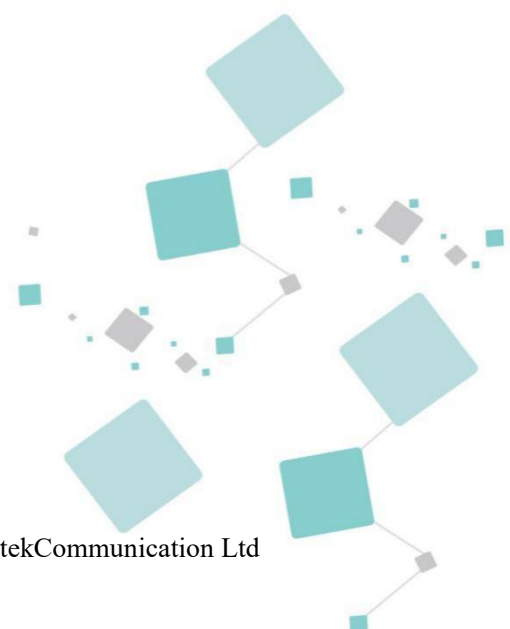# L510_AT_Command_User_Guide

LTE-GSM   Module Series

Version： V1.0

Date： 2022-04-26

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Revision History

Date	Version	Description of chage	Author
2022-04-26	V1.0	Initial	Li Yong

Contents

1.Introduction

1.1 Overview

This document introduces the supported AT command set of L501 project.

We don't suggest using proprietary command in a multiple command. There might be abnormal situation occurs.

1.2 References

[1] 3GPP TS 27.007 V3.13.0 (2003-03)
[2] ETSI TS 27.005 V3.1.0 (2000-01)
[3] ITU-T V.25 ter(07/1997)

2.V.25ter AT Commands

2.1 AT

Return to online command state from online data state

Execution Command **AT**	Response **OK**

2.2 ATE

This setting determines whether or not the TA echoes characters received from TE during command state.

Execution Command **ATE[<value>]**	Response **OK**
Reference V.25ter	Note

Parameters are defined below:

Parameters	Description
<value>	0 Echo mode off 1 Echo mode on default parameter is 1,so echo mode is on

2.3 ATI

Set result code format mode

Execution Command **ATI**	Response **<text>** **OK**
Reference **text**	Note Product information Model Revision IMEI

2.4 +++

Switch from Data Mode or PPP Online Mode to Command Mode

Execution Command	Response
+++	The +++character sequence causes the TA to cancel the data flow over the AT interface and switch to Command mode. This allows you to enter AT Command while maintaining the data connection to the remote server. **OK** To prevent the +++escape sequence from being misinterpreted as data, it should comply to following sequence: 1. No characters entered for T1 time (1 second) 2. "+++" characters entered with no characters in between (0.5 second) 3. No characters entered for T1 timer (0.5 second) 4. Switch to Command mode, otherwise go to step 1.
Peference	Note
	To return from Command mode back to data mode: Enter ATO0

2.5 ATO

Switch from Data mode/ppp Online to command mode

Execution Command	Response
ATO<value>	**CONNECT**
Peference	Note
ATO0	**CONNECT**

Parameters are defined below:

Parameters	Description
value	**0** Switch from command mode to data mode.

2.6 ATQ

Set result code suppression mode

Read Command	Response
ATQ[<value>]	**OK** If value is **0.**
	(none) If value is 1 (because result codes are suppressed).
	ERROR For unsupported values (if previous value was **Q0**).
	(none) For unsupported values (if previous value was **Q1**).
	Note

Example:

AT Command	Response
ATQ0	OK
ATQ1	
ATQ	OK

Parameters are defined below:

Parameters	Description
value	0 DCE transmits result code
	1 Result codes are suppressed and not transmitted.

2.7 ATS0

This command is used to Set the automatic answering delay

Execution Command	Response
ATS0=<value>	**OK**
	or
	ERROR
Read Command	Response
ATS0?	**<value>**
	OK

Parameters are defined below:

Parameters	Description
value	Enable automatic answering after n seconds.
	0-255 Set Command line termination character to this value
	Default value is 0

2.8 ATS3

Command line termination character

This S-parameter represents the decimal IA5 value of the character recognized by the DCE from theDTE to terminate an incoming command line. It is also generated by the DCE as part of the header,trailer, and terminator for result codes and information text, along with the S4 parameter (see the description of the V parameter for usage).

Execution Command **ATS3=\<value\>**	Response **OK** or **+CME ERROR:\<err\>**
Read Command **ATS3?**	Response **\<value\>** **OK**

Parameters are defined below:

Parameters	Description
value	**13** Carriage return character(CR IA5 0/13) **0-31** Set Command line termination character to this value

2.9 ATS4

Response formatting character

This S-parameter represents the decimal IA5 value of the character generated by the DCE as part of the header, trailer, and terminator for result codes and information text, along with the S3 parameter(see the description of the V parameter for usage).

Execution Command **ATS4=\<value\>**	Response **OK** **or** **+CME ERROR:\<err\>**
Read Command **ATS4?**	Response **Value** **OK** or **+CME ERROR:\<err\>**
Parameters **value**	Description **10** Line feed character(LF,IA50/10) **0-31** Set response formatting character to this value

2.10 ATS5

Command line editing character.

This S-parameter represents the decimal IA5 value of the character recognized by the DCE as are quest to delete from the command line the immediately preceding character.

Execution Command **ATS5=\<value\>**	Response **OK** **or** **+CME ERROR:\<err\>**
Read Command **ATS5?**	Response **Value** **OK** or **+CME ERROR:\<err\>**
Reference V.25ter	Note

Parameters are defined below:

Parameters	Description
\<value\>	**8** Backspace character(BS,IA50/8)
	0-31 Set command line editing character to this value

2.11 ATV

Set DCE response format

Execution Command **ATV[\<value\>]**	Response **OK** or **+CME ERROR:\<err\>**
Parameter **\<value\>**	Note **0**:Information response:\<text\>\<CR\>\<LF\>Short result code format:\<numric code\>\<CR\> **1**:Information response:\<CR\>\<LF\>\<text\>\<CR\>\<LF\>Long result code format:\<CR\>\<LF\>\<verbose code\>\<CR\>\<LF\>

2.12 ATX

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

However, this setting has no effect on the operation of the W dial modifier, which always checks fordial tone regardless of this setting, nor on the busy signal detection capability of the W and @dialmodifiers. See Table.

Execution Command **ATX[<value>]**	Response **OK** **or** **+CME ERROR:<err>**

Parameters are defined below:

Parameters	Description
<value>	**0** CONNECT result code is given upon entering online data state. Dial tone and busy detection are disabled. **1**CONNECT<text> result code is given uponentering online data state. Dial tone and busy detection are disabled. **2** CONNECT<text> result code is given uponentering online data state. Dial tonedetection is enabled, and busy detection is disabled. **3** CONNECT<text> result code is given uponentering online data state. Dial tonedetection is disabled, and busy detection is enabled. **4**CONNECT<text> result code is given uponentering online data state. Dial tone and busydetection are both enabled.

2.13 ATZ

Reset to default configuration

Execution Command **ATZ[<value>]**	Response **OK** or **+CME ERROR:<err>**
Reference V.25ter	Note

Parameters are defined below:

Parameters	Description
<value>	**0** The default configure of the manufacturer.

2.14 AT&F

Set to factory-defined configuration

Execution Command **AT&F[\<n\>]**	Response **OK** **or** **+CME ERROR:\<err\>**
Parameters **\<n\>**	Description 0 Set all parameters to manufacturer default value

3.General Commands

3.1 AT+CGMI   Request Manufacturer Identification

The command causes the phone to return one or more lines of information text< manufacturer > which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to

Test Command **AT+CGMI=?**	Response **+CGMI:< manufacturer >** **OK**
Execution Command **AT+CGMI**	Response **+CGMI:< manufacturer>** **OK**

Parameters ard defined below:

Parameter note	Description
<manufacturer>	Product brand text

3.2 AT+CGMM   Request model identification

The command causes the phone to return one or more lines of information text <model>
which is intended to permit the user of the ITAE/ETAE to identify the specific model of phone
to which it is connected to

Test Command **AT+CGMM=?**	Response **+CGMM:<module>** **OK**
Execution Command **AT+CGMM**	Response **+CGMM:<module>** **OK**

Parameter are defined below:

Parameter note	Description

<module>	Product module id text

3.3 AT+CGMR   Request revision identification

This command causes the phone to return a string containing information regarding SW version

Test Command **AT+CGMR=?**	Response +CGMR:<revision>,<build_time> **OK**
Execution Command **AT+CGMR**	Response **+CGMR:"<revision>,<build_time>"** **OK**

Parameters are defined below:

Parameter note:	Description
<revision>	Product revision
<build_time>	Compile soft time

3.4 AT+CGSN   Request product serial number identification

Returns the IMEI number of the phone

Execution Command **AT+CGSN**	Response **"<IMEI>"** **OK**
Test Command **AT+CGSN=?**	Response **OK**

3.5 AT+CIMI   Request international mobile subscriber identity

Execution Command **AT+CIMI**	Response **<IMSI>** **OK**
Test Command **AT+CIMI=?**	Response **OK**

3.6 AT+GSN   Request TA Serial Number Identification

This command is used to request TA Serial Number Identification(serialNumber)

Execution Command **AT+GSN**	Response **"IMEI"** **OK**
Test Command **AT+GSN=?**	Response +GSN:<serialNumId> **OK**

3.7 AT+MRD_SN   Get TA Serial Number Identification

This command is used to request TA Serial Number Identification(serialNumber)

Read Command **AT+MRD_SN?**	Response +MRD_SN:<serialNumId> **OK**

3.8 AT+CSCS   Select TE character set

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

Execution Command **AT+CSCS=<chset>**	Response **OK** or **+CME ERROR:<err>**
Test Command **AT+CSCS=?**	Response **+CSCS：(list of suproted<chset>s)** **OK**
Read Command **AT+CSCS?**	Response **+CSCS:<chset>** **OK**

Parameters are defined below:

Parameters	Description
<chset>	**"GSM"**GSM 7 bit default alphabet (3GPP TS 23.038); this setting causes easily software flow control (XON/XOFF) problems. **"IRA"** international Reference alphabet(ITU-T T.50) **"UCS2"** 16-bit universal multiple-octet coded character set (ISO/IEC10646 [32]); **"HEX"**Character strings consist only of hexadecimal numbers from 00 to FF

3.9 AT+GMI Request manufacturer identification

The command causes the phone to return one or more lines of information text< manufacturer > which is intended to permit the user of the ITAE/ETAE to identify the manufacturer of the phone to which it is connected to

Test Command **AT+GMI=?**	Response **+GMI:< manufacturer >** **OK**
Execution Command **AT+GMI**	Response **+GMI:< manufacturer >** **OK**

Parameters are defined below:

Parameter note:	Description
<manufacturer >	Product manufacturer text

3.10 AT+GMM　Request TA model identification

This command requests TA model identification(may equal to +CGMM)

Test Command **AT+GMM=?**	Response **+GMM:\<module>** **OK**
Execution Command **AT+GMM**	Response **+GMM:\<module>** **OK**

3.11 AT+GMR　Request revision identification

This command request TA revision identification(may equal to +CGMR)

Test Command **AT+GMR=?**	Response **+GMR:\<revision>,\<build_time>** **OK**
Execution Command **AT+GMR**	Response **+GMR:"Revision:\<version>,build_time: \<load file compile_time>"** **OK**

3.12 AT+IPR　UART BAUD rate setting

Specifies the data rate, in addition to 921600 bits/s or 9600 bits/s, at which the DCE will accept commands. May be used to select operation at rates at which the DCE is not capable of automatically detecting the data rate being used by the DTE.

Test Command **AT+IPR=?**	Response **+IPR:(list of supported\<rate>s)** **OK**
Execution Command **AT+IPR=\<rate>**	Response **OK**
Read Command	Response **+IPR:\<rate>** **OK**

Parameters are defined below:

Parameters	Description
\<rate>	The rate, in bits per second, at which the DTE-DCE interface should operate. Currently, the following rates are supported: 300,1200,4800,9600,14400,19200,28800,38400, 57600,115200,230400,460800,921600.If unspecified, Default rate is

115200 bps.	

3.13 AT+CMEE Report Mobile Equipment Error

Set command disables or enables the use of result code +CME ERROR: <err>as an indication of an error relating to the functionality of the MT. When enabled, MT related errors cause +CME ERROR: <err>final result code instead of the regular ERROR final result code. ERROR is returned normally when error is related to syntax, invalid parameters, or TA functionality.

Test command returns values supported as a compound value.

Write Command **AT+CMEE=[<n>]**	Response **OK** **or** **+CME ERROR:<err>**
Read Command **AT+CMEE?**	Response **+CMEE: <n>** **OK**
Test Command **AT+CMEE=?**	Response **+CMEE: (list of supported <n>s)** **OK**

Parameters are defined below:

Parameters	Description

<n>	0 disable +CME ERROR: <err> result code and use ERROR instead
	1enable +CME ERROR: <err> result code and use numeric <err>
	    values (refer next subclause)
	2enable +CME ERROR: <err> result code and use verbose <err>
	    values (refer next subclause)

3.14 AT+ICCID   Read ICCID of SIM Card

This command is used to read SIM card ICCID if SIM inserted. If SIM not inserted, return +CME ERROR: 10

Execution Command	Response
AT+ICCID	**+ICCID: <iccid>** **OK** **or** **+CME ERROR: <err>**

Parameters are defined below:

Parameters	Description
<iccid>	String type

4.Call Control Commands

4.1 ATD Mobile Originated Call to Dial a Number

Causes the MT to transition from the command state to the online state

Execution Command	Response
ATD<dial string>;	**OK** **Or** **+CME ERROR:<err>**
Reference	Note: The <dial string> is optional. For circuit switched data services, the dial string may contain the following characters: Digits 0 to 9, *, #;

4.2 ATH Disconnect Existing Connection

Causes the MT to transition from online command state to command state; use of the digit '0' is optional.

Execution Command	Response
ATH[<value>]	**OK** **Or** **+CME ERROR:<err>**
Reference	Note: <value> 0: Disconnect from line and terminate call.

4.3 ATA Answer

Instructs the modem to immediately go off-hook and attempt to establish a connection without waiting for a ring, this is used to answer an incoming call if auto answer (s0) is disabled.

Execution Command	Response
ATA	**OK** **Or** **+CME ERROR:<err>**
Reference	Note: Answer a call

4.4 AT*DIALE emergency call

This command is used to make an emergency call

Execution Command **AT*DIALE=<dial string>,<server type>;**	Response **OK** **Or** **+CME ERROR:<err>**
Test Command **AT*DIALE=?**	Response ***DIALE: <number>, (0-31)** **OK**

Parameter are defined below:

Parameters **<dial string>**	Descrption The <dial string> is optional. For circuit switched data services, the dial string may contain the following characters: Digits 0 to 9, *, #;
<server type>	Bit mask indicating the required emergency call service category. Bit 0: POLICE Bit 1: AMBULANCE Bit 2: FIRE_BRIGADE Bit 3: MARINE_GUARD Bit 4: MOUNTAIN_RESCUE

4.5 AT+CNUM Subscriber Number

The MS ISDN related to the subscriber

Test Command **AT+CNUM=?**	Response **OK**
Execute Command **AT+CNUM**	Response **+CNUM:[<alphal>],<number1>,<type>[<CR><LF>]** **OK**

Parameter are defined below:

Parameters	Description
<alphax>	Optional alphanumeric string associated with number used character set should be the one selected with command Select TE Character Set +CSCS

<number>	String type phone number of format specified by <typex>
<typex>	Type of address octet in integer format
<text>	Field of maximum length<tlength>;character set as specified by command+CSCS.The display of text depending to the storage format in the sim card.If we store the pbk entry with usc2 format,we show Chinese string here,otherwise,we show NON-Chinese string.We do not care about charsets.it is decided by command +CSCS setting when we store them

Example:

AT command	Response
AT+CPBS="ON"	+CPBS:"ON",2,2 **OK**
AT+CPBW=1,"10600000 000",129,"test1"	**OK**
AT+CPBR=1	+CPBR:1,"10600000000",129,"test1" **OK**
AT+CNUM	+CNUM:"test1","10600000000",129 **OK**

4.6 AT+CCFC   Call Forwarding Number and Conditions

This command allows control of the call forwarding supplementary service according to 3GPP TS 22.082. Registration, erasure, activation, deactivation, and status query are supported.

Write Command **AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]**	Response **OK** or **+CME ERROR:<err>**
Test Command **AT+CCFC=?**	Response **+CCFC: (0,1,2,3,4,5)** **OK**

Parameters are defined below:

Parameters	Description

\<reason\>	0: unconditional 1: mobile busy 2: no reply 3: not reachable 4: all call forwarding (refer 3GPP TS 22.030) 5: all conditional call forwarding
\<mode\>	0: disable 1: enable 2: query status 3: registration 4: erasure
\<number\>	string type phone number of forwarding address in format specified by \<type\>
\<type\>	type of address octet in integer format (refer TS 24.008 subclause 10.5.4.7); default 145 when dialling string includes international access code character "+", otherwise 129
\<subaddr\>	string type subaddress of format specified by \<satype\>
\<satype\>	type of subaddress octet in integer format (refer TS 24.008 subclause 10.5.4.8); default 128

<class>	is a sum of integers each representing a class of information (default 7): 1: voice (telephony) 2: data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 OK/+CME ERROR: <err> Note: when <mode>=2 and command successful: +CCFC: <status>,<class1>[,<number>,<type> [,<subaddr>,<satype>[,<time>]]][<CR><LF> +CCFC: <status>,<class2>[,<number>,<type>[,<subad dr>,<satype>[,<time>]]] [...]]Copyright ? 2018 ASR Confidential August 6, 2019, Draft ASR micro Page 63 and 128) 4: fax (facsimile services) 8: short message service 16: data circuit sync 32: data circuit async 64: dedicated packet access 128: dedicated PAD access
<time>	1...30: when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded,default value is 20
<status>	0：not active 1：active

4.7 AT+CCWA   Call waiting

This command allows control of the Call Waiting supplementary service according to 3GPP TS 22.083.

Write Command	Response
AT+CCWA=[<n>[,<mode >[,<class>]]]	**OK** **or** **+CME ERROR:<err>**

Test Command **AT+CCWA=?**	Response **+CCWA: (0-1)** **OK**
Read Command **AT+CCWA?**	Response **+CCWA: <n>** **OK**

Parameter are defined below:

Parameters	Description
<n>	<n>(sets/shows the result code presentation status to the TE) 0: disable 1: enable
<mode>	integer type (when <mode> parameter is not given, network is not interrogated) 0:disable 1:enable 2:query status

<class>	is a sum of integers each representing a class of information (default 7): 1: voice (telephony) 2: data (refers to all bearer services; with <mode>=2 this may refer only to some bearer service if TA does not support values 16, 32, 64 OK/+CME ERROR: <err> Note: when <mode>=2 and command successful: +CCFC: <status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][<CR><LF> +CCFC: <status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]] [...]]Copyright ? 2018 ASR Confidential August 6, 2019, Draft ASR micro Page 63 and 128) 4: fax (facsimile services) 8: short message service 16: data circuit sync 32: data circuit async 64: dedicated packet access 128: dedicated PAD access

4.8 AT+CHLD Call Holding Services

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

Write Command **AT+CHLD=<n>**	Response **OK** **or** **+CME ERROR:<err>**
Test Command **AT+CHLD=?**	Response **+CHLD: (0, 1, 1x, 2, 2x, 3, 4)** **OK**

Parameter are defined below:

Parameters	Description

<n>	Call hold operation:
	0 - Release all held calls or set User Determined User Busy (UDUB) for a waiting call
	1 - Release all active calls (if any exist) and accept the other (held or waiting) call
	1x - Release specific active call x, where x is the serial number of a call participating in an active Multiparty call.
	2- Place all active calls (if any exist) on hold and accept other (held or waiting) call
	2x - In the case of an active Multiparty call, places all active calls on hold, except for call x. Call x remains active.
	3 - Add a held call to the conversation (Multiparty)
	4 - Connects the two calls and disconnects thesubscriber from both calls (ECT)

4.9 AT+CRSM Restricted SIM Access

This command is used to transmits to the MT the SIM command and its required parameters

Write Command	Response
AT+CRSM==<command >[,<fileid>[,<P1 >,<P2>,<P3> [,<data>[,<pathid>]]]]	+CRSM: <sw1>,<sw2>[,<response>]
	OK/+CME ERROR: <err>
	Note: This can also be an indication to list the current call information
Test Command **AT+CRSM=?**	Response
	+CRSM: (176,178,192,214,220,242),(12037-28599),(0-255),(0-255),(0-255),<data>,<pathid>
	OK

Parameter are defined below:

Parameters	Description
<command>	command passed on by the ME to the SIM
	176 READ BINARY
	178 READ RECORD
	192 GET RESPONSE
	214 UPDATE BINARY
	220 UPDATE RECORD
	242 STATUS

<field>	identifier of an elementary data file on SIM. Mandatory for every command except STATUS.
<P1>,<P2>,<P3>	parameter passed on by the ME to the SIM; they are mandatory for every command except GET RESPONSE and STATUS 0..255
<Data>	information to be read/written to the SIM (hexadecimal character format)

4.10 AT+CLCC List Current Calls

This command is used to list current calls

Write Command	Response
AT+CLCC	[+CLCC: <id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]] [<CR><LF>+CLCC: <id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]] [...]]](Note) OK/+CME ERROR: <err> Note: This can also be an indication to list the current call information

Parameters are define below:

Parameters	Description
<idx>	integer type; call identification number as described in 3GPP TS 22.030 subclause 4.5.5.1; this number can be used in +CHLD command operations
<dir>	0 mobile originated (MO) call 1 mobile terminated (MT) call
<stat>	0 active 1 held 2 dialing (MO call) 3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call) 6 offering(MT call)

\<mode\>	0 voice
	1 data
	2 fax
	3 voice followed by data, voice mode
	4 alternating voice/data, voice mode
	5 alternating voice/fax, voice mode
	6 voice followed by data, data mode
	7 alternating voice/data, data mode
	8 alternating voice/fax, fax mode
	9 unknown
\<mpty\>	0 call is not one of multiparty (conference) call parties
	1 call is one of multiparty (conference) call parties
\<number\>	string type phone number in format specified by \<type\>
\<type\>	type of address octet in integer format (refer TS 24.008 subclause 10.5.4.7)
	129 Dialing string without international access code "+"
	145 Dialing string includes international access code character "+"
\<alpha\>	string type alphanumeric representation of \<number\> corresponding to the entry
	found in phonebook; used character set should be the one selected with command Select TE Character Set +CSCS

4.11 AT+PLAYMP3   Play Mp3 Tone

This command is used to play mp3 tones

Write Command **AT+PLAYMP3="filenam e.mp3"**	Response **OK** **or** **+CME ERROR:\<err\>**
Test Command **AT+PLAYMP3=?**	Response **+PLAYMP3: \<filename\>** **OK**

4.12 AT+STOPMP3 Stop Mp3 tone

This command is used to play mp3 tones

Write Command	Response
AT+STOPMP3="filename.mp3"	**OK** **or** **+CME ERROR:<err>**
Test Command AT+STOPMP3=?	Response **+STOPMP3: <filename>** **OK**

4.13 AT+VTS   DTMF tones

This command is used to allows the transmission of DTMF tones

Write Command	Response
AT+VTS=<DTMF>[,<duration>] Note:	**OK** **or** **+CME ERROR:<err>**
Test Command AT+VTS=?	Response **+VTS: <DTMF>, (300-600)** **OK**

Parameters are define below:

Parameters	Description
<DTMF>	**DTMF string, up to 32 characters, valid character: (0, 1, ..., 9, A, B, C, D, *, #).**
<duration>	**(300-600ms)**

4.14 AT+AUDIORECORD   Record audio into SDcard

This command is used to record audio into SDcard

Write Command	Response
AT+AUDIORECORD=<a ction>[,<savefile>[,<tim e>]]	**OK** **+AUDIORECORD OK** **or** **ERROR**
Test Command **AT+AUDIORECORD=?**	Response **+AUDIORECORD:(0-1),"file",1-60000** **OK**

Parameters are define below:

Parameters	Description
<action>	1 start record 0 stop record
<savefile>	saved wav file path and name, must begin with D:\\ and end with .wav
<time>	need record total time ,with msecond

4.15 AT+AUDIOSEND   Upload audio file to server

This command is used to upload audio file to server

Write Command	Response
AT+AUDIOSEND=<file>, <serverIP>, <serverPort>	Response **OK** **+AUDIOSEND OK** **or** **ERROR**
Test Command **AT+AUDIOSEND=?**	Response **+AUDIOSEND:"file","server address",(1-65535)** **OK**

Parameters are define below:

Parameters	Description
<file>	upload wav file path and name
<serverIP>	Identifies the IP address of server.
<serverPort>	Identifies the port ofserver,

5.Network Service related Commands

5.1 AT+COPS Operator Selection

Set command forces an attempt to select and register the GSM/UMTS/NB-IOT network operator. If the selected operator is not available, ERROR is returned.Read command returns the current mode, the currently selected operator.Test command returns operator list present in the network

Test Command **AT+COPS=?**	Response **+COPS: list of supported (\<mode\>,\<format\>s,\<oper\>),[\<long alphanumeric\<oper\>,short alphanumeric \<oper\>,numeric \<oper\>]** **OK** **or** **+CME ERROR: \<err\>**
Write Command **AT+COPS=\<mode\>[,\<fo rmat\>,\<oper\>[,\<Act\>]]**	Response *OK* **or** **+CME ERROR: \<err\>**
Read Command **AT+COPS?**	Response **+COPS: \<mode\>[,\<format\>,\<oper\>,\<Act\>]** **OK** **or** **+CME ERROR: \<err\>**

Reference	Note
	+COPS? response is not alphanumeric format when setting with alphanumeric format
	example:
	+COPS: 0,0," KG Telecom Co."
	If you got +COPS: 0,0,"46688"
	This is possibly due to there is no alphanumeric format name mapping to the operator id
	You can define operator name table in the following file under custom folder.
	mcu\custom\common\customer_operator_name.c
	Please check if there is operator name mapping in the name table.
	If not , Please add your operator name and operator id
	There is comment information in the file to guide you .
	Please read the guide before modification.

