value

AT+HTTTPARA 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+HTTTPARA Set HTTP Parameters value	
Test Command AT+HTTTPARA=?	Response OK
Write Command AT+HTTTPARA="URL",<url>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="CONNECTTO",<conn_timeout>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="RECVTO",<recv_timeout>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="CONTENT",<content_type>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="ACCEPT",<accept-type>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="SSLCFG",<sslcfg_id>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="USERDATA",<user_data>	Response 1)If parameter format is right: OK

	2)If parameter format is not right or other errors occur: ERROR
Write Command AT+HTTTPARA="READMODE", <readmode>	Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

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, and default is "text/plain".
<accept-type>	This is for HTTP "Accept-type" tag, String type, max length is 256, and 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 repeatedly. The limit is that the size of HTTP server response content should be shorter than 1M.Default is 0.

NOTE

When you want to use content-type mutipart/form-data to transfer data, you should set AT+HTTTPARA="CONTENT","mutipart/form-data" .And we will construct boundary header.

Examples

```
AT+HTTPPARA="URL","http://www.baidu.com"
OK
```

14.2.4 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: (0-4) OK
Write Command AT+HTTPACTION=<method>	Response 1)If parameter format is right: OK +HTTPACTION: <method>,<statuscode>,<datalen> 2)If parameter format is right but server connected unsuccessfully: OK +HTTPACTION: <method>,<errcode>,<datalen> 3)If parameter format is not right or other errors occur: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<method>	HTTP method specification: 0 GET 1 POST 2 HEAD 3 DELETE 4 PUT
<statuscode>	Please refer to the end of this chapter

<datalen>	The length of data received
-----------	-----------------------------

Examples

```
AT+HTTPACTION=?
+HTTPACTION: (0-4)
```

```
OK
AT+HTTPACTION=0
OK
```

```
+HTTPACTION: 0,200,104220
```

14.2.5 AT+HTTPHEAD Read the HTTP Header Information of Server Response

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 Response

Test Command	Response
AT+HTTPHEAD=?	OK
Execute Command	Response
AT+HTTPHEAD	1)If read the header information successfully: +HTTPHEAD: <data_len> <data> OK 2)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
```

14.2.6 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

Test Command	Response
AT+HTTPREAD=?	OK
Read Command AT+HTTPREAD?	Response 1)If check successfully: +HTTPREAD: LEN,<len>

	<p>OK</p> <p>2)If failed (no more data other error):</p> <p>ERROR</p>
	<p>Response</p> <p>1)If read the response info successfully:</p> <p>OK</p>
<p>Write Command</p> <p>AT+HTTPREAD=[<start_offset>, <byte_size>]</p>	<p>+HTTPREAD: <data_len></p> <p><data></p> <p>+HTTPREAD: 0</p> <p>If <byte_size> is bigger than the data size received, module will only return actual data size.</p> <p>2)If read failed:</p> <p>ERROR</p>
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.

When the total size of the data from server is bigger than that and 'READMODE' is 0, you should read the data quickly, or you will fail to read it.

14.2.7 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

Test Command AT+HTTPDATA=?	Response OK
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 seconds to input data.range is 10-65535

Examples

```
AT+HTTPDATA=18,1000
DOWNLOAD
Message=helloworld
OK
```

14.2.8 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

<p>Test Command AT+HTTPPOSTFILE=?</p>	<p>Response +HTTPPOSTFILE: <filename>[(1-2)[(0-4)[(0-1)]]] OK</p>
<p>Write Command AT+HTTPPOSTFILE=<filename> [,<path>,<method>,<send_header>]]]</p>	<p>Response 1)if parameter format is right and server connected successfully: a)if parameter <method> is valid: OK +HTTPPOSTFILE: <method>,<statuscode>,<content_len> b)if parameter <method> is ignored: OK 2)if parameter format is right but server connected unsuccessfully: a)if parameter <method> is valid: OK +HTTPPOSTFILE: <method>,<errcode>,0 b)if parameter <method> is ignored: OK +HTTPPOSTFILE: <errcode>,0 3)if parameter format is not right or any other error occurs:</p>

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<filename>	String type, filename. Unit: byte. The max length is 55.
<path>	The directory where the sent file saved. Numeric type, range is 1-2 1 C:/ (local storage) 2 Not supported.
<method>	HTTP method specification: 0 GET 1 POST 2 HEAD 3 DELETE 4 PUT If this value is not provided, it is same to the value described in the post file.
<send_header>	Send file as HTTP header and Body or Only as Body. Numeric type, the range is 0-1, the default is 0. 0 Send file as HTTP header and body 1 Send file as Body

Examples

```

AT+HTTPPOSTFILE=?
+HTTPPOSTFILE: <filename>[(1-2)][(0-4)][(0-1)]

OK
AT+HTTPPOSTFILE="getbaidu.txt",1
OK

+HTTPPOSTFILE: 200,14615
AT+HTTPPOSTFILE="getbaidu.txt",1,1,1
OK

+HTTPPOSTFILE: 1,200,14615
    
```

14.2.9 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. Unit: byte. The max length is 55.
<path>	The directory where the read file saved. Numeric type, range is 1-2. 1 C:/(local storage) 2 Not supported.

Examples

```
AT+HTTPREADFILE=?
+HTTPREADFILE: <filename>[, (1-2)]
```

OK

AT+HTTPREADFILE="readbaidu.dat"

OK

+HTTPREADFILE: 0

14.3 Command Result Codes

14.3.1 Description of <statuscode>

<statuscode>	Description
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

14.3.2 Description of <errcode>

<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

14.4 Unsolicited Result Codes

URC	Description
+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.

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15 AT Commands for FTP(S)

15.1 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+CFTPSSSLCFG	Set the SSL context id for FTPS session

15.2 Detailed Description of AT Commands for FTP(S)

15.2.1 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

Test Command AT+CFTPSSTART=?	Response OK
Execution Command AT+CFTPSSTART	Response 1) OK +CFTPSSTART: 0 2) OK +CFTPSSTART: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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
```

15.2.2 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

Test Command AT+CFTPSSTOP=?	Response OK
Execution Command AT+CFTPSSTOP	Response 1)

	OK
	+CFTPSSTOP: 0
	2)
	OK
	+CFTPSSTOP: <errcode>
	3)
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<errcode>	The result of stop FTP(S)service, 0 is success, others are failure. Please refer to errcode list.
-----------	---

Examples

AT+CFTPSSTOP

OK

+CFTPSSTOP: 0

15.2.3 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	Response
AT+CFTPSLOGIN=?	+CFTPSLOGIN: "ADDRESS",(1-65535),"USERNAME","PASSWORD"[(,0-3)]
	OK
Read Command	Response
AT+CFTPSLOGIN?	1) i If the status is not logged in

	<p>+CFTPSLOGIN: 0</p> <p>OK</p> <p>2) If it is logged in</p> <p>+CFTPSLOGIN: 1</p> <p>OK</p> <p>3)</p> <p>ERROR</p>
Write Command	Response
AT+CFTPSLOGIN=<host>,<port>,<username>,<password>[<server_type>]	<p>1)</p> <p>OK</p> <p>+CFTPSLOGIN: 0</p> <p>2)</p> <p>OK</p> <p>+CFTPSLOGIN: <errcode></p> <p>3)</p> <p>ERROR</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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
<server_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. 3 Implicit FTPS server.
<errcode>	The result code of the FTP/FTPS login. 0 is success. Others are failure, please refer to errcode list.

Examples

AT+CFTPSLOGIN=?

+CFTPSLOGIN:

"ADDRESS",(1-65535),"USERNAME","PASSWORD"[(0-3)]

OK

AT+CFTPSLOGIN?

+CFTPSLOGIN: 0

OK

AT+CFTPSLOGIN="serveraddr",21,"username","password",0

OK

+CFTPSLOGIN: 0

15.2.4 AT+CFTPSLOGOUT Logout a FTP(S)server

AT+CFTPSLOGOUT is used to logout a FTP(S)server, make sure you login a FTP(S)server before you execute AT+CFTPSLOGOUT command.

AT+CFTPSLOGOUT Logout a FTP(S)server

Test Command	Response
AT+CFTPSLOGOUT=?	OK
	Response
	1)
	OK
Execute Command	+CFTPSLOGOUT: <0>
AT+CFTPSLOGOUT	2)
	OK
	+CFTPSLOGOUT: <errcode>
	3)
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<errcode> The result code of the FTP/FTPS logout. 0 is success. Others are

failure, please refer to errcode list.

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.

15.2.5 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

Test Command	Response
AT+CFTPSLIST=?	OK
	Response
	1)
	OK
	+CFTPSLIST: DATA,<len>
	...
Write Command	+CFTPSLIST: 0
AT+CFTPSLIST=<dir>	2)
	OK
	+CFTPSLIST: <errcode>
	3)
	ERROR

Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.
<len>	The server All files and related information in the directory.

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
```

15.2.6 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+CFTPSMKD Create a new directory on 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
	4) + CFTPSMKD: <errcode>
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```
AT+CFTPSMKD=?
+CFTPSMKD: "DIR"
```

```
OK
AT+CFTPSMKD="test"
OK
```

```
+CFTPSMKD: 0
```

15.2.7 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	Response
AT+CFTPSRMD=?	+CFTPSRMD: "DIR"

	OK
	Response
	1)
	OK
	+CFTPSRMD: 0
	2)
	OK
Write Command	
AT+CFTPSRMD=<dir>	
	+CFTPSRMD: <errcode>
	3)
	ERROR
	4)
	+ CFTPSRMD: <errcode>
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```
AT+CFTPSRMD=?
+CFTPSRMD: "DIR"

OK
AT+CFTPSRMD="test"
OK

+CFTPSRMD: 0
```

15.2.8 AT+CFTPSCWD Change the current directory on FTP(S)server

You can use this command to change the current directory on FTP(S)server. 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 4) + CFTPSCWD: <errcode> ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```
AT+CFTPSCWD=?
+CFTPSCWD: "DIR"

OK
AT+CFTPSCWD="test"
OK

+CFTPSCWD: 0
```

15.2.9 AT+CFTPSPWD Get the current directory on FTP(S)server

This command is used to get the current directory on FTPS 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

Test Command AT+CFTPSPWD=?	Response +CFTPSPWD:
	OK
Execute Command AT+CFTPSPWD	Response 1) OK +CFTPSPWD: <dir> 2) OK +CFTPSPWD: <errcode> 3) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<dir>	The directory to be got, string type.
<errcode>	The result of create directory, 0 is success, others are failure, please refer to errcode list.

