R7072 Series_AT Command Manual

LPWA Module

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Contents

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

1 Introduction

The R7072 series wireless module is a dual-mode terminal that supports both NB-IoT and GSM/GPRS. It supports NB-IoT Band 1/2/3/5/8/12/18/19/20/26/28 and GSM 900/1800 multi-band, supports IPv4/IPv6, and supports AT command extension. The scope of application includes: smart municipal, smart campus, smart meter reading, public asset tracking, safe city, industrial Internet of Things and smart home, etc. Narrowband Internet of Things using NB-IoT、GSM applications.

1.1 Scope of the document

The document described AT commands which R7070 and R7072 support, including standard commands and SIMCOM extended commands. It will guide the user to design R7070 and R7072 in their applications.

1.2 Related Documents

You can visit the SIMCom Website using the following link:
http://www.simcom.com

1.3 Command Format

1.3.1 The AT command format principle

1) Every AT command starts with the character AT and ends with <CR> (Note: Quite few commands start with “+”).
2) The command line may have several AT commands, which are separated by semicolon as command delimiter.
3) Standard basic commands are referred to GSM Rec 07.07,07.05,3GPP TS 27.007, and ITU-T Rec. V25ter.
4) Every extended command has a Testto check the available of the command and its parameters’type and range.
5) The commands with parameters also have a Query to read the current values of parameters.

6) Sets are used to set parameters and accomplish corresponding functions.

Picture 1 is the structure of R7072 Series AT command line:

AT CMD1 CMD2=12; +CMD1 ; +CMD2=,, 15; +CMD2?; +CMD2=? <CR>
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①: Command line prefix
②: Basic command(no prefix)
③: Subparameter
④: Extended command(prefixed with +)
⑤: Extended commands are delimited with semicolon
⑥: Subparameters may be omitted
⑦: Read command for checking current subparameter values
⑧: Test command for checking possible subparameter values
⑨: Command line termination character

Picture 1: The structure of AT command

1.3.2 AT commands syntax

The AT command set implemented by R7072 series is a combination of GSM07.05, GSM07.07, 3GPP TS 27.005, 3GPP TS 27.007, ITU-T V.25ter and the extended AT commands developed by SIMCOM.

All these AT commands can be split into two categories syntactically: “basic” and “extended”.

1) Basic syntax

These AT commands have the format of “AT<x><CR>”, where “<x>”is the command, and <CR> is the end character.

Example: ATZ<CR>

2) Extended syntax

These commands can operate in several modes, as shown in the following table:

Table 1: The category of the extended command

Category	Syntax	Example
Test	AT+<x>=?	AT+CMEE=?
Read	AT+<x>?	AT+CMEE?
Set(with parameter)	AT+<x>=<…>	AT+CMEE=0
Set(without para.)	AT+<x>	AT+CGSN

1.4 Information Possible response and Result Codes

1.4.1 AT command result codes

1) The Possible response of every executed command starts and ends with <CR><LF>. Except for the ATV0 (returns 0<CR>) and ATQ1(no return).
2) If command syntax is incorrect, an “ERROR” string will be returned.
3) If AT command syntax is correct but transmitted with wrong parameters, the +CME ERROR: <err> or +CMS ERROR:<err> strings will be returned.(SMS Command).
4) If an AT command has been executed successfully，an “OK” string will be returned.
5) When receiving SMS, definite characters will be sent to terminal, referring to the following AT command introduction.

You can set different result codes by AT+CMEE=<…> when error message returns. Referred to the AT command introduction.

1.5 Abbreviations

Table 2: Abbreviation and description

Abbreviation	Description
AMR	Adaptive Multi-rate
BER	Bit Error Rate
BTS	Base Transceiver Station
CS	Circuit Switched Domain
CSD	Circuit Switched Data
DCE	Data Communication Equipment
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
NB-IoT	Narrow Band Internet of Things
CP	Control Plane
UP	User Plane
EMC	Electromanetic Compability
ESD	Electrostatic Discharge
FR	Frame Relay
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Input Output
GPRS	General Packet Radio Service
GSM	Global Standard for Mobile Communications

HR	Half Rate
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access
HSPA	High-Speed Packet Access
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity
I/O	Input/Output
ISO	International Standards Organization
ITU	International Telecommunications Union
bps	Bits per second
LED	Light Emitting Diode
M2M	Machine to Machine
MO	Mobile Originated
MT	Mobile Terminated
NTC	Negative Temperature Coefficient
PC	Personal Computer
PCB	Printed Circuit Board
PCS	Personal Cellular System
PCI	Peripheral Component Interconnect
PCM	Pulse Code Modulation
RAI	Release Assistance Indication
PCS	Personal Communication System
PDU	Packet Data Unit
PPP	Ponit-to-Point Protocol
PS	Packet Switched
QPSK	Quardrate Phase Shift Keying
SIM	Subscriber Identity Module
TE	Terminal Equipment
TA	Terminal Adaptor
TCP/IP	Transmission Control Protocol/Internet Portocol
UART	Universal Asynchronous receiver-transmitter
USIM	Universal Subscriber Identity Module
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
NAS	Non-access stratum

2 Common Commands for Control

2.1 Overview of AT Common Commands for Control

Command	Description
AT	check the communication with DCE
ATZ	Restore to AT&W saved configuration
ATE	Set the echo mode
ATS0	Controls DCE's auto Possible response
ATQ	Controls whether TA result code sent to TE or not
ATV	Set the format of DCE return results
ATS3	Set the AT command line terminator <CR>
ATS4	Set the response format character <LF>
ATS5	Set the backspace character
ATI	Read manufacturer information
AT&W	Save user settings
AT&F	Restore to factory settings
AT+CMEE	Control error reporting
AT+CFUN	Control Protocol Stack or reboot
AT+CCLK	Set or read the current time
AT+IPR	Set or read the baud rate
AT+CGSN	Read the IMEI
AT+EGMR	Set or read the IMEI
AT+CGMM	Read the ID of DCE module
AT+CGMR	Read the version number
AT+CGMI	Read the ID of the DCE manufacturer
AT+CPAS	Read the status of DCE
AT+CCID	Read ICCID
AT+CIMI	Read IMSI
AT+NRB	Reboot module
AT+TRB	Reboot module
AT+CPOF	Shut down module
AT+LSVER	Read software version information.
AT+LCVER	Read the archive version number
AT+BTIME	Read software version time

AT+MBSN	Read or set the SN number
AT+CSCS	Set the character set that DCE will use
AT+CRSM	Access SIM content
AT+CMER	Control the reporting of +CIEV events
AT+UPTIME	Get system update time

2.2 Detailed Description of AT Common Commands for Control

2.2.1 AT Check the Communication with DCE

AT Check the Communication with DCE	
Execution Command AT	Response **OK**
Parameter Saving Mode	NO_SAVE
Max Response Time	-
Reference	-

Example

```
AT
OK
```

2.2.2 ATZ Restore to AT&W Saved Configuration

Parameters that can be stored by AT&W and restored by ATZ.

ATZ Restore to AT&W saved configuration	
Execution Command ATZ	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	V.25ter

Example

```
ATZ
OK
```

2.2.3 ATE Set the echo mode

This command controls whether or not the ATC echoes characters received from the DTE during command state.

ATE Set the echo mode	
Execution Command **ATE[<value>]**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	V.25ter

Defined Values

<value>	0	not display command
	1	display command

Example

```
ATE0
OK
ATE1
OK
```

2.2.4 ATS0 Controls DCE's Auto Possible Response

This command controls DCE's auto Possible response function.

ATS0 Controls DCE's auto Possible response	
Test Command **ATS0=?**	Response **(0-255)** **OK**
Write Command **ATS0=<n>**	Response **OK** or

	ERROR
Read Command **ATS0?**	Response **<n>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<n>	Set to 0, automatic answering is disabled. A non-zero value will cause the DCE to automatically answer after the number of notifications (rings) has been set. For example, setting this value to 1 will cause the DCE to automatically answer after the first ring.

Example

```
ATS0=1
OK
```

2.2.5 ATQ Controls Whether TA Result Code Sent to TE or not

This command controls whether TA result code sent to TE or not

ATQ Controls Whether TA Result Code Sent to TE or not	
Write Command **ATQ<mode>**	Response **OK** or No Return Result
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<n>	0	send the command result code to TE
	1	not send the command result code to TE

Example

```
ATQ
OK
```

2.2.6 ATV Set the Format of DCE Return Results

Use this command to set the result code transmission format to digital format, or letter format, and set the head and tail of content that is returned with the result code and information sent with the results.

ATV Set the Format of DCE Return Results	
Write Command **ATV<value>**	Response **OK** or **0**
Read Command **ATV?**	Response **1** **OK** or **0** **0**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<value>	0	text: <text><CR><LF> numeric code: <numeric code><CR>
	1	text: <CR><LF><text><CR><LF> verbose code: <CR><LF><verbose code><CR><LF>

Example

```
ATV1
OK
```

2.2.7 ATS3 Set the AT command line terminator <CR>

The main function of this command is to set the AT command line terminator <CR>. This character is sent by the TE, indicating the termination of a line of commands, identified by the MS.

ATS3 Set the AT command line terminator <CR>	
Test Command **ATS3=?**	Response **S3: (0-31)** **OK**
Write Command **ATS3=<n>**	Response **OK**
Read Command **ATS3?**	Response **<n>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0—31: Set the S3 character in ASCII code value. The default value is 13 (corresponding to the carriage return in ASCII code). Note: Changing this value may affect the execution of AT commands.

Example

```
ATS3=13
OK
```

2.2.8 ATS4 Set the response format character <LF>

The main function of this command is to set the Possible response format character <LF>. This character is sent by MS.

ATS4 Set the response format character <LF>	
Test Command **ATS4=?**	Response **S4: (0-31)** **OK**
Write Command **ATS4=<n>**	Response **OK**
Read Command	Response

ATS4?	**<n>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0—31: Set the S4 character in ASCII code value. The default value is 10 (corresponding to the newline character in ASCII code).

Example

```
ATS4=10
OK
ATS4?
10
OK
```

2.2.9 ATS5 Set the backspace character

The main function of this command is to set the backspace character. Issued by TE, indicating the deletion of the previous character, confirmed by the MS

ATS5 Set the backspace character	
Test Command **ATS5=?**	Response **S5: (0-31)** **OK**
Write Command **ATS5=<n>**	Response **OK**
Read Command **ATS5?**	Response **<n>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-

Reference	

Defined Values

<n>	0—31: Set the S5 character in ASCII code value. The default value is 8 (corresponding to the backspace character in ASCII code).

Example

```
ATS5=8
OK
ATS5?
8

OK
```

2.2.10 ATI Read manufacturer information

This command allows the DCE to transmit one or more pieces of text information, as determined by the manufacturer, returning the manufacturer information.

ATI Read manufacturer information	
Execute Command **ATI**	Response **<version number>** **Manufacturer: <manufacturer>** **Model: <model>** **Revision: <revision>** **IMEI: [<sn>]** **+GCAP: list of <name>s** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<manufacturer>	The identification of manufacturer.
<model>	The identification of model.
<revision>	The revision identification of firmware.

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

Example

```
ATI
Manufacturer: SIMCOM INCORPORATED
Model: SIMCOM_R7072
Revision: R7072M6_V1.0.0
IMEI: 351602000330570
+GCAP: +CGSM

OK
```

2.2.11 AT&W Save user settings

This command saves the settings to a non-dynamic storage area. The corresponding values are modified using the corresponding commands (see the table below). If you do not want to save these values to the non-dynamic memory area without the command AT&W, the system needs to be reset if the system is restarted or shut down. The set commands are cmee,cmgf,cscs,csclk,cereg, cnmi,ctzr,ipr,cereg,cscon etc.

AT&W Save user settings	
Execute Command AT&W	Response OK
Parameter Saving Mode	-
Max Response Time	-
Reference	

The following table is a list of parameters that AT&W saves to non-dynamic storage.

NO.	Content	AT command (modify the corresponding value to use)
1	CSCON flag	AT+CSCON
2	CSCLK mode	AT+CSCLK

3	Display the character's flag	ATE
4	Return the wrong format	AT+CMEE

Example

```
AT&W
OK
```

2.2.12 AT&F Restore to factory settings

Restore to factory settings. If there is a call currently, this command will not hang up the current call. The commands to restore to the default value are S0, S3, S4, S5, ate, cmee, cmgf, cscs, crc, cgreg, cusd, cnmi, cpms, csca, ctzr, ipr, cereg, cscon, etc.

AT&F Restore to factory settings	
Write Command **AT&F<value>**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value>	0: Restore all MS parameters to factory settings

The factory-set instructions and their parameters can be restored by AT&F:

Command	Parameter
ATS0	n=0
ATS3	n=13
ATS4	n=10
ATS5	n=8
ATE	value=1
AT+CMEE	value=1
AT+CMGF	mode=0
AT+CSCS	chest=”GSM”
AT+CRC	n=0
AT+CNMI	3,0,0,1,0

AT+CPMS	“SM”,”SM”,”SM”
AT+CTZR	flag=0
AT+IPR	Baudrate is 9600
AT+CEREG	n=0
AT+CSCON	n=0

Example

```
AT&F0
OK
```

2.2.13 AT+CMEE Control error reporting

This command is used to activate or deactivate the type returned by +CME ERROR. Please refer to Chapter 19 for the numbers or detailed descriptions that may be returned by different commands after setting.

AT+CMEE Control error reporting	
Test Command **AT+CMEE=?**	Response **+CMEE: (0-2)** **OK**
Write Command **AT+CMEE=<value>**	Response **OK** or **+CME ERROR <err>**
Read Command **AT+CMEE?**	Response **<value>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value>	0	Cancel +CME ERROR return code
	1	Activate +CME ERROR return code and use the wrong numeric value
	2	Activate the +CME ERROR return code and use the detailed description

Example

```
AT+CMEE=1
OK
```

2.2.14 AT+CFUN Control Protocol Stack or reboot

This command is used to activate or deactivate the PS (Protocol Stack) or restart the module. If the module is restarted with this command, the PS (Protocol Stack) is set to the state before the restart after restarting.

AT+CFUN Control Protocol Stack or reboot	
Test Command **AT+CFUN=?**	Response **+CFUN: (0-1),(0-1)** **OK**
Write Command **AT+CFUN=<value1>,[<value2>]**	Response **OK**
Read Command **AT+CFUN?**	Response **<value1>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value1>	0	Deactivate PS
	1	Activate PS
<value2>	0	Do not restart the module
	1	Restart the module

Example

```
AT+CFUN=1,1                    // Restart module
OK
AT+CFUN=1                      // Activate PS
OK
```

2.2.15 AT+CCLK Set or read the current time

AT+CCLK Set or read the current time	
Write Command **AT+CCLK=<date and time string>**	Response **OK** or **+CME ERROR <err>**
Read Command **AT+CCLK?**	Response **+CCLK: <current date and time>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<date and time string>	<date and time string>: “yy/mm/dd,hh:mm:ss”,The total length is 17 bytes. The user must enter the number according to the format, otherwise it will return ERROR. +zz is the time zone (quarter hour; range: -96...+ 96)

Example

```
AT+CCLK=”19/04/01,19:12:18+32”
OK
```
// Tip: +32 refers to the zone: +8 (+8*4)

2.2.16 AT+IPR Set or read the baud rate

Used to set or read the baud rate of the DCE. After setting the baud rate, the corresponding tools such as HyperTerminal must also be modified to the corresponding baud rate, otherwise normal communication cannot be performed.

AT+IPR Set or read the baud rate	
Test Command **AT+IPR=?**	Response **+IPR: (0,2400,4800,9600,14400,19200,28800,38400,57600)** **OK**
Write Command **AT+IPR=<baudrate>**	Response **OK** or

	ERROR
Read Command **AT+IPR?**	Response **+IPR:<current baudrate>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<baudrate>	(0, 2400,4800,9600,14400,19200,28800,38400,57600) default: 9600

Example

```
AT+IPR=9600
OK
```

2.2.17 AT+CGSN Read the IMEI

This command is used to read the IMEI of DCE. (International Mobile Equipment Identity)

AT+CGSN Read the IMEI	
Test Command **AT+CGSN=?**	Response **OK**
Execute Command **AT+CGSN**	Response **<sn>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<sn>	IMEI

Example

```
AT+CGSN
```

```
860111020157289

OK
```

2.2.18 AT+EGMR Set or read the IMEI

AT+EGMR Set or read the IMEI	
Test Command **AT+EGMR=?**	Response **+EGMR: (1,2),(7)** **OK**
Write Command **AT+EGMR=<mode>,<format>,[<data>]**	Response **+EGMR:<IMEI>** **OK** or **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	1 Write ,2 Read
<format>	7 just support 7
<data>	IMEI, when mode=2, this parameter is omitted.

Example

```
AT+EGMR=1,7,"862437040000078"
OK
AT+EGMR=2,7
+EGMR: 862437040000078

OK
```

2.2.19 AT+CGMM Read the ID of DCE module

AT+CGMM Read the ID of DCE module	
Test Command	Response

AT+CGMM=?	**OK**
Execute Command **AT+CGMM**	Response **<module identification>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<module identification>	ID of DCE module

Example

```
AT+CGMM
A9800

OK
```

2.2.20 AT+CGMR Read the version number

AT+CGMR Read the version number	
Test Command **AT+CGMR=?**	Response **OK**
Execute Command **AT+CGMR**	Response **+CGMR: <version number>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<version number>	Module version information

Example

```
AT+CGMR
+CGMR: W19B03R7072M6

OK
```

2.2.21 AT+CGMI Read the ID of the DCE manufacturer

AT+CGMI Read the ID of the DCE manufacturer	
Test Command **AT+CGMI=?**	Response **OK**
Execute Command **AT+CGMI**	Response **<manufacturer>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<manufacturer>	ID of DCE manufacturer

Example

```
AT+CGMI
SIMCOM INCORPORATED

OK
```

2.2.22 AT+CPAS Read the status of DCE

AT+CPAS Read the status of DCE	
Test Command **AT+CPAS=?**	Response **+CPAS: (0,3,4)** **OK**
Execute Command **AT+CPAS**	Response **+CPAS:<code>** **OK**

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<code>	0 in the READY state 3 Ringing status 4 Call status

Example

```
AT+CPAS
+CPAS: 3

OK
```

2.2.23 AT+CCID Read ICCID

This command is used to read the SIM card unique identification number（Card identification number）.