Parameter are defined below:

Parameters	Description
<mode>	0 automatic (<oper> field is ignored)
	1 manual (<oper> field shall be present)
	2 deregister from network
	3 set only <format> (for read command +COPS?), do not attemptregistration/deregistration
	4 manual/automatic (<oper> field shall be present); if manual selectionfails, automatic mode (<mode>=0) is entered
<format>	0 long format alphanumeric <oper>
	1 short format alphanumeric <oper>
	2 numeric <oper>
<oper>	string type
<stat>	0 unknown
	1 available
	2 current
	3 forbidden

<Act>	0	GSM
	1	GSM_COMPACT
	2	UTRAN
	3	GSM_EGPRS
	4	UTRAN_HSDPA
	5	UTRAN_HSUPA
	6	UTRAN_HSDPA_HSUPA
	7	EUTRAN
	8	ECGSM

5.2 AT+CREG Network Registration

This command be used to query the register status

Test Command **AT+CREG=?**	Response **+CREG: list of supported (<n>s)** **OK** **or** **+CME ERROR: <err>**
Write Command **AT+CREG=<n>**	Response **OK** **or** **+CME ERROR: <err>**
Read Command **AT+CREG?**	Response **+CREG:<n>,<stat>[,<lac>,<ci>,<Act>]** **OK** **or** **+CME ERROR: <err>**

Parameters are defined below:

Parameters	Description
<n>	0 disable network registration unsolicited result code 1 enable network registration unsolicited result code+CREG:<stat> 2 enbale network registration and location information unsolicited result code+CREG:<stat>[,<lac>,<ci>] 3enable network registration, location information and cause value information unsolicited result code +CREG: <stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

<stat>	0 not registered,MT is not currently searching a new operator to register to
	1 registered,home work
	2 not registered,but MT is currently searching a new operator to register to
	3 registration denied
	4 unkown
	5 registered,romaing
	6registered for "SMS only", home network (applicable only when <AcT> indicates E-UTRAN)
	7 registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN)
	8attached for emergency bearer services only (see NOTE 2) (not applicable)
	9 registered for "CSFB not preferred", home network (applicable only when <AcT> indicates E-UTRAN)
	10registered for "CSFB not preferred", roaming (applicable only when <AcT> indicates E-UTRAN)
	11only emergency services are available.
	<lac>: string type; two byte location area code in hexadecimal format
	12registeration denied in roaming
	13 sync done in LTE roaming network
	14 ecall inactive
<lac>	String type,two byte location area code
<ci>	string type,two byte cell ID in hexadecimal format
<Act>	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: E-UTRAN
	8: UTRAN w/HSPA+
	9: E-UTRAN CA

5.3 AT+CLCK   Facility Lock

Execute command is used to lock, unlock or interrogate a ME or a network facility <fac>

Write Command	Response
AT+CLCK=<fac>,<mode >[,<passwd>,<class>]]	**+CME ERROR: <err>** **when <mode>=2 and command successful:** **+CLCK: <status>[,<class1>** **[<CR><LF>+CLCK: <status>,<class2>** **[...]]** **OK** **or** **+CME ERROR: <err>**
Test Command **AT+CLCK=?**	Response **+CLCK: (list of supported <fac>s)** **OK** **or** **+CME ERROR: <err>**

Parameters are defined below:

Parameters	Description
<fac>	"CS","PS","PF","SC","AO","OX","OI","AI","IR","NT","NM","NS","NA" "AB","AG","AC","FD","PN","PU","PP","PC"
<mode>	0 unlock 1 lock 2 query status (only "SC"support query mode)
<status>	0 not active
<passwd>	1 active string type
<classx>	is a sum of integers each representing a class of information (default 7) 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 8 short message service 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access

The <fac>"AB", "AG" and "AC" are applicable only for <mode>=0

5.4 AT+CPWD Change Password

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

Write Command	Response
AT+CPWD=<fac>,<oldpwd>,<newpwd>	**OK** **or** **+CME ERROR: <err>**
Test Command	Response
AT+CPWD=?	**+CPWD: list of supported** **(<fac>,<pwdlength>)s** **OK** **or** **+CME ERROR: <err>**

Parameters are defined below:

Parameters	Description
<fac>	"SC" SIM (lock SIM/UICC card) (SIM/UICC asks password in MT power-up and when this lock command issued) Correspond to PIN1 code. "P2" SIM PIN2
<oldpwd>	String type
<newpwd>	String type
<pwdlength>	integer type maximum length of the password for the facility

5.5 AT+CPOL   Preferred operator list

This command is used to edit the SIM preferred list of networks. Execute command writes an entry in the SIM list of preferred operators (EFPLMNsel). If <index> is given but <oper> is left out, entry is deleted. If <oper> is given but <index> is left out, <oper> is put in the next free location. If only <format> is given, the format of the <oper> in the read command is changed.

Test Command	Response
AT+CPOL=?	**+CPOL: (list of supported <index>s),** **(list of supported <format>s)** **OK** or **+CME ERROR: <err>**
Execution Command	Response
AT+CPOL=<index>[,<format>[,<oper>[<GSM_AcT>,<GSM_compact_AcT>,<UTRAN_AcT>]]]	**OK** or **+CME ERROR: <err>**

Read Command **AT+CPOL?**	Response **+CPOL:** **<index1>,<format>,<oper1>[,<GSM_AcT1>,** **<GSM_Compact_AcT1>,<UTRAN_AcT1>]** **[<CR><LF>+CPOL:** **<index2>,<format>,<oper2>[,<GSM_AcT2>,** **<GSM_Compact_AcT2>,<UTRAN_AcT2>]** **[...]]** **OK** or **+CME ERROR: <err>**

Parameter are defined below:

Parameters	Description
<indexn>	the order number of operator in the SIM/USIM preferred operator list
<format>	0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper>
<opern>	string type; <format> indicates if the format is alphanumeric or numeric (see +COPS)
<GSM_AcTn>	0 access technology not selected 1 access technology selected
<GSM_Compact_AcTn>	0 access technology not selected 1 access technology selected
<UTRAN_AcT>	0 access technology not selected 1 access technology selected
Reference	Note: when adding preferred operater, <format> can only be 2

Example:

AT Commands	Response
AT+CPOL=?	+CPOL: (1-8),(0,1,2) **OK**
AT+CPOL?	+CPOL: 1,2,"46000" **OK**
AT+CPOL=2,2,"46001"	**OK** <Note:>Add a preferred operator If perator is full, then report ERROR
AT+CPOL?	+CPOL: 1,2,"46000" +CPOL: 2,2,"46001" **OK**

AT+CPOL=,0	OK <Note :>Set the display format as long format alphanumeric <oper>
AT+CPOL?	+CPOL: 1,0,"China Mobile" +CPOL: 2,0,"China Unicom" OK
AT+CPOL=1 AT+CPOL?	OK <Note :>Delete the preferred operator with index of 1 +CPOL: 2,0,"China Unicom"

5.6 AT+CGREG   GPRS network registration status

This command is used to controls the presentation of an unsolicited result for package network

Write Command AT+CGREG=<n>	Response OK or +CME ERROR:<err>
Test Command AT+CGREG=?	Response +CGREG: (list of supported <n>s) OK
Read Command AT+CGREG?	Response +CGREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>],[<rac>] [,<cause_type>,<reject_cause>]] OK or +CME ERROR: <err>

Parameters are defined below:

Parameters	Description

<n>	integer type
	0 disable network registration unsolicited result code
	1 enable network registration unsolicited result code +CGREG: <stat>
	2 enable network registration and location information unsolicited result code +CGREG:
	<stat>[,<tac>,<ci>,<AcT>,<rac>]
	3 enable network registration, location information and cause value information unsolicitedresult code +CEREG:
	<stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]
<stat>	registration status
	0 - not registered, terminal is not currently searching a new operator to register to
	1 - registered, home network
	2 - not registered, but terminal is currently searching a new operator to register to
	3 - registration denied
	4 - unknown
	5 - registered, roaming
	6 - not initialized(Internal use only)
	If <n>=2 - enable network registration and location information unsolicited result code. if there is a change of the network cell, it is issued the unsolicited result code
	+CGREG: <stat>[,<lac>,<ci>,<Act>,<rac>]
	or
	+CGREG: <stat>[,<lac>,<ci>,<Act>]

5.7 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. The parameters <AcT>, <tac> and <ci> are provided only if available.The value <n>=3 further extends the unsolicited result code with [,<cause_type>,<reject_cause>], when available, when the value of <stat>changes.If the UE wants to apply PSM for reducing its power consumption, see +CPSMS command and 3GPP TS 23.682 [149], the set command controls the presentationofanunsolicitedresultcode+CEREG:
<stat>[,[<tac>],[<ci>],[<AcT>][,[<cause_type>],[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]].
When <n>=4 the unsolicited result code will provide the UE with additional information for the Active Time value and the extended periodic TAU value if there is a change of the network cell in E-UTRAN. The value <n>=5 further enhances the unsolicited result code with <cause_type> and <reject_cause> when the value of <stat> changes. The parameters <AcT>, <tac>, <ci>, <cause_type>, <reject_cause>, <Active-Time> and <Periodic-TAU> are provided only if available.Refer subclause 9.2 for possible <err> values.

NOTE 1: If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes apply to the registration status and location information for those services.

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. The parameters [,<cause_type>,<reject_cause>], if available, are returned when <n>=3.

Test command returns values supported as a compound value.

Write Command **AT+CEREG=<n>**	Response **OK** **or** **+CME ERROR:<err>**
Test Command **AT+CEREG=?**	Response **+CEREG: (list of supported <n>s)** **OK**
Read Command **AT+CEREG?**	Response when <n>=0, 1, 2 or 3 and command successful: +CEREG: <n>,<stat>[,[<tac>], [<ci>],[<AcT>[,<cause_type>, <reject_cause>]]] **OK**

Parameter are defined below:

Parameters	Description
<n>	integer type 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CEREG: <stat> 2 enable network registration and location information unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]] 3 enable network registration, location information and EMM cause value information unsolicited result code +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]

\<stat\>	integer type; indicates the EPS registration status 0 not registered, MT is not currently searching an operator to register to 1 registered, home network 2 not registered, but MT is currently trying to attach or searching an operator to register to 3 registration denied 4 unknown (e.g. out of E-UTRAN coverage) 5 registered, roaming 6 registered for "SMS only", home network (not applicable) 7 registered for "SMS only", roaming (not applicable) 8 attached for emergency bearer services only (See NOTE 2) 9 registered for "CSFB not preferred", home network (not applicable) 10 registered for "CSFB not preferred", roaming (not applicable) NOTE 2: 3GPP TS 24.008 [8] and 3GPP TS 24.301 [83] specify the condition when the MS isconsidered as attached for emergency bearer services. 11attached for emergency bearer services only
\<tac\>	string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal)
\<ci\>	string type; four byte E-UTRAN cell ID in hexadecimal format
\<AcT\>	integer type; indicates the access technology of the serving cell 0 GSM (not applicable) 1 GSM Compact (not applicable) 2 UTRAN (not applicable) 3 GSM w/EGPRS (see NOTE 3) (not applicable) 4 UTRAN w/HSDPA (see NOTE 4) (not applicable) 5 UTRAN w/HSUPA (see NOTE 4) (not applicable) 6　UTRAN w/HSDPA and HSUPA (see NOTE 4) (not applicable) 7　E-UTRAN 8　EC-GSM-IoT 9　E-UTRAN(NB-S1 mode) NOTE 3: 3GPP TS 44.060 [71] specifies the System Information messages which give the information about whether the serving cell supports EGPRS. NOTE 4: 3GPP TS 25.331 [74] specifies the System Information blocks which give the information about whether the serving cell supports HSDPA or HSUPA.
\<cause_type\>	integer type; indicates the type of \<reject_cause\>. 0 Indicates that \<reject_cause\> contains an EMM cause value, see 3GPP TS 24.301 [83] Annex A. 1 Indicates that \<reject_cause\> contains a manufacturer-specific cause.

<reject_cause>	integer type; contains the cause of the failed registration. The value is of type as defined by<cause_type>.

5.8 AT+CIREG   Ims registration status information

This command is set command controls the presentation of an unsolicited result code +CIREGU: <reg_info>[,<ext_info>] when there is a change in the MT's IMS registration information.

The read command returns <n>, that shows whether reporting is enabled or disabled, <reg_info> that shows whether one or more of the public user identities are registered and optionally <ext_info>, that shows the status of the MT's IMS capabilities. For <ext_info>, all relevant values are always summarized and reported as a complete set of IMS capabilites in the unsolicited result code.

Read Command **AT+CIREG?**	Response **+CIREG: <n>,<reg_info>[,<ext_info>]** **OK**
Write Command **AT+CIREG=[<n>]**	Response **OK** **Or** **+CME ERROR:<err>**

Parameters are defined below:

Parameters	Description
<n>	Enables or disables reporting of changes in the MT's IMS registration information. 0: disable reporting. 1: enable reporting (parameter <reg_info>). +CIREG: < reg_info > 2: enable extended reporting (parameters<reg_info> and <ext_info>).
<reg_info>	Indicates the IMS registration status. 0: not registered. 1: registered.

<ext_info>	The value range is from 0 to FFFFFFFF
	It is a sum of hexadecimal values, each representing a particular IMS capability of the MT
	1: RTP-based transfer of voice according to MMTEL, see 3GPP TS 24.173 [87]. This functionality can not be indicated if the UE is not available for voice over PS, see 3GPP TS 24.229 [89].
	2: RTP-based transfer of text according to MMTEL, see 3GPP TS 24.173 [87].
	4: SMS using IMS functionality, see 3GPP TS 24.341 [101].
	8: RTP-based transfer of video according to MMTEL, see 3GPP TS 24.173 [87]. The hexadecimal values 10, 20, 40 ....80000 are reserved by the present document.

5.9 AT+CPSI Inquiring UE System Information

This command is used to return the UE system information.

Test Command **AT+CPSI=?**	Response **+CPSI: (scope of <time>)** **OK**
Read Command **AT+CPSI?**	Response **+CPSI:<system mode>** **OK** If camping on a GSM cell: **+CPSI:<System Mode>,<Operation Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Absolute RF Ch Num>,** **<RxLev>,<C1-C2>** **OK** If camping on a LTE cell: **+CPSI:<System Mode>,<OperationMode>,<MCC>-<MNC>,<TAC>,<SCellID>,<PCellID>,** **<Frequency Band>,<earfcn>,<dlbw>,<ulbw>,** **<RSRQ>,<RSRP>,<RSSI>,<RSSNR>,<SINR>** **OK**

Write Command	Response
AT+CPSI=\<time>	**OK**
	or
	ERROR
	Note: When AT + CPSI = 0 is executed or AT + CPSI=? is executed Or AT + CPSI ? is executed, will stop reporting.

Parameters are defined below:

Parameters	Description
\<time>	Mandatory parameter. The range is 0-255, unit is second, after set \<time> will report the system information every the seconds.

AT+CPSI? Defined values:

Parameters	Description
\<System Mode>	System mode, values: "NO SERVICE", "GSM",, "LTE", "ERROR"…
\<Operation Mode>	UE operation mode, values: "Online","Offline","Factory Test Mode","Reset", "Low Power Mode".
\<MCC>	Mobile Country Code (first part of the PLMN code)
\<MNC>	Mobile Network Code (second part of the PLMN code)
\<LAC>	Location Area Code (hexadecimal digits)
\<Cell ID>	Service-cell ID.
\<Absolute RF Ch Num>	AFRCN for service-cell.
\<C1>	Coefficient for base station selection
\<C2>	Coefficient for Cell re-selection
\<Frequency Band>	Frequency Band of active set
\<RxLev>	RX level value for base station selection
\<TAC>	Tracing Area Code

\<PCellID\>	Physical Cell ID
\<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 receive power in dBm x10, Range: -44 to -140.
\<RSRQ\>	Current reference signal receive quality, The quantities are in dB x10. Range: -20.0 to -3.0 dB.
\<RSSNR\>	Average reference signal signal-to-noise ratio of the serving cell over the last measurement period in decibels. Range: -10 to 30.
\<RSSI\>	Received signal strength indicator, values are in dBm x10. Range: -120.0 to 0.
\<SINR\>	Serving cell SINR information, Values are in 1/5th of a dB. Range 0-250 which translates to -20dB - +30dB.

Example:

Commands	Response
AT+CPSI=?	**+CPSI: (0-255)** **OK**
AT+CPSI=5	**OK**
AT+CPSI?	**+CPSI:LTE,1120,0,33033,20487,305,40,5,34,36,0,16** **OK**

5.10 AT+CNMP Preferred Mode Selection

This command is used to preferred mode selection

Test Command **AT+CNMP=?**	Response **+CNMP: (list of supported \<n\>s)** **OK**

Read Command	Response
AT+CNMP?	**+CNMP:<mode>**
	OK

Write Command	Response
AT+CNMP=<mode>	This command is used to select or set the state of the mode preference,The read command return the current preferred mode that may differ from the setting because of other network operations.
	OK

Parameters are defined below:

Parameters	Description
<mode>	integer type
	0 GSM
	1 LTE only
	2 GSM-LTE DUAL MODE LTE PREFERRED
	3 GSM-LTE DUAL MODE GSM PREFERRED
	4 GSM-LTE DUAL MODE AUTO
	default value is 2

5.11 AT+BAND   GSM/UMTS/LTE mode and optionally band settings

This command is used to controls parameters for GSM/UMTS/LTE user mode and optionally band settings.
The new parameters will be saved in NVM,UE will be reset to apply the new settings.
The default value of <bandPriorityFlag> is 0, it only works if <mode> is LTE.

Write Command	Response
AT+BAND=<mode>,<gsmband>,<umtsband>,<ltebandh>,<ltebandl>[,<roamingConfig>[,<srvDomain>[,<bandPriorityFlag>]]]	**OK**
	or
	+CME ERROR:<err>
Test Command	Response
AT+BAND=?	**+BAND: (list of supported<mode>s),<gsm_band>,<umts_band>,<ltebandh>, ltebandl>**
	OK/+CME ERROR: <err>

Read Command	Response
AT+BAND?	**+BAND :\<mode>,\<gsmband>,\<umtsband>,\<ltebandh>,\<ltebandl>,\<roamingConfig>,\<srvDomain>,\<bandPriorityFlag>,\<isLteDualLink>,\< ltebandExt >** **OK** Note: If has used set command to set GSM band in GSM mode(AT+BAND=0,\<gsm_band>), and current is in GSM mode, the queried GSM band will mask a GSM band lock 0x200.

Parameters are defined below:

Parameters	Description
\<mode>	integer type 0 GSM network 1 UMTS network 2 Dual mode(auto) 3 Dual mode(GSM preferred) 4 Dual mode(UMTS preferred) 5 LTE network 6 Dual mode(2G/4G)(auto) 7 Dual mode(2G/4G)(GSM preferred) 8 Dual mode(2G/4G)(LTE preferred) 9 Dual mode(3G/4G)(auto) 10 Dual mode(3G/4G)(UMTS preferred) 11 Dual mode(3G/4G)(LTE preferred) 12 Triple mode(2G/3G/4G) (auto) 13 Triple mode(2G/3G/4G) (GSM preferred) 14 Triple mode(2G/3G/4G) (UMTS preferred) 15 Triple mode(2G/3G/4G) (LTE preferred) 16 Dual link (GSM/LTE) 17 Dual link(UMTS/LTE) 18 Dual link(GSM/UMTS/LTE) (UMTS preferred for 2/3G link)

<gsmband>	integer type;GSM network band If <mode> is set to GSM network, gsmband is a sum of integers each representing a GSM band (in other words bit mask) 1 PGSM 900 (standard or primary) 2 DCS GSM 1800 4 PCS GSM 1900 8 EGSM 900 (extended) 16 GSM 450 32 GSM 480 64 GSM 850 78 DCS GSM 1800PCS GSM 1900EGSM 900GSM 850 Note: now only support PGSM 900 and DCS GSM 1800
<umtsband>	integer type; UMTS network band If <mode> is set to UMTS network, umtsband is a sum of integers each representing a UMTS band (in other words bit mask) 1 UMTS_BAND_1 2 UMTS_BAND_2 4 UMTS_BAND_3 8 UMTS_BAND_4 16 UMTS_BAND_5 32 UMTS_BAND_6 64 UMTS_BAND_7 128 UMTS_BAND_8 256 UMTS_BAND_9
<ltebandh>	integer type; TD LTE network band If <mode> is set to TD LTE network, ltebandh is a sum of integers each representing a TD LTE band (in other words bit mask) 32 TDLTE_BAND_38 64 TDLTE _BAND_39 128 TDLTE _BAND_40 256 TDLTE _BAND_41
<ltebandl>	integer type;FDD LTE network band If <mode> is set to FDD LTE network, ltebandl is a sum of integers each representing a FDD LTE band (in other words bit mask) 1 FDDLTE_BAND_1 2 FDDLTE_BAND_2 4 FDDLTE _BAND_3 8 FDDLTE _BAND_4 16 FDDLTE _BAND_5 64 FDDLTE _BAND_7 4096 FDDLTE _BAND_13 65536 FDDLTE _BAND_17 524288 FDDLTE _BAND_20

<roamingConfig>	integer type; 0 not support 1 support 2 no change
<srvDomain>	integer type; 0 CS only 1 PS only 2 CS and PS 3 ANY 4 no change
<bandPriorityFlag>	integer type; 0: default 1: TD-LTE 2: FDD-LTE
<isLteDualLink>	integer type; 0: single link 1: dual link

6.MT control and status Commands

6.1 AT+CFUN   Set Phone Functionality

Set command selects the level of functionality <fun> in the MT.