Examples

AT+CFTPSPWD

OK

+CFTPSPWD: "/"

15.2.10 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 3) ERROR 4) + CFTPSDELE: <errcode> ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```
AT+CFTPSDELE=?
+CFTPSDELE:"FILENAME"

OK
```

AT+CFTPSDELE="testfile"

OK

+CFTPSDELE: 0

15.2.11 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 4) + CFTPSGETFILE: <errcode> ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 53
<dir>	The directory to save the downloaded file. Numeric type, range is 1-2, default is 1(local storage) <u>1</u> 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 errcode list.

Examples

```
AT+CFTPSGETFILE=?
+CFTPSGETFILE: "FILEPATH"[(1-2)]

OK
AT+CFTPSGETFILE="test.txt",1
OK

+CFTPSGETFILE: 0
```

15.2.12 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"[(range of supported <dir>s),(range of supported <rest_size>s)]
	OK
Write Command AT+CFTPSPUTFILE=<filepath>[<dir>[,<rest_size>]]	Response 1) OK +CFTPSPUTFILE: 0 2) OK +CFTPSPUTFILE: <errcode> 3) ERROR 4) + CFTPSPUTFILE: <errcode>

	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
Reference	

Defined Values

<filepath>	The remote file path. String type, maximum length is 53
<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. If the file is complete, the file length is not increased. 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 errcode list.

Examples

```

AT+CFTPSPUTFILE=?
+CFTPSPUTFILE: "FILEPATH"[(1-2),(0-2147483647)]

OK
AT+CFTPSPUTFILE="test.txt",1
OK

+CFTPSPUTFILE: 0
  
```

15.2.13 AT+CFTPGET 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+CFTPGET Get a file from FTP(S)server to serial port

Test Command	Response
AT+CFTPGET=?	+CFTPGET: "FILEPATH" [<rest_size>]
	OK
Write Command	Response
AT+CFTPGET=<filepath> [<re	1)

```

st_size>]
OK

+CFTPSGET:DATA,<len>
...
+CFTPSGET:DATA,<len>
...
+CFTPSGET:0
2)
OK

+CFTPSGET: <errcode>
3)
ERROR
4)
+CFTPSGET: <errcode>

ERROR
Parameter Saving Mode      NO_SAVE
Max Response Time         5000ms
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 errcode list.
<len>	The total size of the file from the server

Examples

```

AT+CFTPSGET=?
+CFTPSGET: "FILEPATH"[,<rest_size>]

OK
AT+CFTPSGET="test.txt"
OK

+CFTPSGET: DATA,3
321
+CFTPSGET: 0

```

15.2.14 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
	Response 1)if upload file through serial port successfully: OK
	+CFTPSPUT: 0
	2)if failed before input data: ERROR
Write Command AT+CFTPSPUT=<filepath>[,<data_len>[,<rest_size>]]	+CFTPSPUT: <errcode>
	3)if failed after input data: OK
	+CFTPSPUT: <errcode>
	4) ERROR
	5) + CFTPSPUT: <errcode>
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	600000ms
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 errcode list.

Examples

```

AT+CFTPSPUT=?
+CFTPSPUT:
"FILEPATH"[,<data_len>[,<rest_size>]]

OK
AT+CFTPSPUT="test.txt",4
>
data
OK

+CFTPSPUT: 0
  
```

15.2.15 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+CFTPSSINGLEIP Set FTP(S) data socket address type

Test Command AT+CFTPSSINGLEIP=?	Response +CFTPSSINGLEIP: (0,1)
Read Command AT+CFTPSSINGLEIP?	OK +CFTPSSINGLEIP: <singleip>
Write Command AT+CFTPSSINGLEIP=<singleip> >	Response 1) OK 2) ERROR

	3) +CFTPSSINGLEIP: <singleip>
	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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
```

15.2.16 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+CFTPSSIZE Get the file size on FTP(S)server

Test Command AT+CFTPSSIZE=?	Response +CFTPSSIZE: "FILEPATH"
	OK
Write Command AT+CFTPSSIZE=<filepath>	Response 1) OK

	+CFTPSSIZE: <filesize> 2) ERROR
	+CFTPSSIZE: <errcode> 3) +CFTPSSIZE: <errcode>
	ERROR 4) ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```

AT+CFTPSSIZE=?
+CFTPSSIZE: "FILEPATH"

OK
AT+CFTPSSIZE="test"
OK

+CFTPSSIZE: 3
  
```

15.2.17 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 4) + CFTPSTYPE: <errcode> ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	5000ms
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 errcode list.

Examples

```
AT+CFTPSTYPE=?
+CFTPSTYPE: (A,I)

OK
AT+CFTPSTYPE?
+CFTPSTYPE: I
```

```
OK
AT+CFTPSTYPE=A
OK
+CFTPSTYPE: 0
```

15.2.18 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	5000ms
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
```

15.3 Command Result Codes

15.3.1 Description of <errcode>

<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.

15.4 Unsolicited Result codes

Unsolicited codes	Description
+CFTPSNOTIFY: PEER CLOSED	When client disconnect passively, URC "+CFTPSNOTIFY: PEER CLOSED" will be reported, then user need to execute AT+CFTPSLOGOUT and log in again.
+CFTPSNOTIFY:FTPS DISCONNECT	During the FTP client and FTP server is connecting,the net disconnect will report "+CFTPSNOTIFY:FTPS DISCONNECT " to URC,then user need excute

AT+CFTPSTART and login again

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16 AT Commands for MQTT(S)

16.1 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+CMQTTPUB	Publish a message to server
AT+CMQTTSUB	Subscribe a message to server
AT+CMQTTUNSUB	Unsubscribe a message to server
AT+CMQTTCFG	Configure the MQTT Context

16.2 Detailed Description of AT Commands for MQTT(S)

16.2.1 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	Response
AT+CMQTTSTART	1)If start MQTT service successfully:

	<p>OK</p> <p>+CMQTTSTART: 0</p> <p>2)If failed:</p> <p>OK</p> <p>+CMQTTSTART: <errcode></p> <p>3)If MQTT service have started successfully and you executed AT+CMQTTSTART again:</p> <p>ERROR</p>
Max Response Time	12000ms
Parameter Saving Mode	-
Reference	

Defined Values

<errcode>	The result code, please refer to Chapter 16.3
-----------	---

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.

16.2.2 AT+CMQTTSTOP Stop MQTT service

AT+CMQTTSTOP is used to stop MQTT service.

AT+CMQTTSTOP Stop MQTT service

Execute Command AT+CMQTTSTOP	Response
	1)If stop MQTT service successfully: OK
	+CMQTTSTOP: 0
	2)If failed: +CMQTTSTOP: <errcode>
	ERROR
	3)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 16.3
-----------	---

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.

16.2.3 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 1)If successfully: OK 2)If failed: +CMQTTACCQ: <client_index>,<err> ERROR 3)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 16.3

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

16.2.4 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 1)If successfully: OK 2)if MQTT not start ERROR
Write Command AT+CMQTTREL=<client_index>	Response 1)If successfully: OK 2)If failed: +CMQTTREL: <client_index>,<err> ERROR 3)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 16.3

Examples

```

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

OK
AT+CMQTTREL=0
OK
AT+CMQTTREL?
OK
    
```

16.2.5 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 (only for SSL/TLS MQTT)

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 1)If successfully: OK 2)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+CMQTTSSLCFG=?

+CMQTTSSLCFG: (0,1),(0-9)

OK

AT+CMQTTSSLCFG=0,1

OK

16.2.6 AT+CMQTTWILLTOPIC Input the topic of will message

AT+CMQTTWILLTOPIC is used to input the topic of will message.

AT+CMQTTWILLTOPIC Input the topic of will message

Test Command AT+CMQTTWILLTOPIC=?	Response +CMQTTWILLTOPIC: (0-1),(1-1024) OK
Write Command AT+CMQTTWILLTOPIC=<client_index>,<req_length>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTWILLTOPIC: <client_index>,<err> ERROR 3)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 16.3

Examples

```
AT+CMQTTWILLTOPIC=0,10
>
OK
```

16.2.7 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)
Write Command AT+CMQTTWILLMSG=<client_index>,<req_length>,<qos>	<p>Response</p> <p>1)If successfully: > <input data here> OK</p> <p>2)If failed: +CMQTTWILLMSG: <client_index>,<err></p> <p>ERROR</p> <p>3)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 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
```

16.2.8 AT+CMQTTCONNECT Connect to MQTT server

AT+CMQTTCONNECT is used to connect to a MQTT server.

AT+CMQTTCONNECT Connect to MQTT server

<p>Test Command</p> <p>AT+CMQTTCONNECT=?</p>	<p>Response</p> <p>+CMQTTCONNECT: (0-1),(9-256),(1-64800),(0-1)[,<user_name>,<pass_word>]</p> <p>OK</p>
<p>Read Command</p> <p>AT+CMQTTCONNECT?</p>	<p>Response</p> <p>+CMQTTCONNECT: 0[,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]]</p> <p>+CMQTTCONNECT: 1[,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]]</p> <p>OK</p>
<p>Write Command</p> <p>AT+CMQTTCONNECT=<client_index>,<server_addr>,<keepalive_time>,<clean_session>[,<user_name>[,<pass_word>]]</p>	<p>Response</p> <p>1)If successfully:</p> <p>OK</p> <p>+CMQTTCONNECT: <client_index>,0</p>

>]]	<p>2)If failed: OK</p> <p>+CMQTTCONNECT: <client_index>,<err></p> <p>3)If failed: ERROR</p> <p>+CMQTTCONNECT: <client_index>,<err></p> <p>4) If failed: +CMQTTCONNECT: <client_index>,<err></p> <p>ERROR</p> <p>5)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>	<p>The clean session flag. The value range is from 0 to 1, and default value is 0.</p> <p>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.</p> <p>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.</p>
<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 16.3.