AT+CCID Read ICCID	
Test Command **AT+CCID=?**	Response **+CCID:** **OK**
Execute Command **AT+CCID**	Response **+CCID: ”sim number”** **OK**
Read Command **AT+CCID?**	Response **+CCID: ”sim number”** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

sim number	Card identification number

Example

```
AT+CCID?
+CCID:”89860081090209606758”

OK
AT+CCID?
OK                                  // No SIM card
```

2.2.24 AT+CIMI Read IMSI

This command is used to read IMSI

AT+CIMI Read IMSI	
Test Command **AT+CIMI=?**	Response **OK**
Execute Command **AT+CIMI**	Response **<imsi string>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<imsi string>	SIM IMSI

Example

```
AT+CIMI
460006963106758

OK
```

2.2.25 AT+NRB Reboot module

This command is used to reboot the module

AT+NRB Reboot module

Execute Command	Response
AT+NRB	**REBOOTING**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+NRB
REBOOTING
```

2.2.26 AT+TRB Reboot module

This command is used to reboot the module

AT+TRB Reboot module	
Execute Command	Response
AT+TRB	**REBOOTING**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+TRB
REBOOTING
```

2.2.27 AT+CPOF Shut down module

This command is used to shut down

AT+CPOF Shut down module	
Execute Command	Response
AT+CPOF	**OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+CPOF
OK
```

2.2.28 AT+LSVER Read software version information

This command is used to read software version information.

AT+LSVER Read software version information	
Execute Command **AT+LSVER**	Response **<lsver string>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<lsver string>	Software version information

Example

```
AT+LSVER
R110001.W18.11.1.5T34S0128_M061_KR9608_MODEM
R110001.W18.11.1.5T34S0128_M061

OK
```

2.2.29 AT+LCVER Read the archive version number

This command is used to query the archive version number

AT+LCVER Read the archive version number	
Execute Command **AT+LCVER**	Response **<lcver string>** **OK**
Parameter Saving Mode	-
Max Response Time	-

Reference	

Defined Values

<lcver string>	Archive version number

Example

```
AT+LCVER
R110001.1.5_M061
OK
```

2.2.30 AT+BTIME Read software version time

This command is used to query the version time.

AT+BTIME Read software version time	
Execute Command **AT+BTIME**	Response **<build time string>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<build time string>	Software version time

Example

```
AT+BTIME
2019-01-28_17:49:14
OK
```

2.2.31 AT+MBSN Read or set the SN number

AT+MDSB Read or set the SN number	
Test Command **AT+MBSN=?**	Response **+MBSN: mbsn number**

	OK
Write Command **AT+MBSN=<mbsn number>**	Response **OK**
Read Command **AT+MBSN?**	Response **+MBSN: <mbsn number>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mbsn number>	SN

Example

```
AT+MBSN?
+MBSN: D110001T187C00148

OK
```

2.2.32 AT+CSCS Set the character set that DCE will use

AT+CSCS Set the character set that DCE will use	
Test Command **AT+CSCS=?**	Response **+CSCS:（“GSM”，“UCS2”）** **OK**
Write Command **AT+CSCS=<chset>**	Response **OK**
Read Command **AT+CSCS?**	Response **+CSCS: <chset>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<chset>	“GSM” GSM default character “UCS2” 16bit universal eight-byte multiple-encoded character set (ISO/IEC10646[32]); UCS2 string is converted to hexadecimal value from 0000 to FFFF; for example, "004100620063" can be converted to three ten Hex value, decimal values 66, 98, and 99

Example

```
AT+CSCS?
+CSCS: “GSM”

OK
AT+CSCS=”UCS2”
OK
AT+CSCS?
+CSCS: “UCS2”

OK
```

2.2.33 AT+CRSM Access SIM content

This command can be used to access SIM card content under restricted conditions.

AT+CRSM Access SIM content	
Test Command **AT+CRSM=?**	Response **OK**
Write Command **AT+CRSM=<command>[,<fileid>[,<P1>,<P2>,<P3>[,<data>,[<pathid>]]]]**	Response **+CRSM: <sw1>,<sw2>[,<response>]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<command>	176 read in binary mode 178 reading records 192 get Possible response 214 binary update 220 record content update

	242 Get status
<fileid>	The EF file ID, integer, and commands other than the status query must be sent.
<P1><P2><P3>	In addition to obtaining the Possible response and status Read Command, the P1 and P2 parameters must be specified. For details, refer to ts10221.
<data>	Information field in hex format
<sw1>	Possible response returned by the USIM/SIM card after the command is executed
<sw2>	Possible response returned by the USIM/SIM card after the command is executed
<response>	Carrying the data reported after successful execution of the command. For binary update and record update commands, Possible response does not return.
<pathid>	EF file path ID. Note: In general, the SIM card SMS and Phonebook are in the 3f007f10 directory. The pathid cannot be omitted using this command.

Example

```
AT+CRSM=220,28474,7,4,28,"4161616161ffffffffffffffffffff038111f1ffffffffffffffffffff"
+CRSM: 144,0

OK
```

2.2.34 AT+CMER Control the reporting of +CIEV events

This command is used to control the reporting of +CIEV events.

AT+CMER Control the reporting of +CIEV events	
Test Command **AT+CMER=?**	Response **+CMER: (3),(0),(0),(0,2)** **OK**
Write Command **AT+CMER=<mode>,<keyp>,<disp>,<ind>**	Response **OK** or **ERROR**
Read Command **AT+CMER?**	Response **+CMER: <mode>,<keyp>,<disp>,<ind>** **OK**
Parameter Saving Mode	-

Max Response Time	-
Reference	

Defined Values

<mode>	Support reporting +CIEV events, 3 the current platform only supports 3
<keyp>	0 Does not support buttons
<disp>	0 Does not support screen
<ind>	0 Do not report events (default) 2 Reporting event

Example

```
AT+CMER=3,0,0,2
OK
```

2.2.35 AT+UPTIME Get system update time

Get the system update time (milliseconds), the cumulative time since booting or PSM wakeup

AT+UPTIME Get system update time	
Execute Command **AT+UPTIME**	Response **^UPTIME:<milliseconds>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+UPTIME
^UPTIME: 16153771

OK
```

3 Call control commands

3.1 Overview of Call Control Commands

Command	Description
ATD	Call remote users
ATA	Answer calls from remote users
ATH	Hang up all calls

3.2 Detailed Description of Call Control Commands

3.2.1 ATD Call remote users

This command is used to call remote users
Note: The system does not currently support the ability to call by phone.

ATD Call remote users	
Execute Command ATD<dialing string>	Response **OK** or **NO CARRIER, Call setup failed or remote user release** **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<dialing string>	{0-9, *, #,+, a, b, c}, the maximum length is 40. If the dialing strring ends with ",#", it is treated as an emergency call number.
<Call_index>	Call ID
<Call_type>	0 voice 1 CS data 2 PS data 9 emergency call

Example

```
atd10086
OK
atd**61*00431234*11*5#          // Additional business functions
OK
ATD911,#                        // Emergency call
OK
```

3.2.2 ATA Answer calls from remote users

This command is used to answer calls from remote users，RING (Incoming call)

ATA Answer calls from remote users	
Execute Command **ATA**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
ATA
OK
```

3.2.3 ATH Hang up all calls

This command is used to hang up all (possibly one or more) calls that are being established or have been established

ATH Hang up all calls	
Execute Command **ATH**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
ATH
OK
```

4 Security Control Commands

4.1 Overview of Security Control Commands

Command	Description
AT+CPIN	Enter or modify the PIN code
AT+CLCK	Set status of device/network
AT+CPWD	Change the password
AT+CPIN2	Enter or modify the PIN2 code
AT^CPINC	Read the remaining number of PIN and PUK

4.2 Detailed Description of Security Control Commands

4.2.1 AT+CPIN Enter or modify the PIN code

AT+CPIN Enter or modify the PIN code	
Test Command AT+CPIN=?	Response **OK**
Write Command AT+CPIN=<pin> or AT+CPIN=<puk>,<newpin>	Response **OK**
Read Command AT+CPIN?	Response **+CPIN: <code>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<PIN>	4-8 numbers
<new pin>	4-8 numbers
<puk>	8 numbers

<code>	READY No input required SIM PIN Enter PIN code ME is waiting for SIM PIN SIM PUK Enter PIN code ME is waiting for SIM PUK SIM PIN2 Enter PIN code ME is waiting for SIM PIN2 SIM PUK2 Enter PIN code ME is waiting for SIM PUK2 BLOCK Locked NO SIM No SIM card

Example

```
AT+CPIN?
+CPIN:SIM PUK

OK
AT+CPIN=12345678,2345
OK
AT+CPIN?
+CPIN:SIM PIN

OK
AT+CPIN=2345
OK
AT+CPIN?
+CPIN:READY

OK
```

4.2.2 AT+CLCK Set status of device/network

This command is used to lock, unlock, and negotiate functions between the UE and the network.

AT+CLCK Set status of device/network	
Test Command **AT+CLCK=?**	Response **+CLCK(list all supported<fac>s)**
Write Command **AT+CLCK=<fac>,<mode>[,<password>[,<class>]]**	Response **OK** or **+CME ERROR: <err>** or **+CLCK: <status>[,<class>]**（When mode is set to 2, the query status）
Parameter Saving Mode	-
Max Response Time	-

Reference

Defined Values

<fac>	“SC” Whether to start the PIN test “FD” Not supported yet “AO” Not supported yet “OI” Not supported yet “OX” Not supported yet “AI” Not supported yet “IR” Not supported yet “AB” Not supported yet “AG” Not supported yet “AC” Not supported yet
<mode>	0 Unlock this feature 1 Lock this function 2 Query status
<class>	1 sound (telephone) 2 Data (all bearer services) 4 Fax 8 Short message service 7 The above complete set, the default value
<status>	0 not activated 1 activated
<password>	(0~9) characters, the maximum length is determined by the AT+CPWD=? command

Example

```
AT+CLCK=”SC”,1,1234
OK
AT+CLCK=”SC”,2
+CLCK: 1

OK
```

4.2.3 AT+CPWD Change the password

This command is used to change the password.

Note:

“PS”、“PN”、“PU”、“PP”、“PC”and“FD” Currently not supported.

AT+CPWD Change the password	
Test Command **AT+CPWD=?**	Response **+CPWD: (“SC”,8), (“P2”, 8)** **OK**
Write Command **AT+CPWD=<fac>,<oldpwd>,<newpwd>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<fac>	“SC”	Whether to start the PIN test
	“P2”	PIN2 lock

Example

```
AT+CPWD=”SC”,1234,1111
OK
```

4.2.4 AT+CPIN2 Enter or modify the PIN2 code

This command is used to enter or modify the PIN2 code

AT+CPIN2 Enter or modify the PIN2 code	
Write Command **AT+CPIN2=<pin2>** 或 **AT+CPIN2=<puk2>,<newpin2>**	Response **OK** or **+CME ERROR: <err>**
Read Command **AT+CPIN2?**	Response **+CPIN2: <code>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<pin2>	4-8 numbers
<new pin2>	4-8 numbers
<puk2>	8 numbers
<code>	READY No input required SIM PIN INVALID SIM PUK INVALID SIM PIN2 Enter PIN2 codeME is waiting for SIM PIN2 SIM PUK2 Enter PIN2 codeME is waiting for SIM PIN2 BLOCK Locked

Example

```
AT+CPIN2?
+CPIN2:SIM PUK2

OK
AT+CPIN2=12345678,2345
OK
AT+CPIN2?
+CPIN2:SIM PIN2

OK
AT+CPIN2=2345
OK
AT+CPIN2?
+CPIN2:READY

OK
```

4.2.5 AT^CPINC Read the remaining number of PIN and PUK

AT^CPINC Read the remaining number of PIN and PUK	
Execute Command **AT^CPINC**	Response **^CPINC: PIN1,PUK1,PIN2, PUK2** **OK** or

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

Defined Values

<PIN1>	PIN1 rest_time: Value (1-3)
<PUK1>	PUK1 rest_time: Value (1-10)
<PIN2>	PIN2 rest_time: Value (1-3)
<PUK2>	PUK2 rest_time: Value (1-10)

Example

```
AT^CPINC
^CPINC: 3,10,3,10

OK
```

5 Phone Book Commands

5.1 Overview of Phone Book Commands

Command	Description
AT+CPBS	select the type of phone book
AT+CPBR	Read phonebook according to the range specified
AT+CPBF	Find phone book by name
AT+CPBW	Write the phone book record
AT+CNUM	Read MSISDN (native number)

5.2 Detailed Information of Phone Book Commands

5.2.1 AT+CPBS Select the type of phone book

AT+CPBS Select the type of phone book	
Test Command AT+CPBS=?	Response **+CPBS: ("SM","ON","FD","LD","ME")** **OK**
Write Command AT+CPBS=<storage>	Response **OK** or **ERROR**
Read Command AT+CPBS?	Response **+CPBS: <storage>(default "SM"),<num used>,<num available>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<num used>	Number of phonebooks already used
<num available>	Number of available phone books
<storage>	“SM” SIM card phone book “FD” fixed dial phone book “ME” mobile phone book “LD” Recently dialed phone book “ON” local number phone book

Example

```
AT+CPBS=”SM”
OK
```

5.2.2 AT+CPBR Read phonebook according to the range specified

The current phonebook is read according to the range specified by the entered parameters. If the second parameter defaults, reading the entry specified by the first parameter will return: +CME ERROR: NOT FOUND if the phonebook entry is not read.

AT+CPBR Read phonebook according to the range specified	
Test Command **AT+CPBR=?**	Response **+CPBR:<list supported <index>s>,<nlength>,<tlength>,[<glength>],[<slength>],[<elength>]** **OK**
Write Command **AT+CPBR=<index1>[,<index2>]**	Response **+CPBR=<index1>,<number>,<type>,<text>[,<adnumber>][,<adtype>][,<secondtext>][,<email>]<CR>,<CF>** **……** **<index2>,<number>,<type>,<text>,<CR>,<CF>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<index1>	Integer value, location in the phone book memory
<index2>	Integer value, location in the phone book memory
<number>	Phone number in type format
<type>	Integer octet address type

<text>	The maximum length character field; the same as the character set specified by the Select TE Character Set command +CSCS
<adnumber>	Additional phone number (Note: not supported at this time)
<adtype>	Additional phone number type (Note: not supported at this time)
<secondtext>	The character length field with the maximum length of slength; the same as the character set specified by the "Select TE character set" command +CSCS (Note: Not supported at this time)
<nlength>	Maximum length of phone number
<tlength>	Maximum length of name
<glength>	The maximum length of the group (Note: not supported at this time)
<slength>	The maximum length of secondtext (Note: not supported at this time)
<elength>	Maximum length of email (Note: +CPBS=”ME”)

Example

```
AT+CPBR=1
+CPBR:1,”13918928056”,129,”STEVEN”

OK
AT+CPBR=1,2
+CPBR:1,”13918928056”,129,”STEVEN”
+CPBR:2,”13980563798”,129,”MARY”

OK
```

5.2.3 AT+CPBF Find phone book by name

AT+CPBF Find phone book by name	
Test Command **AT+CPBF=?**	Response **+CPBF: <nlength>,<tlength>** **OK**
Write Command **AT+CPBF=<name>**	Response **+CPBF: <index>,<number>,<type>,<name>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<nlength>	The most number of phone numbers
<tlength>	Maximum length of name

Example

```
AT+CPBF=”Mary”
+CPBF:2,”13980563798”,129,”MARY”

OK
```

5.2.4 AT+CPBW Write the phone book record

The phone book record can be written in the location number <index> of the current phone book memory. The current phonebook memory can be selected by +CPBS. The recorded record field is the phone number <number> associated with the number (using the <type> format) and the text <text>. If these fields are omitted, the phone book record will be deleted.

AT+CPBW Write the phone book record	
Test Command **AT+CPBW=?**	Response **+CPBW: (list supported <index>s),<nlength>,<list supported types>,<tlength>** **OK**
Write Command **AT+CPBW=<index>[,<number>[,<type>[,<text>]]]**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<index>	The index number
<number>	Phone number, the maximum length cannot exceed <nlength>
<type>	type of phone number 128 Unknown number type

	129 SDN number type (default) 145 International ISDN Phone Number 161 Domestic ISDN phone number
<text>	name, the maximum length cannot exceed <tlength>; it is the same as the character set specified by the "Select TE character set" command +CSCS
<nlength>	Maximum length of phone number
<tlength>	Maximum length of name

Example

```
AT+CPBW=3
OK
AT+CPBW=3, “88086666”, 129, “John”
OK

AT+CSCS="UCS2"                    // When the user wants to enter [<text>] of UCS2, the user must enter the ASCII format starting with 80. Such as: enter "804F60597D" (hello) , “0X8000410042”（AB）。
OK

AT+CPBW=3, “88086666”, 129,“6797519B”
OK
```

5.2.5 AT+CNUM Read MSISDN (native number)

This command is used to read MSISDN (native number).