Test Command AT+ CFUN=?	Response **+CFUN: (list of supported <fun>s), (list of supported <rst>s)** **OK** **or** **+CME ERROR: <err>**
Write Command **AT+CFUN=<fun>[,<rst>]**	Response **OK** or **+CME ERROR: <err>** **Note：Currently, CFUN=5 is not supported to switch to CFUN=0.** **Please switch to CFUN=1 before switching back to CFUN=0**
Read Command **AT+CFUN?**	Response **+CFUN:<fun>** **OK** **Or** **+CME ERROR: <err>**

Parameters are defined below:

Parameters	Description
<fun>	0 minimum functionality 1 full functionality 3 disable phone receive RF circuits 5 disable phone both transmit and receive RF circuits (supported only for module solution) 6 disable SIM
<rst>	0 do not reset the MT before setting it to <fun> power level 1 reset the MT before setting it to <fun> power level

6.2 AT+CPIN   Enter PIN

Set command sends to 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 ME and an error message, +CME ERROR, is returned to TE. Refer [1] 9.2 for possible <err> values.

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.

Test Command **AT+ CPIN=?**	Response **OK** or **+CME ERROR:<err>**
Read Command **AT+ CPIN?**	Response **+CPIN: <code>** **OK** or **+CME ERROR: <err>**
Write Command **AT+CPIN=<pin>[,<newpin>]**	Response **OK** or **+CME ERROR: <err>**

Parameters are defined below:

Parameters **<pin>**	Description **String type values**
<newpin>	**String type values,new pin after <pin> check pass**

<code>	<code>values reserved by the present document:
	READY MT is not pending for any password
	SIM PIN MT is waiting SIM PIN to be given
	SIM PUK MT is waiting SIM PUK to be given
	PH-SIM PIN MT is waiting phone to SIM card password to be given
	PH-FSIM PIN MT is waiting phone-to-very first SIM card password to be given
	PH-FSIM PUK MT is waiting phone-to-very first SIM card unblocking password to be given
	SIM PIN2 MT is waiting SIM PIN2 to be given
	SIM PUK2 MT is waiting SIM PUK2 to be given
	PH-NET PIN MT is waiting network personalization password to be given
	PH-NET PUK MT is waiting network personalization unblocking password to be given
	PH-NETSUB PIN MT is waiting network subset personalization password to be given
	PH-NETSUB PUK MT is waiting network subset personalization unblocking password to be given
	PH-SP PIN MT is waiting service provider personalization password to be given
	PH-SP PUK MT is waiting service provider personalization unblocking password to be given
	PH-CORP PIN MT is waiting corporate personalization password to be given
	PH-CORP PUK MT is waiting corporate personalization unblocking password to be given

6.3 AT+CSQ   Signal Quality

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

Execution Command	Response
AT+ CSQ	**+CSQ: <rssi>,<ber>** **OK** **or** **+CME ERROR:<err>**

Test Command	Response
AT+CSQ=?	**+CSQ: (0-31),(0-7)**
	OK

Parameters are defined below:

Parameters	Description
<rssi>	0-113dBm or less
	1 -111dBm
	2…30 -109... -53dBm
	31-51dBm or greater
	99 not known or not detectable
<ber>	0...7 as RXQUAL values in the table in TS 45.008 [20] subclause 8.2.4
	99 not known or not detectable

6.4 AT+CIND   Indicator control

Displays the value of ME indicators

Test Command	Response
AT+CIND=?	**+CIND: ("service",(0-1))**
	OK
	or
	+CME ERROR: <err>
Read Command	Response
AT+CIND?	**+CIND: <ind>[,<ind>[,...]]**
	OK
	or
	+CME ERROR: <err>
Write Command	Response
AT+CIND=[<ind>[,<ind>[,…]]	**OK**
	or
	+CME ERROR: <err>
Reference note:	Note
	"call setup" is proprietary defined and only used when BT supported.

Parameters are defined below:

Parameters	Description
\<ind\>	integer type value, which shall be in range of corresponding \<descr\> \<descr\> values reserved by the present document and their \<ind\> ranges: "battchg" battery charge level (0-5) "signal" s ignal quality (0-5) "service" service availability (0-1) "sounder" (0-1) "message" message received (0-1) "call" call in progress (0-1) "roam" roaming indicator (0-1) "smsfull" a short message memory storage in the MT has become full(1) or memory locations are available (0)

6.5 AT+CCLK   Clock

Set command sets the real-time clock of the MT.
Read command returns the current setting of the clock.

Test Command **AT+CCLK=?**	Response **OK**
Read Command **AT+CCLK?**	Response **+CCLK: \<time\>** **OK** **or** **+CME ERROR: \<err\>**
Write Command **AT+CCLK=\<time\>**	Response **OK** **or** **+CME ERROR:\<err\>**

Parameters are defined below:

Parameters	Description
\<time\>	string type value; format is "yy/MM/dd,hh:mm:ss+timezone", where characters indicate year (two last digits), month, day, hour, minutes, seconds.If does not support timezone,the\<time\> format is "yy/MM/dd,hh:mm:ss"or"yy/MM/dd,hh:mm:ss+"

6.6 AT+NTP   set automatic time to ntp server

This command is used to set automatic to ntp server

Write Command **AT+NTP=<mode>**	Response **OK** **or** **+CME ERROR:<err>**
Read Commands **AT+NTP?**	Response **+NTP: <mode>** **OK** or **+CME ERROR: <err>**
Test Command **AT+NTP=?**	Response **+NTP: (enable/disable)** **OK**

Parameters are defined below:

Parameters	Description
<mode>	Integer type value indicating: 0 Disable automatic time zone update via NTP Server(default). 1 Enable automatic time zone update via NTP Server

6.7AT+CTZR   Time Zone Reporting

Enable/Disable the time zone change event reporting.If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz> whenever the time zone is changed.

Write Command **AT+CTZR=<mode>**	Response **OK** **or** **+CME ERROR:<err>**
Read Commands **AT+CTZR?**	Response **+CTZR: <mode>** **OK** or **+CME ERROR: <err>**

Test Command	Response
AT+CTZR=?	**+CTZR: (list of supported <mode>s)** **OK**
Reference note	Note China Mobile card only. Send AT+CTZR=1 command immediately when modem starting up;or send the following commands in order AT+CTZR=1、AT+CFUN=0、AT+CFUN=1.

Parameters are defined below:

Parameters	Description
<mode>	Integer type value indicating: 0 Disable automatic time zone update via NITZ. 1 Enable automatic time zone update via NITZ(default).

7.GPRS Commands(27.007)

7.1 AT+CGDCONT   Define PDP Context

This command is used to Specifies PDP context parameter values for a PDP context identified by the (local) context identification parameter, <cid>.

Test Command **AT+CGDCONT=?**	Response **+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),** **(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]]** **[<CR><LF>+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s),** **(list of supported <h_comp>s)[,(list of supported <pd1>s)[,…[,(list of supported <pdN>s)]]]** **[...]]** **OK**
Read Command **AT+CGDCONT?**	Response **+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,…[,pdN]]]** **[<CR><LF>+CGDCONT: <cid>, <PDP_type>, <APN>,<PDP_addr>, <d_comp>, <h_comp>[,<pd1>[,…[,pdN]]]** **[...]]** **OK**
Write Command **AT+CGDCONT=<cid>[,< PDP_type>[,<APN> [,<PDP_addr> [,<d_comp>[,<h_comp> [,<pd1>[,…[,pdN]]]]]]]]**	Response **OK** or **+CME ERROR:<err>**

Reference	Note
	Only set 1 PDP channel parameter(APN,pdptype,cid etc..) to execute AT+CGACT=1 ,1 and active PDP context.

Parameters are defined below:

Parameters	Description
<cid>	(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.
<PDP_type>	(Packet Data Protocol type) a string parameter. IP Internet Protocol (IETF STD 5)
<APN>	(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.
<PDP_address>	a string parameter that identifies the MT in the address space applicable tothe PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startupprocedure or, failing that, a dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read usingthe +CGPADDR command.
<d_comp>	a numeric parameter that controls PDP data compression (applicable for SNDCP only)0 - off (default if value is omitted)
<h_comp>	a numeric parameter that controls PDP header compression 0 - off (default if value is omitted)
<pd1>,…<pdN>	zero to N string parameters whose meanings are specific to the <PDP_type>

7.2 AT+CGQREQ   Quality of Service Profile(Requested)

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network.

Test Command AT+CGQREQ=?	Response **+CGQREQ: <PDP_type>, (list ofsupported<precedence>s), (list ofsupported<delay>s), (list ofsupported<reliability>s) , (list ofsupported<peak>s), (list of supported<mean>s) [<CR><LF>+CGQREQ: <PDP_type>, (list ofsupported<precedence>s), (list ofsupported<delay>s), (list ofsupported<reliability>s) , (list ofsupported<peak>s), (list of supported<mean>s)[…]]** **OK**
Read Command AT+CGQREQ?	Response **+CGQREQ: <cid>, <precedence>,<delay>, <reliability>, <peak>, <mean>[<CR><LF>+CGQREQ: <cid>, <precedence>, <delay>, <reliability.>, <peak>,<mean>[…]]** **OK** or **+CME ERROR:<err>**
Write Command AT+CGQREQ=[<cid>[,< precedence>[,<delay>[, <reliability.>[,<peak>[,< mean>]]]]]]	Response **+CGQREQ: <cid>, <precedence>,<delay>, <reliability>, <peak>, <mean>[<CR><LF>** **OK** or **+CME ERROR:<err>**

Parameters are defined follow:

Parameters	Description
<cid>	a numeric parameter which specifies a particular PDP context definition
<precedence>	a numeric parameter which specifies the precedence class
<delay>	a numeric parameter which specifies the delay class
<reliability>	a numeric parameter which specifies the reliability class
<peak>	a numeric parameter which specifies the peak throughput class
<mean>	a numeric parameter which specifies the mean throughput class

7.3 AT+CGQMIN   Quality of Service Profile(Minimum acceptable)

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message.

Test Command AT+CGQMIN=?	Response **+CGQMIN: <PDP_type>, (list ofsupported<precedence>s), (list ofsupported<delay>s), (list ofsupported<reliability>s) , (list ofsupported<peak>s), (list ofsupported<mean>s) [<CR><LF>+CGQMIN: <PDP_type>, (listof supported <precedence>s), (listof supported <delay>s), (list of supported<reliability>s) , (list ofsupported<peak>s), (list ofsupported<mean>s)[…]]** **OK**
Read Command **AT+CGQMIN?**	Response **+CGQMIN: <cid>, <precedence>,<delay>, <reliability>, <peak>,<mean>[<CR><LF>+CGQMIN: <cid>, <precedence>, <delay>, <reliability.>, <peak>,<mean>[…]]** **OK**
Write Command **AT+CGQMIN=[<cid>[,<p recedence>[,<delay> [,<reliability.> [,<peak> [,<mean>]]]]]]**	Response **OK** **or** **+CME ERROR:<err>**

Paramters are defined below:

Parameter	Description
PDP_type	**IP** Internet Protocol **IPV6** Internet Protocol **IPV4V6** Virtual introduced to handle dual IP stack UE capablity **PPP** Point to Point Protocol
<cid>	a numeric parameter which specifies a particular PDP context definition
<precedence>	a numeric parameter which specifies the precedence class
<delay>	a numeric parameter which specifies the delay class
<reliability>	a numeric parameter which specifies the reliability class
<peak>	a numeric parameter which specifies the peak throughput class
<mean>	a numeric parameter which specifies the mean throughput class

7.4 AT+CGATT   PS attach or detach

The execution command is used to attach the MT to, or detach the MT from, the Packet Domain service. After the command has completed, the MT remains in V.250 command state

Test Command **AT+CGATT =?**	Response **+CGATT: (list of supported <state>s)** **OK**
Read Command **AT+CGATT?**	Response **+CGATT: <state>** **OK** or **+CME ERROR:<err>**
Write Command **AT+CGATT= <state>**	Response **+CGATT: <state>** **OK** or **+CME ERROR:<err>**

Parameters are defined below:

Parameters	Description
<state>	indicates the state of PS attachment 0 detached 1 attached

7.5 AT+CGACT   PDP Context activate or deactivate

This command is used to active PDP Context ,but not update PDP Context information to lwip netif ,so after this command can't directly use connect tcp socket

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>[...]]** **OK**

Write Command	Response
AT+CGACT=\<state\>[,\<c id\>]	**OK** or **+CME ERROR:\<err\>**

Parameters are defined below:

Parameters	Description
\<state\>	indicates the state of PDP context activation 0 deactivated 1 activated Other values are reserved and will result in an ERROR response to the execution command.
\<cid\>	a numeric parameter which specifies a particular PDP context definition. If no \<cid\>isspecified, then UE will return ERROR. The usage of omitted \<cid\> to activate/deactivate.

7.6 AT+CGDATA   Enter data state

The execution 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.

Write Command	Response
AT+CGDATA=\<L2P\> ,\<c id\>	**CONNECT** or **+CME ERROR:\<err\>**
Test Command **AT+ CGDATA=?**	Response **+CGDATA: (list of supported \<L2P\>s),(1-16)** **OK**

Parameters are defined below:

Parameters	Description
\<L2P\>	a string parameter that indicates the layer 2 protocol to be used between the TE and MTPPP Point-to-point protocol for a PDP such as IP Other values will result in an ERROR response. PPP Point-to-point protocol for a PDP such as IP
\<cid\>	a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). Range from 1 to 16.

7.7 AT+CGPADDR   Show PDP address

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

The test command returns a list of defined <cid>s.

Write Command **AT+CGPADDR=\<cid>[,< cid>[,]]**	Response **+CGPADDR:** **\<cid>,\<PDP_addr>[\<CR>\<LF>+CGPADDR:\<cid>,\<PDP_addr>[…]]** **OK** **Or** **+CME ERROR:\<err>**
Test Command **AT+CGPADDR=?**	Response **+CGPADDR: (list of defined \<cid>s)** **OK**

Parameters are defined below:

Parameters	Description
\<cid>	a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT command). If no <cid> is specified, an ERROR result code will be returned. Multiple <cid>field is not supported. For a dynamic address it will be the one
\<PDP_address>	a string that identifies the MT in the address space applicable to the PDP. The addressmay be static or dynamic. For a static address, it will be the one set by the +CGDCONT andassigned during the last PDP context activation that used the context definition referred to by <cid>.<PDP_address> is omitted if none is available.

7.8 AT+CGCLASS   GPRS mobile station class

The set command is used to set the MT to operate according to the specified GPRS mobileclass. If the requested class is not supported, an ERROR or +CME ERROR response isreturned. Extended error responses are enabled by the +CMEE command.The read command returns the current GPRS mobile class.

The test command is used for requesting information on the supported GPRS mobile classes.

Write Command **AT+CGCLASS=\<class>**	Response **OK** **or** **+CME ERROR:\<err>**

Read Command	Response
AT+ CGCLASS?	**+CGCLASS:<class>**
	OK

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

Parameters are defined below:

Parameters	Description
<class>	A string parameter which indicates the GPRS mobile class (in descending order offunctionality) (not support)
	A class-A mode of operation(A/Gb mode),or CS/PS mode of operation(Iu mode)(highest mode of operation)
	B class-B mode of operation(A/Gb mode),(not application in Iu mode)
	CG class-C mode of operation in PS only mode(A/Gb mode),or PS mode of operation(Iu mode)
	CC class-C mode of operation in CS only mode(A/Gb mode),or CS(Iu mode)(lowest mode of operation)
	NOTE:<class>A means that the MT would operate simultaneous PS and CS service <class> B means that the MT would operate PS and CS Services but not simultaneously <class>CG means that the MT would only operate PS services<class>CC means that the MT would only operate CS services Other values are reserved and will result in an ERROR response to the set command
	If the MT is attached to the PS domain when the set command is issued with a <class> = CC specified,a PS detach shall beperformedby the MT.

7.9 AT+CGSMS   Select service for MO SMS messages

The set command is used to specify the service or service preference that the MT will use to send MO SMS messages.
The read command returns the currently selected service or service preference.
The test command is used for requesting information on the currently available services and service preferences.

Write Command	Response
AT+CGSMS=<service>	**OK**
	or
	+CME ERROR:<err>

Read Command	Response
AT+ CGSMS?	**+CGSMS: <service>** **OK**

Parameters are defined below:

Parameters	Description
<service>	**0** Packet Domain **1** circuit switched **2** Packet Domain preferred (use circuit switched if GPRS not available) **3** circuit switched preferred (use Packet Domain if circuit switched not available)

7.10 AT+CGEREP   Control Unsolicited GPRS Event Reporting

This command is used to control unsolicited GPRS event reporting.

Write Command	Response
AT+CGEREP=<mode>	**OK** **or** **+CME ERROR:<err>**

Read Command	Response
AT+CGEREP?	**+CGEREP: <mode>,<bfr>** **OK**

Test Command	Response
AT+CGEREP=?	**+CGEREP: (0-2),(0-1)** **OK**

Parameters are defined below:

Parameters	Description
<mode>	0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE 1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE 2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode) and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE

<bfr>	0	MT buffer of unsolicited result codes defined within this command is cleared when <mode>1 or 2 is entered.
	1	MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes).

Unsolicited Result Codes

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

+CGEV: REJECT <PDP_type>, <PDP_addr>

A network request for PDP context activation occurred when the TA
was unable to report it to the TE with a +CRING unsolicited result
code and was automatically rejected.

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

The network has requested a context reactivation. The <cid> that
was used to reactivate the context is provided if known to TA.

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

The network has forced a context deactivation. The <cid> that was
used to activate the context is provided if known to TA.

+CGEV: ME DEACT <PDP_type>, <PDP_addr>, [<cid>]

The mobile equipment has forced a context deactivation. The <cid>
that was used to activate the context is provided if known to TA.

+CGEV: NW DETACH

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

+CGEV: ME DETACH

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

+CGEV: ME CLASS <class>

The mobile equipment has forced a change of MS class. The
highest available class is reported (see +CGCLASS)

+CGEV: EPS ACT <cid>

The network has activated a PDP context. The associated <cid> is
provided to the TE, its
format is found in command +CGDCONT.

+CGEV: EPS MODIFY <cid>, <change_reason>

The network has modified EPS bearer context parameter(s). The
associated <cid> is
provided to the TE in addition of the change reason: TFT and/or QoS
modification. The
format of the parameter <cid> is found in command +CGDCONT.
<change_reason> integer type parameter indicates what kind of change
occurred.

1: TFT only changed

| | 2:Qos only changed |
| | 3: Both TFT and QoS changed |

7.11 AT+CELLINFO　Get Nearby Cell Information

This command is used to get Nearby cell information

Read Command	Response
AT+CELLINFO?	**+CELLINFO:<net_mode>,<net>**
	<nmr_1>...<nmr_n>
	<nmr_1>...<nmr_n>
	......
	OK
	Nearby cell information for GSM
	For current and nearby cell
	<lac>,<cell_id>,<rssi>
	Nearby cell information for LTE
	For current cell:
	<tac>,<cell_id>,<rssi>
	For nearby cell:
	<earfcn>,<pci>,<rssi>

Parameter are defined bellow:

Parameters	Descripton
<net_mode>	**0　GSM**
	1　LTE
<net>	**GSM**
	LTE

8.SMS AT Commands

8.1 AT+CSMS   Select Message Service

Selects the message service and returns the type of messages supported by the ME. If chosen service is not supported by the ME (but supported by the TA), +CME ERROR is returned.

Write Command **AT+CSMS=\<service>**	Response **+CSMS:\<service>,\<mt>,\<mo>,\<bm>** **OK** **or** **+CMS ERROR: \<err>**
Read Command **AT+ CSMS?**	Response **+CSMS: \<service>,\<mt>,\<mo>,\<bm>** **OK**
Test Command **AT+ CSMS=?**	Response **+CSMS: (list of supported \<service>s)** **OK**

Parameters are defined below:

Parameters	Description
\<service>	**0** 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] **1** 3GPP TS 23.040 [3] and 3GPP TS 23.041 [4] the requirement of \<service> setting 1 is mentioned under corresponding commanddescriptions)
\<mt>	**0** type not supported **1** type supported
\<mo>	**0** type not supported **1** type supported
\<bm>	**0** type not supported **1** type supported

8.2 AT+CPMS   Preferred Message Storage

Selects memory storage spaces to be used for reading, writing, etc. If chosen storage is not

appropriate for the ME (but is supported by the TA), +CME ERROR is returned.

Write Command **AT+CPMS=<mem1>[,<mem2>[,<mem3>]]**	Response **+CPMS:** **<used1>,<total1>,<used2>,<total2>,<used3>,<total3>** **OK** **or** **+CMS ERROR: <err>**
Read Command **AT+ CPMS?**	Response **+CPMS:** **<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,** **<mem3>,<used3>,<total3>** **OK** **or** **+CMS ERROR: <err>**
Test Command **AT+ CPMS=?**	Response **+CPMS: ("SM,ME"),("SM,ME"),("SM,ME")** **OK**

Parameters are defined below

Parameters	Description
<mem1>	**SM** SIM card **ME** modem **SM_P** SIM priority(not support) **ME_P** Modem NV priority(not support) **MT** Modem terminal
<mem2>	**SM** SIM card **ME** modem **SM_P** SIM priority(not support) **ME_P** Modem NV priority(not support) **MT** Modem terminal
<mem3>	**SM** SIM card **ME** modem **SM_P** SIM priority(not support) **ME_P** Modem NV priority(not support) **MT** Modem terminal
<usedX>	**Num of memX used**

8.3 AT+CMGF   Message Format

Sets the input and output format to be used by the TA

Write Command	Response
AT+CMGF=[<mode>]	**OK**

Read Command	Response
AT+CMGF?	**+CMGF: <mode>**
	OK

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

Parameters are defined below:

Parameters	Description
<mode>	0PDU mode (default when implemented)
	1 TEXT mode

8.4 AT+CMGS   Send Message

This command send SMS message from TE to network in text or PDU mode

Write Command	Response
If PDU mode(+CMGF=0)	**+CMGS:<length>**
AT+CMGS=<length><CR>	**OK**
PDU is given<ctrl+z/ESC>	
if text mode (+CMGF=1):	
AT+CMGS=<da>[,<toda>]<CR>	
Text entered<ctrl-Z/ESC>	

Test Command	Response
AT+CMGS=?	**+CMGS:**
	OK

8.5 AT+CMGW   Stores Message

This command stores a message in memory storage

Write Command	Response
if text mode (+CMGF=1): **AT+CMGW=<oa/da>[,<t ooa/toda>[,<stat>]]<CR >** Textis entered<ctrl-Z/ESC> if PDU mode (+CMGF=0): **AT+CMGW=<length>[,< stat>]<CR>** PDU is given<ctrl-Z/ESC>	+CMGW:<index> **OK Or +CMS ERROR:<err>**
Test Command **AT+CMGW=?**	Response **+CMGW: OK**

Parameters are defined below:

Parameters	Description
<length>	Length of the PDU to be sent in bytes
<stat>	Message status 0 new message 1 read message 2 stored message not yet sent 3 stored message already sent
<index>	Message location index in the memory<memw>
<da>	Destination address,string type represented in the currently selected character set if the network is UMTS.
<toda>	Type of destination address 129- number in national format 145-number in international format
<Text mode> <stat>	Message status "REC UNREAD"–new received message unread "REC READ"-received message read "STO UNSENT"-message stored not yet sent(default) "STO SENT"-message stored already sent

8.6 AT+CMGD Delete Message

This command deletes message from preferred message storage<mem1> location

Write Command	Response
AT+CMGD=<index>[,<delflag>	**OK** **Or** **+CMS ERROR:<err>**
Test Command **AT+CMGD=?**	Response **+CMGD: (list of valid <index>s),(list of valid<deflag>s)** **OK**

Parameters are defined below:

Parameters	Description
<index>	message index in the selected storage <memr>
<delflag>	0 (or omitted) - delete message specified in <index> 1 Deletes all read messages 2 Deletes all read messages and sent MO messages 3 Deletes all read messages,sent and unsent MO messages 4 Deletes all messages

8.7 AT+CMGL List messages

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

Write Command
AT+CMGL=[<stat>]
	Response
	if PDU mode(+CMGF=0), command successful
	+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>
	[<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]]
	OK
	if text mode (+CMGF=1), command successful and SMS-DELIVERs:
	+CMGL:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[<CR><LF>+CMGL:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[...]]
	OK
	if text mode (+CMGF=1), command successful and SMS-SUBMITs:
	+CMGL: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>[<CR><LF>+ CMGL: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>[...]]
	OK
	Or
	+CMS ERROR:<err>

Test Command **AT+CMGL=?**	Response if PDU mode (+CMGF=0) +CMGL: (0-4) **OK** if text mode (+CMGF=1) +CMGL: "REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL" **OK**

Parameters are defined below:

Parameters	Description
<stat>	0 - new message 1 - read message 2 - stored message not yet sent 3 - stored message already sent 4 - all messages.