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.

16.2.9 AT+CMQTTDISC Disconnect from server

AT+CMQTTDISC is used to disconnect from the server.

AT+CMQTTDISC Disconnect from server

Test Command AT+CMQTTDISC=?	Response: +CMQTTDISC: (0-1),(0, 60-180) OK
Read Command AT+CMQTTDISC?	Response: +CMQTTDISC: 0,<disc_state> +CMQTTDISC: 1,<disc_state>

	OK
	Response
	1)If disconnect successfully: +CMQTTDISC: <client_index>,0
	OK
	2)If disconnect successfully: OK
Write Command AT+CMQTTDISC=<client_index>,<timeout>	+CMQTTDISC: <client_index>,0
	3)If failed: OK
	+CMQTTDISC: <client_index>,<err>
	4)If failed: ERROR
	5)If failed: +CMQTTDISC: <client_index>,<err>
	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.
<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 16.3.

Examples

AT+CMQTTDISC=0,120

OK

+CMQTTDISC: 0,0

16.2.10 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 AT+CMQTTTOPIC=?	Response +CMQTTTOPIC: (0-1),(1-1024) OK
Write Command AT+CMQTTTOPIC=<client_index>,<req_length>	Response 1)If successfully: > <input data here> OK 2)If failed: +CMQTTTOPIC: <client_index>,<err> ERROR 3)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 16.3.

Examples

```
AT+CMQTTTOPIC=0,9
>
OK
```

NOTE

The topic will be clean after execute AT+CMQTTPUB.

16.2.11 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 The SIM76XX is: +CMQTTPAYLOAD: (0-1),(1-4096)
Write Command AT+CMQTTPAYLOAD=<client_index>,<req_length>	<p>OK</p> <p>Response 1)If successfully: > <input data here></p> <p>OK</p> <p>2)If failed: +CMQTTPAYLOAD: <client_index>,<err></p> <p>ERROR</p> <p>3)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 message data. The publish message should be UTF-encoded string. The range is from 1 to 4096 bytes.
<err>	The result code: 0 is success. Other values are failure. Please refer to chapter 16.3.

Examples

AT+CMQTTPAYLOAD=0,6

>

OK

NOTE

The topic will be clean after execute AT+CMQTT PUB.

16.2.12 AT+CMQTT PUB Publish a message to server

AT+CMQTT PUB is used to publish a message to MQTT server.

AT+CMQTT PUB Publish a message to server

Test Command AT+CMQTT PUB=?	Response +CMQTT PUB: (0-1),(0-2),(60-180),(0-1),(0-1) OK
Write Command AT+CMQTT PUB=<client_index>,<qos>,<pub_timeout>[,<retained>[,<dup>]]	Response 1)If successfully: OK +CMQTT PUB: <client_index>,0 2)If failed: OK +CMQTT PUB: <client_index>,<err> 3)If failed: +CMQTT PUB: <client_index>,<err> ERROR 4)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 16.3.

Examples

```
AT+CMQTTPUB=0,1,60
```

```
OK
```

```
+CMQTTPUB: 0,0
```

NOTE

The topic and payload will be clean after execute AT+CMQTTPUB.

16.2.13 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),(1-1024),(0-2),(0-1)
```

	OK
Read Command AT+CMQTTSUB?	Response +CMQTTSUB: [<topic>] OK
Write Command /* subscribe one topic */ AT+CMQTTSUB=<client_index>,<reqLength>,<qos>[,<dup>]	Response 1)If successfully: > <input data here> OK 2)If failed: OK +CMQTTSUB: <client_index>,0 3)If failed: +CMQTTSUB: <client_index>,<err> 4)If failed: ERROR 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 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 16.3.
<topic>	Topics to which you have subscribed

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.

16.2.14 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 topic*/

```
AT+CMQTTUNSUB=<client_index>,<reqLength>,<dup>
```

Response

1)If successfully:

```
>
```

```
<input data here>
```

```
OK
```

```
+CMQTTUNSUB: <client_index>,0
```

2)If failed:

```
OK
```

```
+CMQTTUNSUB: <client_index>,<err>
```

3)If failed:

```
+CMQTTUNSUB: <client_index>,<err>
```

	ERROR 4)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 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 16.3.

Examples

```
AT+CMQTTUNSUB=0,1
```

```
OK
```

```
+CMQTTUNSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

16.2.15 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

Test Command	Response
AT+CMQTTCFG=?	+CMQTTCFG: "checkUTF8",(0-1),(0-1)

	<p>+CMQTTCFG: "optimeout ",(0-1),(20-120) +CMQTTCFG: "version",(0-1),(3-4)</p> <p>OK</p>
<p>Read Command AT+CMQTTCFG?</p>	<p>Response</p> <p>+CMQTTCFG: 0,<checkUTF8_flag>,<optimeout_val> +CMQTTCFG: 1,<checkUTF8_flag>,<optimeout_val></p> <p>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</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command /*Configure the max timeout interval of the send or receive data operation */ AT+CMQTTCFG="optimeout",<index>,<optimeout_val></p>	<p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<checkUTF8_flag>	<p>The flag to indicate whether to check the string is UTF8 coding or not, the default value is 1.</p> <p>0 Not check UTF8 coding. <u>1</u> Check UTF8 coding.</p>
<optimeout_val>	<p>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.</p>
<p>+CMQTTCFG: "version",(0-1),(3-4)</p>	<p>(0-1): A numeric parameter that identifies a client. The range of permitted values is 0 to 1.</p> <p>(3-4): Version of MQTT.</p> <p><u>3</u>: MQTT 3.1. The default value is 3.</p> <p>4: MQTT 3.1.1.</p>

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.

16.3 Command Result Codes

16.3.1 Description of <err>

<err>	Description
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

16.4 Unsolicited Result Codes

URC	Description
+CMQTTCONNLOST: <client_index>,<cause>	When client disconnect passively, URC "+CMQTTCONNLOST" will be reported, then user need to connect MQTT server again.
+CMQTTNONET	When the network is become no network, the module will report this URC. If received this message, you should restart the MQTT service by AT+CMQTTSTART.
+CMQTTTRXSTART:	If a client subscribes to one or more

```

<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 multiple packets to report*/
[+CMQTTRXPAYLOAD: <client_index>,<sub_payload_len>
<sub_payload>]
+CMQTTRXEND: <client_index>

```

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>\r\n

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> after "\r\n".

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 the rest of topic content. The sum of <sub_topic_len> is equal to <topic_total_len>.

3)+CMQTTRXPAYLOAD:
 <client_index>,<sub_payload_len>\r\n
 <sub_payload>

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".

For long payload, the same as

"+CMQTTRXTOPIC".
 4)+CMQTTRXEND: <client_index>
 At last, the module will send fourth message to user and indicate the topic and payload have been transmitted completely.

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.
<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.

17 AT Commands for SSL

17.1 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+CCHRECV	Read the cached data that received from the server
AT+CCERTMOVE	Move the cert from file system to cert content

17.2 Detailed Description of AT Commands for SSL

17.2.1 AT+CSSLCFG 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_inde x></p>	<pre>Response +CSSLCFG: <ssl_ctxindex>,<sslversion>,<authmode>,<ignoreltime>,<nego tiatettime>,<ca_file>,<clientcert_file>,<clientkey_file>,<enableS NI></pre>

<p>Write Command</p> <p>/*Configure the version of the specified SSL context*/</p> <p>AT+CSSLCFG="sslversion",<ssl_ctx_index>,<sslversion></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the authentication mode of the specified SSL context*/</p> <p>AT+CSSLCFG="authmode",<ssl_ctx_index>,<authmode></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the ignore local time flag of the specified SSL context*/</p> <p>AT+CSSLCFG="ignorelocaltime",<ssl_ctx_index>,<ignorelocaltime></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the negotiate timeout value of the specified SSL context*/</p> <p>AT+CSSLCFG="negotiatetime",<ssl_ctx_index>,<negotiatetime></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the server root CA of the specified SSL context*/</p> <p>AT+CSSLCFG="cacert",<ssl_ctx_index>,<ca_file></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the client certificate of the specified SSL context*/</p> <p>AT+CSSLCFG="clientcert",<ssl_ctx_index>,<clientcert_file></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the client key of the specified SSL context*/</p> <p>AT+CSSLCFG="clientkey",<ssl_ctx_index>,<clientkey_file></p>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
<p>Write Command</p> <p>/*Configure the enableSNI flag</p>	<p>OK</p> <p>Response</p> <p>1)If successfully:</p>

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.(If the server does not need to authenticate the client ,it is equivalent to value 1.) 3 client authentication and no server authentication. It needs the cert and key of the client.(If the server does not need to authenticate the client ,it is equivalent to value 0.)
<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 55 bytes. There are two ways to download certificate files to module: 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 55 bytes.</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 55 bytes.</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

17.2.2 AT+CCERTDOWN Download certificate into the module

AT+CCERTDOWN Download certificate into the module

Test Command AT+CCERTDOWN=?	Response The SIM76XX is: +CCERTDOWN: (5-55),(1-10240)
Write Command AT+CCERTDOWN=<filename>,<len>	OK 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>	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 55 bytes.
<len>	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.

Examples

```

AT+CCERTDOWN=?
+CCERTDOWN: (5-108),(1-10240)

OK
AT+CCERTDOWN="ls.pem",1970
>

OK

```

17.2.3 AT+CCERTLIST List certificates

AT+CCERTLIST List certificates

Execute Command AT+CCERTLIST	Response [+CCERTLIST: <file_name> [+CCERTLIST: <file_name> ...]
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The certificate/key files which has been downloaded to the module.
------------	--

Examples

```

AT+CCERTLIST
+CCERTLIST: "ls.pem"

OK

```

17.2.4 AT+CCERTDELETE Delete certificates

AT+CCERTDELETE Delete certificates

Write Command AT+CCERTDELETE=<filename>	Response 1) If remove the file successfully: OK 2) Else ERROR
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 55 bytes.
-------------------------	--

Examples

AT+CCERTDELETE="ls.pem"

OK

17.2.5 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	Response

AT+CCHSET=<report_send_result>[,<recv_mode>]	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, the default value is 0: 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
```

17.2.6 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 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<mode>	The mode value: 0 Normal 1 Transparent mode
--------	---

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.

17.2.7 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

+CCHSTART: 0

17.2.8 AT+CCHSTOP Stop SSL service

AT+CCHSTOP is used to stop SSL service.

AT+CCHSTOP Stop SSL service

Execute Command AT+CCHSTOP	Response 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

17.2.9 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
```

17.2.10 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.