AT+CNUM Read MSISDN (native number)	
Test Command **AT+CNUM=?**	Response **OK**
Write Command **AT+CNUM**	Response **+CNUM: [<alpha1>],<number1>,<type1>[<CR><LF>+CNUM: [<alpha2>],<number2>,<type2>[…]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<numberx>	Phone number in typex format
<typex>	Integer octet address type

<Alphax>	an optional character field associated with numberx; the same as the character set specified by the Select TE Character Set command +CSCS

Example

```
AT+CNUM
+CNUM: NAME,”13918928056”,129

OK
```

6 GPRS Commands

6.1 Overview of GPRS Commands

Command	Description
AT+CGDCONT	Define PDP Context
AT+CGAUTH	Configure APN information
AT+CGQREQ	Quality Of Service Profile (requested)
AT+CGQMIN	Quality Of Service Profile (Minimum)
AT+CGATT	PS Attach or Detach
AT+CGACT	PDP Context Activate or Deactivate
AT+CGPADDR	Show PDP Address
AT+CGCLASS	Set the GPRS type of MT
AT+CGEREP	Packet Domain Event Reporting
AT+CGREG	GPRS Network Registration Status
AT+CRC	Show MT call additional information
AT+CEER	Extend error report command
AT+CGSMS	Select Service For MO SMS Messages
Extension of ATD	Request GPRS Service
AT+LSRAICFG	Set RAI flag
AT+PING	Start Ping IP address or host
AT+PINGSTOP	Stop Ping IP Address or Host

6.2 Detailed Information of GPRS Commands

6.2.1 AT+CGDCONT Define PDP Context

Use this command to configure the PDP context parameters when the MT sends a PDP context activation message. After the system is restarted, the settings made by this command will not be saved.
Note: After pdp is activated, this command can only query the pdp context parameter in the active state.

AT+CGDCONT Define PDP Context	
Test Command AT+CGDCONT=?	Response **+CGDCONT: (range of supported <cid>s),<pdp_type>,(list of supported<d_comp>s and <h_comp>s)** **OK**

Write Command **AT+CGDCONT=[<cid>[,<pdp_type>[,<APN>[,<pdp_addr>[,<d_comp>[,<h_comp>]]]]]]**	Response **OK** or **ERROR**
Read Command **AT+CGDCONT?**	Response **+CGDCONT: <cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp><CR><LF>** **[+CGDCONT:<cid>,<pdp_type>,<APN>,<pdp_addr>,<d_comp>,<h_comp><CR><LF>[...]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1, maximum value =7) is returned by the test form of the command.
<pdp_type>	（Packet Data Protocol type），support IP,IPV6,IPV4V6,PPP,Non-IP IP Internet Protocol(IETF STD 5) IPV6 Internet Protocol,version 6(IETF RFC 2460) IPV4V6 Virtual <PDP_type> introduced to handle dual IP stack UE capability. (See 3GPP TS 24.301[83]) PPP Point to Point Protocol (IETF STD 51) Non-IP Transfer of Non-IP data to external packet data network (see 3GPP TS 23.401[82])
<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_addres>	a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure 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 using the +CGPADDR command.
<d_comp>	a numeric parameter that controls PDP data compression (applicable for SNDCP only) (refer 3GPP TS 04.65 [59])

	0 off (default if value is omitted) 1 on (manufacturer preferred compression) 2 V.42bis 3 V.44bis Other values are reserved.
<h_comp>	a numeric parameter that controls PDP header compression (refer 3GPP TS 04.65[59]) 0 off (default if value is omitted) 1 on (manufacturer preferred compression) 2 RFC1144 3 RFC2507 4 RFC3095 Other values are reserved

Example

```
AT+CGDCONT=1,"IP","ctnb"
OK
AT+CGDCONT=1,"IP","ctnb",,1,1
OK
AT+CGDCONT=4,"IP","ctnb","1.1.1.1",0,0
OK
AT+CGDCONT?
+CGDCONT:1,,"ctnb","0.0.0.0",1,1
+CGDCONT:4,"IP","ctnb","1.1.1.1",0,0

OK
AT+CGDCONT=1
OK
AT+CGDCONT?
+CGDCONT:4,"IP","ctnb","1.1.1.1",0,0

OK
```

6.2.2 AT+CGAUTH Configure APN Information

Use this command to configure APN username and password with target PDP context.

AT+CGAUTH Configure APN Information	
Test Command **AT+CGAUTH=?**	Response **+CGAUTH: <cid>,<auth_prot>,<userid>,<password>][<CR><LF>[...]** **OK**

Read Command **AT+CGAUTH?**	**+CGAUTH: <cid>,<auth_prot>,<userid>,<password>][<CR><LF>[...]** **OK**
Write Command **AT+CGDCONT=<cid>,<auth_type>,<usrname>,<password>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1, maximum value =7) is returned by the test form of the command.
<auth_type>	Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters <passwd> and <user> need to specified. 0 – none 1 – PAP 2 – CHAP
<usrname>	Parameter specifies the user name used for authentication.
<password>	Parameter specifies the password used for authentication.

Example

```
AT+CGAUTH=?
+CGAUTH: <CID>,<AUTH_PROT>,<USERID>,<PASSWORD>][<CR><LF>[...]

OK
AT+CGAUTH=1,2,"test","test1234"
OK
```

6.2.3 AT+CGQREQ Quality Of Service Profile (requested)

This AT command be used to set the parameters of the QoS when MT send the PDP context message for activation

Note:
In the streamlined version, the AT+CGQREQ? command is not supported and only returns OK

AT+CGQREQ Quality Of Service Profile (requested)	
Test Command **AT+CGQREQ=?**	Response **+CGQREQ: <pdp_type>,(list of supported <precedence>s, <delay>s, <reliability>s,<peak>s, and <mean>s)** **OK**
Write Command **AT+CGQREQ=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]**	Response **OK** or **ERROR**
Read Command **AT+CGQREQ?**	Response **+CGQREQ:[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	PDP Context Identifier，Specify the ID number of the PDP context, Integer: 1～7
<precedence>	Specify priority category 0 Subscribed(from network)value used 1 High priority 2 Normal priority 3 Low priority
<delay>	Specify the delay category. 4 has the least delay time and the best performance; 1 has the worst performance 0 Subscribed(from network) value used 1～4 Delay class
<reliability>	Specify the reliability category. 1 has the best reliability; 3 is the same level; 5 is the worst 0 Subscribed (from network) value used 1～5 Reliability class
<peak>	Peak throughput category 0 Subscribed (from network) value used 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s)

	4 Up to 8000 (64 kbit/s) 5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s)
<mean>	Define average throughput category 0 Subscribed (from network) value used 1 100 (~0.22 bits/s) 2 200 (~0.44 bits/s) 3 500 (~1.1 bits/s) 4 1 000 (~2.2 bits/s) 5 2 000 (~4.4 bits/s) 6 5 000 (~11.1 bits/s) 7 10 000 (~22 bits/s) 8 20 000 (~44 bits/s) 9 50 000 (~111 bits/s) 10 100 000 (~0.22 kbit/s) 11 200 000 (~0.44 kbit/s) 12 500 000 (~1.11 kbit/s) 13 1 000 000 (~2.2 kbit/s) 14 2 000 000 (~4.4 kbit/s) 15 5 000 000 (~11.1 kbit/s) 16 10 000 000 (~22 kbit/s) 17 20 000 000 (~44 kbits/s) 18 50 000 000 (~111 kbits/s) 31 Maximum throughput
<pdp_type>	PDP Types: “IP” Internet Protocol “PPP” Point-to-Point Protocol “IPV6” Internet Protocol Version 6

Example

```
AT+CGQREQ=1,2,4,5,5,16<cr>
OK
```

6.2.4 AT+CGQMIN Quality Of Service Profile (Minimum)

When the MT sends a PDP context activation message, this command is used to configure the minimum acceptable QOS parameter of the MT. If the network negotiates the QOS parameter in the PDP context activation accept message to be less than the minimum acceptable QOS parameter, the MT initiates the PDP context to deactivate. Procedure. AT+CGQREQ, AT+CGQMIN These two commands are an extension of AT+CGDCONT

Note:

In the streamlined version, the AT+CGQMIN? command is not supported, only OK is returned.

AT+CGQMIN Quality Of Service Profile (Minimum)	
Test Command **AT+CGQMIN=?**	Response **+CGQMIN: IP,(0..3),(0..4),(0..5),(0..9),(0..18,31)** **+CGQMIN: PPP,(0..3),(0..4),(0..5),(0..9),(0..18,31)** **+CGQMIN: IPV6,(0..3),(0..4),(0..5),(0..9),(0..18,31)** **OK**
Write Command **AT+CGQMIN=[<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]]]**	Response **OK** or **ERROR**
Read Command **AT+CGQMIN?**	Response **+CGQMIN: (list all supported <cid>),<precedence>,<delay>,<reliability>,<peak>,<mean>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	PDP Context Identifier，Specify the ID number of the PDP context, range is 1~7
<precedence>	Specify priority category 0 Subscribed (from network) value used 1 High priority 2 Normal priority 3 Low priority
<delay>	Specify delay category 0 Subscribed (from network) value used 1～4 Delay class
<reliability>	Specify the reliability category. See description AT+CGQREQ 0 Subscribed (from network) value used 1～5 Reliability class
<peak>	Peak throughput category 0 Subscribed (from network) value used 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s) 4 Up to 8000 (64 kbit/s)

	5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s)
<mean>	Define average throughput category 0 Subscribed (from network) value used 1 100 (~0.22 bits/s) 2 200 (~0.44 bits/s) 3 500 (~1.1 bits/s) 4 1 000 (~2.2 bits/s) 5 2 000 (~4.4 bits/s) 6 5 000 (~11.1 bits/s) 7 10 000 (~22 bits/s) 8 20 000 (~44 bits/s) 9 50 000 (~111 bits/s) 10 100 000 (~0.22 kbit/s) 11 200 000 (~0.44 kbit/s) 12 500 000 (~1.11 kbit/s) 13 1 000 000 (~2.2 kbit/s) 14 2 000 000 (~4.4 kbit/s) 15 5 000 000 (~11.1 kbit/s) 16 10 000 000 (~22 kbit/s) 17 20 000 000 (~44 kbits/s) 18 50 000 000 (~111 kbits/s) 31 Maximum throughput
<pdp_type>	PDP type, described in AT+CGQREQ “IP” Internet Protocol “PPP” Point-to-Point Protocol “IPV6” Internet Protocol Version 6

Example

```
AT+CGQMIN=1,2,4,5,5,16
OK
```

6.2.5 AT+CGATT PS Attach or Detach

Attach or detach the GPRS service. If the MT is already in the required state, Set Command is ignored and returns OK; if the requested state is not available, ERROR is returned. After the MT detaches the GPRS service, any activated PDP CONTEXT is automatically deactivated.

AT+CGATT PS Attach or Detach

Test Command **AT+CGATT=?**	Response **+CGATT: (list of supported <state>s)** **OK**
Write Command **AT+CGATT=[<state>]**	Response **OK** or **ERROR**
Read Command **AT+CGATT?**	Response **+CGATT: <state>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<state>	0	Detach GPRS service
	1	Attached GPRS service

Example

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

6.2.6 AT+CGACT PDP Context Activate or Deactivate

Activate or deactivate the specified PDP context. If the MT is already in the required state, Set Command is ignored and returns OK; if the requested state is not available, ERROR is returned. If the MT has not performed the GPRS ATTACH operation when the specified PDP context command is activated, the MT performs the GPRS ATTACH operation first, and then activates the specified PDP context operation. If the GPRS ATTACH operation fails, it returns ERROR

AT+CGACT PDP Context Activate or Deactivate	
Test Command **AT+CGACT=?**	Response **+CGACT: (list of supported <state>s)** **OK**
Write Command **AT+CGACT=[<state>[,<cid>[,<cid>[,...]]]]**	Response **OK** or

	ERROR
Read Command **AT+CGACT?**	Response **+CGACT: <cid>,<state><CR><LF>** **[+CGACT: <cid>,<state><CR><LF>[...]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<state>	0: PDP context deactivated 1: PDP context activation
<cid>	PDP Context Identifier, which specifies the ID number of a PDP context. Integer: 1 to 7. When the <cid> number is not specified, the active PDP context defaults to cid=1, ie AT+CGACT=1 and AT+CGACT=1,1; if the <cid> is not specified when the PDP context is deactivated, the default is deactivated. All active PDP contexts Note: There must be a PDP context that is active, the default cid is 1. Such as: AT+CGACT=0,1 can not be deactivated

Example

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

6.2.7 AT+CGPADDR Show PDP Address

Returns the address of the specified PDP CONTEXT

AT+CGPADDR Show PDP Address	
Test Command **AT+CGPADDR=?**	Response **+CGPADDR: (list of supported <cid>s)** **OK**
Write Command **AT+CGPADDR=[<cid>[,<cid>[,...]]]**	Response **+CGPADDR: <cid>,<pdp_addr><CR><LF>**

	[+CGPADDR: <cid>,<pdp_addr><CR><LF> [...]] **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cid>	PDP Context Identifier，Specifies the ID number of the PDP context. Integer: 1 to 7. Returns all PDP context addresses if not specified
<pdp_addres>	String, PDP context address

Example

```
AT+CGPADDR=1
+CGPADDR: 1,”10.11.12.13”

OK
AT+CGPADDR=?
+CGPADDR: (1)                    // The test command returns the currently available
                                 //  parameters
OK
```

6.2.8 AT+CGCLASS Set the GPRS type of MT

AT+CGCLASS Set the GPRS type of MT	
Test Command **AT+CGCLASS=?**	Response **+CGCLASS: (list of supported <class>s)** **OK**
Write Command **AT+CGCLASS=[<class>]**	Response **OK** or **ERROR**
Read Command **AT+CGCLASS ?**	Response **+CGCLASS: <class>**

	OK
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<class>	Specify GPRS type B class B CC class C in circuit switched only mode (lowest) If the MT is in the GPRS attach state and the GPRS type of the MT is set to CC by this command, the MT will initiate the GPRS detach procedure.

Example

```
AT+CGCLASS=”CC”<cr>
OK
AT+CGCLASS=”A”<cr>
ERROR
```

6.2.9 AT+CGEREP Packet Domain Event Reporting

AT+CGEREP Packet Domain Event Reporting	
Test Command **AT+CGEREP=?**	Response **+CGEREP:(0-2),(0,1)** **OK**
Write Command **AT+CGEREP=[<mode>[,<bfr>]]**	Response **OK** or **ERROR**
Read Command **AT+CGEREP?**	Response **+CGEREP: <mode>,<bfr>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0 Cache active echo content on the MT 1 If the MT-TE link is unavailable, discard the active echo content, otherwise send it directly to the TE 2 If the MT-TE link is unavailable, the cache actively echoes the content and waits until it is available. Otherwise, it is sent directly to the TE.
<bfr>	0 Clear the echo content in the MT cache (valid for 1 and 2) 1 Send the contents of the MT buffer to the TE (valid for 1 and 2)

Example

```
AT+CGEREP=0,1
OK
AT+CGEREP=2,0
OK
```

6.2.10 AT+CGREG GPRS Network Registration Status

AT+CGREG GPRS Network Registration Status	
Test Command **AT+CGREG=?**	Response **+CGREG: (list of supported <n>s)** **OK**
Write Command **AT+CGREG=[<n>]**	Response n=1, format shows: **+CGREG: <stat>** n=2, format shows: **+CGREG: <stat>[,<lac>,<ci>[,<AcT>]]**
Read Command **AT+CGREG?**	Response **+CGREG: <n>,<stat>[,<lac>,<ci>] /+CME ERROR: <err>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CGREG: <stat> 2 enable network registration and location information unsolicited result code +CGREG:<stat>[,<lac>,<ci>]
<stat>	0 not registered, MT is not currently searching an operator to register to The UE is in GMM state GMM-NULL or GMM-DEREGISTERED-INITIATED. The GPRS service is disabled, the UE is allowed to attach for GPRS if requested by the user. 1 registered, home network The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED INITIATED on the home PLMN 2 not registered, but MT is currently trying to attach or searching an operator to register to. The UE is in GMM state GMM-DEREGISTERED or GMM-REGISTERED-INITIATED. The GPRS service is enabled, but an allowable PLMN is currently not available. The UE will start a GPRS attach as soon as an allowable PLMN is available 3 registration denied The UE is in GMM state GMM-NULL. The GPRS service is disabled, the UE is not allowed to attach for GPRS if requested by the user. 4 unknown 5 registered, roaming The UE is in GMM state GMM-REGISTERED or GMM-ROUTING-AREA-UPDATING-INITIATED on a visited PLMN. 8 emergency call status
<lac>	string type; two byte location area code in hexadecimal format (e.g. “00C3” equals 195 in decimal)
<ci>	string type; two byte cell ID in hexadecimal format

Example

```
AT+CGREG=1
+CGREG:1
AT+CGREG=2
+CGREG: 1,"0888","BF6A",0
```

6.2.11 AT+CRC Show MT call additional information

AT+CRC Show MT call additional information	
Test Command	Response

AT+CRC=?	**+CRC: (list of supported <n>s)** **OK**
Write Command **AT+CRC=[<n>]**	Response **OK/ERROR**
Read Command **AT+CRC?**	Response **+CRC: [<n>]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	Whether current command is valid 0: invalid 1 valid

Example

```
AT+CRC=1
OK
```

6.2.12 AT+CEER Extend error report command

This command is used to get failure cause of last call failure or GPRS attach failure,PDP context activatation failure

AT+CEER Extend error report command	
Execute Command **AT+CEER**	Response **+CEER: Error <xxx>**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<xxx>	Error code, please refer to chapter 19

Example

```
AT+CEER
+CEER : ERROR 3
OK
```

6.2.13 AT+CGSMS Select Service For MO SMS Messages

AT+CGSMS Select Service For MO SMS Messages	
Test Command **AT+CGSMS=?**	Response **+CGSMS: (list of currently available <service>s)** **OK**
Write Command **AT+CGSMS=[<service>]**	Response: **OK** or **ERROR**
Read Command **AT+CGSMS?**	Response **+CGSMS: <service>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<service>	0: GPRS 1: circuit switched 2: GPRS preferred (use circuit switched if GPRS not available) 3: circuit switched preferred (use GPRS if circuit switched not available) Currently the network does not support GPRS SMS.

Example

```
AT+CGSMS=1
OK
```

6.2.14 Extension of ATD Request GPRS Service

Login the server, the IP of it be provided by DHCP of GGSN. This command causes the MT to perform whatever actions are necessary to establish communication between the TE and the external PDN. The V.25ter 'D' (Dial) command causes the MT to enter the V.25ter online data state and, with the TE, to start the specified layer 2 protocols. The MT shall return CONNECT to confirm acceptance of the command prior to entering the V.25ter online data state. No further commands may follow on the AT command line.