8.8 AT+CMGR Read Message

This command retrieves a message from the short message storage. The short messagestorage being used is defined by the command +CPMS

Write Command
AT+CMGR=<index>
	Response
	if PDU mode (+CMGF=0)，command successful:
	+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu>
	OK
	if text mode (+CMGF=1), command successful and SMS-DELIVER:
	+CMGR:<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>
	OK
	if text mode (+CMGF=1), command successful and SMS-SUBMIT:
	+CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>
	OK
	Or
	+CMS ERROR:<err>

Test Command **AT+CMGR=?**	Response **OK**

Parameters are defined below:

Parameters	Description

<index>	(PDU Mode)
	The output has the following format:
	+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> Where:
	<stat> - status of the message
	0 - new message
	1 - read message
	2 - stored message not yet sent
	3 - stored message already sent
	<alpha> - string type alphanumeric representation of <da> or <oa>, corresponding to an entry found in the phonebook; used character set is the one selected with command +CSCS.
	<length> - the length of the actual TP data unit in octets.(i.e. the RP layer SMSC address octets are not count ed in the length)
	<pdu> - message in PDU format according to 3GPP TS 3.40/23.040.
	(Text Mode)
	Output format for received messages (the information written in italics will be present depending on +CSDH last setting):
	+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>, <dcs>,<sca>,<tosca>,<length>]<CR><LF><data>
	Output format for message delivery confirm:
	+CMGR: <stat>,<fo>,<mr>,,,<scts>,<dt>,<st>

8.9 AT+CSCA   Service Center Address

Updates the SMCS address, through which mobile-originated SMSs are transmitted. In text mode, the setting is used by send (AT+CMGS) and write (AT+CMGW) commands. In PDU mode, the setting is used by the same commands, but only when the length of the SMCS address (coded into <pdu> parameter) equals zero..

Write Command	Response
AT+CSCA=<sca>[,<tosca>]	**OK**
	or
	+CME ERROR:<err>
Read Command	Response
AT+CSCA?	**+CSCA: <sca>,<tosca>**
	OK

Test Command	Response
AT+ CSCA=?	**OK**

Reference	Note This AT is related to local operators,CTCC dont support it for the moment.

Parameters are defined below:

Parameters	Description
<sca>	GSM 04.11 RP SC address Address-Value filed in string format
<tosca>	GSM 04.11 RP SC address Type-of-address octet in integer format

Example:

AT Command	Response
AT+CSCA="+8613800100500"	**OK**
AT+CSCA?	**+CSCA:"8613800100500",145** **OK**

8.10 AT+CSMP   Set Text Mode Parameters

Setting Text Mode Parameters. Set command is used to select values for additional parameters needed when SM is sent to the network or placed in a storage when text format message mode is selected. It is possible to set the validity period starting from when the SM is received by the SMSC (<vp> is in range 0... 255) or define the absolute time of the validity period termination (<vp> is a string). The format of <vp> is given by <fo>.

Write Command	Response
AT+CSMP=<fo>[,<vp>[, <pid>[,<dcs>]]]	**OK** **or** **+CMS ERROR:<err>**
Read Command **AT+ CSMP?**	Response **+CSMP:<fo>,<vp>,<pid>,<dcs>** **OK** **Or** **+CMS ERROR:<err>**
Test Command **AT+ CSMP=?**	Response **OK** **or** **+CMS ERROR:<err>**

8.11 AT+CSCB Select Cell Broadcast Message Types

Selects which types of CBMs are to be received by the ME.

Write Command	Response
AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	TA selects which types of CBMs are to be received by the ME.
	Note: The Command writes the parameters in NON-VOLATILE memory.
	OK
	If error is related to ME functionality:
	+CMS ERROR: <err>
Read Command	Response
AT+ CSCB?	**+CSCB: <mode>,<mids>,<dcss>**
	OK
Test Command	Response
AT+ CSCB=?	**+CSCB: (0,1)**
	OK

Parameters are defined below:

Parameters	Description
<mode>	**0** message types specified in <mids> and <dcss> are accepted
	1 message types specified in <mids> and <dcss> are not accepted
<mids>	We support **10** message identifiers at most.
	String type (string should be included in quotation marks); all different possible combinations of CBM message identifiers (refer <mid>) (default is empty string); e.g. "0,1,5,320,922". Total 15 different <mids> values can be supported. <mids> values cannot be written consecutively,
	such as "100-200"
String type	all different possible combinations of CBM message identifiers (refer <mid>)
	(default is empty string);
<dcss>	string type; all different possible combinations of CBM data coding schemes (refer<dcs>) (default is empty string);e.g. "0-3,5"

Example:

AT Command	Response
AT+CSCB=?	**+CSCB:(0,1)**
	OK
AT+CSCB?	**+CSCB:1,"5","3"**
AT+CSCB=1,"5","3"	**OK**

8.12 AT+CMSS Sends message with location value

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

Write Command	Response
AT+CMSS=<index>[,<da >[,<total>]]	**OK** or **+CMS ERROR: <err>**
Test Command	Response
AT+CMSS=?	**OK**

Parameters are defined below:

Parameters	Description
<index>	Message location index in the memory<memw>
<da>	Destination address,string type represented in the currently selected character set if the network is UMTS.
<toda>	Type of destination address 129- number in national format 145-number in international format

8.13 AT+CNMI New Message Indications to TE

Set command selects the procedure,how receiving of new messages from the network is indicated to The TE when TE is active

Write Command	Response
AT+CNMI=<mode>[,<mt >[,<bm>[,<ds> [,<bfr>]]]]	**OK** or **+CMS ERROR: <err>**
Read Command	Response
AT+CNMI?	**+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>** **OK**

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**

Parameters are defined below:

Parameters	Description
<mode>	**0** disable unsolicited result code **1**Discard indication and reject new received message unsolicited result codes whenTA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE. **2** Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-linedata mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE. **3** Forward unsolicited result codes directly to the TE. TA-TE link specific in band technique used toembed result codes and data when TA is in on-line data mode
<mt>	**0** No SMS-DELIVER indications are routed to the TE. **1** If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed tothe TE usingunsolicited result code: +CMTI: <mem>,<index> **2** SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group(store message)) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>, [<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>, <length>] <CR><LF><data> (text mode enabled; about parameters in italics, refer commandShow Text Mode Parameters +CSDH) **3** Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codesdefined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1

\<bm\>	**0** No CBM indications are routed to the TE.
	2 New CBMs are routed directly to the TE using unsolicited result code:
	+CBM: \<length\>\<CR\>\<LF\>\<pdu\> (PDU mode enabled); or
	+CBM: \<sn\>,\<mid\>,\<dcs\>,\<page\>,\<pages\>\<CR\>\<LF\>\<data\> (text mode enabled)If ME supports data coding groups which define special routing also for messagesother than class 3 (e.g. (U)SIM specific messages), ME may choose not to routemessages of such data coding schemes into TE (indication of a stored CBM may be given as defined in \<bm\>=1).
\<ds\>	**0** No SMS-STATUS-REPORTs are routed to the TE.
	1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:
	+CDS: \<length\>\<CR\>\<LF\>\<pdu\> (PDU mode enabled); or
	+CDS: \<fo\>,\<mr\>,[\<ra\>],[\<tora\>],\<scts\>,\<dt\>,\<st\> (text mode enabled)
\<bfr\>	**0** TA buffer of unsolicited result codes defined within this command is flushed to the TEwhen\<mode\>1 is entered (OK response shall be given before flushing the codes).
	1 TA buffer of unsolicited result codes defined within this command is cleared when\<mode\> 1...3 isentered.

9.Hardware Testing AT Commands

9.1 AT+CGDRT Set the Direction of Specified GPIO

This Command is used to Set the direction of specified GPIO

Write Command **AT+CGDRT=<gpio_num >,<gpio_io>**	Response 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. **OK**
Write Command **AT+CGDRT=<gpio_num >**	Response When only one parameter is used to read the configuration of the current GPIO port +CGDRT: <gpio_num>,<gpio_io> **OK** **or** **+CME ERROR:<err>**
Test Command **AT+CGDRT=?**	Response +CGDRT: (list of supported< gpio_num >s),(list of supported< gpio_io >s) **OK**

Parameters are defined below:

Parameters	Description
<gpio_num>	supported operating gpio num
<gpio_io>	0 – in 1 – out

9.2 AT+CGSETV Set the Value of Specified GPIO

This Command is used to Set the Value of Specified GPIO

Write Command **AT+CGSETV=<gpio_num>,<gpio_hl>**	Response This command is used to set the value of the specified GPIO to high or low. GPIO should first be set to output mode with +CGDRT **OK**

Test Command	Response
AT+CGSETV=?	**+CGSETV: (list of supported< gpio_num >s),(list of supported< gpio_ hl >s)**
	OK

Parameters are defined below:

Parameters	Description
<gpio_num>	supported operating gpio num
<gpio_hl>	0 – low
	1 – high

9.3 AT+CGGETV Get the Value of Specified GPIO

This Command is used to Get the Value of Specified GPIO

Write Command	Response
AT+CGGETV=<gpio_num>	This command is used to get the value (high or low) of the specified GPIO. GPIO should first be set to intput mode with +CGDRT
	+CGGETV: <gpio_num>,<gpio_hl>
	OK
Test Command	Response
AT+CGGETV=?	+CGDRT: list of supported< gpio_num >s
	OK

Parameters are defined below:

Parameters	Description
<gpio_num>	supported operating gpio num
<gpio_hl>	0 – low
	1 – high

9.4 AT+CGFLY Flight Mode Control

This command is used to set flight mode control

Write Command **AT+CGFLY=\<mode\>**	Response This command is used to enable or disableFLIGHT GPIO port state, When enabled, the gpio port can control entry or exit flight mode **OK**
Test Command **AT+CGFLY=?**	Response +CGFLY: (list of supported \<mode\>s) **OK**
Read Command **AT+ CGFLY?**	Response **+CGFLY: \<mode\>** **OK**

Parameters are defined below:

Parameters	Description
\<mode\>	0 – disable 1 – enable

9.5 AT+CGNETLED Network LED Control

This command is used to set the Network LED state to enable or disable

Write Command **AT+CGNETLED=\<mode\>**	Response **OK**
Test Command **AT+CGNETLED=?**	Response **+CGNETLED: (list of supported \<mode\>s)** **OK**
Read Command **AT+CGNETLED?**	Response **+CGNETLED: \<mode\>** **OK**

Parameters are defined below:

Parameters	Description
\<mode\>	0 – disable 1 – enable

9.6 AT+SDTEST   Read SD Card Volume

This command is used to read SD Card   total volume

Execute Command	Response
AT+SDTEST	**+SDVOLUME: XXMB** **OK**

9.7 AT+SYSSLEEP   Configure System Sleep

This Command is used to Configure syssleep

Write Command	Response
AT+SYSSLEEP= <n>	**OK**
Read Command **AT+SYSSLEEP?**	Response **+SYSSLEEP:n** **OK** or **+CME ERROR:<err>**
Test Command **AT+ SYSSLEEP=?**	Response **+SYSSLEEP: (0-1)** **OK**

Parameters are defined below:

Parameters	Description
n	0: not sleep 1: sleep

9.8 AT+CSCLK   Configure Slow Clock

This Command is used to Configure Slow Clock.

Write Command	Response
AT+CSCLK= \<n>	**OK**

Read Command	Response
AT+CSCLK?	**+CSCLK:n** **OK** or **+CME ERROR:\<err>**

Test Command	Response
AT+CSCLK=?	**+CSCLK: (**list of supported **\<n>**s**)** **OK**

Parameters are defined below:

Parameters	Description
\<n>	**0** Disable slow clock, module will not enter sleep mode. **1** Enable slow clock, it is controlled by DTR. When DTR is high, module can enter sleep mode. When DTR changes to low level, module can quit sleep mode. **2** Enable slow clock,it is controlled by WakeUp,Whe WakeUp Pin is high, module can enter sleep mode. When WakeUp Pin changes to low level, module can quit sleep mode.

9.9 AT+ RESET   Reboot the Module

This Command is used to reboot the module

Write Command	Response
AT+RESET	**OK**

9.10 AT+POWEROFF   Poweroff the Module

This Command is used to poweroff .the module

Write Command	Response
AT+POWEROFF	**OK**

9.11 AT+SPKSWITCH   Switch Speaker mode and Receiver mode

The command is used to switch speaker mode and receiver mode

Write Command	Response
AT+SPKSWITCH=\<mode\>	**Spk Mode** **or** **Rec Mode** **OK**
Read Command **AT+SPKSWITCH?**	Response **+Mode:\<type\>** **OK**
Test Command **AT+SPKSWITCH =?**	Response **+SPWSWITCH：(0-1)** **OK**

Parameters are defined below:

Parameters	Description
\<mode\>	**0: SPEAKER MODE** **1: RECEIVER MODE**

9.12 AT+ MSPKVOL   Set Speaker Volume

The command is used to set speaker volume

Write Command	Response
AT+MSPKVOL=\<value\>	**OK** **or** **ERROR**

Read Command	Response
AT+ MSPKVOL?	**+VOLUME:<value>** **OK**

Test Command	Response
AT+ MSPKVOL =?	**+SPWSWITCH：(0-11)** **OK**

Parameters are defined below:

Parameters	Description
<value>	**0-11** the default value is 5

9.13 AT+FLOWCTRL Control UART Flow Control

This command is used to control uart flow control

Write Command	Response
AT+FLOWCTRL=<option n>	**OK** **Or** **+CME ERROR**

Read Command	Response
AT+FLOWCTRL?	**+FLOWCTRL:<option>** **OK** **Or** **+CME ERROR:<err>**

Test Command	Response
AT+FLOWCTRL=?	**+FLOWCTRL：(0-1)** **OK**

Parameters are defined below:

Parameters	Description
<option>	0 close uart flow control 1 start uart flow control default value is 0

9.14 AT+WIFICTRL Control WIFI scan function

This command is used to control WIFI scan function

Write Command **AT+WIFICTRL=<option>**	Response **OK** **Or** **+CME ERROR**
Read Command **AT+WIFICTRL?**	Response ***WIFICTRL:<option>,<mac_addr>,<rssi>,<channel_num>** **OK** **Or** **+CME ERROR:<err>**
Test Command **AT+WIFICTRL=?**	Response ***WIFICTRL：(0-1)** **OK**

Parameters are defined below:

Parameters	Description
<option>	0 stop to scan wifi hotspot 1 start to scan wifi hotspot
<mac_addr>	string type, MAC address
<rssi>	integer type, receive signal,in dBm
<channel_num>	integer type

9.15 AT+GTPOS Get Station Positioning

The command is used to retrieve information base station positioning (not support CDMA network).

Write Command **AT+GTPOS=<mode>**	Response <mode>=0: **OK** **<mode>=1:** **CONNECT OK** **CONNECT FAILED** **ERROR** **<mode>=2:** **OK** **+GTPOS: <precision>,<latitude>**
Read Command **AT+GTPOS?**	Response **+GTPOS:<mode>** **OK**
Test Command **AT+GTPOS=?**	Response **+GTPOS: (list of supported <mode>s)** **OK**

Parameters are defined below:

Parameters	Description
<mode>	0 - Close the base station positioning function 1 - Open the base station positioning function 2 - Get the base station positioning function

Example:

Commands	Response
AT+GTPOS=1	**OK** **CONNECT OK**
AT+GTPOS=2	**+GTPOS:104.0553231,30.5497824** **OK**
AT+GTPOS=0	**OK**

9.16 AT+WAKEUPCFG Wakeup Service Config

The command is used to configurewakeup service.

Write Command	Response
AT+WAKEUPCFG=<mode>[,<gpio>]	This command is used to configure wakeup host function
	OK or **ERROR**

Read Command	Response
AT+WAKEUPCFG?	**+WAKEUPCFG:<mode>,<gpio>**
	OK

Test Command	Response
AT+WAKEUPCFG=?	**+WAKEUPCFG: (0-7),(0-1)**
	OK

Parameters are defined below:

Parameters	Description
<mode>	Range:0 to 7(default is 3)
	Description:
	0： close wakeup host function
	1： call wakeup host function
	2： sms wakeup host function
	3： call and sms wakeup host function
	4： data wakeup host function
	5： call and data wakeup host function
	6： data and sms wakeup host function
	7： call、 sms and data wakeup host function
<gpio>	Range:0 to 1(default is 0)
	0:select ri port to outputpulse.
	1:select wakeup out port to output pulse.

Example:

Commands	Response
AT+ WAKEUPCFG=3,1	**OK**

---

10. TTS AT Commands

10.1 AT+MTTSP Set voice broadcast parameters

This command is used to setvoice broadcast parameters

Test Command AT+MTTSP=?	Response +MTTSP: (1-2),(0-32768),(50-150),(50-200) OK
Read Command AT+MTTSP?	Response +MTTSP: <speaker>,<volume>,<speed>,<pitch> OK
Write Command AT+MTTSP=[<speaker>[,<volume>[,<speed>[,<pitch>]]]]	Response OK or ERROR

Parameters are defined below:

Parameters	Description
<speaker>	voice speaker 1 - female voice (default 1) 2 - male voice
<volume>	Speech size 0 - 32768 (default 32000)
<speed>	Speech speed 50 - 150 (default 100) 50 is the fastest speed while 200 is the slowest one
<pitch>	Speech speed 50 - 200 (default 100) 50 is the lowest pitch while 200 is the highest one

10.2 AT+MTTS Audio Play

This command is used to play Audio

Test Command **AT+MTTS=?**	Response **+MTTS: (1-2),"text"** **OK**
Write Command **AT+MTTS=<encode>,<text>**	Response **OK** **+MTTS:<result>** or **ERROR**

Parameters are defined below:

Parameters	Description
<encode>	Text encoding format 1　: the beginning of the GBK encoded text broadcast (default 1) 2　: the beginning of the UTF16 encoded text broadcast
<text>	Broadcast text content is encoded format Encode=1, feed text in MBCS/ANSI to TTS engine.A maximum of 128 characters can be input. Encode=2, feed text in UTF16 to TTS engine.Amaximum of 512 characters can be input.
<result>	The result of TTS operation SUCCESS FAILURE NO MEMORY BUSY

Example:

AT Commands	Response
AT+QICSGP=1,1,"cmnbiot","",""	**OK**
AT+NETOPEN	**OK**　　//first need netopen ,after support　offline play
AT+MTTS=1,"我是小智"	**OK** **+MTTS:SUCCESS**

11.Proprietary AT Commands For PS

11.1 AT+CESQ Received signal level indication

Set command to enable +ECSQ unsolicited result code .to indicate the received signal level.

Execute Command AT+CESQ	Response +CESQ: <rssi>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp> OK or +CME ERROR:<err>
Test Command AT+CESQ=?	Response +CESQ: (range of supported <rssi>s),(range of supported <ber>s), (range of supported <rscp>s), (range of supported <ecno>s), (range of supported <rsrq>s), (range of supported <rsrp>s) OK

Parameters are defined below:

Parameters	Description
rssi	Received signal strengthindication 0 <rssi>< -110dBm 1 -110dBm ≤ <rssi>< -109dBm 2 -109dBm ≤ <rssi>< -108dBm … 61 -50dBm ≤ <rssi>< -49dBm 62 -49dBm ≤ <rssi>< -48dBm 63 -48dBm ≤ <rssi> 99 not known or not detectable
ber	integer type; channel bit error rate (in percent) **0...7** as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 **99** not known or not detectable

<rscp>	integer type, received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3). 0 rscp< -120 dBm 1 -120 dBm ? rscp< -119 dBm 2 -119 dBm ? rscp< -118 dBm 94 -27 dBm ? rscp< -26 dBm 95 -26 dBm ? rscp< -25 dBm 96 - 25 dBm ? rscp 255 not known or not detectable
<ecno>	integer type, ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause). 0 Ec/Io < -24 dB 1 -24 dB ? Ec/Io < -23.5 dB 2 -23.5 dB ? Ec/Io < -23 dB 47 -1 dB ? Ec/Io < -0.5 dB 48 -0.5 dB ? Ec/Io< 0 dB 49 0 dB ? Ec/Io 255 not known or not detectable
<rsrq>	integer type, reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7). 0 rsrq< -19.5 dB 1 -19.5 dB ? rsrq< -19 dB 2 -19 dB ? rsrq< -18.5 dB 32 -4 dB ? rsrq<-3.5 dB 33 -3.5 dB ? rsrq< -3 dBC
<rsrp>	integer type, reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4). 0 rsrp< -140 dBm 1 -140 dBm ? rsrp< -139 dBm 2 -139 dBm ? rsrp< -138 dBm 95 -46 dBm ? rsrp< -45 dBm 96 -45 dBm ? rsrp< -44 dBm 97 -44 dBm ? rsrp 255 not known or not detectable

11.2 AT+CCID   Read CCID of SIM Card

This command is used to read SIM card ICCID if SIM inserted. If SIM not inserted, return
+CME ERROR: 10

Execution Command	Response
AT+CCID	**+CCID: \<iccid\>** **OK** **or** **+CME ERROR: \<err\>**

Parameters are defined below:

Parameters	Description
\<iccid\>	String type

12.Proprietar Unsolicited Result Code

12.1 URC:+CESQ

This URC is to report signal strength

Execution Command	Response **Unsolicited result code** **+CESQ: <rssi>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>**

Parameters are defined below:

Parameters	Description
<rssi>	0-255 Received signal strength indication level
<ber>	integer type; channel bit error rate (in percent) **0...7** as RXQUAL values in the table in 3GPP TS 45.008 [20] subclause 8.2.4 **99** not known or not detectable
<rscp>	integer type, received signal code power (see 3GPP TS 25.133 [95] subclause 9.1.1.3 and 3GPP TS 25.123 [96] subclause 9.1.1.1.3). 0 rscp< -120 dBm 1 -120 dBm ? rscp< -119 dBm 2 -119 dBm ? rscp< -118 dBm 94 -27 dBm ? rscp< -26 dBm 95 -26 dBm ? rscp< -25 dBm 96 - 25 dBm ? rscp 255 not known or not detectable
<ecno>	integer type, ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [95] subclause). 0 Ec/Io < -24 dB 1 -24 dB ? Ec/Io < -23.5 dB 2 -23.5 dB ? Ec/Io < -23 dB 47 -1 dB ? Ec/Io < -0.5 dB 48 -0.5 dB ? Ec/Io < 0 dB 49 0 dB ? Ec/Io 255 not known or not detectable

\<rsrq\>	integer type, reference signal received quality (see 3GPP TS 36.133 [96] subclause 9.1.7). 0 rsrq< -19.5 dB 1 -19.5 dB ? rsrq< -19 dB 2 -19 dB ? rsrq< -18.5 dB 32 -4 dB ? rsrq<-3.5 dB 33 -3.5 dB ? rsrq< -3 dBC
\<rsrp\>	integer type, reference signal received power (see 3GPP TS 36.133 [96] subclause 9.1.4). 0 rsrp< -140 dBm 1 -140 dBm ? rsrp<-139 dBm 2 -139 dBm ? rsrp< -138 dBm 95 -46 dBm ? rsrp< -45 dBm 96 -45 dBm ? rsrp< -44 dBm 97 -44 dBm ? rsrp 255 not known or not detectable

12.2 URC:*ATREADY

AT command to indicate that AT command server is ready to handler AT
commands

Execution Command	Response ***ATREADY: \<bReady\>**

Parameters are defined below:

Parameters	Description
\<bReady\>	1 ready 0 not ready

12.3 URC:+NITZ

NITZ, or Network Identity and Time Zone, is a mechanism for provisioning local time
and date information to mobile devices via a wireless network

Execution Command	Response **+NITZ:\<DST\>[,\<sign\>\<timezone\>[,\<year\>/\<month\>/\<day\>,\<hour\>: \<minute\>:\<second\>]]**

Parameters are defined below:

Parameters	Description
<year>	The integer value is in range [00...99]
<month>	The integer value is in range [1...12].
<day>	The integer value is in range [1...31]
<hour>	The integer value is in range [0...24]
<minute>	The integer value is in range [0...59]
<second>	The integer value is in range [0...59]

<sign>	a char value
	  '+' – local time zone is passive.
	  '-' – local time zone is negative.