17.2.11 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

Test Command	Response
AT+CCHCFG=?	+CCHCFG: "sendtimeout",(0-1),(60-150) +CCHCFG: "sslctx",(0-1),(0-9)

Read Command AT+CCHCFG?	<p>OK</p> <p>Response</p> <p>+CCHCFG: 0,<sendtimeout_val>,<sslctx_index> +CCHCFG: 1,<sendtimeout_val>,<sslctx_index></p>
Write Command /*Configure the timeout value of the specified client when sending data*/ AT+CCHCFG="sendtimeout",<session_id>,<sendtimeout_val>	<p>OK</p> <p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed: ERROR</p>
Write Command /*Configure the SSL context index, it's as same as AT+CCHSSLCFG*/ AT+CCHCFG="sslctx",<session_id>,<sslctx_index>	<p>Response</p> <p>1)If successfully: OK</p> <p>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: 0,150,0
+CCHCFG: 1,150,0

```

OK

AT+CCHCFG="sendtimeout",0,120

OK

AT+CCHCFG="sslctx",0,3

OK

17.2.12 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.

17.2.13 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

17.2.14 AT+CCHSEND Send data to server

AT+CCHSEND Send data to server

Test Command AT+CCHSEND=?	Response +CCHSEND: (0,1),(1-2048) OK
Read Command	Response

AT+CCHSEND?	+CCHSEND: 0,<unsent_len_0>,1,<unsent_len_1>
	OK
	Response
	1)if parameter is right:
	>
	<input data here>
Write Command	When the total size of the inputted data reaches <len>, TA will
AT+CCHSEND=<session_id>,<len>	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

17.2.15 AT+CCHRECV Read the cached data that received from the server

AT+CCHRECV Read the cached data that received from the server

Read Command AT+CCHRECV?	Response +CCHRECV: LEN,<cache_len_0>,<cache_len_1>
	OK
Write Command AT+CCHRECV=<session_id>[,<max_rcv_len>]	Response 1)if parameter is right and there are cached data: OK [+CCHRECV: DATA,<session_id>,<len> ... +CCHRECV: DATA,<session_id>,<len> ...] +CCHRECV: <session_id>,<err> 2)if parameter is not right or any other error occurs: +CCHRECV: <session_id>,<err> ERROR 3)others: ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
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. The value ranges from 0 to 2048. 0 means it will receive all data from the current cache. The default value is 0 and it will receive all 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="//ss1.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?
+CCHRCV: DATA,0,1024
經浣豺氨鏹ラ込</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;p
adding:0}.clearfix:after{content:'\20';display:block;height:0;clear:both}.clearfix{zoom:1}#wrapper{p
osition: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-he
ight: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.co
m/static/superman/img/icons-5859e577e2.png);background-repeat:no-repeat;_background-image:u
rl(http://ss.bdimg.com/static/superman/img/icon
+CCHRCV: 0,0

+CCHEVENT: 0,RECV EVENT
```

NOTE

If connection is closed by server, the cached data will not be cleaned.

17.2.16 AT+CCERTMOVE Move the cert from file system to cert content

AT+CCERTMOVE Move the cert from file system to cert content

Test Command	Response
AT+CCERTMOVE=?	+CCERTMOVE: "FILENAME"

	OK
	Response
	1)if parameter is right and the file need to move is exist:
	OK
Write Command	2)if parameter is not right or any other error occurs:
AT+CCERTMOVE=<filename>	ERROR
	3)others:
	ERROR
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<filename>	The filename exist in file system,can be found by AT+FSLS. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 55 bytes.
------------	---

Examples

AT+CCERTMOVE="baidu.der"

OK

17.3 Command Result Codes

17.3.1 Description of <err>

Result codes	Description
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

17.4 Unsolicited Result Codes

URC	Description
+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.
+CCH:CCH STOP	CCH stopped caused by network error.

18 AT Commands for FOTA

18.1 Overview of AT Command for FOTA

Command	Description
AT+CFOTA	Start FOTA Service

NOTE

Currently, only CAT1 modules support at commands for FOTA.

18.2 Detailed Description of AT Command for FOTA

18.2.1 AT+CFOTA Start FOTA service

AT+CFOTA Start FOTA Service	
Write Command AT+CFOTA=<channel>,<mode>,<destination_ip/url>,<username>,<password>	Response 1) <CR><LF>OK<CR><LF>
	+CFOTA: <err> 2) <CR><LF>ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	-

Defined Values

<channel>	0–5 means the channel number
<mode>	0 FTP way 1 HTTP way
<destination_ip:port/url>	The remote site server's IP address or URL address. IP address should be in the format of the dotted decimal notation: http://XXX.XXX.XXX. URL address should be ASCII characters, the maximum of the length is 255 bytes. NOTE: If <port> are omitted, the default FTP port is 21 and the default HTTP port is 80. The URL must be preceded by "http" or "https".
<username>	The login user name, it should be ASCII characters, and the maximum of the length is 128 bytes.
<password>	The login password, it should be ASCII characters, and the maximum of the length is 128 bytes.

Examples

```
AT+CFOTA=0,1,"http://183.230.174.137:6022/bin/fbf_dfota.par",simcom,simcom
```

```
+CFOTA: FOTA,START
```

```
+CFOTA: DOWNLOADING:0
```

```
+CFOTA: DOWNLOADING:17
```

```
+CFOTA: DOWNLOADING:50
```

```
+CFOTA: DOWNLOADING:83
```

```
+CFOTA: DOWNLOADING:99
```

```
+CFOTA: DOWNLOADING:100
```

18.3 Unsolicited Result Codes

URC

Description

+CFOTA: 100

FOTA COMPLETE, it will restart in 8s.

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19 AT Commands for CTBURST

19.1 Overview of AT Commands for CTBURST

Command	Description
AT+CTBURST	The RF TX Burst Test

19.2 Detailed Description of AT Commands for CTBURST(CAT1)

19.2.1 AT+CTBURST The TX/RX Burst Test

AT+CTBURST The RF TX Burst Test	
Test Command AT+CTBURST=?	Response +CTBURST=0-2,1-74,8000-27000,80-104,0-5 OK
Write Command AT+CTBURST=<mode>[,<b and>,<channel>,<power>[,<bandwidth>]]	Response If mode is 0 +CTBURST: TX/RX OFF OK MT000000000000 MT000000000000 If mode is 1 +CTBURST: TX ON OK MT000000000000 MT000000000000 If mode is 2 (nonsupport)

	For LTE +CTBURST: RX ON
	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	

Defined Values

<mode>	Start/stop TX/RX the burst/waveform 0 – stop RF TX/RX 1 – start RF TX 2 – start RF RX (nonsupport)
<band>	The band of burst/waveform to be sent 1~74, in common use band numbers: 1/3/5/8/20/28
<channel>	Frequency channel, the range is different according to different band 8000~27000 unit: 100 KHZ
<power>	The power unit: 0.25 dBm, the value is different for different band
<bandwidth>	Rx band width:0~5. 0 1.4M 1 3M 2 5M 3 10M 4 15M 5 20M

Examples

```

AT+CFUN=0 // Minimum functionality
+SIMCARD: NOT AVAILABLE

OK
AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

MT00000000000000

MT00000000000000
AT+CTBURST=1,1,18300,92 //Start RF TX Power of LTE BAND1 the arfcn is
                            1830 MHZ the power is 23 dBm

```

+CTBURST: TX ON

OK

MT000000000000

MT000000000000

NOTE

To test each item, close the previous item first ,then restart the module.

MT000000000000: Indicates normal return.

MTFE0000000000: Indicates that the sending mode is incorrectly configured.

MTFC0000000000: Indicates that the working status of the terminal is incorrect.

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20 AT Commands for WIFI

20.1 Overview of AT Commands for WIFI

Command	Description
AT+CWSTASCAN	Scan WIFI network
AT+CWSTASCANEX	Scan WIFI network extension command
AT+CWSTASCANSYN	Asynchronous control command of scan wifi network

20.2 Detailed Description of AT Commands for WIFI

20.2.1 AT+CWSTASCAN Scan WIFI network

AT+CWSTASCAN Scan WIFI network	
Test Command AT+CWSTASCAN=?	Response +CWSTASCAN: (0-1) OK
Read Command AT+CWSTASCAN?	Response +CWSTASCAN: <flag_show_signal> OK
Write Command AT+CWSTASCAN=<flag_show_signal>	Response 1)if the mode is 0 or 1: OK 2) ERROR
Execution Command AT+CWSTASCAN	Response [+CWSTASCAN: <bssid>,<channel_num>,[signal] [.....]] OK

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<flag_show_signal>	0 Don't show the signal level. 1 Show the signal level. It's the default value.
<bssid>	The MAC address of external wireless network.
<channel_num>	The channel number of external wireless network.
<signal>	The signal level of external wireless network.