Extension of ATD Request GPRS Service	
Execute Command **ATD*<GPRS_SC>[***<cid>]#** or **ATD*<GPRS_SC_IP>[*<cid>]#**	Response **CONNECT** or **ERROR** or **NO CARRIER**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<GPRS_SC>	A numeric string requesting the number using the GPRS service. Value is 99
<GPRS_SC_IP>	A numeric string requesting the number using the GPRS service. The value is 98
<cid>	PDP Context Identifier，Specifies the ID number of the PDP context. Ranges: 1 to 7.

Example

```
ATD*99#
CONNECT
ATD*99***1
CONNECT
ATD*98#
CONNECT
ATD*98*1#
CONNECT
```

6.2.15 AT+LSRAICFG Set RAI flag

If the flag is set before sending UDP data,RRC can be quickly released,and then the module enter the low power mode(Idle，eDRX，PSM). RAI is Release assistance indication.

AT+LSRAICFG Set RAI flag	
Test Command **AT+LSRAICFG=?**	Response **+LSRAICFG: <enable(0-1)>,<flag(0-2)>** **OK**
Write Command **AT+LSRAICFG=<enable>[,<flag>]**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<enable>	0 Close 1 Open
<flag>	The type of message transport, by default, is 0 0: no information available 1: uplink or downlink data transmission is not expected after uplink data transmission 2: it is expected that only a single downlink data transmission will be carried out after the uplink data transmission without further uplink data transmission

Example

After sending UDP (including UDP-based cloud platforms such as OneNet, Ocean Connect) data, RRC needs to be released quickly. There are two kinds of processing:

1. Only need to send, and do not need to receive (for example, UDP):
AT+LSRAICFG=1,1
OK
AT+MIPSTRS=1,0,"333"
+MIPSTRS: 1,3,1096

OK
^ENTERPSMMODE
2. Need to receive a downlink data after sending (for example, OceanConnect):
AT+LSRAICFG=1,2
OK
AT+NMGS=40,0201FD68656c6c6f2c41393630302052322168656c6c6f52322168656c6c686

```
56c6c6f2c41393630
OK
+NNMI: 4,bbbb0000
^ENTERPSMMODE
```

6.2.16 AT+PING Start Ping IP address or host

AT+PING Start Ping IP address or host	
Test Command AT+PING=?	Response +PING: (DNS/IP address),(list of supported<timeout>s),(list of supported<packet_length>),(list of supported <ping_count>s) OK
Write Command AT+PING=<IPaddress>,[<timeout>,<packet_length>,<ping_count>] 或 AT+PING=<domainname>,[<timeout>,<packet_length>,<ping_count>]	Response OK Reply from <IP address>: bytes= <nbyte> time =< replyTime>(ms), TTL = <ttl> Reply from <IP address>: bytes= <nbyte> time =<replyTime>(ms), TTL = <ttl> [...] Ping statistics for <IP address>:Packets: Sent= <nsendPackage>, Received = <nreceivePackage>, Lose = <nlostPackage><<lostRange>%>
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<IP address>	A string parameter which indicates ping IP address
<domain name>	A string parameter which indicates ping domain name
<timeout>	Ping ICMP package timeout (1~255)
<packet_length>	Ping ICMP package size (36~1500 ipv4) (56~1500 ipv6)
<ping_count>	Ping ICMP package send times (1~65535)
<nbyte>	Ping package size
<replyTime>	Time, in units of ms, required to receive the response
<ttl>	Time to live
<nsendPackage>	Send package number
<nreceivePackage>	Receive package number
<nlostPackage>	Lost package number
<lostRange>	Lost package range

Example

```
AT+PING="180.101.147.115",10,64,1
Reply from 180.101.147.115: bytes= 64 time = 958(ms), TTL = 255
Ping statistics for 180.101.147.115
Packets: Sent = 1, Received = 1, Lose = 0 <0%>, max_delay = 958 ms, min_delay
= 958 ms, average delay = 958 ms
```

6.2.17 AT+PINGSTOP Stop Ping IP Address or Host

AT+PINGSTOP Stop Ping IP Address or Host	
Execute Command **AT+PINGSTOP**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+PINGSTOP
OK
```

7 Network Service Commands

7.1 Overview of Network Service Commands

Command	Description
AT+COPS	Operator Selects
AT+CSQ	Signal Quality
AT+CPOL	Manually set the network list in SIM
AT+CTZR	Time zone report
AT+CEREG	LTE registration status report
AT+CSCON	RRC connectin status report

7.2 Detailed Information of Network Service Commands

7.2.1 AT+COPS Operator Selects

This command is used to select and register a mobile communication network (only Read Command allowed in the presence of a call).

AT+COPS Operator Selects	
Test Command **AT+COPS=?**	Response **+COPS: <mode>[,<format>,<current oper>,<AcT>]** **OK**
Write Command **AT+COPS=<mode>,[<format>[,<oper>[,<AcT>]]]**	Response **OK** **+CME ERROR: <err>**
Read Command **AT+COPS?**	Response **+COPS:[** Mobile communication network list **(<stat>,long alphanumeric<oper>,short phanumeric<oper>s,numeric<oper>,<AcT>)s][,,(list of supported <mode>s),(list of supported <format>s)]** **OK**
Parameter Saving Mode	-

Max Response Time	-
Reference	

Defined Values

<mode>	0: oper is ignore 1: manual selection (oper should be present) 2: Unregister the network 3: only for formatting 4: Manual / automatic (automatic selection after manual selection is unsuccessful)
<format>	0: long name 1: short name 2: Number <oper>
<stat>	0: Unknown 1: available 2: Currently using 3: disabled
<AcT>	0: GSM 1: GSM Compact 2: UTRAN 9: NB-IOT
<oper>	Operation code, (MCC/MNC digital code, used when selecting the network, such as China Mobile is 46000, China Unicom 46001)

Example

```
AT+COPS=?
+COPS:(2,"CHINATELECOM","CT","46011"),
(1,"CHINAMOBILE","CMCC","46000"),(0,"C
HINAUNICOM","UNICOM","46001"),(0,"CHIN
ATELECOM","CT","46012"),,(0,1,2,3,4),(0,1,2
)

OK
AT+COPS?
+COPS: 1,2,”46000”,9

OK
AT+COPS=0                          // Automatic network selection
OK
AT+COPS=1,2,”46000”,9              // Manual network selection
OK
```

7.2.2 AT+CSQ Signal Quality

AT+CSQ Signal Quality	
Test Command **AT+CSQ=?**	Response **+CSQ: <rssi>,<ber>** **OK**
Execute Command **AT+CSQ**	Response **+CSQ: <rssi>,<ber>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<rssi>	0 -113 dBm or less 1 -111 dBm 2...30 -109...-53 dBm 31 -51 dBm or greater 99: not known or not detectable
<ber>	0～7: RXQUAL values in the table in GSM 05.08 [20] sub clause 8.2.4 99: not known or not detectable

Example

```
AT+CSQ
+CSQ:23,99

OK
```

7.2.3 AT+CPOL Manually set the network list in SIM

AT+CSQ Manually set the network list in SIM	
Test Command **AT+CPOL=?**	Response **+CPOL: (list of supported <index>s),(list of supported <format>s)** **OK**
Write Command **AT+CPOL=[<index>][,<format>[,<oper>]]**	Response **OK** or **ERROR**

Read Command **AT+CPOL?**	Response **+CPOL: <index1>,<format>,<oper1>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<Index>	Index number, must start from 1
<Format>	2: Number <oper>
<oper>	Opcode (MCC/MNC digital code, used when selecting the network, such as China Mobile is 46000, China Unicom 46001)

Example

```
AT+CPOL=1,2,”46000
OK
```

7.2.4 AT+CTZR Time zone report

AT+CTZR Time zone report	
Test Command **AT+CTZR=?**	Response **+CTZR:(0-2)** **OK**
Write Command **AT+CTZR=<flag>**	Response **OK** or **ERROR**
Read Command **AT+CTZR?**	Response **+CTZR: <flag>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<flag>	0: Close time zone report 1: Turn on the time zone report 2: Turn on extended time zone reporting When flag = 1, the format of the active reporting time zone information is as follows: +CTZV: "tz" When flag = 2, the format of the active reporting time zone information is as follows: +CTZE: "(+/-)tz",<dt>, "YY/MM/DD,hh:mm:ss" YY: year MM: Month DD: Day Hh: hour Mm: minute Ss: seconds Tz: time zonedt: summer time

Example

```
AT+CTZR=1                                  // Send it before registering the network
OK
+CTZV: “+32”                               // After registering the network, please report it as follows
AT+CTZR=2                                  // Send it before registering the network.
 OK
+CTZE: "+32",0,"17/11/15,7:28:29"          // After registering the network, please report it as follows
```

7.2.5 AT+CEREG LTE registration status report

The setup command controls the display of some unsolicited result codes regarding the LTE registration status.

- ✧ When <n>=1 and the MT's LTE registration status changes, this instruction set controls the unsolicited result code +CEREG, which will prompt +CEREG: <stat>.
- ✧ When <n>=2 and the registered cell changes, there will be: +CEREG: <stat>[,<tac>,<rac>,<ci>[,<AcT>]].
- ✧ When the UE reduces power consumption by applying PSM and sets <n>=4, if the registered cell changes, there will be: +CEREG: <stat>[,<tac>,<rac>,<ci>[,<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]].

Read CommandPossible response The display form of the result code <n> and a parameter <stat> that indicates the registration status of the MT network. Only when <n>=2 and the MT is registered in the network, it is only possible to respond to the location information element

AT+CEREG LTE registration status report	
Test Command	Response

AT+CEREG=?	**+CEREG:(<N>** List of values**)** **OK**
Write Command **AT+CEREG=[<n>]**	Response **OK** or **ERROR** or **+CME ERROR: <ERR>**
Execute Command **AT+CEREG**	Response **OK**
Read Command **AT+CEREG?**	Response when <n>=0, 1, 2, 3 and command successful: **+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<Act>[,<cause_type>]]** **OK** when <n>=4 or 5 and command successful: **+CEREG:** **<n>,<stat>[,[tac],[<ci>],[<Act>],-[<rac>][,[<cause_type>],[<reject_cause>][,[<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0 Disable network registration unsolicited result code **+CEREG** 1 Enable network registration unsolicited result code **+CEREG: <stat>** 2 Enable network registration and location letter Non-request result code **+CEREG: <stat>[,[<tac>], [<ci>], [<AcT>]]** 3 Enable unsolicited result code for network registration, location information, and value information generated by EMM: **+CEREG:** **<stat>[,[<tac>],[<ci>],[<Act>][,<cause_type>,<reject_cause>]]** 4 Enable network registration and location information unsolicited result code when UE attempts to apply PSM **+CEREG:** **<stat>[,[<tac>],[<ci>],[<Act>][,,[,[Active-Time],[<Periodic-TAU>]]]]** 5 When the UE attempts to apply the PSM, the network registration, location information, and unsolicited result code of the EMM generated value information are enabled.: **+CEREG:**

	<stat>[,[<tac>],[<ci>],[<Act>][,<cause_type>,<reject_cause>][,[<Active-Time>],[<Periodic-TAU>]]]]
<stat>	0 Unregistered; ME does not currently have a new operator to search for registered business 1 Registered, local network 2 Not registered, but ME is searching for new carriers for registered business 3 Registration rejected 4 unknown 5 Registered, roaming
<tac>	Character type; 2-byte hexadecimal tracking area code (for example: 00C3 is equivalent to 195 in decimal)
<ci>	Character type; 4 byte hexadecimal cell number
<AcT>	0 GSM(Not supported yet) 1 GSM Compact(Not supported yet 2 UTRAN(Not supported yet) 3 GSM w/EGPRS(Not supported yet) 4 UTRAN w/HSDPA(Not supported yet) 5 UTRAN w/HSUPA (Not supported yet) 6 UTRAN w/HSDPA and HUSPA(Not supported yet) 7 E-UTRAN 8 EC-GSM-IoT(A/Gb (Not supported yet) 9 E-UTRAN(NB-S1)
<cause_type>	Integer; identifies Types of <reject_cause> 0 identifier <reject_cause> contains EMM cause value
<Active-Time>	Character type; 1 byte 8 bit format. The Active Time value (T3324) assigned to the UE in the E-UTRAN system. Refer to the +CPSMS command related parameter configuration.
<Periodic-TAU>	Character type; 1 byte 8 bit format. The exteaned periodic TAU value (T3412) assigned to the UE in the E-UTRAN system. Refer to the +CPSMS command related parameter configuration.

Example

```
AT+CEREG=1
OK
AT+CEREG?
+CEREG: 1,1,"187B","081B1130",7
OK
AT+CEREG=?
+CEREG: (0-5)
OK
```

7.2.6 AT+CSCON RRC connectin status report

AT+CSCON RRC connectin status report	
Test Command **AT+CSCON=?**	Response **+CSCON: (0-3)** **OK**
Write Command **AT+CSCON=<n>**	Response **OK** or **ERROR**
Read Command **AT+CSCON?**	Response **+CSCON: <N>,<MODE>[,<STATE>]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0 Turn off active reporting 1 Open the active report and report the content: +CSCON: <mode> 2 Open the active report and report the content: +CSCON: <mode>,<state> 3 Open the active report, report the content: +CSCON: <mode>, <state>, <access>
<mode>	Indicates the connection status of signaling 0 standby (idle) 1 connection status (connected)
<state>	Integer, under the GERAN network, indicates the state of the CS or PS; in the UTRAN and E-UTRAN networks, if the MT is in the connected state, it indicates the status information of the RRC. 0 UTRAN URA_PCH status； 1 UTRAN Cell_PCH status； 2 UTRAN Cell_FACHstatus； 3 UTRAN Cell_DCHstatus 4 GERAN CS connectionstatus 5 GERAN PS connectionstatus 6 GERAN CS and PS All connectionstatus； 7 E-UTRAN connectionstatus
<access>	Indicates the current wireless access network Types 0 GERAN，See3GPP TS 45.001[146]; 1 UTRAN TDD，See 3GPP TS 25.212[144]; 2 UTRAN FDD，See 3GPP TS 25.212[144];

	3 E-UTRAN TDD，See 3GPP TS 36.300[145]; 4 E-UTRAN FDD，See 3GPP TS 36.300[145]

Example

```
AT+CSCON=3
OK
+CSCON: 1, 7, 4                    // When AT+CGATT=0, will report
AT+CSCON?
+CSCON:3,0

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

OK
```

8 SMS Commands

8.1 Overview of SMS Commands

Command	Description
AT+CSMS	Select message service
AT+CSDH	Show Text Mode Parameters (for SMS)
AT+CPMS	Preferred SMS Message Storage
AT+CSCA	SMS Service Center Address
AT+CMGF	Select SMS Message Format
AT+CMGL	List SMS Messages From Preferred Store
AT+CMGR	Read SMS Message
AT+CMGS	Send SMS message
AT+CSMP	Set Text Mode Parameters
AT+CMGW	Write SMS Message To Memory
AT+CMSS	Send Message From Storage(for SMS)
AT+CMGD	Delete SMS Message
AT+CSCB	Set Cell Broadcast function
AT+CNMI	New SMS Message Indications
AT+CNMA	ME/TA new message acknowledgement
AT+CMMS	Set SMS Concat

8.2 Detailed Information of SMS Commands

8.2.1 AT+CSMS Select message service

This command is used to query and set the supported short message service types.

Note:

The current system does not distinguish between GSM07.05 PHASE 2 and GSM07.05 PHASE 2+.

AT+CSMS Select message service	
Test Command AT+CSMS=?	Response **+CSMS: <service>** **OK**
Write Command	Response

AT+CSMS=<service>	**+CSMS: <mo>,<mt>,<cb>** **OK**
Read Command **AT+CSMS?**	Response **+CSMS: <service>,<mo>,<mt>,<cb>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<service>	0: SMSAT command is compatible with GSM07.05 PHASE 2 1: SMSAT command is compatible with GSM07.05 PHASE 2+
<mo>	0: Do not support short messages of mo 1: short message supporting mo
<mt>	0: mt short message is not supported 1: Support mt short message
<cb>	0: cb is not supported 1: Support cb

Example

```
AT+CSMS=0
OK
```

8.2.2 AT+CSDH Show Text Mode Parameters (for SMS)

This command is used to set the information attached in the text mode.

AT+CSDH Show Text Mode Parameters (for SMS)	
Test Command **AT+CSDH=?**	Response **+CSDH: (0-1)** **OK**
Write Command **AT+CSDH=<value>**	Response **OK**
Read Command **AT+CSDH?**	Response **+CSDH: <value>** **OK**

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value>	0: In text mode, +CSCA, +CMGL, +CMT's Possible Response value does not display parameter<sca>, <tosca>, <fo>, <vp>, <pid> defined by +CSCA and +CSMP. <dcs> does not display <length>, <toda>/<tooa> 1: Display additional information

Example

```
AT+CSDH=1
OK
```

8.2.3 AT+CPMS Preferred SMS Message Storage

AT+CPMS Preferred SMS Message Storage	
Test Command **AT+CPMS=?**	Response **+CPMS:** **(("ME","SM","MT"),("ME","SM","MT"),("ME","SM" ,"MT"))** **OK**
Write Command **AT+CPMS=<mem1>[,<mem2>,[<mem3>]]**	Response **OK** or **ERROR**
Read Command **AT+CPMS?**	Response **+CPMS:** **<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mem1>	Short message read, deleted storage area. Optional values: "ME",

	"SM"
<mem2>	The storage area for short message writing and sending. The optional value is the same as <mem1>
<mem3>	Received SMS storage area. Optional value is the same as <mem1>
<usedx>	The number already used in <memx>
<totalx>	Total amount that can be stored in <memx>
<"SM">	SIM card storage area
<"ME">	Storage area for short messages in NV
<"MT">	Priority storage "ME", "ME" is full, then stored in "SM"

Example

```
AT+CPMS="ME","SM",”SM”
+CPMS: 0,1000,12,20,12,20

OK
```

8.2.4 AT+CSCA SMS Service Center Address

AT+CSCA SMS Service Center Address	
Test Command **AT+CSCA=?**	Response **OK**
Write Command **AT+CSCA=<sca>[,<tosca>]**	Response **OK**
Read Command **AT+CSCA?**	Response **+CSCA: <sca>[,<tosca>]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<sca>	Short message center number, {0-9, *, #,+, a, b, c}, maximum length 20
<tosca>	value range, {128,129,145,161},default value 129

Example