<DST>	Daylight Saving Time (DST),also summer time. 0 no adjustment 1 +1 hour 2 +2 hour

Example:

	+NITZ: 0,"+32","11/08/02","09:27:39"

12.4 URC:^MODE

Indicates that system mode has changed

Execution Command	Response **^MODE: <sys_mode>**

Parameters are defined below:

Parameter	Description

<sys_mode>	system mode 0 no service 1 reserved 2 reserved 3 GSM/GPRS 4 WCDMA 5 TD_SCDMA

12.5   URC:+MSTK

Services related to SIM Toolkit application

Execution Command	Response **+MSTK:X，XXXXXXXXXXXX**

12.6   URC:+MMSG

Indicate an Short Messages Storage status change

Execution Command	Response **+MMSG:<smsReady>,<smsFull>**

Parameters are defined below:

Parameter	Description
<smsReady>	indicates if the SIM is ready for SMS 0 not ready 1 ready
<smsFull>	indicates if the memory capacity of SIM for SMS has been reached 0 not reached 1 reached

12.7   URC:+CGEV

Indication from MT to TE in the case of certain events occurring in the Packet Domain

MT or the network. Refer to the details in AT+CGEREP

Execution Command	Response **+CGEV:XXX**

13.TCPIP AT Commands

13.1 AT+QICSGP   Configure APN

This command is used to configure apn,username ,password

Read Command	Response
AT+QICSGP?	**OK**

Write Command	Response
AT+QICSGP=<CID>,<C ONTEXTTYPE>,<APN>, <username>,<password >	**OK** or **ERROR**

Test Command	Response
AT+QICSGP=?	**+QICSGP: (list of supported <cid>s), (list of supported <context_type>s,<APN>,<username>,<password>,<authentication >)** **OK**

Reference	Note

Parameters are defined below:

Parameters	Description
<cid>	1-6
<context_type>	Connect type 1: IPV4 2: IPV4V6 3: IPV6
<APN>	string
<username>	string

<password>	string
<authentication>	Int type 0　none 1　PAP 2　CHAP

13.2 AT+NETOPEN　Active PDP Context and Open packet network

This command is used to open packet network.

Read Command **AT+NETOPEN?**	Response **+ NETOPEN:<net_state>** **OK**
Write Command **AT+NETOPEN**	Response **OK** **+NETOPEN:<err>** or **ERROR**

Parameters are defined below:

Parameters	Description
<err>	Indicate the result of operation. SUCCESS: is success ONGOING：is open in progress FAIL: is failure Error Code:902 pdp already active
<net_state>	Indicate the current network state 0: network close (deactivated) 1: network open(activated)

13.3 AT+NETCLOSE　Close network

This command is used to closes network.

Read Command **AT+NETCLOSE?**	Response **OK** **ERROR**

Execution Command	Response
AT+NETCLOSE	**OK**
	+NETCLOSE:<err>
Reference	Note

Parameters are defined below:

Parameters	Description
<err>	Indicate the result of operation. SUCCESS: is success ONGOING：is open in progress FAIL: is failure

13.4 AT+CIPOPEN   Establish Connection in Multi-socket Mode

This command is used to establish a connection with TCP server and UDP server, The sum of all connections is 6.

Test Command **AT+CIPOPEN=?**	Response **+CIPOPEN: (list of supported <link_num>s), (list of supported <type>s)** **OK**
Read Command **AT+CIPOPEN?**	Response **+CIPOPEN: <link_num>[,<type>,<serverIP>,** **<serverPort>,<index>]** **OK** **Or** **ERROR**
Write Command **AT+CIPOPEN=** **<link_num>,<type>,<ser** **verIP>,<serverPort>[,<lo** **calPort>]**	Response **OK** **+CIPOPEN: <err>,<link_num** **>** **OK** **ERROR**
Reference	Note

Parameters are defined below:

Parameters	Description

<link_num>	Identifies a connection , from 0 to 5, and default value is 0. If AT+CIPMODE=<mode> is set, the <link_num> is restricted to be only 0, +++ is exit send and receive mode.
<type>	Identifies the type of transmission protocol. TCP: Transfer Control Protocol UDP: User Datagram Protocol
<serverIP>	Identifies the IP address of server. If type is UDP serverIP set to empty,except AT+CIPMODE=1.
<serverPort>	Identifies the port ofserver, from 0 to 65535, and default value is 0. If type is UDP serverPort set to empty,except AT+CIPMODE=1.
<localPort>	Identifies the port of local socket, from 0 to 65535, and default value is 0.
<err>	Indicate the result of operation. SUCCESS: is success FAIL: is failure if AT+CIPMODE=1: >: connect establish and can be send or receive data. OK: exit online data send and receive mode.

13.5 AT+CIPSEND   Send Data Through TCP or UDP Connection

This command is used to send data through TCP or UDP connection on non_transparent mode

Test Command AT+CIPSEND=?	Response +CIPSEND: (list of supported <link_num>s), (list of supported <length>s) OK
Read Command AT+CIPSEND?	Response OK Or ERROR

Write Command	Response
AT+CIPSEND= **<link_num>,** **[<length>]** **AT+CIPSEND=** **<link_num>,,,,** **<data>** **AT+CIPSEND=** **<link_num>,** **[<length>],** **<serverIP>,** **<serverPort>** (This format is for UDP connect)	**OK** **+CIPSEND:** **<err>,<link_num>,<reqSendLength>,<cnfSendLength>** **ERROR** This command is used to send data to remote side on non_transparent mode. Single <Ctrl+Z>is start send. Single <ESC> is used to cancel the sending. Single<Ctrl+D>means exit the sending mode. <Ctrl+Z> is 0x1A, <ESC> is 0x1B, <Ctrl+D> is x04. These signals take effect when no length is specified Note 1.In transparent mode <length> will be ignore or the <length> is empty, when input data length reach to 2500 will trigger send out. 2.Small data can be sent as follows: TCP type: AT+CIPSEND=<link_num>,,,,<data> UDP type: AT+CIPSEND=<link_num>,,<serverIP>,<serverPort>,<data>

Parameters are defined below:

Parameters	Description
<link_num>	Identifies a connection , from 0 to 5, and default value is 0.
<length>	Indicates the length of sending data, from 1 to 2500, and default value is 0. TCP: Transfer Control Protocol UDP: User Datagram Protocol Identifies the IP address of server.The IP address format consists of 4 octets,separated by decimal point:"AAA.BBB.CCC.DDD"
<serverPort>	Identifies the port of UDP server, from 0 to 65535, and default value is 0.
<data>	Identifies the contents for sending,and The maximum length is 512
<reqSendLength>	a numeric parameter that requested number of data bytes to be transmitted.
<cnfSendLength>	a numeric parameter that confirmed number of data bytes to be transmitted. PS: When set to hexadecimal by the MCIPCFGPL, <cnfSendLength>=<reqSendLength>/2.

<err>	Indicate the result of operation. SUCCESS: is success FAIL: is failure

13.6 AT+CIPRXGETGet the Network Data Manually

This command is used to Get the Network Data Manually

Test Command **AT+CIPRXGET=?**	Response **+CIPRXGET: (list of supported <mode >s), (list of** **supported <cid>s),** **(list of supported<len>s)** **OK**
Read Command **AT+CIPRXGET?**	Response **+CIPRXGET:<link0_mode>...,<link9_mode>** **OK** **Or** **ERROR**
Write Command **AT+CIPRXGET=** **<mode >,** **<cid>[,<len>]**	Response **<mode> = 2:** **+CIPRXGET:SUCCESS,<mode>,<cid>,<read_len>,<re** **maining data len>,** **<data>** **OK** **Others:** **+CIPRXGET:SUCCESS,<mode>,<cid>[,<read_len>,** **<data>]** **OK** **ERROR**

Parameters are defined below:

Parameters	Description
<mode>	Indicate how to get the network data , from 0 to 4, and default value is 0. 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
<cid>	Identifies a connection, from 0 to 5, and default value is 0.
<len>	The data length to be read.
<read_len>	The length of the data that have read.

<remaining data len>	The length of remaining data.
<data>	The read data.
<err>	Indicate the result of operation. SUCCESS: is success FAIL: is failure

13.7 AT+CIPCLOSE   Close TCP or UDP Socket Connection

This command is used to Close TCP or UDP Socket

Test Command AT+CIPCLOSE=?	Response **+CIPCLOSE: (list of supported <link_num>s)** **OK**
Write Command AT+CIPCLOSE=<link_num>	Response **OK** **+CIPCLOSE: <err>,<link_num>** or **ERROR**

Parameters are defined below:

Parameters	Description
<link_num>	Identifies a connection .from 0 to 5, and default value is 0. Indicate the result of operation. SUCCESS: is success FAIL: is failure

13.8 AT+CIPMODE   Select TCP/IP Application Mode

This command is used to select transparent mode (data mode) or non-transparent mode (command mode) before network open.

Execution Command AT+CIPMODE	Response **OK** Execute command will set the parameter to default value.
Write Command AT+CIPMODE=<mode>	Response **OK** **Or** **ERROR**

Read Command	Response
AT+CIPMODE?	**+CIPMODE: <mode>**
	OK

Test Command	Response
AT+CIPMODE=?	**+CIPMODE: (list of supported<mode>s)**
	OK

Reference	Note
	when set to transparent mode, the ACK and HEX set
	by MCIPCFGPL will not take effect.

Parameters are defined below:

Parameters	Description
<mode>	Indicates to select transparent mode or non-transparent mode.
	from 0 to 1, and default value is 0.
	0: non-transparent mode
	1: transparent mode(similar to the data entry pattern)

13.9 AT+MCIPCFGPL Configure parameters of TCP/IP

This command is used to configure parameters of socket.

Test Command	Response
AT+MCIPCFGPL=?	**+MCIPCFGPL:(list of supported <link_num>s), (list of**
	supported <hex_support>s),(list of supported
	<ack_support>s), (list of supported <ssl_support>s,
	(list of supported <ignore_cert>s)
	OK
Write Command	Response
AT+MCIPCFGPL=<link_ num>,[[<hex_support>], [<ack_support>],[<ssl_s upport>] ,[<ignore_cert >]]	**OK** or **ERROR**
	Ps. If would like to change hex/ack/ssl/ support. all scokets must be disconnected before
Read Command	Response
AT+MCIPCFGPL?	**+MCIPCFGPL:**
	(<hex_support>,<ack_support>,<ssl_support>,<ignore _cert>),…
	OK

Parameters are defined below:

Parameters	Description
<link_num>	Identifies a connection. The range of permitted values is 0 to 5.
<hex_support>	Indicates the form of sending data, 0 - normal,1 – HEX.
<ack_support>	Indicates the form of sending ACK, default ACKfunction is not supported. 0 – not wait for server ACK,1 – need to wait for server ACK
<ssl_support>	Indicates used to set the SSL function for TCP connection only, maximum support three SSL TCP connections, and default SSL function is not supported. 0: Not support SSL,1: Support SSL
<ignore_cert>	Indicates whether the SSL connection ignores the certificate,and default is 0. 0 - ignores certificate 1 - use certificate

13.10 AT+MCIPCFG Configure parameters of TCP/IP

Configure parameters of TCP/IP

Test Command **AT+MCIPCFG=?**	Response **+MCIPCFG: (list of supported <heartbeat_time>s), (list of supported <delay_time>ms)** **OK**
Write Command **AT+MCIPCFG= [<heartbeat_time>], [<delay_time>]**	Response **OK** or **ERROR** Ps.If need to read/write value of heartbeat/delay time, all scokets must be disconnected before.
Read Command **AT+MCIPCFG?**	Response **+MCIPCFG: <heartbeat_time><,delay_time>** **OK**

Parameters are defined below:

Parameters	Description
<heartbeat_time>	Indicates keepalive time,the time depends on the network(test eg:GSMcan not exceed 10min . It takes at least about 12 minutes to recognize that TCP has been disconnected.). Range:0-7200 sencod, and default value is 0 sencod . Ps. When heartbeat_time set to 0, the function of keepalive will be closed

<DelayTm>	a numeric parameter which is number of milliseconds to delay to output data of Receiving.The default value is 0.

13.11 AT+MPING   Ping destination address

Ping destination address .

Write Command **AT+MPING=<dest_addr >,<dest_ad dr_type> [,<num_pings>[,<data_ packet_size >[,<wait_ti me>]]]**	Response **OK** **If ping'sresult_type= 1** **+MPING:<result_type>,<resolved_ip_addr>,<data_pac ket_size>,<rtt>, <TTL>** **If ping's result_type = 2** **+MPING: <result_type>** **If ping's result_type = 3** **+MPING:** **<result_type>,<num_pkts_sent>,<num_pkts_recvd>,< num_p kts_lost>,<min_rtt>** **,<max_rtt>,<avg_rtt>** **ERROR**
Test Command **AT+MPING=?**	Response **+MPING:IPaddress, (list of supported<dest_addr_type>s) ,(1-100),(32-256),(1-255)** **OK**

Parameters are defined below:

Parameters	Description
<dest_addr>	The destination is to be pinged; it can be an IP address or a domain name.
<dest_addr_type>	Integer type. Address family type of the destination address 1 – IPv4. 2 – IPv6(reserved)
<num_pings>	Integer type. The num_pings specifies the number of times the ping request (1-100) is to be sent. The default value is 4.
<data_packet_size>	Integer type. Data byte size of the ping packet (32-256). The default value is 32 bytes.
<wait_time>	Integer type. Wait time for ping response. An ping response received after the timeout shall not be processed(1-255).The default value is 3.
<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.
\<TTL\>	Time-To-Live

13.12 AT+MPINGSTOP Stop an ongoing ping session

Stop an ongoing ping session.

Execution Command **AT+MPINGSTOP**	Response **OK** **+MPING:** **\<result_type\>,\<num_pkts_sent\>,\<num_pkts_recvd\>,\<** **num_p kts_lost\>,\<min_rtt\>** **,\<max_rtt\>,\<avg_rtt\>**
Test Command **AT+MPINGSTOP=?**	Response **OK**

13.13 AT+IPADDR Inquire Socket PDP Address

This command inquires the IP address of current active socket PDP
Before calling this command, AT+NETOPEN have been execute first.

Execution Command **AT+IPADDR**	Response **+IPADDR:\<err\>,\<ip_address\>** **OK** **ERROR**

Read Command	Response
AT+IPADDR?	**OK**
	ERROR

Parameters are defined below:

Parameters	Description
<err>	Indicate the result of operation.
	SUCCESS: is success
	FAIL: is failure
<ip_address>	This command inquires the IP address of current active socket
	PDP

13.14 AT+SERVERSTART Startup TCP Server

This command starts up 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 >,<client_IP>:<port>..

Test Command	Response
AT+SERVERSTART=?	**+SERVERSTART: (1-65535),(1-6),(0-1)**
	OK
Read Command	Response
AT+SERVERSTART?	**+SERVERSTART: <port>,< backlog >,<iptype>**
	OK
Write Command	Response
AT+SERVERSTART=	**OK**
< port>,	**+SERVERSTART:<err>**
< backlog>,	**ERROR**
<iptype>	

Parameters are defined below:

Parameters	Description
<port>	The server port, from 1 to 65535.
< backlog >	The maximum connections can be queued in listen queue, from 1
	to 6.

<iptype>	0:IPV4
	1:IPV6
<err>	Indicate the result of operation.
	SUCCESS: is success
	FAIL: is failure

13.15 AT+SERVERSTOP Stop TCP Server

This command stops TCP server.

Execution Command **AT+SERVERSTOP**	Response **OK** **+SERVERSTOP:<err>** **ERROR**
Test Command **AT+SERVERSTOP=?**	Response **OK**

Parameters are defined below:

Parameters	Description
<err>	Indicate the result of operation.
	SUCCESS: is success
	FAIL: is failure

13.16 AT+MDNSGIP Query the IP address of given domain name

Query the IP address of given domain name.

Write Command **AT+MDNSGIP=<domain name>**	Response If successful,return: **+MDNSGIP: <domain name>,<IP address>** **OK** If fail,return: **ERROR**
Test Command **AT+MDNSGIP=?**	Response **+MDNSGIP:"domain name"** **OK**

Parameters are defined below:

Parameters	Description

<domain name>	A string parameter (string should be included in quotation marks) which indicates the do ma-in name.
<IP address>	A string parameter (string should be included in quotation marks) which indicates the IP address corresponding to the domain name.

13.17 AT+USEDDATA Statistics of current data traffic

This command is used to get currently used all data traffic.

Action Command	Response
AT+USEDDATA	**+USEDDATA:<useddata>** **OK**

Parameters are defined below:

<useddata>	A interger parameter,represents the total data traffic consumed, in bytes.

13.18 AT+CLRARDATA Reset data traffic statistics

This command is used to clear data traffic statistics.

Action Command	Response
AT+CLEARDATA	**OK**

13.19 AT+NETDNS   Setting DNS configuration

This command is used to set dns

Write Command	Response
AT+NETDNS=<dns1>[,<dns2>]	If success,return: **OK** If fail,return: **ERROR**
Read Command **AT+NETDNS?**	Response **+NETDNS:<dns1>,<dns2>** **OK**

Test Command	Response
AT+NETDNS=?	**+NETDNS:<dns1>,<dns2>** **OK**

Parameters are defined below:

Parameters	Description
<dns1>	Dns1 address IP
<dns2>	Dns2 address IP

13.20 AT+CIPOPQUERY Inquire the Specific Link Connect Status

This command is used to inquire the specific link connect status.

Write Command	Response
AT+CIPOPQUERY=<link _num>,[<link_num>,...]	**+CIPOPQUERY: <link_num_state>[,···,<link_n_state>]** **OK** **Or** **ERROR**
Read Command **AT+CIPOPQUERY?**	Response **+CIPOPQUERY: (list of link_num <state >s)** **OK**
Test Command **AT+CIPOPQUERY=?**	Response **+CIPOPQUERY:(0-5),(0-5),(0-5),(0-5),(0-5),(0-5)** **OK**

Parameters are defined below:

Parameters	Description
<link_num >	Identifies a connection. The range of permitted values is 0 to 5.
<state>	0:disconnected 1:connected

14.HTTP AT Commands

14.1 AT$HTTPOPEN Open HTTP Service

The command is used to open HTTP service

Execution Command **AT$HTTPOPEN**	Response **OK** The command is used to open HTTP service. To use HTTP, you must execute the command in the first.In the last, execute $HTTPCLOSE to close HTTP service.
Read Command **AT$HTTPOPEN?**	Response **$HTTPOPEN:<opened_or_not>** **OK** **Return HTTP service is opened or not.** **1: HTTP service is opened.** **0: HTTP service is not opened.**

14.2 AT$HTTPCLOSE Close HTTP Service

The command is used to close http service

Execution Command **AT$HTTPCLOSE**	Response **OK** The command is used to close HTTP service. After executing this command, HTTP will be closed after 1 minute and the http will be unavailable.
Read Command **AT$HTTPCLOSE?**	Response **$HTTPCLOSE:<closed_or_not>** **OK** **Return HTTP service is closed or not.** **1: HTTP service is closed.** **0: HTTP service is not closed.**

14.3 AT$HTTPPARA   Set HTTP Request URL And Port

The command is used to Set HTTP Request URL And Port

Write Command	Response
AT$HTTPPARA=<url>,< **port>[,<type>][,<cert>]**	**OK** **or** **ERROR**
Test Command **AT$HTTPPARA=?**	Response **$HTTPPARA="",(0-65535),(0-1), (0-1)** **OK**
Read Command **AT$HTTPPARA?**	Response **Return current HTTP request's host,uri,and port,such as:** **AT$HTTPPARA?** **Host : "182.150.28.206"** **URI : "/httpdemo/http"** **Port : 8182.** **Cert : 1**

Parameters are defined below:

Parameters	Description
<url>	<Mandatory Parameter> 0-255 HTTP client URL:"http://server'/path':'tcpPort
<port>	The HTTP request's port.The HTTP default port is 80,and HTTPS is 443.
<type>	HTTP request type.Default is HTTP. 0: HTTP request 1: HTTPS request
<cert>	Indicates whether the SSL connection ignores the certificate,and default is 0. 0 - ignores certificate 1 - use certificate

14.4 AT$HTTPACTION Send HTTP Request

The command is used to send HTTP Request.Support request include GET,POST and HEAD.

Write Command	Response
AT$HTTPACTION=\<req uest\>	**$HTTPRECV:DATA,\<len\>** **......** **$HTTPRECV:DATA,2** **\<r\>\<\n\>** **$HTTPRECV:DATA,\<len\>** or **$HTTPERROR:\<errno\>** **ERROR** This command will return HTTP response header fields and file path which storage HTML text or download file if request success. If request fail ,this command just return response header fields. Specially, the HEAD request only return response header fields. For POST,must set Conten-Length header item and POST's content data. Note If a 202 error code appears and the request fails, execute the AT$HTTPOPEN instruction after the AT$HTTPCLOSE command.
Test Command **AT$HTTPACTION=?**	Response **$HTTPACTION:(0-3)** **OK**

Parameters are defined below:

Parameters	Description
\<request\>	HTTP request type ,available data include 0,1,2,3. 0: GET request 1: POST request 2: HEAD request 3: POST request (Content length must be less than 500 and set content in the first.)

14.5 AT$HTTPDATA Set HTTP Post Request's Data

This command is used to set http post request's data

Write Command	Response
AT$HTTPDATA=\<data _len\>	The command is used to set HTTP post request's content. This command is effective only to POST.

Test Command **AT$HTTPDATA=?**	Response **$HTTPDATA:(0-1024)** **OK**
Read Command **AT$HTTPDATA?**	Response **$HTTPDATA:<data_len>** **OK**

Parameters are defined below:

Parameters	Description
<data_len>	The post request's content length.The length is between 0 and 1024. 0 mean data write end. When data length reach <data_len>,it's auto exit inputing. After this,must use $HTTPSEND to send data every time.