Examples

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

OK

```
AT+CWSTASCAN=1
```

OK

```
AT+CWSTASCAN?
```

```
+CWSTASCAN: 1
```

OK

```
AT+CWSTASCAN
```

```
+CWSTASCAN:
```

```
50:FA:84:AF:C8:B9,11,-61
```

```
86:40:BB:00:2E:AD,11,-65
```

```
1C:15:1F:55:56:7A,1,-76
```

```
B0:D5:9D:AF:57:A1,6,-79
```

```
30:7B:AC:6C:F9:B0,1,-81
```

OK

20.2.2 AT+CWSTASCANEX Scan WIFI network extension command

AT+CWSTASCANEX Scan WIFI network extension command	
Test Command AT+CWSTASCANEX=?	Response +CWSTASCANEX: (0-1),(1-3),(4-10),(1-255),(0-1) OK
Read Command AT+CWSTASCANEX?	Response +CWSTASCANEX: <flag_show_signal>,<scan_round_num>,<scan_max_bssid_num>,<scan_timeout>,<scan_priority> OK
Write Command AT+CWSTASCANEX=<flag_show_signal>,<scan_round_num>,<scan_max_bssid_num>,<scan_timeout>,<scan_priority>]]]]	Response 1) OK 2) ERROR
Execution Command AT+CWSTASCANEX	Response [+CWSTASCANEX: <bssid>,<channel_num>,<signal> [... ...]] OK
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<flag_show_signal>	0 Don't show the signal level. 1 Show the signal level. It's the default value.
<scan_round_num>	The range is 1-3, means the number of rounds of WIFI scan.
<scan_max_bssid_num>	The range is 4-10, maximum number of bssid per WIFI scan.
<scan_timeout>	The range is 1-255, timeout.
<scan_priority>	The range is 0-1, priority.
<bssid>	The MAC address of external wireless network.
<channel_num>	The channel number of external wireless network.
<signal>	The signal level of external wireless network.

Examples

AT+CWSTASCANEX=?

+CWSTASCANEX: (0-1),(1-3),(4-10),(1-255),(0-1)

OK

AT+CWSTASCANEX=1,3,4,25,0

OK

AT+CWSTASCANEX?

+CWSTASCANEX: 1,3,4,25,0

OK

AT+CWSTASCANEX

+CWSTASCANEX:

08:4F:0A:CA:45:80,6,-64

92:32:4B:9F:E2:EB,1,-66

08:4F:0A:CA:45:40,1,-79

1C:15:1F:FD:C7:6C,6,-83

OK

20.2.3 AT+CWSTASCANSYN Asynchronous control command of scan wifi network

AT+CWSTASCANSYN Asynchronous control command of scan wifi network

Test Command AT+CWSTASCANSYN=?	Response +CWSTASCANSYN: (0-1) OK
Read Command AT+CWSTASCANSYN?	Response +CWSTASCANSYN: <op> OK
Write Command AT+CWSTASCANSYN=<op>	Response 1) If op==1 and parameter format is right, response 0 indicates the end of the scan response OK [+CWSTASCANSYN: <mac_addr>,<channel_number>,<rssi>

	,[... ...]]
	+CWSTASCANSYN: 0
	2) If op==0 and parameter format is right,
	OK
	3)
	ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	255s
Reference	

Defined Values

<op>	0 Stop scan wifi network. 1 Start scan wifi network.
<mac_addr>	The MAC address of external wireless network.
<channel_number>	The channel number of external wireless network.
<rsssi>	The signal level of external wireless network.

Examples

AT+CWSTASCANSYN=?

+CWSTASCANSYN: (0-1)

OK

AT+CWSTASCANSYN?

+ CWSTASCANSYN: 0

OK

AT+CWSTASCANSYN=1

OK

+CWSTASCANSYN: "08:4F:0A:CA:45:80",6,-64

+CWSTASCANSYN: "92:32:4B:9F:E2:EB",1,-66

+CWSTASCANSYN: "1C:15:1F:FD:C7:6C",6,-83

+CWSTASCANSYN: 0

AT+CWSTASCANSYN=0

OK

NOTE

The platform does not support actively ending scanning, and can only wait for the scanning to timeout or end.

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21 AT Commands for GNSS

21.1 Overview of AT Commands for GNSS

NOTE

Commands related to GNSS are only used in the SIM76XX Series.

Command	Description
AT+CGNSSPWR	GNSS power control
AT+CGNSSTST	Send data received from UART to NMEA port
AT+CGPSCOLD	Cold start GPS
AT+CGPSWARM	Warm start GPS
AT+CGPSHOT	Hot start GPS
AT+CGNSSIPR	Configure the baud rate of UART and GPS module
AT+CGNSSMODE	Configure GNSS support mode
AT+CGNSSNMEA	Configure NMEA sentence type
AT+CGNSSNMEARATE	Set NMEA output rate
AT+CGNSSPORTSWITCH	Select the output port of data.
AT+CGNSSCMD	Send command to GNSS
AT+CGNSSRTC	Configure GNSS RTC mode
AT+CGNSSSLEEP	Set GNSS UART into Sleep
AT+CGNSSWAKEUP	Set GNSS UART Wakeup form Sleep
AT+CGNSSFTM	Start GNSS test mode
AT+CGPSINFO	Get GPS fixed position information
AT+CGNSSINFO	Get GNSS fixed position information
AT+CGNSSPROD	Get the product information of GNSS

21.2 Detailed Description of AT Commands for GNSS

21.2.1 AT+CGNSSPWR GNSS power control

This command can control the GNSS module by pulling up/down the power pin.

AT+CGNSSPWR GNSS power control and AP-Flash control

Test Command
AT+CGNSSPWR=?

Response
+CGNSSPWR: <GNSS_Power_status>

	OK
Read Command AT+CGNSSPWR?	Response +CGNSSPWR: <GNSS_Power_status>
Write Command AT+CGNSSPWR=<GNSS_Power_status>	OK Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<GNSS_Power_status>	0 Close GNSS 1 Active GNSS The function will take effect immediately.
----------------------------------	---

Examples

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

```
OK
AT+CGNSSPWR?
+CGNSSPWR: 1
```

```
OK
AT+CGNSSPWR=1
OK
```

21.2.2 AT+CGNSSTST Send data received from UART to NMEA port

AT+CGNSSTST is used to print raw GPS data to the NMEA port.

AT+CGNSSTST Send data received from UART3 to NMEA port

Test Command AT+CGNSSTST=?	Response +CGNSSTST: (0,1)
--------------------------------------	-------------------------------------

Read Command AT+CGNSSTST?	OK Response +CGNSSTST: <on/off>
Write Command AT+CGNSSTST=<on/off>	OK Response 1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<on/off>

- 0 Stop sending data received from UART3 to NMEA port.
 - 1 Start sending data received from UART3 to NMEA port.
- The function will take effect immediately.
If you want to get NMEA data by NMEA port, you should to excute AT+CGNSSTST=1 first.

Examples

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

```
OK
AT+CGNSSTST?
+CGNSSTST: 0
```

```
OK
AT+CGNSSTST=1
OK
```

21.2.3 AT+CGPSCOLD Cold start GPS

This command is valid after the GNSS power on!

AT+CGPSCOLD Cold start GPS

Execution Command	Response
AT+CGPSCOLD	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Examples

AT+CGPSCOLD

OK

21.2.4 AT+CGPSWARM Warm start GPS

This command is valid after the GNSS power on!

AT+CGPSWARM Warm start GPS

Execution Command	Response
AT+CGPSWARM	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Examples

AT+CGPSWARM

OK

21.2.5 AT+CGPSHOT Hot start GPS

This command is valid after the GNSS power on!

AT+CGPSHOT Hot start GPS

Execution Command	Response
AT+CGPSHOT	OK
Parameter Saving Mode	NO_SAVE

Max Response Time	10000ms
Reference	-

Examples

```
AT+CGPSHOT
OK
```

21.2.6 AT+CGNSSIPR Configure the baud rate of UART3 and GPS module

This command is valid after the GNSS power on!

AT+CGNSSIPR Configure the baud rate of UART3 and GPS module

Test Command AT+CGNSSIPR=?	Response +CGNSSIPR: (list of supported <baud-rate>s) OK
Read Command AT+CGNSSIPR?	Response +CGNSSIPR: <baud-rate> OK
Write Command AT+CGNSSIPR=<baud-rate>	Response 1)If successfully: OK 2)If failed: ERROR
Execution Command AT+CGNSSIPR	Response Set default value OK
Parameter Saving Mode	SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<baud-rate>	9600
	115200
	230400
	921600
The function will take effect immediately.	

Examples

```
AT+CGNSSIPR=?
+CGNSSIPR: (9600,115200,230400,921600)
```

OK

```
AT+CGNSSIPR?
+CGNSSIPR: 115200
```

OK

```
AT+CGNSSIPR=9600
```

OK

21.2.7 AT+CGNSSMODE Configure GNSS support mode

This command is valid after the GNSS power on!

AT+CGNSSMODE Configure GNSS support mode

Test Command AT+CGNSSMODE=?	Response +CGNSSMODE: (list of supported <mode>s) OK
Read Command AT+CGNSSMODE?	Response +CGNSSMODE: <mode> OK
Write Command AT+CGNSSMODE=<mode>	Response 1)If successfully: OK 2)If failed: ERROR
Execution Command AT+CGNSSMODE	Response Set default value 15 OK
Parameter Saving Mode	SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<mode>	<p>1 GPS</p> <p>3 GPS + GLONASS</p> <p>5 GPS + GALILEO</p> <p>9 GPS + BDS</p> <p>13 GPS + GALILEO + BDS</p> <p><u>15</u> GPS + GLONASS + GALILEO + BDS</p> <p>The function will take effect immediately.</p>
--------	--

Examples

```
AT+CGNSSMODE=?
+CGNSSMODE: (1,3,5,9,13,15)
```

```
OK
AT+CGNSSMODE?
+CGNSSMODE: 15
```

```
OK
AT+CGNSSMODE=1
OK
```

21.2.8 AT+CGSSNMEA Configure NMEA sentence type

This command is valid after the GNSS power on!

AT+CGSSNMEA Configure NMEA sentence type

Test Command AT+CGSSNMEA=?	<p>Response</p> <p>+CGSSNMEA: (0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1)</p>
--------------------------------------	---

OK

Read Command AT+CGSSNMEA?	<p>Response</p> <p>+CGSSNMEA: 1,1,1,1,1,1,1,0,0,0</p>
-------------------------------------	--

OK

Write Command AT+CGSSNMEA=[nGGA],[nGLL],[nGSA],[nGSV],[nRMC],[nVTG],[nZDA],[nANT],[nDHV],[nLPS],[res1	<p>Response</p> <p>1)If successfully: OK</p> <p>2)If failed:</p>
---	---

Test Command AT+CGNSSMEARATE=?	Response +CGNSSMEARATE: (1) OK
Read Command AT+CGNSSMEARATE?	Response +CGNSSMEARATE: <rate> OK
Write Command AT+CGNSSMEARATE=<rate>	Response 1)If successfully: OK 2)If failed: ERROR
Execution Command AT+CGNSSMEARATE	Response Set default value 1 OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<rate>	<u>1</u> 1Hz, one anchor point is output per second The function will take effect immediately.
--------	---

Examples

```
AT+CGNSSMEARATE=?
+CGNSSMEARATE: (1)
```

```
OK
AT+CGNSSMEARATE?
+CGNSSMEARATE: 1
```

```
OK
AT+CGNSSMEARATE=1
OK
AT+CGNSSMEARATE
OK
```

21.2.10 AT+CGNSSPORTSWITCH Select the output port of data.

This command is valid after the GNSS power on!