```
AT+CSCA?
```

```
+CSCA: "+8613800230500",145

OK
AT+CSCA="8613800230500"
OK
AT+CSCA=?
OK
```

8.2.5 AT+CMGF Select SMS Message Format

AT+CMGF Select SMS Message Format	
Test Command **AT+CMGF=?**	Response **+CMGF:(0,1)** **OK**
Write Command **AT+CMGF=<mode>**	Response **OK** or **ERROR**
Read Command **AT+CMGF?**	Response **+CMGF=<mode>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0: PDU mode (default setting) 1: Text mode

Example

```
AT+CMGF?
+CMGF: 0
OK
AT+CMGF=1
OK
```

8.2.6 AT+CMGL List SMS Messages From Preferred Store

Used to list different statuses or all short messages. There are different Possible response formats for different Types of (send short message SMS-DELIVER, sent short message SMS-SUBMIT and short message status report SMS-ATATUS-REPORT). For the short message status report, the module treats it as a normal MT short message.

AT+CMGL List SMS Messages From Preferred Store	
Write Command **AT+CMGL=<state>**	Response Text mode: **+CMGL:** **<index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]** **<CR><LF><data>(for SMS-SUBMIT)** **+CMGL:** **<index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]** **<CR><LF><data>(for SMS-DELIVER)** **+CMGL:** **<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>(for SMS-STA TUS-REPORT）** **OK** PDU mode: **+CMGL: <index>,<stat>,<length>,<CR><LF>** **<PDU>(for SMS-DELIVER, SMS-SUBMIT and SMS-ATATUS-REPORT)** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0: PDU mode（default） 1: Text mode
<index>	Position in memory
<dcs>	Text of the short message content Types of: 0: default Types of 4: 8BIT 8: UCS2（Such as Chinese）
<da/oa>	Target/source address: TP-Destination-Address/ TP-Originating-Address address-Value field in string format in GPP TS 23.040; converts the BCD value (or defaultGSM 7-bit character) to the character in the currently selected

	TE character set
<ra>	Status report receiving address: String-type TP-Recipient-Address "Address-Value" field in 3GPP TS 23.040; converts BCD value (or defaultGSM 7bit character) to the character of the currently selected TE character set
<scts>	Time to arrive at the short message center: TP-Service-Centre-Time-Stamp field in the "Time-String" format in 3GPP TS 23.040
<tooa>	Source address Types of: TP-Originating-Address 8-bit "Types of-Address" field of integer type in 3GPP TS 24.01
<toda>	Destination address Types of: Integer type TP-Destination-Address 8-bit "Types of-address" field in 3GPP TS 24.011 (when the first character of <da> is +(IRA43), the default value is 145; otherwise the default value is 129) 128: Unknown number Types of 129: SDN number Types of (default) 145: International ISDN Phone Number 161: Domestic ISDN phone number
<tora>	Status report receiving address Types of: Integer type TP-Recipient-Address 8-bit "Types of-address" in 3GPP TS 24.011 (default value, please refer to <toda>)
<fo>	Depends on the command or the result code of the command: 3GPP TS 23.040 SMSDELIVER, SMS-SUBMIT message (default value: 17), SMS-STATUS-REPORT, or the first 8 bits of the integer SMS-COMMAND message (default value: 2)
<mr>	Short message index value: TP-Message-Reference of integer type in 3GPP TS 23.040
<dt>	Time to reach the target address: TP-Discharge-Time in time-string format in 3GPP TS 23.040: "yy/MM/dd, hh:mm:ss±zz". In the message of this format, the character part indicates the year (last 2 digits), month , day, hour, minute, second, and time zone. For example: 6th of May 1995, 22:10:00GMT+2 hours is equivalent to "95/05/06, 22:10:00+08"
<st>	Status report: TP-Status of the integer type in 3GPP TS 23.040
<data>	Short message content in text format: 1. If <dcs> is using the GSM 7bit encoding scheme and <fo> is not used 1) If the character set of the TE is not "HEX" (refer to the TE character set selection Set Command+CSCS), the MT/TA converts the string from the GSM character set to the current TE character set; 2) If the character set of TE is "HEX", MT/TA converts each GSM7bit character into a hexadecimal format represented by two IRA

	characters; 2. If <dcs> is using an 8-bit or UCS2 encoding scheme, or <fo> is already used: ME/TA converts each octet into a hexadecimal format of two IRA characters. The format of the cell broadcast message text mode: 1. If <dcs> is using GSM 7bit encoding scheme 1) If the TE character set is not "HEX" (refer to the TE character set selection Set Command + CSCS): MT/TA converts the string from the GSM character set to the current TE character set; 2) If the character set of TE is "HEX": MT/TA converts each GSM7bit character into a hexadecimal format represented by two IRA characters; 2. If <dcs> uses an 8-bit or UCS2 encoding scheme: ME/TA converts each octet into a hexadecimal format of two IRA characters.
<stat>	（Text Mode） （PDU Mode） meaning “REC UNREAD” 0 Unread new short message “REC READ” 1 Read short message “STO UNSENT” 2 Stored unsent short message “STO SENT” 3 Stored sent short messages indeed “ALL” 4 All short messages

Example

```
AT+CMGF=0                                   // Set to PDU mode
OK
AT+CMGL=4                                   // Show all short messages
+CMGL: 1,2,,21
0891683108200305F0114A0481111100008F0
CD3E594B85C1297C4257109
+CMGL: 2, 2, ,24
0891683108200305F0314A0B803118665868F
50008AD0A00680065006C006C006F
+CMGL: 3, 1, ,13
018000008000000000000000000000

OK
AT+CMGF=1
OK                                          // Set to TEXT mode
AT+CMGL="ALL"
+CMGL: 1,"REC READ","",,"00/00/00,00:00:00+00"   // Show all short messages
+CMGL: 2,"REC READ","",,"00/00/00,00:00:00+00"
+CMGL: 3,"STO UNSENT","1111",,43200
```

```
SKSDKKDKDKDK
+CMGL:                                  4,"STO
UNSENT","13816685865",,604800
00680065006C006C006F
+CMGL:                                  5,"REC
READ","12581",,"04/05/13,11:43:06+00"
975E5E3853EF4E50003A7532003A4E456CA
180547EDC7684540C5B664E0076F45411621
163A895004E005957767E79D151684E66FF0
C70E6FF0162115C3176F463A57ED94ED68B
F4201C5C1167658FD94E005957201D4E5900
3A4ED667094EC04E4853CD5E94FF1F7532
003A7ED3679C4ED653C84ECB7ECD621153
E64E0059573002

OK
```

8.2.7 AT+CMGR Read SMS Message

Used to read a specified short message. There are different Possible response formats for different Types of (send short message SMS-DELIVER, sent short message SMS-SUBMIT and short message status report SMS-ATATUS-REPORT)

Note:

For the short message status report, the module treats it as a normal MT short message

AT+CMGR Read SMS Message	
Write Command **AT+CMGR=<index>**	Response Text mode **+CMGR:** **<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,sca>,<tosca>,<length>]<CR><LF><data> (for SMS-DELIVER only)** **+CMGR:** **<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data>(for SMS-SUBMIT only)** **+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>** **(for SMS-STATUS-REPORT）** **OK** PDU mode **+CMGR: <stat>,<length>,<CR><LF>** **<PDU>**

	OK
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<stat>	Short message status
<dcs>	Text of the short message content Types of: 0: defaultTypes of 4: 8BIT 8: UCS2（Such as Chinese）
<da/oa>	Target/source address
<vp>	The validity period of the short message: Depends on the setting of SMS-SUBMIT<fo>; 3GPP TS 23.040 uses integer type (default value: 167) or time-string format (please refer to <dt>) or enhanced format (16 in double quotes) Encoded strings and support EVPF's TP-Validity-Period
<ts>	Short message delivery time
<st>	Status report
<pid>	Short message protocol identification number
<data>	Text content

Example

```
AT+CMGR=12
+CMGR:                                  "REC
READ","12581",,"04/05/17,11:33:39+00"
975E5E3853EF4E50003A9662957F53EE5631
533B751F003A4F607ED967D05B98592A592
A62A5544A68C067E57ED3679C65F6FF0C75
288BCD8981658796C53002533B751F70B95
934FF0C68C067E55B8540EFF0C533B751F8
BF4003A606D559C592B4EBAFF0C60A8818
080F191CC67094E00989700340030514B62C
976846F024EAE77F35934

OK
AT+CMGF=1
OK
AT+CMGR=4
+CMGR:                                  "REC
READ","+8615710126408",  ,"10/02/21,15:18:
52+32"
```

```
7ED590538DEF4E0A6D77591656FD5BB65E
AD96626821957F671F95F463A553D752304E
86541776848BDD8BF4660E663E793A83035
6F4

OK
AT+CSDH=1
OK
AT+CMGR=4
+CMGR:"REC
READ","+8615710126408",  ,"10/02/21,15:18:
52+32",145,60,0,2,
"+8613800210500",145,
547ED590538DEF4E0A6D77591656FD5BB65
EAD96626821957F671F95F463A553D75230
4E86541776848BDD8BF4660E663E793A830
356F4

OK
```

8.2.8 AT+CMGS Send SMS message

This command is used to send short messages. In TEXT mode, if you transfer UCS2 characters, you must first set dcs to UCS2 with the command AT+CSMP, and UCS2 with hexadecimal input must be converted to two ASCII characters, such as 0X2A for 2 (ASCII 50) and A (ASCII 65)

Note:

The serial port has set the timeout. When sending a short message in PDU or TEXT format, if there is no input [Ctrl+Z] to send the SMS content within 10S after the 『> appears, the module will automatically return to the AT command input mode, and then input the short message content after the timeout. Send will report ERROR。

AT+CMGS Send SMS message	
Test Command **AT+CMGS=?**	Response **OK**
Write Command If the format of the short message sent is text (AT+CMGF=1) mode **AT+CMGS=<da>[,<toda>]<CR>TEXT <ctrl+Z/ESC>** If the format of the short message sent is PDU (AT+CMGF=0) mode	Response **+CMGS: <mr>** **OK**

AT+CMGS=<length><CR>	
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<length>	length of the TPDU in 8-bit byte format (excluding the 8-bit byte number of the SMSC address), ranging from 9 to 160
<PDU>	consists of <SMS Center Number> (00 means the number set with +CSCA) + <TPDU>, where <SMS Center Number> complies with GSM 04.11, <TPDU> complies with GSM 03.40. A hexadecimal TPDU must be converted to two ASCII characters such as 0X2A for 2 (ASCII 50) and A (ASCII 65). The length range is 18-502
<da>	The TP-Destination-Address target address field in the string format, BCD number (or GSM 7bitdefault character), converted to the character in the currently selected TE character set (reference command +CSCS)
<toda>	128: Unknown number Types of 129: SDN number Types of (default) 145: International ISDN Phone Number 161: Domestic ISDN phone number
<Text content (0…9,A…F) >	1. If dcs (AT+CSMP setting) is 7Bit ASCII characters and <fo> is TP-User-Data-Header-Indication, no status is set. 1) If the TE character set is set to non-HEX (refer to the +CSCS command), ME/TA converts the input text to the GSM 7bit character. 2) If the TE character set is set to "HEX", the input text should be converted to a GSM 7bit character by a hexadecimal number consisting of two IRAs (eg 17 (IRA values: 49 and 55) converted to characters (GSM) 7bit value: 23)) Note: length range 0-160 2. If dcs is 8Bit or UCS2 encoded: The input text must be a string consisting of two IRA characters in hexadecimal format, and ME/TA converts the string into eight characters. Note: The length range is 0-140

Example

PDU MODE:

AT+CMGS=18

>0891683108200105F031020b815109

905944f5000800044F60597D<ctrl+z>

// TEXT MODE

AT+CMGS="13888888888"

```
> hello <ctrl+z>
AT+CMGF=1
OK
AT+CSMP=19,143,0,8                    // Set <dcs> to UCS2
OK
AT+CMGS="13918928066"                 //4F60597D: 你好
>4F60597D001A
OK
```

PDU encoding analysis:

08	Short message center address length Description: 91683108200105F0 converted 8 octets in length (ie SMSC format + length of SMSC address) Note: If it is 00, the following two items do not need to be filled out
91	Short message center address format (TON/NPI) Description: Use international format number (plus '+' in front)
683108200105F0	ShortMessage Center Address (BCD format) Description: 8613800210500，Make up 'F' to make an even number
31	<fo> (MS-SUBMIT's first octet) Description: 30: The first octet of SMS-DELIVER 31: The first octet of SMS-SUBMIT
02	SMS reference value (ie TP MR) Description: Range 0-255
0b	Target address length Description: Same as short message center number length definition
81	Destination address format: <toda>
5109905 944f5	Destination address: <da> (ie TP -DA) Description: 15900995445, Make up 'F' to make an even number
00	Protocol ID <pid> (ie TP -PID) Description: Normal Types of, point-to-point mode
08	User coding method (TP-DCS) Description: 00: Default 7bit encoding 04: 8bit encoding 08: UCS2 code

00	Validity period (TP-VP) Description: 5 minutes
04	User information length (TP-UDL) Actual length 4 bytes
4F60597D	User Information (TP-UD) Description: 4F60597D: Hello there

8.2.9 AT+CSMP Set Text Mode Parameters

This command is used to set or read <vp>, <pid>, and <dcs>.

AT+CSMP Set Text Mode Parameters	
Test Command **AT+CSMP=?**	Response **OK**
Write Command **AT+CSMP=[<fo>,[<vp>,[<pid>,[<dcs>]]]]**	Response **OK** or **ERROR**
Read Command **AT+CSMP?**	Response **+CSMP: <fo>,<vp>,<pid>,<dcs>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<fo>	First Octet, the default value is 17. please refer to ‘fo’ bit value.
<vp>	valid time value, default value is 167 0 to 143: (VP + 1) × 5 minutes (maximum 12 hours) 144 ~ 167: 12 hours + ((VP . 143) × 30 minutes) 168～196: (VP. 166)×1 day 197~255: (VP. 192) × 1 week
<pid>	Used to indicate which upper layer protocols are used and which telecommunication devices are used in the network. The default value is 0. 0: implicit - device type is specific to this SC, or can be concluded on the basis of the address 1: telex (or teletex reduced to telex format)

	2: group 3 telefax 3: group 4 telefax 4: voice telephone (i.e. conversion to speech) 5: ERMES (European Radio Messaging System) 6: National Paging system (known to the SC) 7: Videotex (T.100/T.101) 8: teletex, carrier unspecified 9: teletex, in PSPDN 11: teletex, in analog PSTN 12: teletex, in digital ISDN 7F: SIM DOWNLOAD
<dcs>	The encoding method of the information, the default value is 0. 0: default alphabet 4: 8 bit data 8: UCS2

Fo meaning

b7	Coding: RP Description: Reply path, invalid in TEXT mode
b6	Coding: UDHI Description: User data header information
b5	Coding: SRR Description: The status report is required. If a status report is required, then the location is 1
b4	Coding:
b3	VPF Description: Effective term format: b4=0 & b3=0: <vp> bit does not exist B4=1 & b3=0: <vp> bits exist in a correlated format Other formats are not supported
b2	Coding: RD Description: Reject the copy, b2=1 informs the SMS center to reject the short message SMS-SUBMIT that still exists in the SMS center and has the same <mr>, <da> as the previously transmitted <oa>
b1	Coding:

b0	SMS Types of indicator B1=0 & b0=0: SMS-DELIVER (from SC to MS) B1=0 & b0=1: SMS-SUBMIT (from MS to SC)

Example

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

OK
```

8.2.10 AT+CMGW Write SMS Message To Memory

AT+CMGW Write SMS Message To Memory	
Write Command If the short message format is PDU mode: **AT+CMGW=<length>[,<stat>]<CR>** **>PDU is given <ctrl+Z/ESC>** If the short message format is TEXT mode: A**T+CMGW=<oa/da>,[<tooa/toda>[,<stat>]]<CR>** **>TEXT is given <ctrl+Z/ESC>**	Response **+CMGW: <index>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<length>	Length of the TPDU (in bytes), ranging from 9 to 160
<oa/da>	Target (source) address, the maximum length is 40
<stat>	Integer, if the parameter is not filled in, the default value is 2 (unsent message) 0: Unread message (MT) 1: Read message (MT) 2: Unsent message (MO) 3: Sent message (MO)

<tooa/toda>	Toa/toda: destination address Types of 128: Unknown number Types of 129: SDN number Types of (default) 145: International ISDN Phone Number 161: Domestic ISDN phone number
<index>	Index number in <mem2>
<PDU>	Same as AT+CMGS
<Text>	Same as AT+CMGS

Example

```
AT+CMGF=1
OK
AT+CMGW="13918928088"
>TEST <CTRL+Z>
+CMGW: 16

OK
```

8.2.11 AT+CMSS Send Message From Storage(for SMS)

AT+CMSS Send Message From Storage(for SMS)	
Test Command **AT+CMSS=?**	Response **OK**
Write Command **AT+CMSS=<index>[,<da>,[<toda>]]**	Response **+CMSS: <mr>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<index>	Index number in SIM
<da>	Target number, maximum length is 40
<tooa/toda>	destination address Types of 128: Unknown number Types of 129: SDN number Types of (default) 145: International ISDN Phone Number 161: Domestic ISDN phone number

Example

```
AT+CMGF=1
OK
AT+CMGW="13918928088"
>TEST <CTRL+Z>
+CMGW: 16

OK
AT+CMSS=16
OK
```

8.2.12 AT+CMGD Delete SMS Message

AT+CMGD Delete SMS Message	
Test Command **AT+CMGD=?**	Response **+CMGD: <index>,<DelFlag>** **OK**
Write Command **AT+CMGD=<index>[,<DelFlag>]**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<index>	The index number in the selected memory <mem1>, the range is the maximum number of <mem1>
<DelFlag>	0: delete a short message according to the index index 1: delete all read short messages 2: Delete all read and sent short messages 3: Delete all short messages that have been read, sent, and not sent 4: Delete all short messages Note: <index> is ignored when <DelFlag> is 1-4