14.6 AT$HTTPSEND Send HTTP Post Content Data

This command is used to Send HTTP Post Content Data

Execute Command **AT$HTTPSEND**	Response The command is used to send HTTP post request's content. This command effective only to POST.After data send complete,will receive response. **OK**

14.7AT$HTTPDATAEX Set HTTP Post Request's Data

This command is used to Set HTTP Post Request's Data

Write Command **AT$HTTPDATAEX=<data_len>,<data>**	Response **OK** **or** **ERROR**
Test Command **AT$HTTPDATAEX=?**	Response **$HTTPDATAEX:(0-500) ,""** **OK**

Read Command	Response
AT$HTTPDATAEX?	**$HTTPDATAEX:<data_len>** **OK**

Parameters are defined below:

Parameters	Description
<data_len>	The post request's content length.The length is between 0 and 500. Before thismust be set "Content-Length" request head,and must be the same as the value.
<data>	The post request's content.The length must be same as the <data_len>.

14.8 AT$HTTPRQH Set HTTP header fields

Set HTTP header fields

Test Command	Response
AT$HTTPRQH=?	**$HTTPRQH="",""** **OK**
Read Command **AT$HTTPRQH?**	Response Return current HTTP request header fields and entity header fields.
Write Command **AT$HTTPRQH=<Param Key>,<ParamValue>**	Response The command is used to set HTTP request header fields and entity header fields. The common request header: "Host" : The server's host.Must be matched with URL,If not set,will get from URL. "Content-Length" : The content length which will be send.This only for POST. Refer to : " IETP-RFC 2616 "

Parameters are defined below:

Parameters	Description

<ParamKey>	HTTP request or entity header field's Key. If there are special characters, please add quotes.The max length is 50. Support parameter： "accept","accept-charset","accept-encoding","accept-language","au thorization","expect","from","host","if-match","if-modified-since","if-n one-match","if-range","if-unmodified-since","max-forwards","proxy authorization","range","referer","te","rser-agent","allow","content-en coding","content-language","content-length","content-location","con tent-md5","content-range","content-type","expires","last-modified"," user-agent","connection"
<ParamValue>	HTTP request or entity header field's Value. If there are special characters, please add quotes. The max length is 255.

14.9 AT$HTTPTYPE Set HTTP Receive Content Data Save Location

Set HTTP Recv Content Data Save In Local File Or Output To Te.

Write Command **AT$HTTPTYPE=<type>**	Response **OK**
Test Command **AT$HTTPTYPE=?** Read Command **AT$HTTPTYPE?**	Response **$HTTPTYPE:(0-1)** **OK** Response **$HTTPTYPE:<type>** **OK**

Parameters are defined below:

Parameters	Description
<type>	HTTP recv data set save the way,available data include 0,1 0:data output to Te. 1:data save to efs. Note:set value after open HTTP service,and set value before AT$HTTPACTION.Its default value is 0.

14.10 AT$HTTPREAD Read Content Data from Local File.

This command is used to read file content from local file.but AT$HTTPTYPE=1 effective.

Test Command **AT$HTTPREAD=?**	Response **$HTTPREAD:(0-1),(0-512000)** **OK**
Read Command **AT$HTTPREAD?**	Response **$HTTPREAD:<read_type>,<offset>** **OK** **Note:when <read_type>=1,<offset> value is 0.**
Write Command **AT$HTTPREAD=<read_t ype>[,<offset>]**	Response **$HTTPREAD:<offset>,<data_size>** **<data>** **OK** **Or** **$HTTPREAD:<read_type>,<file_size>** **OK** **Or** **ERROR** **Or** **$HTTPERROR:<errno>** **ERROR**

Parameters are defined below:

Parameters	Description
<read_type>	0 Read File 1 File size
<offset>	Start read file position,The range is from 0 to 512000,its value should less than file size. Note:when<read_type>=1,set<offset>value will return error. when<read_type>=0,<offset> default value is 0.
<data_size>	Every time the length of the read from local file.Its value is 1024 byte.

14.11 HTTP Error Code

Numeric Format	Verbose Format General errors:
200	Subsystem established and available
201	Subsystem establishment in progress.
202	Network subsystem unavailable.
203	PPP is closing.
204	Existing net subsystem resources.
205	Physlink going dormant.
300	HTTP service is not opened.
301	HTTP service has opened.
302	URL resolve fail.
303	DNS error.
304	Action error.
305	Request timeout.
306	Downloading file
307	URL not set.
308	Header fields's number exceeds the limit.
309	Header fields error,such as not set "Content-Length" for POST request
310	Header response error(Exception).
311	Is sending post data.
312	Post request not started,only for $HTTPACTION=1
313	The value of "Content-Length" not same as the content's length.
314	Request fail and should close socket.
315	Connection to server failed
316	EFS not enough space
317	EFS operation failed
350	Unknown HTTP error

15.FTP AT Commands

15.1 AT+CFTPPORT Set FTP Server Port

This command is used to set ftp server port

Write Command **AT+CFTPPORT=\<port\>**	Response **OK** **or** **ERROR**
Test Command **AT+CFTPPORT=?**	Response **+CFTPPORT: (list of supported \<port\>s)** **OK** **or** **ERROR**
Read Command **AT+CFTPPORT?**	Response **+CFTPPORT: \<port\>** **OK**

Parameters are defined below:

Parameters	Description
\<port\>	The FTP server port, from 1 to 65535, and default value is 21.

Example:

AT Command	Response
AT+CFTPPORT=21	**OK**

15.2 AT+CFTPUN Set User Name for FTP Access

Write Command **AT+CFTPUN="\<name>"**	Response This command is used to set user name for FTP server access. **OK** Note: A single input no more than 1535 bytes
Read Command **AT+CFTPUN?**	Response **+CFTPUN: "\<name>"** **OK**
Test Command **AT+CFTPUN=?**	Response **OK**

Parameters are defined below:

Parameters	Description
\<name>	The user name for FTP server access. The maximum length is 30

15.3 AT+CFTPPW Set User Password for FTP Access

This command is used to Set User Password for FTP Access

Write Command **AT+CFTPPW="\<password>"**	Response **OK** **or** **ERROR**
Test Command **AT+CFTPPW=?**	Response **OK**
Read Command **AT+CFTPPW?**	Response **+ CFTPPW: "\<password>"** **OK**

Parameters are defined below:

Parameters	Description

<password>	The user password for FTP server access. The maximum length is 40.

Example:

AT Command	Response
AT+CFTPPW="myp ass"	**OK**
AT+CFTPPW?	**+CFTPPW: "mypass"** **OK**

15.4 AT+CFTPTLS   Set FTP Security Mode

Set FTP Security Mode

Write Command **AT+CFTPTLS=<mode>[, <cert>]**	Response This command is used to set FTP Security Mode. **OK** **or** **ERROR**
Test Command **AT+CFTPTLS=?**	Response **+CFTPTLS: (0-2),(0-1)** **OK**
Read Command **AT+CFTPTLS?**	Response **+CFTPTLS: < mode>,<cert>** **OK**

Parameters are defined below:

Parameters	Description
<mode>	Default is 0.When mode is non 0, FTP will over TLS use SSL. 0 - None 1 - Implict 2 - Explicit
<cert>	Whether to ignore a certificate,Default is 0 0 - Ignore 1 - Don't ignore

Example:

AT Command	Response
AT+ CFTPTLS=2,0	**OK**

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

15.5 AT+CFTPTYPE   Set FTP Type

This command is used to Set FTP Type

Write Command **AT+CFTPTYPE=\<type\>**	Response This command is used to set FTP type. Default is binary type. **OK** **or** **ERROR**
Test Command **AT+CFTPTYPE=?**	Response **+CFTPTYPE: (list of supported \<type\>s)** **OK**
Read Command **AT+CFTPTYPE?**	Response **+CFTPTYPE: \<type\>** **OK**

Parameters are defined below:

Parameters	Description
\<type\>	I – binary type. A – ASCII type

Example:

AT Command	Response
AT+CFTPTYPE="A"	**OK**
AT+CFTPTYPE="I"	**OK**
AT+CFTPTYPE?	**+CFTPTYPE: "I"** **OK**
AT+CFTPTYPE=?	**+CFTPTYPE: ("I","A")** **OK**

15.6 AT+CFTPGETFILE Get a File from FTP Server to EFS

This command is used to Get a File from FTP Server to EFS

Write Command **AT+CFTPGETFILE= "<remote_path>"," <local_path>"[,<rest_si ze>]**	Response **OK +CFTPGETFILE: SUCCESS,<length>** **or** **+CFTPGETFILE: FAIL,<err> ERROR**
Test Command **AT+CFTPGETFILE=?**	Response **+CFTPGETFILE: ,,(0-2147483647) OK**
Read Command **AT+CFTPGETFILE?**	Response **+CFTPGETFILE:"remote_path", "local_path" ,<rest_size> OK**

Parameters are defined below:

Parameters	Description
<remote_path>	The remote file path. The maximum length is 512. If the directory contains non-ASCII characters, the <remote_path> parameter should contain a prefix of {non-ascii}.
<local_path>	The efs file path. The maximum length is 512. Local file name string notsopport non-ascii and cannot contain: / \ : , * ? ">< | Note : local_path root directory"/" is default"C: / " in EFS
<rest_size>	The value for FTP "REST" command which is used for broken transfer when transferring failed last time. The range is from 0 to 2147483647.
<length>	The size of the download file

Example:

AT Command	Response

AT+CFTPGETFILE= "/test/CXL/abc.txt", "/mydir/test1.txt"	OK ... +CFTPGETFILE: SUCCESS,10245 AT+CFTPGETFILE= "/test/CXL/abc.txt", "/mydir/test1.txt",10 AT+CFTPGETFILE={non-ascii}"2F746573742F63584C2F616263 2E747874", "/mydir/test1.txt",10 OK ... +CFTPGETFILE: SUCCESS,10235

15.7 AT+CFTPPUTFILE Upload a File from Module EFS to FTP Server

This command is used to Upload a File from Module EFS to FTP Server

Write Command **AT+CFTPPUTFILE="<re mote_path>","<local_pa th>"[,<rest_size>]**	This command is used to upload a file from module EFS to FTP server. Response **OK** **+CFTPPUTFILE: SUCCESS** **or** **+CFTPPUTFILE: FAIL,<err>** **ERROR**
Read Command **AT+CFTPPUTFILE?**	Response **+CFTPGETFILE:"remote_path",** **"local_path" ,<rest_size>** **OK**
Test Command **AT+CFTPPUTFILE=?**	Response **+CFTPPUTFILE: ,,(0-2147483647)** **OK**

Parameters are defined below:

Parameters	Description
<remote_path>	The remote file path. The maximum length is 512. If the directory contains non-ASCII characters, the <remote_path> parameter should contain a prefix of {non-ascii}
<local_path>	The efs file path. The maximum length is 512. Note : local_path root directory"/" is default"C: / " in EFS

<rest_size>	The value for FTP "REST" command which is used for broken transfer when transferring failed last time. The range is from 0 to 2147483647.

Example:

AT Command	Response
AT+CFTPPUTFILE ="/test/CXL/abc.txt" , "/mydir/test1.txt"	**OK** **...** **+CFTPPUTFILE: SUCCESS**
AT+CFTPPUTFILE= {non-ascii}"2F7465 73742F63584C2F61 62632E747874", "/mydir/test1.txt",10	**OK** **...** **+CFTPPUTFILE: SUCCESS**

15.8 AT+CFTPLIST List the Items in the Directory on FTP Server

This command is used to List the Items in the Directory on FTP Server

Write Command **AT+CFTPLIST="<dir>"**	Response This command is used to list the items in the specified directory on FTP server **OK** **+CFTPLIST:** **...]** **+CFTPLIST: SUCCESS** **CFTPLIST:FAIL,<err>** **ERROR**
Test Command **AT+CFTPLIST=?**	Response **OK**
Read Command **AT+CFTPLIST?**	Response **+CFTPGETFILE:"dir"** **OK**

Parameters are defined below:

Parameters	Description
<dir>	The directory to be listed, The maximum length is 128. If the directory contains non-ASCII characters, the <remote_path> parameter should contain a prefix of {non-ascii}

Example:

AT Command	Response
AT+CFTPLIST="/tes t/CXL"	**OK** **+CFTPLIST:** **drw-rw-rw- 1 user group 0 Sep 1 18:01 .** **drw-rw-rw- 1 user group 0 Sep 1 18:01 ..** **-rw-rw-rw- 1 user group 2017 Sep 1 17:24** **19800106_000128.jpg** **+CFTPLIST: SUCCESS**
AT+CFTPLIST={non -ascii}"2F74657374 2F43584C"	**OK** **+CFTPLIST:** **drw-rw-rw- 1 user group 0 Sep 1 18:01 .** **drw-rw-rw- 1 user group 0 Sep 1 18:01 ..** **-rw-rw-rw- 1 user group 2017 Sep 1 17:24** **19800106_000128.jpg** **+CFTPLIST: SUCCESS**

15.9 AT+CFTPGET Get a File from FTP Server and Output it to SIO

This command is used to Get a File from FTP Server and Output it to SIO

Write Command **AT+CFTPGET ="<remote_path>" [,<rest_size>]**	Response This command is used to get a file from FTP server and output it to serial port. **OK** **+CFTPGET: DATA,<len>** … **+CFTPGET: DATA, <len>** … **+CFTPGET: SUCCESS, <length>** or **+CFTPGET:FAIL,<err>** **ERROR**
Test Command **AT+CFTPGET=?**	Response **+CFTPGET: ,(0-2147483647)** **OK**
Read Command **AT+CFTPGET?**	Response **+CFTPGET:"remote_path", <rest_size>** **OK**

Parameters are defined below:

Parameters	Description
<remote_path>	The remote file path. The maximum length is 512. If the directory contains non-ASCII characters, the < remote_path > parameter should contain a prefix of {non-ascii}.
<rest_size>	The value for FTP "REST" command which is used for broken transfer when transferring failed last time. The range is from 0 to 2147483647.
<len>	Every time the length of the read from the server
<length>	The size of the download file

Example:

AT Command	Response
AT+CFTPGET="/test/CXL/abc.txt", 10	**OK** **+CFTPGET: DATA, 1020** **AT+CFTPGET={non-ascii}"2F746573742F63584C2F6162632E747874", 10** **OK** **+CFTPGET: DATA, 1058** **...** **+CFTPGET: SUCCESS,1246792**

15.10 AT+CFTPMKD Create a New Directory on FTP Server

This command is used to Create a New Directory on FTP Server

Write Command **AT+CFTPMKD="<dir>"**	Response This command is used to create a new directory on the FTP server. **OK** **or** **+CFTPMKD:FAIL,<err>** **ERROR**
Test Command **AT+CFTPMKD=?**	Response **OK**

Read Command	Response
AT+CFTPMKD?	**+CFTPMKD: "dir"**
	OK

Parameters are defined below:

Parameters	Description
<dir>	The directory to be created, The maximum length is 128.
	If the directory contains non-ASCII characters, the <remote_path>
	parameter should contain a prefix of {non-ascii}.

Example:

AT Command	Response
AT+CFTPMKD="/te st/CXL"	**OK**
AT+CFTPMKD={no n-ascii}"2F7465737 42F43584C"	**OK**

15.11 AT+CFTPRMD Delete a Directory on FTP Server

This command is used to Delete a Directory on FTP Server

Write Command	Response
AT+CFTPRMD ="<dir>"	This command is used to delete directory on the FTP
	server.
	OK
	+ CFTPRMD:FAIL,<err>
	or
	ERROR
Test Command	Response
AT+CFTPRMD =?	**OK**
Read Command	Response
AT+CFTPRMD?	**+ CFTPRMD:"dir"**
	OK

Parameters are defined below:

Parameters	Description

<dir>	The directory to be deleted, The maximum length is 128. If the directory contains non-ASCII characters, the <remote_path> parameter should contain a prefix of {non-ascii}.

Example:

AT Command	Response
AT+CFTPRMD="/test/CXL"	**OK**
AT+CFTPRMD={non-ascii}"2F746573742F43584C"	**OK**

15.12 AT+CFTPDELE Delete a File on FTP Server

This command is used to Delete a File on FTP Server

Write Command **AT+CFTPDELE="<filename>"**	Response This command is used to delete file on the FTP server. **OK** **+ CFTPDELE:FAIL,<err>** **ERROR**
Test Command **AT+CFTPDELE=?**	Response **OK**
Read Command **AT+CFTPDELE?**	Response **+ CFTPDELE:"filename"** **OK**

Parameters are defined below:

Parameters	Description
<filename>	The file to be deleted, The maximum length is 128. If the directory contains non-ASCII characters, the <remote_path> parameter should contain a prefix of {non-ascii}.

Example:

AT Command	Response
AT+CFTPDELE="/test/CXL/abc.txt"	**OK**

AT+CFTPDELE={non-ascii}"2F7465737 42F63584C2F61626 32E747874"	OK

15.13 AT+CFTPSERV Set FTP Server Domain Name or IP Address

This command is used to Set FTP Server Domain Name or IP Address

Write Command **AT+CFTPSERV="<address>"**	Response This command is used to set FTP server domain name or IP address. **OK** **or** **ERROR**
Test Command **AT+CFTPSERV=?**	Response **OK**
Read Command **AT+CFTPSERV?**	Response **+ CFTPSERV: "address"** **OK**

Parameters are defined below:

Parameters	Description
<address>	The FTP server domain name or IP address. The maximum length is 100.

Example:

AT Command	Response
AT+CFTPSERV="58.246.1.50"	**OK**
AT+CFTPSERV?	**+CFTPSERV:58.246.1.50** **OK**
AT+CFTPSERV=?	**OK**

15.14 AT+CFTPRDFILE Read File from Local File to SIO

This command is used to Read file from local file to SIO

Write Command	Response
AT+CFTPRDFILE="<loc al_file>" ,<read_pos>,<r ead_len>	This command is used to read file from local file to SIO. **+ CFTPRDFILE:DATA,<len>** **+ CFTPRDFILE:SUCCESS,<length>** **+ CFTPRDFILE: FAIL,<err_code>**
Test Command **AT+CFTPRDFILE=?**	Response **+CFTPRDFILE:,(0-2147483647),(1-2147483647)** **OK**
Read Command **AT+CFTPRDFILE?**	Response **+CFTPRDFILE: "local_file",read_pos,read_len** **OK**

Parameters are defined below:

Parameters	Description
<local_file>	The local file name. The maximum length is 512. Note : local path root directory"/" is default"C: / " in EFS
<read_pos>	Start read file position,The range is from 0 to 2147483647.
<read_len>	Read file length,The range is from 1 to 2147483647.
<len>	Every time the length of the read from the server
<length>	The size of the download file

Example:

AT Command	Response
AT+CFTPRDFILE="/ p.txt",10,100	**+CFTPRDFILE:DATA,100** **aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa aaaaaaaaaaaaaaaaaaaaaaaaaaaaaa aaaaaaaaaaaaaaaa** **+CFTPRDFILE:SUCCESS,100**

15.15 AT+CFTPPUT Upload the DATA from SIO to FTP server

Upload the DATA from SIO to FTP Server

Write Command **AT+CFTPPUT ="\<remote_path\>" [,\<rest_size\>][,\<put_len\>]**	Response This command is used to upload the DATA from serial port to FTP server as a file . Single \<Ctrl+Z\> means end of the FTP data. \<Ctrl+Z\> is 0x1A. Note: A single input no more than 1536 bytes Note: In \<put_len\> mode, all characters can be transferred **+CFTPPUT: BEGIN … OK +CFTPPUT:SUCCESS +CFTPPUT: FAIL,\<err_code\>**
Test Command **AT+CFTPPUT=?**	Response **+CFTPGET: ,(0-2147483647),(1-1500) OK**
Read Command **AT+CFTPPUT?**	Response **+CFTPPUT:"remote_path", \<rest_size\>,\<put_len\> OK**

Parameters are defined below:

Parameters	Description
\<remote_path\>	The remote file path. The maximum length is 512. If the directory contains non-ASCII characters, the < remote_path > parameter should contain a prefix of {non-ascii}.
\<rest_size\>	The value for FTP "REST" command which is used for broken transfer when transferring failed last time. The range is from 0 to 2147483647.
\<put_len\>	The length is 1~1500.In this mode, all characters can be transferred. Must enter the specified data length before exiting the mode. In this mode **\<rest_size\>**cannot be omitted.

Example:

AT Command	Response
AT+CFTPPUT="/test/CXL/abc.txt", 20	**+CFTPPUT: BEGIN …..\<Ctrl+Z\> OK**

AT+CFTPPUT={non-ascii}"2F746573742F63584C2F616263 2E747874", 20	+CFTPPUT: BEGIN …..<Ctrl+Z> OK
AT+CFTPPUT="/test/test.txt",0,16	+CFTPPUT: BEGIN …...<000102030405060708090a0b0c0d0e0f> OK

15.16 Unsolicited FTP Codes (Summary of CME ERROR codes)

Parameters	Description
201	Unknown error for FTP
202	FTP task is busy
203	Failed to resolve server address
204	FTP timeout
205	Failed to read file
206	Failed to write file
207	Not allowed in current state
208	Failed to login
209	Failed to logout
210	Failed to transfer data
211	FTP command rejected by server
212	Memory error
213	Invalid parameter
214	Network error
215	Failed to connect socket

216	Failed to send data using socket
217	Failed to receive data using socket
218	Failed to verify user name and password
219	Socket connect timeout
220	File does not exist

16.MQTT AT Commands

16.1 AT+MCONFIG Related Parameters Configuration for MQTT

This command is used to set parameters configuration

Test Command **AT+MCONFIG=?**	Response **+MCONFIG: ,,,(0-1),(0-2),(0-1),,** **OK**
Write Command **AT+MCONFIG=<clientid>[,** **<username>],[<password>][,<** **will_flag>,<will_qos>,<will_** **retain>,<will_topic>,<will_** **message>]]**	Response **OK** Or **ERROR**
Read Command **AT+MCONFIG?**	Response **+MCONFIG:<clientid>[,<username>,<password>** **[,<will_flag>,<will_qos>,<will_retain>,<will_topic>,<will** **_message>]]** **OK**
Reference	Note This command you should send before "AT+MIPCONFIG" cmmand.If the server is not a user name and password, please do not enter the user name and password, otherwise will logon failure.

Parameters are defined below:

Parameters	Description
<clientid>	This parameter is used to allow the server to identify the client identity information. The maximum length of 256
<username>	This parameter is used to login server. The maximum length of 256
<password>	This parameter is used to login server. The maximum length of 256

\<will_flag\>	Value of will flag: 1 If the Will flag is set 1, the Will QoS and Will Retain fields must be present in the Connect flags byte, and the Will Topic and Will Message fields must be present in the payload. 0 Without using will Qos, will retain, will topic, will message, please set 0.
\<will_qos\>	Quality of Service: 0 At most once delivery for will message 1 At least once delivery for will message 2 Exactly once delivery for will message
\<will_retain\>	Retain Flag: 0 the Server must not store the will message and must not remove or replace any existing retained message. 1 the Server must store the will Message and its QoS.
\<will_topic\>	The will topic of the will message. The maximum length is 256.
\<will_message\>	The will message content. The maximum length is 1024.