AT+CGNSSPORTSWITCH Select the output port for NMEA sentence

Test Command AT+CGNSSPORTSWITCH=?	Response +CGNSSPORTSWITCH: (0,1),(0,1) OK
Read Command AT+CGNSSPORTSWITCH?	Response +CGNSSPORTSWITCH: <parse_data_port>,<nmea_data_port> OK
Write Command AT+CGNSSPORTSWITCH=<parse_data_port>[,<nmea_data_port>]	Response 1)If send OK: OK 2)If send false: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<parse_data_port>	0 output the parsed data of NMEA to USB AT port. 1 output the parsed data of NMEA to UART port.
<nmea_data_port>	0 output raw NMEA data to USB NMEA port. 1 output raw NMEA data to UART port.

Examples

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

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

21.2.11 AT+CGNSSCMD Send command to GNSS

This command is valid after the GNSS power on!

AT+CGNSSCMD Send command to GNSS

Test Command AT+CGNSSCMD=?	Response +CGNSSCMD: "CmdString" OK
Write Command AT+CGNSSCMD=<CmdString>	Response 1)If send OK: OK 2)If send false: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<CmdString>	Command string, max length of string is 63. For example: if you want to send "PAIR006" command to GNSS. You can use: AT+CGNSSCMD="PAIR006"
--------------------------	--

Examples

```

AT+CGNSSCMD=?
+CGNSSCMD: "CmdString"

OK
AT+CGNSSCMD="$PCAS02,1000*2E"
OK

```

21.2.12 AT+CGNSSRTC Configure GNSS RTC mode

This command is valid after the GNSS power on!

AT+CGNSSRTC Configure GNSS RTC mode

Test Command AT+CGNSSRTC=?	Response +CGNSSRTC: (0,10-864000) OK
Write Command AT+CGNSSRTC=<RtcTime>	Response 1)If send OK:

	OK 2)If send false: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<RtcTime>	0 Enter RTC mode and only use external wake-up. 10-864000 Enter RTC mode and wake up regularly.
-----------	--

Examples

```
AT+CGNSSRTC=?
+CGNSSRTC: (0,10-864000)
```

```
OK
AT+CGNSSRTC=0
OK
```

21.2.13 AT+CGNSSSLEEP Set GNSS UART into Sleep

This command is valid after the GNSS power on!

AT+ CGNSSSLEEP Set GNSS UART into Sleep

Execution Command	Response
AT+CGNSSSLEEP	OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Examples

```
AT+CGNSSSLEEP
OK
```

NOTE

Only SIM767X project supports this command.

21.2.14 AT+CGNSSWAKEUP Set GNSS UART Wakeup form Sleep

This command is valid after the GNSS power on!

AT+CGNSSWAKEUP Set GNSS UART Wakeup form Sleep

Execution Command AT+CGNSSWAKEUP	Response OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Examples

AT+CGNSSWAKEUP

OK

NOTE

Only SIM767X project supports this command.

21.2.15 AT+CGNSSFTM Start GNSS test mode

This command is valid after the GNSS power on!

AT+CGNSSFTM Start GPS test mode

Test Command AT+CGNSSFTM=?	Response OK
Read Command AT+CGNSSFTM?	Response +CGNSSFTM: 0/1
	OK
Write Command	Response

AT+CGNSSFTM=<on/off>	1)If successfully: OK 2)If failed: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<on/off>	0 Close test mode 1 Start test mode The function will take effect immediately.
-----------------------	--

Examples

```

AT+CGNSSFTM?
+CGNSSFTM: 0

OK
AT+CGNSSFTM=1
OK
+GPGSV,10,36.3,12,33.5,14,26.5,15,27.0,18,30.6
,20,29.4,21,14.9,24,32.8,25,30.6,31,29.1,32,27.0
+GBGSV,201,28.7,204,29.0,206,27.3,207,25.9,20
9,25.0,210,18.5
+GLGSV,78,20.6,66,25.6,77,21.6,79,21.9,67,26.2,
68,23.6
+GAGSV
  
```

21.2.16 AT+CGPSINFO Get GPS fixed position information

This command is valid after the GNSS power on!

AT+CGPSINFO Get GPS fixed position information	
Test Command AT+CGPSINFO=?	Response +CGPSINFO: (0-255)
Read Command AT+CGPSINFO?	Response +CGPSINFO: <time>

Write Command AT+CGPSINFO=<time>	<p>OK</p> <p>Response</p> <p>1)If successfully:</p> <p>OK</p> <p>+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]</p> <p>2)If <time>=0:</p> <p>OK</p> <p>3)If failed:</p> <p>ERROR</p>
Execution Command AT+CGPSINFO	<p>Response</p> <p>+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]</p> <p>OK</p>
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<time>	The rang is 0-255, unit is second. after set <time> will report the GPS information every the seconds. The function will take effect immediately.
<lat>	Latitude of current position. Output format is ddmm.mmmmmm.
<N/S>	N/S Indicator, N=north or S=south.
<log>	Longitude of current position. Output format is dddmm.mmmmmm.
<E/W>	E/W Indicator, E=east or W=west.
<date>	Date. Output format is ddmmyy.
<UTC time>	UTC Time. Output format is hhmmss.ss.
<alt>	MSL Altitude. Unit is meters.
<speed>	Speed Over Ground. Unit is knots.
<course>	Course. Degrees.

Examples

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

```
OK
AT+CGPSINFO?
+CGPSINFO: 0
```

```
OK
AT+CGPSINFO
+CGPSINFO:3113.343286,N,12121.234064,E,250311,072809.33,44.1,0.0,0
OK
```

21.2.17 AT+CGNSSINFO Get GNSS fixed position information

This command is valid after the GNSS power on!

AT+CGNSSINFO Get GNSS fixed position information

Test Command AT+CGNSSINFO=?	Response +CGNSSINFO: (0-255) OK
Read Command AT+CGNSSINFO?	Response +CGNSSINFO: <time> OK
Write Command AT+CGNSSINFO=<time>	Response 1)If successfully: OK +CGNSSINFO:[<mode>],[<GPS-SVs>],[<GLONASS-SVs>],[<GALILEO-SVs>],[<BEIDOU-SVs>],[<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VDOP],[NoSV] 2)If <time>=0: OK 3)If failed: ERROR
Execution Command AT+CGNSSINFO	Response +CGNSSINFO:[<mode>],[<GPS-SVs>],[<GLONASS-SVs>],[<GALILEO-SVs>],[<BEIDOU-SVs>],[<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VDOP],[NoSV] OK
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<time>	The rang is 0-255, unit is second. after set <time> will report the GNSS information every the seconds. The function will take effect immediately.
<mode>	Fix mode 2=2D fix 3=3D fix
<GPS-SVs>	GPS satellite visible numbers
<GLONASS-SVs>	GLONASS satellite visible numbers
<GALILEO -SVs>	GALILEO satellite visible numbers
<BEIDOU-SVs>	BEIDOU satellite visible numbers
<lat>	Latitude of current position. Output format is dd.ddddd
<N/S>	N/S Indicator, N=north or S=south.
<log>	Longitude of current position. Output format is ddd.ddddd
<E/W>	E/W Indicator, E=east or W=west.
<date>	Date. Output format is ddmmyy.
<UTC-time>	UTC Time. Output format is hhmmss.ss.
<alt>	MSL Altitude. Unit is meters.
<speed>	Speed Over Ground. Unit is knots.
<course>	Course. Degrees.
<PDOP>	Position Dilution Of Precision.
<HDOP>	Horizontal Dilution Of Precision.
<VDOP>	Vertical Dilution Of Precision.
<NoSV>	Number of satellites involved in positioning

Examples

```
AT+CGNSSINFO=?
```

```
+CGNSSINFO: (0-255)
```

```
OK
```

```
AT+CGNSSINFO?
```

```
+CGNSSINFO: 0
```

```
OK
```

```
AT+CGNSSINFO
```

```
+CGNSSINFO:
```

```
2,09,05,00,00,3113.330650,N,12121.262554,E,131117,091918.00,32.9,0.0,255.0,1.1,0.8,0.7,14
```

```
OK
```

```
AT+CGNSSINFO (if not fix, will report null)
```

```
+CGNSSINFO:,,,,,,,,,,,,,,,,
```

```
OK
```

21.2.18 AT+CGNSSPROD Get the product information of GNSS

This command is valid after the GNSS power on!

AT+CGNSSPROD Get the product information of GNSS

Execution Command	Response 1)If successfully: PRODUCT: < prodversion> OK 2)If the GNSS is power off: ERROR
Parameter Saving Mode	NO_SAVE
Max Response Time	10000ms
Reference	-

Defined Values

<prodname> The product information of GNSS

Examples

AT+CGNSSPROD

PRODUCT: B01V01AG3352B

OK

22 AT Commands for SMTPS

22.1 Overview of AT Commands for SMTPS

Command	Description
AT+CSMTPSCFG	Configure the SMTP context
AT+CSMTPSSRV	Set SMTP server address and port number
AT+CSMTPSAUTH	SMTP server authentication
AT+CSMTPSFROM	Sender address and name
AT+CSMTPSRCPT	Recipient address and name (TO/CC/BCC)
AT+CSMTPSSUB	E-mail subject
AT+CSMTPSBODY	E-mail body
AT+CSMTPSBCH	E-mail body character set
AT+CSMTPSFILE	Select attachment
AT+CSMTPSEND	Initiate session and send e-mail
AT+CSMTPSSTOP	Force to stop sending e-mail
AT+CSMTPSCLEAN	Clean mail content and setting

22.2 Detailed Description of AT Commands for SMTPS

Commands related to SMTPS are only used in the versions that support this feature.