Example

```
AT+CMGF=1
OK
AT+CMGW="13918928088"
>TEST <CTRL+Z>
+CMGW: 16

OK
AT+CMSS=16
OK
```

8.2.13 AT+CSCB Set Cell Broadcast function

AT+CSCB Set Cell Broadcast function	
Test Command **AT+CSCB=?**	Response **+CSCB: (0,1)** **OK**
Write Command **AT+CSCB=[<mode>[,<mids>[,<dcss>]]]**	Response **OK** or **ERROR** AT+CSCB=<enter> only return OK without any setting
Read Command **AT+CSCB?**	Response **+CSCB=<mode>,<mids>,<dcss>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0: DCE receives the message defined in <mids>, <dcss> 1: DCE does not receive messages defined in <mids>, <dcss>
<mids>	string in the format "0,1,5,320-478,922" Among them, the character value Ranges0~999 can take up to 10 values, such as "0-9"; the format separator ",", "-" cannot exist alone, and must have numbers before and after.
<dcss>	Ranges (0-15, 32-36, 72), used to set the language Types of, the rest of the functions are not implemented

Example

```
AT+CNMI=3,0,1,0,0
OK
AT+CMGF=1
OK
at+cscb=0,"34,40,600,999","1,2,3,4,5,6,7,8,9,
10,11,12,13,14,15,32,33,34,35,36,72"
OK
AT+CSCB?
+CSCB:0,"34,40,600,999","1,2,3,4,5,6,7,8,9,1
0,11,12,13,14,15,32,33,34,35,36,72"

OK
// Enter cell broadcast short message
“May you lucky!”
// Received a message
+CBM: 1,34,16,1,1
May you lucky!
// Enter cell broadcast Chinese short message
“你好！”
// Received a message
+CBM: 2,34,17,1,1
4F60597DFF01

// pdu mode
AT+CMGF=0
OK
// Enter cell broadcast short message
“May you lucky!”
// Received a message
+CBM:
21000300221011657 7A319CE83F2EF3A885D
1FAFF321
// Enter cell broadcast Chinese short message
“你好！”
// Received a message
+CBM: 140004002211117A344F60597DFF01
//mode=1 时
at+cscb=0,"34,40,600,999","1,2,3,4,5,6,7,8,9,
10,11,12,13,14,15,32,33,34,35,36,72"
OK
```

```
AT+CSCB?
+CSCB:0,"34,40,600,999","1,2,3,4,5,6,7,8,9,1
0,11,12,13,14,15,32,33,34,35,36,72"

OK
at+cscb=1,"34,600","1,2,3,4,5,6,7,10,11,12,13
,14,15,32,35,36,72"
OK
AT+CSCB?
+CSCB: 1,"40,999","8,9,33,34"

OK
```

8.2.14 AT+CNMI New SMS Message Indications

AT+CNMI New SMS Message Indications	
Test Command **AT+CNMI=?**	Response **+CNMI: 3,(0-3),(0-3),(0-1),(0-1)** **OK**
Write Command **AT+CNMI=<mode>,<mt>,<cbm>,<ds>,<bfr>**	Response **OK** or **ERROR**
Read Command **AT+CNMI?**	Response **+CNMI: <mode>,<mt>,<cbm>,<ds>,<bfr>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	prompt mode, the default value is 3, the current system only supports mode 3 3:Possible responseresult code to DTE
<mt>	Set the Prompt format of the MT short message. The default value is 0. For details, see the table below.
cbm	Set the prompt for cell broadcast, the default value is 0. 0: Do not send +CBM: to DTE 1: Pass +CBM: Send CBMS to DTE 2: Reserved, currently treated the same as <cbm>=1

	3: Reserved, currently treated the same as <cbm>=1
ds	set the prompt for the short message status report, the default value is 0 0: Do not send SMSstatus report to DTE 1: Pass +CDS: Send SMSstatus report to DTE
bfr	0: TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1...3 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 is entered.

Set the Prompt format of the MT short message

mt	**no class or class1**	**class 0 or message waiting indication group (discard)**	**class 2 or message waiting indication group (store)**	**class 3**
0	No prompt No SMS-DELIBER	No prompt No SMS-DELIBER	No prompt No SMS-DELIBER	No prompt No SMS-DELIBER
1	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMTI: <mem>,<index>
2	Direct prompt +CMT:result code.	Direct prompt +CMT:result code.	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMT:result code.
3	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMTI: <mem>,<index>	Automatic prompt +CMTI: <mem>,<index>	Direct prompt +CMT:result code.

Example

```
AT+CNMI=3,0,1,1,0
OK
AT+CNMI?
+CNMI: 3,0,1,1,0
OK
```

8.2.15 AT+CNMA ME/TA new message acknowledgement

This command is used to confirm receipt of a new SMS sent directly to the TE.

The Execution command confirms receipt of a new message sent directly to the TE. This confirmation command should be used when the +CSMS command parameter<service> is equal to 1. The use of this command can be See+CNMI command Description.

AT+CNMA ME/TA new message acknowledgement	
Test Command **AT+CNMA=?**	Response **OK**
Execute Command **AT+CNMA**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT+CNMA
OK
```

8.2.16 AT+CMMS Set SMS Concat

AT+CMMS Set SMS Concat	
Test Command **AT+CMMS=?**	Response **+CMMS: (0-1)** **OK**
Write Command **AT+CMMS=[<n>]**	Response **OK**
Read Command **AT+CMMS?**	Response **+CMMS: <n>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0: No more SMS sent 1: There are more SMS messages sent. If the upper and lower transmission intervals are more than 1-5 seconds

	(depending on the manufacturer), <n>Automatic Possible response 0

Example

```
AT+CMMS=1
OK
```

9 HTTP Commands

9.1 Overview of HTTP Commands

Command	Description
AT+HTTPAUTHOR	Set HTTP authority
AT+HTTPGET	Get HTTP resouces
AT+HTTPDOWNLOAD	Download files from HTTP server
AT+HTTPPOST	Post data to HTTP server
AT+HTTPPUT	Put data to files on HTTP server
AT+HTTPHEAD	Read the HTTP header of server
AT+HTTPOPTIONS	Query HTTP supported methods
AT+HTTPTRACE	Get the requested path of HTTP server
AT+HTTPDELETE	Delete HTTP resources
AT+HTTPTIMEOUT	Set http server response timeout
AT+HTTPHEADERSET	Set httpheader profile

9.2 Detailed Information of HTTP Commands

9.2.1 AT+HTTPAUTHOR Set HTTP authority

AT+HTTPAUTHOR Set HTTP authority	
Test Command AT+HTTPAUTHOR=?	Response **+HTTPAUTHOR: <url>,<username>,<password>** **OK**
Write Command AT+HTTPAUTHOR=<url>,<username>,<password>	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	the address of the access HTTP server

<username>	username of the HTTP server
<password>	password of the HTTP server

Example

```
AT+HTTPAUTHOR="http://101.231.214.90:60
001/test/","test","123456"
OK
+HTTPURC: 200
CONTENT-TYPE: TEXT/HTML
CONTENT-LENGTH: 4958
ACCEPT-RANGES: BYTES
SERVER: HFS 2.3K
SET-COOKIE:
HFS_SID_=0.690894247032702;        PATH=/;
HTTPONLY
CACHE-CONTROL:  NO-CACHE,  NO-STORE,
MUST-REVALIDATE, MAX-AGE=-1
<!DOCTYPE   HTML   PUBLIC   "-//W3C//DTD
XHTML 1.0 TRANSITIONAL//EN">
<HTML>
……
</HTML>
<!-- BUILD-TIME: 0.250 -->
```

9.2.2 AT+HTTPGET Get HTTP resouces

AT+HTTPGET Get HTTP resouces	
Test Command **AT+HTTPGET=?**	Response **+HTTPGET: <url>** **OK**
Write Command **AT+HTTPGET=<url>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	the address of the access HTTP server

Example

```
AT+HTTPGET="http://101.231.214.90:1111/ab
c.txt"
OK
+HTTPURC: 200
HELLOWORLD,
```

9.2.3 AT+HTTPDOWNLOAD Download files from HTTP server

AT+HTTP Download files from HTTP server	
Test Command **AT+HTTPDOWNLOAD=?**	Response **+ HTTPDOWNLOAD: <url>** **OK**
Write Command **AT+HTTPDOWNLOAD=<url>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	Access the resource address of the HTTP server

Example

```
AT+HTTPDOWNLOAD="http://116.22
8.149.59/WAP/Download/Video/3gpp_
video/h263_amr_12.8k_9.87f_qcif.3g
2"
OK
+HTTPURC: 200
AT+HTTPDOWNLOAD="http://101.23
1.214.90:65300/test/123.txt"
OK
+HTTPURC: 200
+HTTPDLD: 6
123456
+HTTPDLD: 3
```

// File 123.txt content is 123456, EOF is the end of file mark

```
EOF
Download succeed
```

9.2.4 AT+HTTPPOST Post data to HTTP server

AT+HTTPPOST Post data to HTTP server	
Test Command **AT+HTTPPOST=?**	Response **+HTTPPOST: <item>,<length>** **OK**
Write Command **AT+HTTPPOST=<item>,<length>**	Response **><item text>** **OK** or **ERROR** **Note:** When the ">" symbol comes out, you need to enter the completion within 10 seconds, otherwise it will report the timeout ERROR and exit the input mode. The Possible responseAT command mode
Execute Command **AT+HTTPPOST**	**OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<item>	String Types ofparameter, parameter range is as follows
<url>	access to the resource address of the HTTP server
<content_type>	Content Types of, for example: text/plain
<body_content>	content sent to the server
<length>	length of <item text>, range 1~65535

Example

```
AT+HTTPPOST="url",21
>HTTP://123.57.221.42/
OK
AT+HTTPPOST="content_type",10
```

>text/plain
OK

AT+HTTPPOST="body_content",5
>12345
OK
AT+HTTPPOST
Content_Type: text/plain
Content_Length: 512345
OK
+HTTPURC: 200
Content-Type: text/html
Content-Length: 4186
Accept-Ranges: bytes
Server: HFS 2.3k
Set-Cookie:
HFS_SID_=0.995334767038003;
path=/; HttpOnly
Cache-Control: no-cache, no-store,
must-revalidate, max-age=-1

9.2.5 AT+HTTPPUT Put data to files on HTTP server

AT+HTTPPUT Put data to files on HTTP server	
Test Command **AT+HTTPPUT=?**	Response **+HTTPPUT: <item>,<length>** **OK**
Write Command **AT+HTTPPUT=<item>,<length>**	Response **><item text>** **OK** or **ERROR** Note: hen the ">" symbol comes out, you need to enter the completion within 10 seconds, otherwise it will report the timeout ERROR and exit the input mode. The Possible responseAT command mode.
Execute Command **AT+HTTPPUT**	**OK** or **ERROR**
Parameter Saving Mode	-

Max Response Time	-
Reference	

Defined Values

<item>	String Types ofparameter, parameter range is as follows
<url>	access to the resource address of the HTTP server
<content_type>	Content Types of, for example: text/plain
<body_content>	content sent to the server
<length>	length of <item text>, range 1~65535

Example

```
AT+HTTPPUT="url",21
>
http://123.57.221.42
OK
AT+HTTPPUT="content_type",10
>
text/plain
OK
AT+HTTPPUT="content_name",7
>
put.txt
OK
AT+HTTPPUT="content_name",7
>
helloworld
OK
AT+HTTPPUT
OK
+HTTPURC: 200
success,file created
```

9.2.6 AT+HTTPHEAD Read the HTTP header of server

AT+HTTPHEAD Read the HTTP header of server	
Test Command **AT+HTTPHEAD=?**	Response **+HTTPHEAD:: <url>** **OK**
Write Command **AT+HTTPHEAD=<url>**	Response **OK**

	or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	the address of the access HTTP server

Example

```
AT+HTTPHEAD="http://123.57.221.42/"
OK
+HTTPURC: 200
Server: nginx/1.13.1
Date: Mon, 12 Mar 2018 06:14:27 GMT
Content-Type: text/html
Connection: keep-alive
```

9.2.7 AT+HTTPOPTIONS Query HTTP supported methods

AT+HTTPOPTIONS Query HTTP supported methods	
Test Command **AT+HTTPOPTIONS=?**	Response **+ HTTPOPTIONS:: <url>** **OK**
Write Command **AT+HTTPOPTIONS=<url>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	access to the resource address of the HTTP server

Example

```
AT+HTTPOPTIONS="http://123.57.221.42/"
```

```
OK
+HTTPURC: 200
Server: nginx/1.13.1
Date: Mon, 12 Mar 2018 08:20:05 GMT
Content-Length: 0
Connection: keep-alive
D AV: 1
Allow:
GET,HEAD,PUT,DELETE,MKCOL,COPY,MOV
E,PROPFIND,OPTIONS
```

9.2.8 AT+HTTPTRACE Get the requested path of HTTP server

AT+HTTPTRACE Get the requested path of HTTP server	
Test Command **AT+HTTPTRACE=?**	Response **+ HTTPTRACE: <url>** **OK**
Write Command **AT+HTTPTRACE=<url>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	Access the resource address of the HTTP server

Example

```
AT+HTTPTRACE="http://123.57.221.42/"
OK
+HTTPURC: 200
Date: Mon, 12 Mar 2018 08:22:02 GMT
Server: Apache/2.4.6 (CentOS)
Transfer-Encoding: chunked
Content-Type: message/http
TRACE/HTTP/1.1
HOST: 101.231.214.90:1113
User-Agent: CyberGarage-HTTP/1.0
```

9.2.9 AT+HTTPDELETE Delete HTTP resources

AT+HTTPDELETE Delete HTTP resources	
Test Command **AT+HTTPDELETE=?**	Response **+HTTPDELETE: <url>,<content_name>** **OK**
Write Command **AT+HTTPDELETE=<url>,<content_name>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	access to the resource address of the HTTP server
<content_name>	resource name

Example

```
AT+HTTPDELETE="http://123.57.221.42/webdav1","put.txt"
OK
+HTTPURC: 200
success,file deleted
```

9.2.10 AT+HTTPTIMEOUT Set http server response timeout

AT+HTTPTIMEOUT Set http server response timeout	
Test Command **AT+HTTPTIMEOUT=?**	Response **+HTTPTIMEOUT: （20- 255）** **OK**
Write Command **AT+HTTPTIMEOUT=<time>**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-

Reference	

Defined Values

<time>	Timeout, range 20-255, in seconds, default 20 seconds

Example

```
AT+HTTPTIMEOUT=30
OK
```

9.2.11 AT+HTTPHEADERSET Set httpheader profile

AT+HTTPHEADERSET Set httpheader profile	
Write Command **AT+HTTPHEADERSET=<valuestr>**	Response **OK** or **ERROR**
Read Command **AT+HTTPHEADERSET?**	Response **+HTTPHEADER: <valuestr>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<valuestr>	HTTPHEADER string,max length is 128 bits.

Example

```
AT+HTTPHEADERSET="Connection:keep-al
ive\0d\0aAccept-Language:pl,en-US;q=0.7,e
n;q=0.3\0d\0aContent-Type:text/html"
OK
```

9.3 HTTP URC

URC	Description
+HTTPURC: <result_code>	The server response code specified by the http protocol. Common codes and explanations are as follows. For more information, please refer to RFC 2616. 200 - OK. The client request has been successful. 401 - Access is denied. 403 - No access. 404 - not found 500 - Internal server error. 501 - The header value specifies an unimplemented configuration. 505 - HTTP version is not supported

10 FTP Commands

10.1 Overview of FTP Commands

Command	Description
AT^FTPOPEN	Open ftp connect
AT^FTPCLOSE	Close ftp connect
AT^FTPSIZE	Get a file size (for FTP)
AT^FTPGETSET	Set GET Params
AT^FTPPUTSET	Set PUT Params
AT^FTPGET	Get file
AT^FTPPUT	Put file

10.2 Detailed Information of FTP Commands

10.2.1 AT^FTPOPEN Open ftp connect

AT^FTPOPEN Open ftp connect	
Test Command AT^FTPOPEN=?	Response **^FTPOPEN:** **<url>,<username>,<password>,<mode>,<tout>,<type>** **OK**
Read Command AT^FTPOPEN?	Response **^FTPOPEN: <status>** **OK** or **ERROR**
Write Command AT^FTPOPEN="<url>",<username>,"<password>",<mode>,<tout>,<type>	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<url>	The IP address or URL of the remote server, the default port 21, can be set to "URL/IP:<port>"
<username>	username, up to 255 bytes
<password>	password, up to 255 bytes
<mode>	0 active mode 1 passive mode
<tout>	connection timeout timer, range 5~180 seconds
<type>	format Types of, 1 bin format 2 ASCII format
<status>	connectionstatus, 1 means connected; 0 means disconnected

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
```

10.2.2 AT^FTPCLOSE Close ftp connect

AT^FTPCLOSE Close ftp connect	
Execute Command **AT^FTPCLOSE**	Response: **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
AT^FTPCLOSE
OK
```

10.2.3 AT^FTPSIZE Get a file size (for FTP)

AT^FTPSIZE Get a file size (for FTP)

Test Command **AT^FTPSIZE=?**	Response **^FTPSIZE: <filename>** **OK**
Write Command **AT^FTPSIZE="<filename>"**	Response **^FTPSIZE: <filesize>** **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	File name, a string of up to 255 bytes in length
<filesize>	file size, unit byte

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
AT^FTPSIZE="/tmp/somefile.name"
^FTPSIZE: 100
OK
```

10.2.4 AT^FTPGETSET Set GET Params

AT^FTPGETSET Set GET Params	
Test Command **AT^FTPGETSET=?**	Response **^FTPGETSET: <filename>[,<offset>[,<size>]]** **OK**
Execute Command **AT^FTPGETSET="<filename>"[,<offset>[,<size>]]**	Response **OK** or **ERROR**
Read Command **AT^FTPGETSET?**	Response **^FTPGETSET: <filename>[,<offset>[,<size>]]** **OK**