16.2 AT+MIPSTARTSet address and port and version

Test Command **AT+MIPSTART=?**	Response **+MIPSTART:,(0-65535),(3-4)** **OK**
Write Command **AT+MIPSTART=\<address\>, \<port\>[,\<version\>]**	Response **OK** **+MIPSTART: \<result\>** **Or** **ERROR**
Read Command **AT+MIPSTART?**	Response **+MIPSTART:\<address\>,\<port\>,\<version\>** **OK**
Reference	Note If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
<ipaddress>	The MQTT server domain name or IP address. The maximum length is 256
<port>	The MQTT Server port.The value is between 0 and 65535,default value is 0.
<version>	The MQTT version.The value is between 3 and 4,default value is 3. 3 stands for mqtt version 3.1, 4 stands for mqtt version 3.1.1.
<result>	The result of opening socket operation: SUCCESS FAILURE

16.3 AT+MCONNECT Client requests Connection to Server

Test Command AT+MCONNECT=?	Response +MCONNECT:(0-1), (30-1800) OK
Write Command AT+MCONNECT=<clean _session>,<keepalive>	Response OK +MCONNECT: <result> Or ERROR
Read Command AT+MCONNECT?	Response +MCONNECT:<clean_session>,<keepalive> OK
Reference	Note If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description

<clean_session>	This parameter specifies the handling of the Session state. 0 If CleanSession is set to 0, the Server must resume communications with the Client based on state from the current Session (as identified by the Client identifier). If there is no Session associated with the Client identifier the Server must create a new Session. The Client and Server MUST store the Session after the Client and Server are disconnected. After the disconnection of a Session that had CleanSession set to 0, the Server MUST store further QoS 1 and QoS 2 messages that match any subscriptions that the client had at the time of disconnection as part of the Session state. It may also store QoS 0 messages that meet the same criteria. 1 If CleanSession is set to 1, the Client and Server must discard any previous Session and start a new one. This Session lasts as long as the Network Connection. State data associated with this Session must not be reused in any subsequent Session.
<keepalive>	30-1800 The Keep Alive is a time interval measured in seconds.
<result>	The result of connectingmqtt server operation: SUCCESS FAILURE

16.4 AT+MPUB Publish message

This command is used to publish message

Test Command **AT+MPUB=?**	Response **+MPUB: ,(0-2),(0-1),** **OK**

Write Command **AT+MPUB=<topic>,<qos>,<retain>,<message>**	Response **OK** or **ERROR** There are two kinds of results depending on the Settings: a.**AT+MQTTMIX=0** **+MPUB:<result>** b.**AT+MQTTMIX=1** If qos=0, nothing returned; if qos>0, return **+MPUBID:** **<packetid>** first,then return as follows: **+MPUBACK: <packetid> qos = 1** **+MPUBREC: <packetid> qos = 2** **+MPUBCOMP:<packetid>**
Read Command **AT+MPUB?**	Response **+MPUB:<topic> ,<qos>,<retain>,<message>** **OK**
Reference	Note This command is sent from a Client to a Server or from Server to a Client to transport an Application Message. If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
<topic>	The topic of the Application message. The maximum length is 256
<qos>	Quality of Service: 0 At most once delivery for Application message 1 At least once delivery for Application message 2 Exactly once delivery for Application message
<retain>	Retain Flag: 0 the Server must not store the Application message and must not remove or replace any existing retained message. 1 the Server must store the Application Message and its QoS.
<message>	The Application message content. The maximum length of 512
<result>	The result of publishing operation: SUCCESS FAILURE
<packetid>	The Packet Identifier field (1~65535).

16.5 AT+MPUBEX Publish a long message

This command is used to publish message

Test Command **AT+MPUBEX=?**	Response **+MPUBEX: ,(0-2),(0-1),(1-65535)** **OK**
Write Command **AT+MPUBEX=<topic>,<qos> ,<retain>,<msgLen>**	Response **OK** Or **ERROR** There are two kinds of results depending on the Settings: a.**AT+MQTTMIX=0** **+MPUBEX:<result>** b.**AT+MQTTMIX=1** If qos=0, nothing returned; if qos>0, return **+MPUBID:** **<packetid>** first,then return as follows: **+MPUBACK: <packetid> qos = 1** **+MPUBREC: <packetid> qos = 2** **+MPUBCOMP: <packetid>**
Read Command **AT+MPUBEX?**	Response **+MPUBEX:<topic> ,<qos>,<retain>,<msgLen>** **OK**
Reference	Note 1.In this mode, data in any format can be sent, such as JSON. 2 Input mode will not sent keepalive, so the input data interval cannot be longer than keepalive, or the connection may be disconnected. 3 Input mode should not exceed 4096 bytes at a time or some data will be lost, and each input should be at least 25 milliseconds apart.

Parameters are defined below:

Parameters	Description
<topic>	The topic of the Application message. The maximum length is 256
<qos>	Quality of Service: 0 At most once delivery for Application message 1 At least once delivery for Application message 2 Exactly once delivery for Application message

<retain>	Retain Flag: 0　the Server must not store the Application message and must not remove or replace any existing retained message. 1　the Server must store the Application Message and its QoS.
<msgLen>	The message content length. The maximum length of65535.
<result>	The result of publishing operation: SUCCESS FAILURE
<packetid>	The Packet Identifier field (1~65535).

16.6 AT+MSUB　Subscribe to topics

This command is used to Subscribe to topics

Test　Command **AT+MSUB=?**	Response **+MSUB: ,(0-2)** **OK**
Read Command **AT+MSUB?**	Response **+MSUB:<topic> ,<qos>** **OK**
Write Command **AT+MSUB=<topic>,<qos>**	Response **OK** Or **ERROR** There are two kinds of results depending on the Settings: a. **AT+MQTTMIX=0** **+MSUB:<result>** b. **AT+MQTTMIX=1** **+MSUBID: <packetid>** **+MSUBACK: <packetid>** This command is used to request to subscribe a topic.The maximum topics is 5. The command is asynchronous. If has succeeded for subscribing a topic, the client will be to start to receive message from other client. Receive format: **+MSUB: <topic>,<len> bytes,<message>**

Reference	Note
	This command is sent from the Client to the Server to create one or more Subscriptions. If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
<topic>	The topic of the Application message. The maximum length is 256
<qos>	Quality of Service: 0　At most once delivery for Application message 1　At least once delivery for Application message 2　Exactly once delivery for Application message
<len>	The received message size.
<message>	Message content.Max length is 1024.
<result>	The result of subscribingtopic operation: SUCCESS FAILURE
<packetid>	The Packet Identifier field (1~65535).

Example:

AT Command	Response
Subscribe: If AT+MQTTMIX=0 : **AT+MSUB=mobilet ek/topic,0**	**OK** **+MSUB: SUCCESS**
If AT+MQTTMIX=1, **AT+MSUB=mo biletek/topic,0**	**OK** **+MSUBID:5** **+MSUBACK:5**

16.7 AT+MUNSUB　 UnSubscribe from Topics

This command is used to Unsubsrcibe from 　topic

Write Command **AT+MUNSUB=\<topic\>**	Response **OK** Or **ERROR** There are two kinds of results depending on the Settings: a. **AT+MQTTMIX=0** **+MUNSUB:\<result\>** b. **AT+MQTTMIX=1** **+MUNSUBID: \<packetid\>** **+MUNSUBACK: \<packetid\>**
Reference	Note If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
\<topic\>	The topic of the will message. The maximum length is 256
\<result\>	The result of unsubscribingtopic operation: SUCCESS FAILURE
\< packetid\>	The Packet Identifier field (1~65535).

Example

AT commands	Response
Unsubscribe: If AT+MQTTMIX=0 : **AT+MUNSUB=mobiletek/topic**	**OK** **+MUNSUB: SUCCESS**
If AT+MQTTMIX=1, **AT+MUNSUB=mobiletek/topic**	**OK** **+MUNSUBID:6** **+MUNSUBACK:6**

16.8 AT+MDISCONNECT Close MQTT connection

This command is used to close MQTT connection.

Execution Command **AT+MDISCONNECT**	Response **OK** **+MDISCONNECT: <result>** Or **Already disconnect** **ERROR**
Reference	Note If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
<result>	The result of disconnecting operation: SUCCESS FAILURE

16.9 AT+MIPCLOSERelease MQTT Resources

This command is used to close TCP connection.

Execution Command **AT+MIPCLOSE**	Response **OK** **+MIPCLOSE:<result>** Or **ERROR**
Reference	Note If server no response,module will return "+CME ERROR: 151" about 30 seconds

Parameters are defined below:

Parameters	Description
<result>	The result of releasing operation: SUCCESS FAILURE

16.10 AT+MQTTSTATU   Query the MQTT connection status

This command is used to Query the MQTT connection status.

Execution Command **AT+MQTTSTATU**	Response **+MQTTSTATU:\<statu>** **OK**
Reference	Note

Parameters are defined below:

Parameters	Description
\<statu>	0 MQTT connection is not established 1 The MQTT connection is successful

16.11 AT+MQTTSSL   MQTTSSL support switch

This command is used to Query the MQTT connection status.

Test Command **AT+MQTTSSL=?**	Response **+MQTTSSL: (0-1),(0-1)** **OK**
Read Command **AT+MQTTSSL?**	Response **+MQTTSSL: \<action>,\<cert>** **OK**
Write Command **AT+MQTTSSL=\<action>[,cert]**	Response **OK** Or **ERROR**
Reference	Note The command must be used before AT+MIPSTART

Parameters are defined below:

Parameters	Description
\<action\>	The switch for SSL support. 0 close SSL support 1 open SSL support The default value is 0.
\<cert\>	Whether to use the certificate. 0 Ignore the certificate 1 Use the certificate

16.12 AT+MQTTMIX   Set Additional Configuration Parameters

This command is used to set additional configuration parameters.

Test Command **AT+MQTTMIX=?**	Response **+MQTTMIX: (0-1)** **OK**
Read Command **AT+ MQTTMIX?**	Response **+MQTTMIX: \<mode\>** **OK**
Write Command **AT+MQTTMIX=\<mode\>**	Response **OK** **Or** **ERROR**

Parameters are defined below:

Parameters	Description
\<mode\>	0 No packetid Mode(Default Mode) 1 Packet ID Mode

16.13 AT+MCACHEMSG Set cache message switch

This command is used to set cache message switch.

Test Command	Response
AT+MCACHEMSG=?	OK

Read Command	Response
AT+MCACHEMSG?	**+MCACHEMSG: 0**
	OK
	Or
	+MCACHEMSG: 1
	OK

Set Command	Response
AT+MCACHEMSG=<mode>	**OK**
	Or
	+CME ERROR: 50

Parameters are defined below:

Parameters	Description
<mode>	0 Close cache
	1 Open cache(Default cache 5 messages)

16.14 AT+MCACHERECV Read cache message

This command is used to read cache message.

Test Command	Response
AT+MCACHERECV=?	Response
	OK

Read Command	Response
AT+MCACHERECV?	If AT+MCACHEMSG=0:
	Response
	Cache mode off
	OK
	If AT+MCACHEMSG=1:
	Response
	cache message number: total
	num[1]: message
	…
	num[total]: message
	OK

Set Command	If AT+MCACHEMSG=0:
AT+MCACHERECV=\<value>	Response
	Cache mode off
	OK
	If AT+MCACHEMSG=1:
	Response
	num[value]: message
	OK
	Or
	If value > total:
	Response
	Total number of caches: total
	OK
	Or
	+CME ERROR: 50

Parameters are defined below:

Parameters	Description
\<value>	Read the value message(value range 1-5)
\<total>	Cache messages total number

16.15 AT+MCACHEDEL Delete cache message

This command is used to Delete cache message.

Test Command	Response
AT+MCACHEDEL=?	**OK**
Read Command	Response
AT+MCACHEDEL?	**OK**

Set Command	If AT+MCACHEMSG=0:
AT+MCACHEDEL=\<value\>	Response
	Cache mode off
	OK
	If AT+MCACHEMSG=1:
	Response
	OK
	Or
	If value > total:
	Response
	Total number of caches: total
	OK
	Or
	+CME ERROR: 50

Parameters are defined below:

Parameters	Description
\<value\>	Delete the value message(value range 1-5)
\<total\>	Cache messages total number

16.16 URC: Pair indication+MDISCONNECTED:

This URC indicates that the MQTT client is disconnected.

URC Information
+MQTT:DISCONNECTED

17.FILESYSTEM Commands

17.1 AT+MFSCD　Select directory as current directory

The command is used to select a directory.

Write Command **AT+MFSCD=\<path\>**	Response **+MFSCD:\<curr_path\>** **OK** or **ERROR**
Read Command **AT+MFSCD?**	Response **+MFSCD:\<curr_path\>** **OK**
Test Command **AT+MFSCD=?**	Response **OK**

Parameters are defined below:

Parameters	Description
\<path\>	String with double quotes,directory for selection.
\<curr_path\>	Current directory without double quotes

Example:

AT Commands	Response
AT+MSFCD="/test1/test2"	**+MFSCD:/test1/test2** **OK**
AT+MSFCD=".."	**+MFSCD:/test1** **OK**

17.2 AT+MFSMKDIR Make new directory in current directory

This command is used to create a new directory in current directory.

Write Command	Response
AT+MFSMKDIR=<dirname>	**OK** or **ERROR**
Test Command **AT+MFSMKDIR=?**	Response **OK**

Parameters are defined below:

Parameters	Description
<dirname>	String with double quotes, directory name which does not already exist in current directory.Maximum name length is 128 name string not sopport non-ascii and cannot contain: / \ : ,* ? ">< | Note：dirname length out the range 126,MFSLS can't dispaly dir.

Example:

AT Commands	Response
AT+MFSMKDIR="Test"	**OK**
AT+MFSLS=1	**+MFSLS: SUBDIRECTORIES:** **Test** **OK**
AT+MFSMKDIR=?	**OK**

17.3 AT+MFSLS List directories/files in current directory

This command is used to list informations of directories and/or files in current directory.

Execution Command **AT+MFSLS**	Response **[+MFSLS: SUBDIRECTORIES:<list of subdirectories>** **<CR><LF>]** **[+MFSLS: FILES:<list of files>** **<CR><LF>]** **OK**
Test Command **AT+MFSLS=?**	Response **+MFSLS: (list of supported <type>s)** **OK**
Read Command **AT+MFSLS?**	Response **+MFSLS:** **SUBDIRECTORIES:<dir_num>,FILES:<file_num>** **OK**
Write Command **AT+MFSLS=<type>**	Response **[+MFSLS: SUBDIRECTORIES:** **<list of subdirectories>** **<CR><LF>]** **[+MFSLS: FILES:** **<list of files>** **<CR><LF>]** **OK** **or** **ERROR**

Parameters are defined below:

Parameters	Description
<type>	0 – list both subdirectories and files 1 – list subdirectories only 2 – list files only
<dir_num>	Integer type, the number of subdirectories in current directory.
<file_num>	Integer type, the number of files in current directory.

Example:

AT Commands	Response
AT+MFSLS?	**+MFSLS: SUBDIRECTORIES:2,FILES:2** **OK**

AT+MFSLS	+MFSLS: SUBDIRECTORIES:
	FirstDir
	SecondDir
	+MFSLS: FILES:
	test_0.txt
	test_1.txt
	OK
AT+MFSLS=2	+MFSLS: FILES:
	test_0.txt
	test_1.txt
	OK

17.4 AT+MFSRMDIR Delete directory in current directory

Delete directory in current directory

Write Command	Response
AT+MFSRMDIR=<dirna me>	This command is used to delete existing directory and its subdirectories in current directory
	OK
	Or
	ERROR
Test Command	Response
AT+MFSRMDIR =?	**OK**

Parameters are defined below:

Parameters	Description
<dirname>	String with double quotes. Directory name to be deleted which already exist in current directory. name string not sopport non-ascii. Maximum name length is 128.

Example:

AT Commands	Response

AT+MFSLS=1	+MFSLS: SUBDIRECTORIES: Test1 Test2 OK
AT+MFSRMDIR="Te st2"	OK
AT+MFSLS=1	+MFSLS: SUBDIRECTORIES: Test1 OK
AT+MFSRMDIR=?	OK

17.5 AT+MFSDEL Delete file in current directory

This command is used to delete a file in current directory. Before do that, it needs to use AT+MFSCD select the father directory as current directory

Write Command **AT+MFSDEL=<filename >**	Response **OK** **or** **ERROR**
Test Command **AT+MFSDEL=?**	Response **OK**

Parameters are defined below:

Parameters	Description
<filename>	String with double quotes, file name which is relative and already existing. If <filename> is *.*, it means delete all files in current directory. Maximum name length is 128, name string not sopport non-ascii

Example:

AT Commands	Response

AT+MFSLS=2	+MFSLS: FILES:
	test_0.txt
	test_1.txt
	OK
	OK
AT+MFSDEL="test_ 0.txt"	OK
AT+MFSLS=2	+MFSLS: FILES:
	test_1.txt
	OK
AT+MFSDEL=?	OK

17.6 AT+MFSATTRI Request file attributes

This command is used to request the attributes of file which exists in current directory

Write Command AT+MFSATTRI=<filena me>	Response +MFSATTRI: <file_size> OK or ERROR
Test Command AT+MFSATTRI=?	Response OK

Parameters are defined below:

Parameters	Description
<filename>	String with double quotes, file name which is in currentdirectory.Maximum name length is 128, name string not sopport non-ascii
<filesize>	The size of specified file, and the unit is in Byte.

Example:

AT Commands	Response

AT+MFSATTRI="im age_0.jpg"	+MFSATTRI: 8604,2017/04/11 10:24:46 Tue OK
AT+MFSATTRI=?	OK

17.7 AT+MFSREAD Read File Content

This command is used to create a file in absolute path or current path

Write Command **AT+MFSREAD=<file>,<o ffs et>,<size>**	Response **+MFSREAD: DATA: <data_size>, <data>** **OK** **or** **ERROR**
Test Command **AT+MFSREAD=?**	Response **OK**

Parameters are defined below:

Parameters	Description
<file>	String with double quotes, fileshould already exist,.Maximum file name length is 128
<offset>	offset from the file beginning,<offset> should less than file size.
<size>	0-1024 Size of data to be read, Reads the entire file when set to 0.

Example:

AT Commands	Response
AT+MFSREAD="Te stfile",0,10	**+MFSREAD: DATA: 10, 1234567890** **OK**
AT+MFSREAD=?	**OK**

17.8 AT+MFSCREATE Create a new File

This command is used to create a file in absolute path or current path

Write Command	Response
AT+MFSCREATE=<file>	**OK**
	or
	ERROR
Test Command	Response
AT+MFSCREATE=?	**OK**

Parameters are defined below:

Parameters	Description
<file>	ing with double quotes, file name which does not already exist in directory.Max file name string length is 128 and max whole path length is 1024
	name string not sopport non-ascii and cannot contain:
	/ \ : , * ? ">< |

Example:

AT Commands	Response
AT+MFSCREATE="Testfile"	**OK**
AT+MFSLS=2	**+MFSLS: FILES:**
	Testfile
	OK
	OK
AT+MFSCREATE=?	**OK**

17.9 AT+MFSMEM Check the size of available memory

This command is used to check the size of total memory and available memory

Action Command	Response
AT+MFSMEM	**+MFSMEM: C:(<total>, <available>)** **OK** **or** **ERROR**
Test Command	Response
AT+MFSMEM=?	**OK**

Parameters are defined below:

Parameters	Description
<total>	The total size of local storage space.
<available>	The available size of local storage space.

Example:

AT Commands	Response
AT+MFSMEM	**+MFSMEM: C:(1348480, 221600)** **OK**
AT+MFSMEM=?	**OK**

17.10 AT+MFSRENAME Rename file or subdirectory in current directory

This command is used to rename a file or subdirectory in current directory.

Write Command	Response
AT+MFSRENAME=<old _name>, <new_name>	**OK** **or** **ERROR**

Test Command	Response
AT+MFSRENAME=?	**OK**

Parameters are defined below:

Parameters	Description
<old_name>	String with double quotes, name which is existed in current directory.
<new_name>	New name of specified file, string with double quotes. Maximum name string length is 128. Name string not support non-ascii and cannot contain: / \ : , * ? ">< |

Example:

AT Commands	Response
AT+MFSRENAME="image_0.jpg","image_1.jpg"	**OK**
AT+MFSRENAME=?	**OK**

17.11 AT+MFSCOPY Copy an appointed file

This command is used to copy an appointed file on / to an appointed directory on /, the new file name should give in parameter.

Test Command	Response
AT+MFSCOPY=?	**OK**

Write Command **AT+MFSCOPY=<file1>,< file2>[,<sync_mode>]**	Response synchronous mode(sync_mode = 0): **+MFSCOPY:<percent>** **[+MFSCOPY:<percent>]** **OK** **or** **BUSY** **or** **+MFSCOPY:FAIL** **ERROR** asynchronous mode(sync_mode = 1): **OK** **+MFSCOPY:<percent>** **+MFSCOPY:[<percent>]** **+MFSCOPY:100.0** **or** **BUSY** **or** **OK** **+MFSCOPY:FAIL**
Reference	Note 1.The<file1> and <file2> should give the whole path and name, if only given file name, it will refer to current path(AT+MFSCD) and check the file's validity. 2. 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. 3. <percent> report refer to the copy file size. The big file maybe report many times, and little file report less. 4. If <sync_mode> is 1, the command will return OK immediately, and report final result with +MFSCOPY: END. If not set<sync_mode>, use the default value. Multiple asynchronous copy operations are not supported at the same time, the busy state is returned

Parameters are defined below:

Parameters	Description

<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. name string not sopport non-ascii and cannot contain: / \ , : * ? "> < | Max file name string length is 128 and max whole path length is 1024
<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 (default 0) 1 - asynchronous mode
<error code>	1 - NEW FILE NAME ALREADY EXIST 2 - SOURCE FILE NOT EXIST 3 - DIRECTORY NOT EXIST 4 - INVALID PATH NAME 5 - INVALID FILE NAME 6 - EFS HAVE NO ENOUGH MEMORY 7 - FILE CREATE ERROR 8 - READ FILE ERROR 9 - WRITE FILE ERROR

Example:

AT Commands	Response
AT+MFSCD?	+MFSCD:/ OK
AT+MFSCOPY="testfile","copyfile"	+MFSCOPY: 1.0 +MFSCOPY: 19.4 ... +MFSCOPY: 100.0 OK
AT+MFSCOPY="C:/testfile","C:/copyfile",1	OK +MFSCOPY: 1.0 +MFSCOPY: 19.4 ... +MFSCOPY: 100.0

17.12 AT+MFSWRITE Write data to file

This command is used to write data to file.
Transparent transmission mode will last 5 seconds. Please inputdata within 5 seconds, or
it will be quitted automatically when timeout and return ERROR.