22.2.1 AT+CSMTPSCFG Config the SMTP context

This command is used to select SMTP ssl context and pdp context. SMTP client will initiate session with the specified context to send an e-mail.

Execution command will set the ssl context and pdp context as default value.

AT+CSMTPSCFG Config the SMTP context

Test Command Response

AT+CSMTPSCFG=? **OK**

Write Command Response

/* select the ssl context */ 1)if the "sslCtxId" is default:

<p>AT+CSMTPSCFG="sslCtxId" "[,<sslCtxId>]</p>	<p>+CSMTPSCFG: "sslCtxId",<sslCtxId></p> <p>OK</p> <p>2) the "sslCtxId" is not default:</p> <p>OK</p> <p>3) error</p> <p>ERROR</p>
<p>Write Command</p> <p>/* select the pdp context */</p> <p>AT+CSMTPSCFG="pdpCtxId" d"[,<pdpCtxId>]</p>	<p>Response</p> <p>1)the "pdpCtxId" is default:</p> <p>+CSMTPSCFG: "pdpCtxId",<pdpCtxId></p> <p>OK</p> <p>2) the "pdpCtxId" is not default:</p> <p>OK</p> <p>3) error</p> <p>ERROR</p>
<p>Execution Command</p> <p>AT+CSMTPSCFG</p>	<p>Response</p> <p>OK</p> <p>or</p> <p>ERROR</p>
<p>Parameter Saving Mode</p>	<p>-</p>
<p>Reference</p>	

Defined Values

<sslCtxId>	SMTP SSL context id. the default is 0.
<pdpCtxId>	SMTP PDP context id. the default is 1.

Example

```

AT+CSMTPSCFG="sslCtxId",0
OK
AT+CSMTPSCFG="sslCtxId"
+CSMTPSCFG: "sslCtxId",0
OK
  
```

22.2.2 AT+CSMTPSSRV Set SMTP server address and port number

This command is used to set SMTP server address and server's port number. SMTP client will initiate TCP session with the specified server to send an e-mail.

Read command returns current SMTP server address and port number.

Execution command will clear SMTP server address and set the port number as default value.

AT+CSMTPSSRV Set SMTP server address and port number

Test Command	Response
AT+CSMTPSSRV=?	OK
Read Command AT+CSMTPSSRV?	Response +CSMTPSSRV: <server>,<port>,<server_type> OK
Write Command AT+CSMTPSSRV=<server>,<port>[, <server_type>]	Response OK or ERROR
Execution Command AT+CSMTPSSRV	Response OK or ERROR
Parameter Saving Mode	-
Reference	

Defined Values

<server>	SMTP server address, non empty string with double quotes, mandatory and ASCII text string up to 127 characters.
<port>	Port number of SMTP server in decimal format, from 1 to 65535, and default port is 465 for SMTP.
<server_type>	The type of server: 1 – SMTP server. 2 – SMTPS server with SSL3.0/TLS1.0/TLS1.1/TLS1.2 supported 3 – SMTPS server with STARTTLS

Example


```

AT+CSMTPSSRV="smtp.server.com",425
OK
AT+CSMTPSSRV?
+CSMTPSSRV: "smtp.server.com",425,2
OK
AT+CSMTPSSRV
OK
AT+CSMTPSSRV?
+CSMTPSSRV: "",465,2
OK

```

22.2.3 AT+CSMTPSAUTH SMTP server authentication

This synchronous command is used to control SMTP authentication during connection with SMTP server. If SMTP server requires authentication while logging in the server, TE must set the authentication control flag and provide user name and password correctly before sending an e-mail.

Read command returns current SMTP server authentication control flag, if the flag is 0, both <user> and <pwd> are empty strings.

Execution Command clears user name and password.

AT+CSMTPSAUTH SMTP server authentication

Test Command AT+CSMTPSAUTH=?	Response +CSMTPSAUTH: (list of supported <flag>s) OK
Read Command AT+CSMTPSAUTH?	Response +CSMTPSAUTH: <flag>, <user>, <pwd> OK
Write Command AT+CSMTPSAUTH= <flag>[, <user>, <pwd>]	Response OK or ERROR
Execution Command AT+CSMTPSAUTH	Response OK or ERROR

Defined Values

<flag>	<p>SMTP server authentication control flag, integer type.</p> <p>0 – SMTP server doesn't require authentication, factory value.</p> <p>1 – SMTP server requires authentication.</p>
<user>	<p>User name to be used for SMTP authentication, non empty string with double quotes and up to 127 characters.</p>
<pwd>	<p>Password to be used for SMTP authentication, string with double quotes and up to 127 characters.</p> <p>NOTE: If <flag> is 0, <user> and <pwd> must be omitted (i.e. only <flag> is present).</p>

Example

```

AT+CSMTPSAUTH?
+CSMTPSAUTH: 0, "", ""
OK
AT+CSMTPSAUTH=1,"username","password"
"
OK
AT+CSMTPSAUTH?
+CSMTPSAUTH: 1, "username", "password"
OK
AT+CSMTPSAUTH
OK
AT+CSMTPSAUTH?
+CSMTPSAUTH: 0, "", ""
OK

```

22.2.4 AT+CSMTPSFROM Sender address and name

This synchronous command is used to set sender's address and name, which are used to construct e-mail header. The sender's address must be correct if the SMTP server requires.

Read command returns current sender's address and name.

Execution command will clear sender's address and name.

AT+CSMTPSFROM Sender address and name

Test Command	Response
AT+CSMTPSFROM=?	OK
Read Command	Response
AT+CSMTPSFROM?	+CSMTPSFROM: <saddr>, <sname>
	OK

Write Command	Response
AT+CSMTPSFROM=	OK
<saddr>[, <sname>]	or
	ERROR
Execution Command	Response
AT+CSMTPSFROM	OK
	or
	ERROR

Defined Values

<saddr>	E-mail sender address (MAIL FROM), non empty string with double quotes, mandatory and ASCII text up to 127 characters. <saddr> will be present in the header of the e-mail sent by SMTP client in the field: "From: ".
<sname>	E-mail sender name, string with double quotes, and alphanumeric ASCII text up to 63 characters. <sname> will be present in the header of the e-mail sent by SMTP client in the field: "From: ".

Example

```

AT+CSMTPSFROM="senderaddress@server.
com","sendername"
OK
AT+CSMTPSFROM?
+CSMTPSFROM:
"senderaddress@server.com","sendername
"
OK
AT+CSMTPSFROM
OK
AT+CSMTPSFROM?
+CSMTPSFROM: "", ""
OK

```

22.2.5 AT+CSMTPSRCPT Recipient address and name (TO/CC/BCC)

This synchronous command is used to set recipient address/name and kind (TO/CC/BCC). If only the parameter of "kind" is present, the command will clear all recipients of this kind, and if only parameters of "kind" and "index" are present, the command will clear the specified recipient.

Read command returns current recipient address/name and kind list.

Execution command will clear all recipient information.

AT+CSMTPSRCPT Recipient address and name (TO/CC/BCC)	
Test Command AT+CSMTPSRCPT=?	Response +CSMTPSRCPT: (list of supported <kind>s), (list of supported <index>s) OK
Read Command AT+CSMTPSRCPT?	Response [+CSMTPSRCPT: <kind>, <index>, <raddr>, <rname> [<CR><LF>...]] OK or OK or ERROR
Write Command AT+CSMTPSRCPT=<kind>[, <index>[,<raddr>[,<rname>]]]	Response OK or ERROR
Execution Command AT+CSMTPSRCPT	Response OK or ERROR

Defined Values

<kind>	Recipient kind, the kinds of TO and CC are used to construct e-mail header in the field: "To: " or "Cc: ". 0 – TO, normal recipient. 1 – CC, Carbon Copy recipient. 2 – BCC, Blind Carbon Copy recipient.
<index>	Index of the kind of recipient, decimal format, and from 0 to 4.
<raddr>	Recipient address, non empty string with double quotes, and up to 127 characters.
<rname>	Recipient name, string type with double quotes, and up to 63

characters.

Example

```
AT+CSMTPSRCPT=0,0,"rcptaddress_to@server.com", "rcptname_to"
OK
AT+CSMTPSRCPT?
+CSMTPSRCPT:
0,0,"rcptaddress_to@server.com","rcptname_to"
OK
AT+CSMTPSRCPT=1,0,"rcptaddress_cc@server.com","rcptname_cc"
OK
AT+CSMTPSRCPT?
+CSMTPSRCPT:
0,0,"rcptaddress_to@server.com","rcptname_to"
+CSMTPSRCPT:
1,0,"rcptaddress_cc@server.com","rcptname_cc"
OK
```

22.2.6 AT+CSMTPSSUB E-mail subject

This synchronous command is used to set the subject of e-mail, which is used to construct e-mail header. Read command returns current e-mail subject. Execution command will clear the subject.

AT+CSMTPSSUB E-mail subject

Test Command	Response
AT+CSMTPSSUB=?	OK
Read Command	Response
AT+CSMTPSSUB?	+SMTPSUB: <subject_len>,<subject_character><CR><LF> [<subject>]
Write Command	Response
AT+CSMTPSSUB=<subject_len>[,<subject_character>]	> OK or

	ERROR
Execution Command	Response
AT+CSMTPSSUB	OK
	or
	ERROR

Defined Values

<subject>	E-mail subject, string with double quotes, and ASCII text up to 511 characters. <subject> will be present in the header of the e-mail sent by SMTPS client in the field: "Subject: ". For write command, it can input any binary data.
<subject_len>	The length of subject content
<subject_character>	The character set of subject. Default is utf-8.