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	File name, up to 255 bytes, if the file does not exist, Possible responseERROR
<offset>	the starting offset of the downloaded data
<size>	download data length, can not be set, can not be 0 after setting

Example

```
AT^FTPOPEN="116.246.23.94","admin","admin
",0,180,1
OK
AT^FTPGETSET="/tmp/somefile.name",3,6
OK
AT^FTPGET=1
^FTPGET:1,1
^FTPGET:2,6                          // Download file data
ABCDEF
^FTPGET:2,0
```

10.2.5 AT^FTPPUTSET Set PUT Params

AT^FTPPUTSET Set PUT Params	
Test Command **AT^FTPPUTSET=?**	Response **^FTPPUTSET: <filename>** **OK**
Write Command **AT^FTPPUTSET="<filename>"**	Response **OK** or **ERROR**
Read Command **AT^FTPPUTSET?**	Response **^FTPPUTSET: <filename>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<filename>	Upload file name, if the file already exists, it will be overwritten

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
AT^FTPPUTSET="/tmp/somefile.name"
OK
AT^FTPPUT=1
OK
^FTPPUT:1,3072
AT^FTPPUT=2,6
ABCDEF                                  // 上传的数据
OK
AT^FTPCLOSE
OK
^URCFTP:0
```

10.2.6 AT^FTPGET Get file

AT^FTPGET Get file	
Test Command **AT^FTPGET=?**	Response **^FTPGET: <mode> [,<reqlength>]** **OK**
Write Command **AT^FTPGET=<mode> [,<reqlength>]**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	1 gets directly, 2 downloads according to reqlength length
<reqlength>	download data length

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
AT^FTPGETSET="/tmp/somefile.name",3,6
OK

AT^FTPGET=2,6
OK
^FTPGET:1,1
^FTPGET:2,3                          //Download file data
ABCDEF
^FTPGET:2,0
```

10.2.7 AT^FTPPUT Put file

AT^FTPPUT Put file	
Test Command **AT^FTPPUT=?**	Response **^FTPPUT: mode[,<reqlength>]** **OK**
Write Command **AT^FTPPUT=<mode>[,<reqlength>]**	Response **CONNECT** ABCDEF **OK** or **ERROR**
Read Command **AT^FTPPUT?**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	1 direct upload, 2 upload according to reqlength length
<reqlength>	upload data length, no more than 3072，When the parameter is 0, represents the end of the file transfer, and the next file transfer can be performed

Example

```
AT^FTPOPEN="116.246.23.94","admin","adm
in",0,180,1
OK
AT^FTPPUTSET="/tmp/somefile.name"
OK
AT^FTPPUT=1
OK
^FTPPUT:1,3072
AT^FTPPUT=2,6
ABCDEF                                  // Data to be sent
OK
AT^FTPPUT=2,0                           // The first file is sent to the end
OK
AT^FTPPUTSET="2.txt"                    // Start the transfer of the second file
OK
AT^FTPPUT=1
OK
^FTPPUT:1,3072
AT^FTPPUT=2,6
ABCDEF                                  // Data to be sent
OK
AT^FTPCLOSE
OK
^URCFTP:0
```

10.3 FTP URC

Unsolicited codes	Description
^URCFTP: 0	Active reporting indicates that FTP connection has been closed

11 NB/2G Dual Mode Commands

11.1 Overview of NB/2G Dual Mode Commands

Command	Description
AT+CFGDUALMODE	Config dual mode
AT+CFGRATPRIO	Config dual mode single standby priority
AT+CFGLOSSCOVLEN	Config network loss and fastswitch related timer length
AT+CFGFASTSWITCHSNR	Config fastswitch threshold value to judge bad cell signal
AT+CFGFASTSWITCHTIMERLEN	Config fast switch timer length

11.2 Detailed Information of NB/2G Dual Mode Commands

11.2.1 AT+CFGDUALMODE Config dual mode

AT+CFGDUALMODE	Config dual mode
Test Command AT+CFGDUALMODE=?	Response **+CFGDUALMODE:support=[0-1](0-NotSupport;1-SingleStand),fastswitch=[0,1]** **OK**
Write Command AT+CFGDUALMODE=[<dualmode>[,<fastswitch>]]	Response **OK**
Read Command AT+CFGDUALMODE?	Response **+CFGDUALMODE: <dualmode>,<fastswitch>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<dualmode>	integer,range[0-1] 0 not support dual mode 1 dual mode single standby

<fastswitch>	integer，range: 0,1 0 close fastswitch 1 open fastswitch

Example

```
AT+CFGDUALMODE=1,1
OK
```

11.2.2 AT+CFGRATPRIO Config dual mode single standby priority

AT+CFGRATPRIO Config dual mode single standby priority	
Test Command **AT+CFGRATPRIO=?**	Response **+CFGRATPRIO: DualModeRatPriority=[2,4](2-2G; 4-NB)** **OK**
Write Command **AT+CFGRATPRIO=[<priority>]**	Response **OK**
Read Command **AT+CFGRATPRIO?**	Response **+CFGRATPRIO: <priority>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<priority>	integer type, value is 2 or 4 2 2G priority 4 NB priority

Example

```
AT+CFGDUALMODE=1,1
OK

AT+CFGDUALMODE=1,0
OK
AT+CFGRATPRIO=4
OK
```

// 1. When Fastswitch is open, the command can execute, but no effect. // System will be always NB first

```
AT+CFGDUALMODE=1,1          // 2. When dual mode and NB priority, Switch from NB to 2G
OK
AT+CFGRATPRIO=2
OK
AT+CFGDUALMODE=1,0          // 3. Dual mode, 2G priority
OK
AT+CFGRATPRIO=2
OK
AT+CFGDUALMODE=0,0          // 4. NB Only (Need to restart after setting)
OK
AT+CFUN=1,1
OK
```

11.2.3 AT+CFGLOSSCOVLEN Config network loss and fastswitch related timer length

AT+CFGLOSSCOVLEN	Config network loss and fastswitch related timer length
Test Command **AT+CFGLOSSCOVLEN=?**	Response **+CFGLOSSCOVLEN: lossCovLen=n(s), LossCovBackoffMaxCnt=[0,12]** **OK**
Write Command **AT+CFGLOSSCOVLEN=[<lossCovLen>,[<lossCovBackoffMaxCnt>]]**	Response **OK**
Read Command **AT+CFGLOSSCOVLEN?**	Response **+CFGLOSSCOVLEN: <lossCovLen>,<lossCovBackoffMaxCnt>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<lossCovLen>	integer type.>0, default 180 seconds
<lossCovBackoffMaxCnt>	integer type. 0 to 12

Example

```
AT+CFGLOSSCOVLEN=5,3
OK
```

11.2.4 AT+CFGFASTSWITCHSNR Config fastswitch threshold value

AT+CFGFASTSWITCHSNR Config fastswitch threshold value	
Test Command **AT+CFGFASTSWITCHSNR=?**	Response **+CFGFASTSWITCHSNR:NbSignal(dbm),GsmSignal=(-dbm)** **OK**
Write Command **AT+CFGFASTSWITCHSNR=[<NbSignal>[,<GsmS+iCgnMalE>]]**	Response **OK**
Read Command **AT+CFGFASTSWITCHSNR?**	Response **+CFGFASTSWITCHSNR: <NbSignal>,<GsmSignal>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<NbSignal>	integer. must >0. unit is dbm
<GsmSignal>	integer. must >0. unit is -dbm

Example

```
AT+CFGFASTSWITCHSNR=10,8
OK
```

11.2.5 AT+CFGFASTSWITCHTIMERLEN Config Fast Switch Timer Length

AT+CFGFASTSWITCHTIMERLEN Config Fast Switch Timer Length	
Test Command **AT+CFGFASTSWITCHTIMERLEN=?**	Response **+CFGFASTSWITCHTIMERLEN: activeProcLen=n(s), prohibitNBrecoverLen=n(s),nasCellSelectLen=n(s),rrcCellSelectLen=n(s), ratChangeLen=n(s), dualLossCovLen=n(s)** **OK**
Write Command **AT+CFGFASTSWITCHTIME**	Response **OK**

RLEN=<activeProcLen>[,<prohibitNBrecoverLen>[,<nasCellSelectLen>[,<rrcCellSelectLen>[,<ratChangeLen>[,<dualLossCovLen>]]]]]	
Read Command **AT+CFGFASTSWITCHTIMERLEN?**	Response **+CFGFASTSWITCHTIMERLEN: <activeProcLen>,<prohibitNBrecoverLen>,<nasCellSelectLen>,<rrcCellSelectLen>,<ratChangeLen>,<dualLossCovLen>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<activeProcLen>	integer . default 180 seconds
<prohibitNBrecoverLen>	integer . default 600 seconds
<nasCellSelectLen>	integer . default 150 seconds
<rrcCellSelectLen>	integer . default 150 seconds
<ratChangeLen>	integer . default 180 seconds
<dualLossCovLen>	integer . default 180 seconds

Example

```
AT+CFGFASTSWITCHTIMERLEN=120
OK
```

12 NB-IoT Commands

12.1 Overview of NB-IoT Commands

Command	Description
AT+CPSMS	PSM settings
AT+CEDRXS	eDRX settings
AT+CEDRXRDP	eDRX dynamic parameter reads
AT+NVSETBAND	Read and set bands
AT+NVSWITCHBS	Scan band
AT+CFGCIOT	CIOT feature configuration
AT+VERCTRL	Set version and attach mode
AT+CSCLK	Set Low Clock Mode
AT+NVSETPM	Set power saving mode
AT+NVCFGARFCN	Set priority search frequency
AT+CFGDFTPDN	Set default PDN
AT+CFGDFTAPNUS	Set default PDN APN configuration
AT+TUESTATS	Query UE status
AT+NVSETLOCKFREQ	Lock frequency
AT+NVSETRRCRLSTIMER10	Set RRC release time
AT+CFGEDRX	Config eDRX features
AT+NVSETRELEASEVERSION	Set 3GPP version
AT+ERASLASTREGFREQ	Erase the last frequency

12.2 Detailed Information of NB-IoT Commands

12.2.1 AT+CPSMS PSM settings

AT+CPSMS PSM settings	
Test Command AT+CPSMS=?	Response **+CPSMS: (0-1),,,(<Units(0-6)><TimerValue(0-31)> in bits),(<Units(0-2)><TimerValue(0-31)> in bits)** **OK**

Write Command **AT+CPSMS=<mode>[,[,[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]**	Response **OK** or **ERROR** or **+CME ERROR: <err>**
Read Command **AT+CPSMS?**	Response **+CPSMS: <mode>,,,[<Requested_Periodic-TAU>],[<Requested_Active-Time>]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0 turns off PSM, 1 turns on PSM
<Requested_Periodic-RAU>	String, requested extended periodic RAU value
<Requested_GPRS-READY-timer>	String, request GPRS READY timer value
<Requested_Periodic-TAU>	sString, request extended periodic TAU value 1 byte 8 bitformat。The exteaned periodic TAU value (T3412) assigned to the UE in the E-UTRAN system. For codingformat and Ranges please refer to 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008 GPRS Timer 3 GPRS Timer 3 value (octet 3) Bits 5 to 1 represent the binary coded timer value. Bits 6 to 8 defines the timer value unit for the GPRS timer as follows: Bits 8 7 6 0 0 0 value is incremented in multiples of 10 minutes 0 0 1 value is incremented in multiples of 1 hour 0 1 0 value is incremented in multiples of 10 hours 0 1 1 value is incremented in multiples of 2 seconds 1 0 0 value is incremented in multiples of 30 seconds 1 0 1 value is incremented in multiples of 1 minute
<Requested_Active-Time>	String, requested activity time value 1 byte 8 bit format。The Active Time value (T3324) assigned to the UE in the E-UTRAN system. For codingformat and Ranges please refer to 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008 GPRS Timer 2

	Timer value (octet 2) Bits 5 to 1 represent the binary coded timer value. Bits 6 to 8 defines the timer value unit for the GPRS timer as follows: Bits 8 7 6 0 0 0 value is incremented in multiples of 2 seconds 0 0 1 value is incremented in multiples of 1 minute 0 1 0 value is incremented in multiples of decihours 1 1 1 value indicates that the timer is deactivated. Other values shall be interpreted as multiples of 1 minute in this version of the protocol.

Example

```
AT+CSCLK=2                                  // Turn on the power saving mode
OK
AT+NVSETPM=2
OK
AT+CPSMS=1
OK
AT&W
OK
AT+CSCLK=0                                  // Turn off the power saving mode
OK
AT+NVSETPM=0
OK
AT+CPSMS=0
OK
AT&W
OK
AT+CPSMS?
+CPSMS:1,,,"10000101","00000011"            // Read Command
OK
```

12.2.2 AT+CEDRXS eDRX settings

This command is used to set the eDRXparameter. You can use this command to enable or shut down the eDRX function, and set or read the eDRXparameter value by using this command.

AT+eDRX eDRX settings	
Test Command **AT+CEDRXS=?**	Response **+CEDRXS: <mode (0-3)>,<AcT-type(5)>,<Requested_eDRX_value(0-15) in bits>**

	OK
Write Command **AT+CEDRXS=<mode>[,<rat>[,<edrx_cycle>]]**	Response **OK** or **ERROR** or **+CME ERROR: <err>**
Read Command **AT+CEDRXS?**	Response **+CEDRXS: <mode>,<AcT-type>,<Requested_eDRX_value>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<mode>	0 shut downeDRX Features 1 OpeneDRX Features 2 Reserve 3 Reserve
<rat>	1 LTE M1 2 GSM 3 UMTS 4 LTE 5 LTE NB
<edrx_cycle>	Character type；4 bitformat. Used to represent E-UTRAN systems eDRX cycle length duration value. Value definition is shown in the table below The field contains the eDRX value for S1 mode. The E-UTRAN eDRX cycle length duration value and the eDRX cycle parameter 'TeDRX' as defined in 3GPP TS 36.304 [121] are derived from the eDRX value as follows: bit E-UTRAN eDRX cycle length eDRX cycle parameter 'TeDRX' Duration 4 3 2 1 0 0 0 0 5,12 seconds (NOTE 4) NOTE 3 0 0 0 1 10,24 seconds (NOTE 4) 20 0 0 1 0 20,48 seconds 21 0 0 1 1 40,96 seconds 22 0 1 0 0 61,44 seconds (NOTE 5) 6

	0 1 0 1 81,92 seconds 23 0 1 1 0 102,4 seconds (NOTE 5) 10 0 1 1 1 122,88 seconds (NOTE 5) 12 1 0 0 0 143,36 seconds (NOTE 5) 14 1 0 0 1 163,84 seconds 24 1 0 1 0 327,68 seconds 25 1 0 1 1 655,36 seconds 26 1 1 0 0 1310,72 seconds 27 1 1 0 1 2621,44 seconds 28 1 1 1 0 5242,88 seconds (NOTE 6) 29 1 1 1 1 10485,76 seconds (NOTE 6) 210 All other values shall be interpreted as 0000 by this version of the protocol. NOTE 3: For E-UTRAN eDRX cycle length duration of 5,12 seconds the eDRX cycle parameter 'TeDRX' is not used as a different algorithm compared to the other values is applied. See 3GPP TS 36.304 [121] for details. NOTE 4: The value is applicable only in WB-S1 mode. If received in NB-S1 mode it is interpreted as if the Extended DRX parameters IE were not included in the message by this version of the protocol. NOTE 5: The value is applicable only in WB-S1 mode. If received in NB-S1 mode it is interpreted as 0010 by this version of the protocol. NOTE 6: The value is applicable only in NB-S1 mode. If received in WB-S1 mode it is interpreted as 1101 by this version of the protocol.

Example

```
AT+CEDRXS=1,5,"0010"
OK
AT+CEDRXS?
+CEDRXS: 1,5,"0010"

OK
```

12.2.3 AT+CEDRXRDP eDRX dynamic parameter reads

AT+CEDRXRDP eDRX dynamic parameter reads	
Execute Command AT+CEDRXRDP	Response **+CEDRXRDP: 0**

	or **+CEDRXRDP: 5,<required_edrx_cycle>,<edrx_cycle>,<edrx_ptw>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<rat>	<rat> only support 5（LTE NB） 1 LTE M1 2 GSM 3 UMTS 4 LTE 5 LTE NB
<required_edrx_cycle>	eDRX cycle value set by the UE, parameter Ranges reference table AT+CEDRXS parameter detailed description
<edrx_cycle>	eDRX cycle value delivered by the current network, parameter Ranges reference table. The field contains the PTW value in seconds for NB-S1 mode.The PTW value is used as specified in 3GPP TS 23.682 [133a].The PTW value is derived as follows: bit 8 7 6 5 Paging Time Window length 0 0 0 0 2,56 seconds 0 0 0 1 5,12 seconds 0 0 1 0 7,68 seconds 0 0 1 1 10,24 seconds 0 1 0 0 12,8 seconds 0 1 0 1 15,36 seconds 0 1 1 0 17,92 seconds 0 1 1 1 20,48 seconds 1 0 0 0 23,04 seconds 1 0 0 1 25,6 seconds

Example

```
AT+CEDRXRDP
+CEDRXRDP: 0

OK
```

12.2.4 AT+NVSETBAND Read and set bands

AT+NVSETBAND Read and set bands	
Test Command **AT+NVSETBAND=?**	Response **+NVSETBAND: band_num(1-11),band_value(1,2,3,5,8,12,18,19,20,26,28)** **OK**
Write Command **AT+NVSETBAND=[<totalband>,<band1>,<band2>]**	Response **OK** or **ERROR**
Read Command **AT+NVSETBAND?**	Response **+NVSETBAND: band_num(1-8),band_value(1,2,3,5,8,12,18,19,20,26,28)** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<totalband> **<band1>** **<band2>**	3GPP TS 27.007 V3.12.0

Example

```
AT+NVSETBAND=3,8,5,3
OK
AT+NVSETBAND?
3 BAND IN TOTAL:8,5,3

OK
```

12.2.5 AT+NVSWITCHBS Scan band

AT+NVSWITCHBS Scan band	
Test Command **AT+NVSWITCHBS=?**	Response

	+NVSWITCHBS: (0-1)0:close,1:open **OK**
Write Command **AT+NVSWITCHBS=<status>**	Response **+NVSWITCHBS: <status>** **OK**
Read Command **AT+NVSWITCHBS?**	Response **Band search is switch on.** **OK** or **Band search is switch off.** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<status>	0 close 1 open

Example

```
AT+NVSWITCHBS=0
+NVSWITCHBS: 0

OK
```

12.2.6 AT+CFGCIOT CIOT feature configuration

This command is used to inquire and methods for setting EPCO and PCO modes.