Test Command **AT+MFSWRITE=?**	Response **OK**
Write Command **AT+MFSWRITE=\<file>,\<** **mo de>,\<size>**	Response **OK** or **ERROR**

Parameters are defined below:

Parameters	Description
\<file>	String with double quotes, fileshould already exist,.Maximum file name length is 128.
\<mode>	0 - write data at the beginning of the file 1 - write data at the end of the file
\<size>	1-1024 Size of data to be written

Example:

AT+MFSWRITE="Te stfile",0,10	**>>1234567890** **// enter +++ to terminate input** **OK**
AT+MFSWRITE="Te stfile",0,10	**>>** **ERROR // timeout**

17.13 AT+FILELOAD   Load file to file system

This command is used to load file to file system

Test Command **AT+FILELOAD=?**	Response **+FILELOAD:(0-4)** **OK**
Write Command **AT+FILELOAD="filena me"**	Response **OK** or **ERROR**

Parameters are defined below:

Parameters	Description
<filename>	File name to load file system

Example:

AT+FILELOAD="lannia nhua.mp3"	**>>** **OK** **+++ exit**
AT+MFSLS=2	**....** **Test.txt** **Lannianhua.mp3**

17.14 AT+CERTLOAD Load certificate to file system

This command is used to load certificate to file system

Test Command **AT+CERTLOAD=?**	Response **+CERTLOAD:(0-4)** **OK**
Write Command **AT+CERTLOAD=<cert_ mode>**	Response **OK** or **ERROR**

Parameters are defined below:

Parameters	Description

<cert_mode>	//SSL certificate
	0 - ca.crt
	1 - client.crt
	2 - client.key
	//TTS certificate
	3 - yt31739_63708_info.dat
	4 - yt32987_62709_info.dat

Example:

AT+CERTLOAD=0	**>>SSL cert data...** //input ctrl z to terminate input **OK**
AT+CERTLOAD=3	**>>TTS cert data...** //input ctrl z to terminate input **OK**
AT+MFSLS=2	**....** **Test.txt** **ca.crt**// SSL cert file **yt31739_63708_info.dat**// TTS cert file

18.FOTA Commands

18.1 AT+FOTA download fota package and run upgrade process

This command is used to download fota package and start upgrade process

Write Command **AT+FOTA=<channel>,< mode>,<destination_ip/ url>,<username>,<pass word>**	Response **OK** **or** **+CME ERROR:<err>**
Read Command **AT+FOTA?**	Response **$MYFOTA:<Status>** **OK** **$MYURCOTA: <status>**

Parameters are defined below:

Parameters	Description
<channel>	Connect id
<mode>	0: ftp 1:http
<destination ip/url>	Server ip or address or url
<username>	User name
<password>	password

<status>	Download progress:
	0-99 download file and progress bar
	100: download and save fota package success
	1001:domain is not exist
	1002: parse timeout
	1003:domain parse unknown error
	1004:connect server fail
	1005:username ,password error
	1006:file not exist
	1007:file size exception
	1008: file receive fail
	1009:file check fail

19.Application Examples

19.1 TCP/UDP Example

1:TCP Example

Step	Command	Response	Description
1	**AT+QICSGP=1,1,"cmnbiot","",""**	OK	//set APN
2	**AT+NETOPEN**	OK	//active PDP context
3	**AT+CIPOPEN=1,"TCP","182.148.114.87",6600**	**OK** **+CIPOPEN: SUCCESS ,1**	//connect socket
4	**AT+CIPSEND=1**	**>2233** **OK**	//send data
5	**AT+CIPRXGET=0,1**	**OK** **+CIPRXGET: SUCCESS,0,1,11,ddd ddddddd**	
6	**AT+CIPRXGET=1,1**	**OK** **+CIPRXGET: SUCCESS,1,1**	
7	**AT+CIPRXGET=2,1, 3**	**+CIPRXGET: SUCCESS,2,1,3,7, 333** **OK**	
8	**AT+CIPSEND=1,5**	**>12345** **OK**	
9	**AT+CIPCLOSE=1**	**OK** **+CIPCLOSE: SUCCESS,1**	

2: TCP   Multiple   Example

Step	Command	Response	Description
1	**AT+QICSGP=1,1,"cmnbiot", "",""**	OK	

2	AT+NETOPEN	OK	
3	AT+CIPOPEN=1,"TCP","182.148.114.87",6600	OK +CIPOPEN: SUCCESS ,1	
4	AT+CIPOPEN=2,"TCP","182.148.114.87",6600	OK +CIPOPEN: SUCCESS ,2	
5	AT+CIPOPEN=3,"TCP","182.148.114.87",6600	OK +CIPOPEN: SUCCESS ,3	
6	AT+CIPSEND=1	>2233 OK +CIPSEND:SUCCESS, 1,4,4	
7	AT+CIPSEND=2	>1234 OK +CIPSEND:SUCCESS, 2,4,4	
8	AT+CIPSEND=3	>12345 OK +CIPSEND:SUCCESS, 3,5,5	
9	AT+CIPRXGET=0,1	OK +CIPRXGET: SUCCESS,0,1,11,ddd ddddddd	
10	AT+CIPRXGET=1,1	OK +CIPRXGET: SUCCESS,1,1	
11	AT+CIPRXGET=2,1, 3	+CIPRXGET: SUCCESS,2,1,3,7, 333 OK	
12	AT+CIPSEND=1,5	>12345 OK	
13	AT+CIPCLOSE=1	OK +CIPCLOSE: SUCCESS,1	

| 14 | AT+CIPCLOSE=2 | OK
+CIPCLOSE:
SUCCESS,2 | |
| 15 | AT+CIPCLOSE=3 | OK
+CIPCLOSE:
SUCCESS,3 | |

3: UDP Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot",",",""	OK	
2	AT+NETOPEN	OK	
3	AT+CIPOPEN=1,"UDP",,	OK +CIPOPEN: SUCCESS,1	
4	AT+CIPSEND=1,5,"182.148.114.87",6600	>ABCDE OK	
5	AT+CIPCLOSE=1	OK +CIPCLOSE: SUCCESS,1	

4: UDP Multiple Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot", "",""	OK	
2	AT+NETOPEN	OK	
3	AT+CIPOPEN=1,"UDP",,	OK +CIPOPEN: SUCCESS,1	
4	AT+CIPOPEN=2,"UDP",,	OK +CIPOPEN: SUCCESS,2	
5	AT+CIPOPEN=3,"UDP",,	OK +CIPOPEN: SUCCESS,3	
6	AT+CIPSEND=1,5,"182.148.114.87",6600	>ABCDE OK +CIPSEND:SUCCESS,1,5,5	

7	AT+CIPSEND=2,5,"182.148.114.87",6600	>123 OK +CIPSEND:SUCCESS,2,5,5	
8	AT+CIPSEND=3,5,"182.148.114.87",6600	>123 OK +CIPSEND:SUCCESS,3,5,5	
9	AT+CIPCLOSE=1	OK +CIPCLOSE:SUCCESS,1	
10	AT+CIPCLOSE=2	OK +CIPCLOSE:SUCCESS,2	
11	AT+CIPCLOSE=3	OK +CIPCLOSE:SUCCESS,3	

5: Transparent mode　Example(TCP)

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot", "",""	OK	
2	AT+CIPMODE=1	OK	
3	AT+NETOPEN	OK	
4	AT+CIPOPEN=0,"TCP","58.246.1.50",63451	>	

Transparent mode　Example(UDP)

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot", "",""	OK	
2	AT+CIPMODE=1	OK	
3	AT+NETOPEN	OK	
4	AT+CIPOPEN=0,"UDP","58.246.1.50",63451	>	

6: Ping Example

Step	Command	Response	Description

1	AT+QICSGP=1,1,"cmnbiot", "",""	OK	
2	AT+NETOPEN	OK	
3	AT+MPING="www.qq.com",1	OK +MPING:1,113 .96.232.215,32 ,145,53 ... +MPING:1,113 .96.232.215,32 ,45,53 ...	
4	AT+MPINGSTOP	OK	

7: TCP Server Example

Step	Command	Response	Description
1	AT+QICSGP=1,2,"cmnbiot", "",""	OK	IPV4V6
2	AT+NETOPEN	OK	
3	AT+IPADDR	+IPADDR: SUCCESS, 10.138.121.82 240E:D8:16C3 :36E6::1 OK	
4	AT+SERVERSTART=8080,6,1	OK +SERVERSTA RT:SUCCESS	Start IPV6 Server
5	AT+SERVERSTOP	OK	stop

8: Get IP by Domain Name Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot", "",""	OK	
2	AT+NETOPEN	OK	

| 3 | AT+MDNSGIP="www.qq.com" | +MDNSGIP: www.qq.com, 14.18.175.154

OK | |

19.2 HTTP Example

1:GET Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT$HTTPOPEN	OK	
3	AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,0,0	OK	
4	AT$HTTPACTION=0	$HTTPRECV:DATA,2048 HTTP/1.1 200 OK Accept-Ranges: bytes Cache-Control: no-cache Connection: keep-alive Content-Length: 14615 Content-Type: text/html	GET
5	AT$HTTPCLOSE	OK	

2:POST Example

1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT$HTTPOPEN	OK	
3	AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,0,0	OK	
4	AT$HTTPRQH=Content-Length,26	OK	
5	AT$HTTPRQH=Connection,keep-alive	OK	
6	AT$HTTPACTION=1	OK	POST
7	AT$HTTPDATA=13	>> name=mobilete OK	

8	AT$HTTPSEND	OK	
9	AT$HTTPDATA=13	>>k&pass=123456 OK	
10	AT$HTTPSEND	OK	
11	AT$HTTPDATA=0	OK	
12	AT$HTTPSEND	$HTTPRECV:DATA,153 HTTP/1.1 200 OK Server: ... Date: Tue, 20 Sep 2016 05:37:48 GMT $HTTPRECV:DATA,2 $HTTPRECV:DATA,195 ... OK	
13	AT$HTTPCLOSE	OK	

3:POST Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT$HTTPOPEN	OK	
3	AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,0,0	OK	
4	AT$HTTPRQH=Content-Length,26	OK	
5	AT$HTTPDATAEX=26,"name=mobiletek&pass=123456"	OK	
6	AT$HTTPACTION=3	$HTTPRECV:DATA,2048 HTTP/1.1 200 OK Accept-Ranges: bytes Cache-Control: no-cache Connection: keep-alive Content-Length: 14615 Content-Type: text/html OK	
7	AT$HTTPCLOSE	OK	

4:https GET Example

Step	Command	Response	Description
1	**AT+QICSGP=1,1,"cmnet","",""**	**OK**	
2	**AT$HTTPOPEN**	**OK**	
3	**AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,1,1**	**OK**	
4	**AT$HTTPACTION=0**	**$HTTPRECV:DATA,2048** **HTTP/1.1 200 OK** **Accept-Ranges: bytes** **Cache-Control:** **no-cache** **Connection: keep-alive** **Content-Length: 14615** **Content-Type: text/html**	**GET**
5	**AT$HTTPCLOSE**	**OK**	

5:https POST Example

1	**AT+QICSGP=1,1,"cmnet","",""**	**OK**	
2	**AT$HTTPOPEN**	**OK**	
3	**AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,1,1**	**OK**	
4	**AT$HTTPRQH=Content-Length,26**	**OK**	
5	**AT$HTTPRQH=Connection,keep-alive**	**OK**	
6	**AT$HTTPACTION=1**	**OK**	**POST**
7	**AT$HTTPDATA=13**	**>> name=mobilete** **OK**	
8	**AT$HTTPSEND**	**OK**	
9	**AT$HTTPDATA=13**	**>>k&pass=123456** **OK**	
10	**AT$HTTPSEND**	**OK**	
11	**AT$HTTPDATA=0**	**OK**	

12	AT$HTTPSEND	$HTTPRECV:DATA,153 HTTP/1.1 200 OK Server: ... Date: Tue, 20 Sep 2016 05:37:48 GMT $HTTPRECV:DATA,2 $HTTPRECV:DATA,195 ... OK	
13	AT$HTTPCLOSE	OK	

6:https POST Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT$HTTPOPEN	OK	
3	AT$HTTPPARA=http://182.148.114.87/file/zip-aa,6600,1,1	OK	
4	AT$HTTPRQH=Content-Length,26	OK	
5	AT$HTTPDATAEX=26,"name=mobiletek&pass=123456"	OK	
6	AT$HTTPACTION=3	$HTTPRECV:DATA,2048 HTTP/1.1 200 OK Accept-Ranges: bytes Cache-Control: no-cache Connection: keep-alive Content-Length: 14615 Content-Type: text/html OK	
7	AT$HTTPCLOSE	OK	

7:http read example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT$HTTPOPEN	OK	

3	AT$HTTPPARA=http://182.148.114.87/file/data.txt,2210,0,0	OK	
4	AT$HTTPTYPE=1	OK	
5	AT$HTTPACTION=0	OK	
6	AT$HTTPREAD=1	$HTTPREAD:1,2849 OK	
7	AT$HTTPREAD=0,0	$HTTPREAD:0,1024 HTTP/1.1 200 OK Date: Thu, 06 Aug 2020 ... OK	
8	AT$HTTPREAD=0,1024	$HTTPREAD:1024,1024 567890123456789012345 ... OK	

19.3 FTP Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT+NETOPEN	OK +NETOPEN:SUCCESS	
3	AT+CFTPPORT=6521	OK	
4	AT+CFTPSERV="58.246.1.50"	OK	
5	AT+CFTPUN="FTP_TST"	OK	
6	AT+CFTPPW="FTPTST_0320"	OK	

7	AT+CFTPLIST="/"	OK +CFTPLIST: -rw-rw-rw- 1user group 10 Jan 7 18:47 11.txt -rw-rw-rw- 1 user group 1360 Jan 2 13:31 12.txt ... +CFTPLIST:S UCCESS	//List Directory
8	AT+CFTPGETFILE="/jiang/test1.txt","/1.txt",0	OK +CFTPGETFIL E: SUCCESS, 31	// Get file
9	AT+CFTPGET="/zs.txt",0	OK +CFTPGET:D ATA,15 qwertyqwerqe rq +CFTPGET:S UCCESS,15	
10	AT+MFSLS=2	+MFSLS:FILE S: Log_Cfg.nvm COMCfg.csv platform.nvm psm.dat Res .... 1.txt OK	List Local file

11	AT+CFTPPUTFILE="/zyqqqq.txt","/1.txt",0	OK +CFTPPUTFIL E:SUCCESS	//put file to ftp server
12	AT+CFTPDELE="/zyqqqq.txt"	OK	//del ftp server file
13	AT+CFTPPUT="/Z1.txt",0,10	+CFTPPUT:B EGIN 1111111111 OK +CFTPPUT: SUCCESS	

19.4 FTPS Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnet","",""	OK	
2	AT+NETOPEN	OK +NETOPEN:S UCCESS	
3	AT+CFTPPORT=6988	OK	
4	AT+CFTPSERV="182.148.114.87"	OK	
5	AT+CFTPUN="jingbin"	OK	
6	AT+CFTPPW="jingbin"	OK	
7	AT+CFTPTLS=2,1	OK	
8	AT+CFTPMKD="ZYQQQ11"	OK	
9	AT+CFTPRMD="ZYQQQ11"	OK	

10	AT+CFTPLIST="/"	OK +CFTPLIST: -rw-rw-rw- 1user group 10 Jan 7 18:47 11.txt -rw-rw-rw- 1 user group 1360 Jan 2 13:31 12.txt ... +CFTPLIST:S UCCESS	
11	AT+CFTPGETFILE="/jiang/test1.txt","/1.txt",0	OK +CFTPGETFIL E: SUCCESS, 31	
12	AT+CFTPPUTFILE="/z2.txt","/1.txt",0	OK +CFTPPUTFIL E:SUCCESS	
13	AT+CFTPGET="/zs.txt",0	OK +CFTPGET:D ATA,15 qwertyqwerqe rq	
14	AT+CFTPPUT="/Z1.txt",0,10	+CFTPPUT:B EGIN 1111111111 OK	
15	AT+CFTPDELE="/Z1.txt"	OK	

19.5 MQTT Example

Step	Command	Response	Description

1	AT+CEREG?	+CEREG: 1, 1,"19a5","0e88d b1d",9 OK	
2	AT+QICSGP=1,1,"cmnbiot","web","password",0	OK	
3	AT+NETOPEN	OK	**Active PDP**
4	AT+MCONFIG="rdatest"	OK	**Configure**
5	AT+MIPSTART="test.mosquitto.org",1883,3	OK	**CreateTCP connection**
6	AT+MCONNECT=1,60	OK	**Create MQTT connection**
7	AT+MSUB="/111",0	OK +MSUB:"/111",5 types,"hello"	**//SubscribeMQTT topic**
8	AT+MPUB="/111",0,0,"hello"	OK	**//Publish MQTT message**
9	AT+MPUBEX="/111",0,0,2	>ab +MPUBEX:SUCCESS	**Publish MQTT a long message**
10	AT+MPUBEX="/111",0,0,46	>{"name":"Sam","id":"01","birthday":"20180808"} OK +MPUBEX:SUCCESS	**Publish MQTT a JSONformat message**
11	AT+MUNSUB="/111"	OK	**UnsubscribeMQTT topic**
12	AT+MDISCONNECT	+MDISCONNECT: SUCCESS OK	**Close MQTT connection**
13	AT+MIPCLOSE	+MIPCLOSE: SUCCESS OK	**Release mqtt resources**

19.6 File System Example

Step	Command	Response	Description
1	**AT+MFSLS=0**	**+MFSLS:SUBDIRE CTORIES:** **+MFSLS:FILES:** **Log_Cfg.nvm** **COMCfg.csv** **platform.nvm** **OK**	
2	**AT+MFSMKDIR="test"**	**OK**	
3	**AT+MFSLS=1**	**+MFSLS:SUBDIRE CTORIES:** **test** **OK**	
4	**AT+MFSCD="test"**	**+MFSCD:/test/** **OK**	
5	**AT+MFSCREATE="test.txt"**	**OK**	
6	**AT+MFSLS=2**	**+MFSLS:FILES:** **test.txt** **OK**	
7	**AT+MFSRENAME="test.txt","test1.txt"**	**OK**	
8	**AT+MFSLS=2**	**+MFSLS:FILES:** **test1.txt** **OK**	
9	**AT+MFSDEL="test1.txt"**	**OK**	
10	**AT+MFSCD=".."**	**+MFSCD:/** **OK**	
11	**AT+MFSRMDIR="test"**	**OK**	

12	AT+MFSREAD="/COMCfg.csv",0,10	+MFSREAD: DATA: 10, TYPE,VALID OK	
13	AT+MFSCOPY="/COMCfg.csv","/2.txt"	+MFSCOPY:99.01 +MFSCOPY:100.0 OK	Sync copy file
14	AT+MFSCOPY="/COMCfg.csv","/3.txt",1	OK +MFSCOPY:99.01 +MFSCOPY:100.0	Async copy file

19.7 Fota Example

1.HTTP Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot","",""	OK	
2	AT+NETOPEN	OK	
3	AT+FOTA=1,1,"58.246.1.50:60881/fbf_dfota.bin","",""	OK	
4	AT+FOTA?	$MYFOTA:100 OK	
5	Reboot module		

2:FTP Example

Step	Command	Response	Description
1	AT+QICSGP=1,1,"cmnbiot","",""	OK	
2	AT+NETOPEN	OK	
3	AT+FOTA=1,0,"58.246.1.50:6521/fbf_dfota.bin","FTP_TST","FTPTST_0320"	OK	

Step	Command	Response	Description
4	**AT+FOTA?**	**$MYFOTA:100** **OK**	
5	**Reboot module**		

19.8 CERTLOAD　Example

Step	Command	Response	Description
1	**AT+CERTLOAD=0**	**>>cert data...** **OK**	**//input cert data** **//Ctrl+z　　terminate input** **Or choose file from sscom tools, thecertfile should save in root patch**
2	**AT+MFSLS=2**	**....** **Test.txt** **ca.crt//　cert file** **OK**	ca.crt in the fs
3	**AT+CERTLOAD=1**	**>>cert data...** **OK**	
4	**AT+MFSLS=2**	**....** **Test.txt** **ca.crt** **client.crt** **OK**	
5	**AT+CERTLOAD=2**	**>>cert data...** **OK**	
6	**AT+MFSLS=2**	**....** **Test.txt** **ca.crt** **client.crt** **client.key** **OK**	

20.Error Code

Description	Error Code
CME_PHONE_FAILURE	0 // phone failure
CME_NO_CONNECTION	1 // no connection to phone
CME_PHONE_ADP_LINK_RSVD	2 // phone adaptor link reserved
CME_OPERATION_NOT_ALLOWED	3 // operation not allowed
CME_OPERATION_NOT_SUPPORTED	4 // operation not supported
CME_PH_SIM_PIN_REQUIRED	5 // PH SIM PIN required
CME_PH_FSIM_PIN_REQUIRED	6 // PH-FSIM PIN required
CME_PH_FSIM_PUK_REQUIRED	7 // PH-FSIM PUK required
CME_NO_SIM	10 // SIM not inserted
CME_SIM_PIN_REQUIRED	11 // SIM PIN required
CME_SIM_PUK_REQUIRED	12 // SIM PUK required
CME_SIM_FAILURE	13 // SIM failure
CME_SIM_BUSY	14 // SIM busy
CME_SIM_WRONG	15 // SIM wrong
CME_INCORRECT_PASSWD	16 // incorrect password
CME_SIM_PIN2_REQUIRED	17 //SIM PIN2 required
CME_SIM_PUK2_REQUIRED	18 //SIM PUK2 required
CME_MEMORY_FULL	20 //memory full

CME_INVALID_INDEX	21 //invalid index
CME_NOT_FOUND	22 //not found
CME_MEMORY_FAILURE	23 //memory failure
CME_TEXT_STRING_TOO_LONG	24 //text string too long
CME_INVALID_CHAR_IN_STRING	25 //invalid characters in text string
CME_DAIL_STRING_TOO_LONG	26 //dial string too long
CME_INVALID_CHAR_IN_DIAL_STRING	27 //invalid characters in dial string
CME_NO_NW_SERVICE	30 //no network service
CME_NW_TIMEOUT	31 //network timeout
CME_NW_NOT_ALLOWED	32 //network not allowedemergency calls only
CME_NW_PIN_REQUIRED	40 //networkpersonalization PIN required
CME_NW_PUK_REQUIRED	41 //network personalization PUK required
CME_NW_SUB_PIN_REQUIRED	42 //network subset personalization PIN required
CME_NW_SUB_PUK_REQUIRED	43 //network subset personalization PUK required
CME_SP_PIN_REQUIRED	44 //service provider personalization PIN required
CME_SP_PUK_REQUIRED	45 //service provider personalization PUK required
CME_CP_PIN_REQUIRED	46 //corporate personalization PIN required
CME_CP_PUK_REQUIRED	47 //corporate personalization PUK required
CME_HD_KEY_REQUIRED	48 //hidden key required
CME_INVALID_PARAM	50 //Invalid Param
CME_UNKNOWN	100 //unknown

CME_ILLEGAL_MS	103 //Illegal MS (#3)
CME_ILLEGAL_ME	106 //Illegal ME (#6)
CME_GPRS_NOT_ALLOWED	107 //GPRS services not allowed (#7)
CME_PLMN_NOT_ALLOWED	111 //PLMN not allowed (#11)
CME_LA_NOT_ALLOWED	112 //Location area not allowed (#12)
CME_ROAMING_NOT_ALLOWED	113 //Roaming not allowed in this location area (#13)
CME_SERVICE_OP_NOT_SUPPORTED	132 //service option not supported (#32)
CME_SERVICE_OP_NOT_SUBSCRIBED	133 //requested service option not subscribed (#33)
CME_SERVICE_OP_OUT_OF_ORDER	134 //service option temporarily out of order (#34)
CME_UNSPECIFIED_GPRS_ERR	148 //unspecified GPRS error
CME_PDP_AUTH_FAILURE	149 //PDP authentication failure
CME_INVALID_MOBILE_CLASS	150 //invalid mobile class
CME_COMMMAND_TIMEOUT_ERR	151 //AT command timeout
CME_IMS_SRV_FAILURE	170 //IMSSRV failure
CMS_ME_FAILURE	300 //ME failure
CMS_SMS_SERVICE_RESV	301 //SMS service of ME reserved
CMS_OPERATION_NOT_ALLOWED	302 //operation not allowed
CMS_OPERATION_NOT_SUPPORTED	303 //operation not supported
CMS_INVALID_PDU_MODE_PARA	304 //invalid PDU mode parameter
CMS_INVALID_TEXT_MODE_PARA	305 //invalid text mode parameter
CMS_NO_SIM	310 //(U)SIM not inserted
CMS_SIM_PIN_REQUIRED	311 //(U)SIM PIN required

CMS_PH_SIM_PIN_REQUIRED	312 //PH-(U)SIM PIN required
CMS_SIM_FAILURE	313 //(U)SIM failure
CMS_SIM_BUSY	314 //(U)SIM busy
CMS_SIM_WRONG	315 //(U)SIM wrong
CMS_SIM_PUK_REQUIRED	316 //(U)SIM PUK required
CMS_SIM_PIN2_REQUIRED	317 //(U)SIM PIN2 required
CMS_SIM_PUK2_REQUIRED	318 //(U)SIM PUK2 required
CMS_MEMORY_FAILURE	320 //memory failure
CMS_INVALID_MEMORY_INDEX	321 //invalid memory index
CMS_MEMORY_FULL	322 //memory full
CMS_SMSC_ADDR_UNKNOWN	330 //SMSC address unknown
CMS_NO_NW_SERVICE	331 //no network service
CMS_NW_TIMEOUT	332 //network timeout
CMS_NO_CNMA_ACK_EXPECTED	340 //no +CNMA acknowledgement expected
CMS_UNKNOWN_ERROR	500 //unknown error
MIRC_PDP_ALREADY_ACTIVE	902 //pdp already active