Example

```

AT+CSMTPSSUB?
+CSMTPSSUB: 0,"UTF-8"
OK
AT+CSMTPSSUB=19, "utf-8"
>THIS IS A TEST MAIL
OK
AT+CSMTPSSUB?
+SMTTPSSUB: 19,"utf-8"
THIS IS A TEST MAIL
OK
  
```

22.2.7 AT+CSMTPSBODY E-mail body

This command is used to set e-mail body, which will be sent to SMTP server with text format. Read command returns current e-mail body. If the process of sending an e-mail is ongoing, the command will return "ERROR" directly. Execution command clears email body.

AT+CSMTPSBODY E-mail body

Test Command	Response
AT+CSMTPSBODY=?	OK
Read Command	Response
AT+CSMTPSBODY?	+CSMTPSBODY: <body_len><CR><LF>
	[<body>]
	OK

Write Command	Response
AT+CSMTPSBODY=<body_len>	> OK
Execution Command	Response
AT+CSMTPSBODY	OK

Defined Values

<body>	E-mail body, up to 5120 characters.
<body_len>	The length of email body.

Example

```

AT+CSMTPSBODY=38
>THIS IS A TEST MAIL FROM SIMCOM
MODULE
OK
AT+CSMTPSBODY?
+CSMTPSBODY: 38
THIS IS A TEST MAIL FROM SIMCOM
MODULE
OK

```

22.2.8 AT+CSMTPSBCH E-mail body character set

This synchronous command is used to set the body character set of e-mail. Read command returns current e-mail body character set.

AT+CSMTPSBCH E-mail body character set

Test Command	Response
AT+CSMTPSBCH=?	OK
Read Command	Response
AT+CSMTPSBCH?	+CSMTPSBCH: <charset> OK
Write Command	Response
AT+CSMTPSBCH=<charset>	OK or ERROR
Execute Command	Response

AT+CSMTPSBCH	OK
	or
	ERROR

Defined Values

<charset>	E-mail body character, string with double quotes. By default, it is "utf-8". The maximum length is 19 bytes.
------------------------	--

Example

```
AT+CSMTPSBCH=?
OK
AT+CSMTPSBCH="gb2312"
OK
AT+CSMTPSBCH?
+CSMTPSBCH: "gb2312"
OK
```

22.2.9 AT+CSMTPSFILE Select attachment

The synchronous command is used to select file as e-mail attachment.
Read command returns current all selected attachments with full path.
Execution command will clear the selected attachments

AT+CSMTPSFILE Select attachment

Test Command	Response +CSMTPSFILE: (list of supported <index>s) OK
Read Command AT+CSMTPSFILE?	Response [+CSMTPSFILE: <index>, <filename>, <filesize> [<CR><LF>...]] OK
Write Command AT+CSMTPSFILE=<index>[, <filename>]	Response OK or [+CSMTPS: <err>] ERROR
Execution Command	Response

AT+CSMTPSFILE

OK

Defined Values

<index>	Index for attachments, from 1 to 10. According to the sequence of <index>, SMTP client will encode and send all attachments.
<filename>	String type with double quotes, the name of a file which is under current directory (refer to file system commands). SMTP client doesn't allow two attachments with the same file name. (For write command, if the file name contains non-ASCII characters, this parameter should contain a prefix of {non-ascii}. Note: This is only for SD cards)
<filesize>	File size in decimal format. The total size of all attachments can't exceed 10MB.
<err>	The error information.

Example

AT+CSMTPSFILE=1,"E:/file1.txt"

OK

**AT+CSMTPSFILE=1,{non-ascii}"E6B58BE8A
F95E99984E4BBB62E6A7067"**

OK

AT+CSMTPSFILE?

+CSMTPSFILE: 1,"E:/file1.txt"

OK

AT+CSMTPSFILE=2,"U:/ file2.txt "

OK

AT+CSMTPSFILE?

+CSMTPSFILE: 1, "E:/file1.txt"

+CSMTPSFILE: 2, "U:/file2.txt"

OK

22.2.10 AT+CSMTPSEND Initiate session and send e-mail

This asynchronous command is used to initiate TCP/SSL session with SMTP server and send an e-mail after all mandatory parameters have been set correctly.

AT+CSMTPSEND Initiate session and send e-mail

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

+CSMTPSEND: <err>

or

ERROR

or

+CSMTPSEND: <err>

ERROR

Defined Values

<err>

The error information. 0 indicates success. Other values indicate failure.

Example

AT+CSMTPSEND
OK

+CSMTPSEND: 0

22.2.11 AT+CSMTPSSTOP Force to stop sending e-mail

The synchronous command is used to force to stop sending e-mail and close the TCP/SSL session while sending an e-mail is ongoing. Otherwise, the command will return "ERROR" directly..

AT+CSMTPSSTOP Force to stop sending e-mail

Test Command	Response
AT+CSMTPSSTOP=?	OK
Execution Command	Response
AT+CSMTPSSTOP	OK
	or
	ERROR

Example

AT+CSMTPSSTOP
OK

22.2.12 AT+CSMTPSCLEAN Clean mail content and setting

The synchronous command is used to clean mail content and setting.

AT+CSMTPSCLEAN Clean mail content and setting

Execution Command	Response
AT+CSMTPSCLEAN	OK
	or
	ERROR

Example

```
AT+CSMTPSCLEAN
OK
```

22.3 Summary of result codes for SMTPS

Code of <errcode>	Meaning
0	SMTPS operation succeeded
600	Busy
601	Network error
602	Socket error
603	Over size
604	Duplicate file
605	Time out
606	Transfer failed
607	Memory error
608	Invalid parameter
609	EFS error
610	SMTP server error
611	Authentication failure
612	User cancel
655	Unknown error

23 Summary of ERROR Codes

23.1 Verbose Codes and Numeric Codes

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

23.2 Response String of AT+CEER

Number	Response string
CS network reject	
2	IMSI unknown in HLR
3	Illegal MS
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
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
100	Conditional IE error
101	Message not compatible with state
111	Protocol error: unspecified

23.3 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

Code of <err>	Meaning
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 str too long
25	invalid characters
26	dial str too long
27	invalid characters in dial str
30	no nw service
31	nw timeout
32	network not allowed - emergency call 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
48	hidden key required
49	EAP method not support
50	Incorrect parameters
51	command implemented but currently disabled
52	command aborted by user
53	not attached to network due to MT functionality restrictions
54	modem not allowed - MT restricted to emergency calls only
55	operation not allowed because of MT functionality restrictions
56	fixed dial number only allowed
57	temporarily out of service due to other MT usage
58	language/alphabet not supported
59	unexpected data value
60	system failure
61	data missing
62	call barred
63	message waiting indication subscription failure
100	unknown error
103	illegal MS
106	illegal ME
107	GPRS services not allowed
108	GPRS services and non GPRS services not allowed

111	PLMN not allowed
112	Location area not allowed
113	Roaming not allowed in this location area
114	GPRS services not allowed in this plmn
115	No suitable cells in location area
121	PTI mismatch
122	Congestion
126	Insufficient resources
127	Mission or unknown APN
128	Unknown pdp address or pdn type
129	User authentication failed
130	Activation rej by CGSN Serving GW or PDN GW
131	Request rej, unspecified
132	Service option not supported
133	requested service option not subscribed
134	service option temporarily out of order
135	PTI already in use
136	Regular deactivation
137	EPS QoS not accepted
140	Feature not supported
141	Semantic errors in the TFT operation
142	Syntactical errors in the TFT operation
143	Invalid EPS bearer identity
144	Semantic errors in packet filters
145	Syntactical errors in packet filters
146	PDP context without TFT already activated
148	unspecified GPRS error
149	PDP authentication failure
150	invalid mobile class
171	Last PDN disconnection not allowed
172	Semantically incorrect message
173	mandatory information element error
174	information element non exist or not implemented
175	Conditional ie error
176	Protocol error unspecified
177	Operator determined barring
178	max num of pdp contexts reached
179	Requested APN not supported in current rat and PLMN combination
180	Request rejected bearer control mode violation
181	Unsupported qci value
182	User data transmission via control plane is congested

184	Invalid PTI value
186	Message not compatible with protocol state
190	Network failure
191	Reactivation requested
192	PDN type IPv4 only allowed
193	PDN type IPv6 only allowed
194	Single address bearers only allowed
195	Collision with network initiated request
196	PDN type IPv4v6 only allowed
197	PDN type non IP only allowed
198	Bearer handling not supported
199	APN restriction value incompatible with active PDP context
200	Multiple accesses to a PDN connection not allowed
201	ESM information not received
202	PDN connection does not exist
203	Multiple PDN connections for a given APN not allowed
208	Message type not compatible with protocol state
209	Information element non-existent or not implemented
301	Internal error base
302	UE busy
303	ue not power on
304	pdn not active
305	pdn not valid
306	pdn type invalid
307	pdn leak param
308	ue fail
309	pdn type and APN duplicate used
310	PAP and EITF not matched
311	SIM PIN disabled
312	SIM PIN already enabled
313	SIM PIN wrong format
512	Required parameter not configured
513	TUP not registered
514	AT internal error
515	CID is active
516	Incorrect state for command
517	CID is invalid
518	CID is not active
520	Deactivate the last active CID
521	CID is not defined
522	UART parity error

523	UART frame error
524	UE is in minimal function mode
525	AT command aborted: in processing
526	AT command aborted: error
527	Command interrupted
528	Configuration conflicts
529	During FOTA updating
530	Not the AT allocated socket
531	USIM PIN is blocked
532	USIM PUK is blocked
533	Not mipi module
534	File not found
535	conditions of use not satisfied
536	AT UART buffer error
537	Back off timer is running

Examples

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

23.4 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

Code of <err>	Meaning
300	ME failure
301	SMS service of ME reserved
302	operation not allowed
303	operation not supported
304	invalid PDU mode parameter

305	invalid text mode parameter
310	(U)SIM not inserted
311	(U)SIM PIN required
312	PH-(U)SIM PIN required
313	(U)SIM failure
314	(U)SIM busy
315	(U)SIM wrong
316	(U)SIM PUK required
317	(U)SIM PIN2 required
318	(U)SIM PUK2 required
320	memory failure
321	invalid memory index
322	memory full
330	SMSC address unknown
331	no network service
332	network timeout
340	no +CNMA acknowledgement expected
500	unknown error

Examples

```
AT+CMGS=02112345678
```

```
+CMS ERROR: 304
```