AT+NVSWITCHBS CIOT feature configuration	
Test Command **AT+CFGCIOT=?**	Response **+CFGCIOT:nonip=[0-1],cpciot=[0-1](NBIoTIgnore),upciot=[0-3],erwopdn=[0-2],sms_wo_comb_att=[0-1],apn_rate_control=[0-1],epco=[0-1],cpbackoff=[0-1],roam=[0-1],nasRai=[0-1]**

	OK
Write Command **AT+CFGCIOT=<nonip>[,<cpciot>[,<upciot>[,<erwopdn>[,<sms_wocomb_att>[,<apn_rate_control>[,epco>[,<cpbackoff>[,<roam>[,<nasRai>]]]]]]]]]**	Response **OK**
Read Command **AT+CFGCIOT?**	Response **+CFGCIOT: <nonip>[,<cpciot>[,<upciot>[,<erwopdn>[,<sms_wocomb_att>[,<apn_rate_control>[,<epco>[,<cpbackoff>[,<roam>[,<nasRai>]]]]]]]]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<nonip>	0 disable NonIP 1 enable NonIP
<cpciot>	Configure CPCIOT: 0 disable CPCIoT, this value is not configured for NB-IoT 1 enable CPCIoT
<upciot>	Whether the configuration supports UPCIoTFeatures: 0 disable S1uData and UPCIoT 1 enable S1uData, does not support UPCIoT 2 enable but not optimized UPCIoT (CP mode is suitable for PDN service CP and up that can be used) 3 enable and optimize UPCIoT (the preferred method for both PDN services can be used simultaneously))
<erwopdn>	configures whether or not ERwoPDN is preferred: 0 disable ERwoPDN 1 enable but not optimize ERwoPDN (additional process must carry PDN) 2 enable and optimize ERwoPDN (do not carry PDN when the attached process cannot carry PDN)
<sms_wocomb_att>	Configure whether to support SMS messages without a combined attachment. 0 disable SMS without combined attachment

	1 enable SMS without combined attachment
<apn_rate_control>	Configure whether to support Apn rate control. 0 disable Apn rate control 1 enable Apn rate control
<EPCO>	Configure whether to support ePCO: 0 disable ePCO 1 enable ePCO
<cpbackoff>	Configure whether to open Backoff 0 disable CP backoff 1 enable CP backoff
<ROAM>	Configure whether to open Roaming business 0 disable Roaming business 1 enable Roaming business
<nasRai>	Configure whether to open NAS RAI 0 disable NAS RAI 1 enable NAS RAI

Example

```
AT+CFGCIOT=0
OK
```

12.2.7 AT+VERCTRL Set version and attach mode

AT+VERCTRL Set version and attach mode	
Test Command **AT+VERCTRL=?**	Response **+VERCTRL:enable=[0-3](0-storeroom;1-gcf;2-product;3-SimConformance),pdn_auto_attach=[0-1](0-disable;1-enable)** **OK**
Write Command **AT+VERCTRL=<enable>,<pdn_auto_attach>**	Response **OK** or **ERROR**
Read Command **AT+VERCTRL?**	Response **+VERCTRL: <enable>,<pdn_auto_attach>**
Parameter Saving Mode	-
Max Response Time	-

Reference	

Defined Values

<enable>	0 toreroom 1 gcf 2 roduct 3 mConformance Note: If you want to make PPP dialing, <pdn_auto_attach> must be set to disable
<pdn_auto_attach>	0:disable pdn auto attach, 1: enable pdn auto attach

Example

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

12.2.8 AT+CSCLK Set Low Clock Mode

AT+CSCLK Set Low Clock Mode	
Test Command **AT+CSCLK=?**	Response **+CSCLK: (list of supported <pas>s)** **OK**
Write Command **AT+CSCLK=<n>**	Response **OK** or **ERROR**
Read Command **AT+CSCLK?**	Response **+CSCLK: <n>** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<n>	0 Disable slow clock 1 Enable slow clock mode,use DTR to control slow clock , when DTR

	is set high, enable slow clock, otherwise disable slow clock 2 Set slow clock mode automaticlly , disable slow clock when uart recieve or send data,otherwise enable slow clock

Example

```
AT+CSCLK=0
OK
```

12.2.9 AT+NVSETPM Set power saving mode

AT+NVSETPM Set power saving mode	
Test Command **AT+NVSETPM=?**	Response **+NVSETPM:(0-2,9,10)0:close,1:pm1,2:pm1+pm3,9:dynamic,10:pm1+pm2** **OK**
Write Command **AT+NVSETPM=<value>**	Response **OK** or **ERROR**
Read Command **AT+NVSETPM?**	Response **pm is <value>**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value>	0: disable PM1/PM2/PM3 1: enable PM1 2: enable PM1/PM3 9: enable PM1/PM2/PM3 10: enable PM1/PM2 If CSCLK is not set to 2, the UE cannot enter PM1/PM2/PM3

Example

```
AT+CSCLK=2
```

```
OK
AT+NVSETPM=2
OK
```

12.2.10 AT+NVCFGARFCN Set priority search frequency

AT+NVSETPM Set priority search frequency	
Test Command **AT+NVCFGARFCN=?**	Response **+NVCFGARFCN: ARFCN_Num=[0-6], ARFCN=(fcn,offset)** **OK**
Write Command **AT+NVCFGARFCN=<ARFCN_Num>[<fcn>,<offset>]**	Response **OK** or **ERROR**
Read Command **AT+NVCFGARFCN?**	Response **ARFCN_Num in total:(fcn-offset)** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<ARFCN_Num>	Set the number of frequency, range: 0-6
<fcn>	frequency
<offset>	offset, range: 0-38

Example

```
AT+NVCFGARFCN=0                    // No a prior frequency
OK
AT+NVCFGARFCN=1,3625,19            // Set one prior frequency
OK
AT+NVCFGARFCN=3,3701,19,37         // Set three priors frequency
```

```
02,20,3703,21
OK
```

12.2.11 AT+CFGDFTPDN Set default PDN

AT+CFGDFTPDN Set default PDN	
Test Command **AT+CFGDFTPDN=?**	Response **+CFGDFTPDN: pdnType=[1,2,3,5], apn="string"** **OK**
Write Command **AT+CFGDFTPDN=<mode>[,<apn>]**	Response **OK** or **ERROR**
Read Command **AT+CFGDFTPDN?**	Response **+CFGDFTPDN: <defaultPdnType>;[0]<pdnType><apn>;[1]<pdnType><apn>;[2]<pdnType><apn>;[3]<pdnType><apn>;** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<defaultPdnType>	1 pdn type is IPv4 2 pdn type is IPv6 3 pdn type is IPv4v6 5 pdn type is NonIP

Example

```
AT+CFGDFTPDN=1,"3GNET"
OK
```

12.2.12 AT+CFGDFTAPNUS Set Default PDN APN Configuration

AT+CFGDFTAPNUS Set default PDN APN configuration	
Test Command **AT+CFGDFTAPNUS=?**	Response **+CFGDFTAPNUS: APN** **OK**
Write Command **AT+CFGDFTAPNUS=<auth_type>,<usrname>,<password>**	Response **OK** or **ERROR**
Read Command **AT+CFGDFTAPNUS?**	Response **+CFGDFTAPNUS: defaultAuth=<auth_type> defaultPdnType=<pdnType>; [0]pdnType=1,apn=<apn>; [1]pdnType=2,apn=<apn>; [2]pdnType=3,apn=<apn>; [3]pdnType=5,apn=<apn>;** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<auth_type>	Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters <passwd> and <user> need to specified. 0 – none 1 – PAP 2 – CHAP
<usrname>	Parameter specifies the user name used for authentication.
<password>	Parameter specifies the password used for authentication.

Example

```
AT+CFGDFTAPNUS=2,"test","test1234"
OK
```

12.2.13 AT+TUESTATS Query UE status

AT+TUESTATS Query UE status	
Write Command AT+TUESTATS=<type>	Response "UE status"
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<UE status>	•RADIO radio specific information •CELL per-cell information for the top 8 cells •BLER block error rate information •THP throughput •ALL all information. The value of <type> output is the correct one for each data type. RADIO: 1. <signal power in centibels> 2. <total power in centibels> 3. <current TX power level in centibels> 4. <total TX time since last reboot in millisecond> 5. <total RX time since last reboot in millisecond> 6. <last SIB1 cell ID> 7. <last ECL value> 8. <last snr value> 9. <last earfcn value> 10. <last pci value> 11. <rsrq in centibels> CELL: 1. <earfcn> absolute radio-frequency channel number 2. <physical cell id> physical id of the cell 3. <primary cell>> 1 indicates the current serving cell 4. <rsrp> reference signal received power 5. <rsrq> reference signal received quality 6. <rssi> received signal strength indicator

	7. <snr> signal to noise ratio BLER:block error rate 1. <rlc_ul_bler> RLC layer block error rate (uplink). Integer % 2. <rlc_dl_bler> RLC layer block error rate (downlink). Integer % 3. <mac_ul_bler> physical layer block error rate (uplink). Integer % 4. <mac_dl_bler> physical layer block error rate (downlink). Integer % 5. <total bytes transmitted> 6. <total bytes received> 7. <transport blocks sent> 8. <transport blocks received> 9. <transport blocks retransmitted> 10. <total ack/nack messages received> THP: throughput 1. <rlc_ul> RLC layer throughput (uplink). Integer bps 2. <rlc_dl> RLC layer throughput (downlink). Integer bps 3. <mac_ul> Physical layer throughput (uplink). Integer bps 4. <mac_dl> Physical layer throughput (downlink). Integer bps

12.2.14 AT+NVSETLOCKFREQ Lock frequency

AT+NVSETLOCKFREQ Lock frequency	
Write Command **AT+NVSETLOCKFREQ=0**	Close the lock freq, Response **OK** or **ERROR**
Write Command **AT+NVSETLOCKFREQ=1,<cell_fcn>,<offset>,<cell_pci>**	Open the lock cell, Response **OK** or **ERROR**
Write Command **AT+NVSETLOCKFREQ=2,<fcn_Num(1-9)>,<fcn>,<offset>**	Open the lock freq, Response **OK** or **ERROR**

Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<cell_fcn>	cell earfcn
<cell_pci>	physical cell id id, range: 0-503
<fcn_Num>	earfcn num, range: 1-9
<fcn>	earfcn
<offset>	offset, range: 0-38

Example

```
AT+NVSETLOCKFREQ=0
OK
```

12.2.15 AT+NVSETRRCRLSTIMER10 Set RRC release time

AT+NVSETRRCRLSTIMER10 Set RRC release time	
Write Command **AT+NVSETRRCRLSTIMER10=<value>**	Response **OK**
Test Command **AT+NVSETRRCRLSTIMER10=?**	Response **+NVSETRRCRLSTIMER10: (0,1)** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<value>	0: After receiving the RRC release message sent by the network, wait for 1s to release the RRC. 1: After receiving the RRC release message sent by the network, wait for 10s to release the RRC.

Example

```
AT+NVSETRRCRLSTIMER10=0
OK
```

12.2.16 AT+CFGEDRX Config eDRX features

AT+CFGEDRX Config eDRX features	
Test Command **AT+CFGEDRX=?**	Response **+CFGEDRX: enable=[0-1], edrxPtw=[0-15], edrxValue=[0-15]** **OK**
Write Command **AT+CFGEDRX=[<enable>[,<ptw>[,<edrx_val>]]]**	Response **OK**
Read Command **AT+CFGEDRX?**	Response **+CFGEDRX: <enable>[,<ptw>[,<edrx_val>]]** **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<enable>	Integer, range [0-1], configured to support eDRX functionality. 0 disable，and <ptw> and <edrx_val> are invalid when the value is taken; 1 enable
<ptw>	Integer, range 0-15], configured to support index of page time window. Please refer to 24.008

Example

```
AT+CFGEDRX=0
OK
```

12.2.17 AT+NVSETRELEASEVERSION Set 3GPP version

AT+NVSETRELEASEVERSION Set 3GPP version	
Write Command **AT+NVSETRELEASEVERSION=**	Response

<value>	**OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<Value>	0: 3GPP R13 1: 3GPP R14

Example

```
AT+NVSETRELEASEVERSION=0
OK
```

12.2.18 AT+ERASLASTREGFREQ Erase the last frequency

This command is used to clear the frequency of the last successful net injection. If it is cleared, it will be re-searched when the module is restarted.

AT+ERASLASTREGFREQ Erase the last frequency	
Write Command **AT+ERASLASTREGFREQ=<value>**	Response **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<Value>	0: Do not erase 1: erase

Example

```
AT+ERASLASTREGFREQ=0
OK
```

13 MQTT Commands

13.1 Overview of MQTT Commands

Command	Description
AT+MQTTCONN	Create MQTT connection
AT+MQTTSUBUNSUB	Subscribe or Unsubscribe topic
AT+MQTTPUB	Publish a MQTT message on topic
AT+MQTTDISCONN	Disconnect the MQTT connection
AT+MQTTMD	Set the mode for transferring data

13.2 Detailed Information of MQTT Commands

13.2.1 AT+MQTTCONN Create MQTT connection

Note:
Manually activate a PDP before using the MQTT command

AT+MQTTCONN Create MQTT connection	
Write Command **AT+MQTTCONN=<host>,<port>,<clientid>,<keepalive>,<cleansession>,[username],[password]**	Response **OK** or **ERROR**

Defined Values

<host>	IP address or URL of the remote MQTT server, up to 255 bytes
<port>	Port of the remote MQTT server, range 1-65535
<clientid>	Client identification number, up to 255 bytes
<keepalive>	Keepalive seconds, range 0-65535, in seconds, 0 for long connection
<cleansession>	Whether to clear the cache, 0 does not clear, 1 clear
username	Username, up to 255 bytes
password	Password, up to 255 bytes

Example

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","1
23456789"
OK
```

13.2.2 AT+MQTTSUBUNSUB Subscribe or Unsubscribe topic

AT+MQTTSUBUNSUB Subscribe or Unsubscribe topic	
Write Command **AT+MQTTSUBUNSUB=<topic>,<sub flag>,<qos>**	Response **OK** or **ERROR**

Defined Values

<topic>	Topic of MQTT, max length: 255 bytes
<sub flag>	0 Unsubscribe 1 Subscribe
<qos>	Quality of service, range: 0,1,2

Example

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","123456789"
OK
AT+MQTTSUBUNSUB="tudou",1,2
OK
AT+MQTTSUBUNSUB="tudou",1,2
OK
```

Note

- Establish MQTT connection before using the MQTT command, see AT+MQTTCONN.

13.2.3 AT+MQTTPUB Publish a MQTT message on topic

AT+MQTTPUB Publish a MQTT message on topic	
Write Command **AT+MQTTPUB=<topic>,<message>,<qos>,<duplicate>,<retain>**	Response **OK** or **ERROR**

Defined Values

<topic>	Publish the subject of MQTT, up to 255 bytes
<message>	Publish the subject message content of MQTT, up to 2048 bytes
<qos>	Quality of service, range 0,1,2
<duplicate>	Resend mark, range 0-1
<retain>	Reserved tag, range 0-1

Example

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","123456789"
OK
AT+MQTTPUB="tudou","tudou-message",2,1,1
OK
+MQTTPUBLISH:1,tudou,13,tudou-message
```

Note

- Establish MQTT connection before using the MQTT command, see AT+MQTTCONN

13.2.4 AT+MQTTDISCONN Disconnect the MQTT connection

AT+MQTTDISCONN Disconnect the MQTT connection	
Execute Command AT+MQTTDISCONN	Response **OK** or **ERROR**

Example

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","123456789"
OK
AT+MQTTDISCONN
OK
```

Note

- Establish MQTTconnection before using the MQTT command, see AT+MQTTCONN. If the server actively disconnects the connection, the module will report it.+MQTTDISCONNECTED

13.2.5 AT+MQTTMD Set the mode for transferring data

AT+MQTTMD Set the mode for transferring data	
Write Command	Response

AT+MQTTMD=<mode>	OK or ERROR

Defined Values

<mode>	range:0,1, default is 0 0 ASCII mode 1 HEX mode

Example

HEX Mode

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","123456789"
OK
AT+MQTTSUBUNSUB="2261626322",1,2
OK
AT+MQTTPUB="2261626322","22414243004422",2,1,1
OK
+MQTTPUBLISH:1,2261626322,14,22414243004422
AT+MQTTDISCONN
OK
```

ASCII Mode

```
AT+MQTTCONN="116.246.23.94",6002,"9589694",0,1,"89099","123456789"
OK
AT+MQTTSUBUNSUB="test",1,2
OK
AT+MQTTPUB="test","simcomtest",2,1,1
OK
+MQTTPUBLISH:1,test,10,simcomtest
AT+MQTTDISCONN
OK
```

14 Alibaba Cloud MQTT Commands

14.1 Overview of Alibaba Cloud MQTT Commands

Command	Description
AT+CLOUDAUTH	Internet of Things Certification
AT+CLOUDCONN	Create an MQTT connection to Ali
AT+CLOUDSUB	Subscribe MQTT topic
AT+CLOUDUNSUB	Unsubscribe MQTT topic
AT+CLOUDPUB	Publish MQTT message on topic
AT+CLOUDDISCONN	Disconnect the MQTT connection

14.2 Detailed Information of Alibaba Cloud MQTT Commands

14.2.1 AT+CLOUDAUTH Internet of Things Certification

AT+CLOUDAUTH Internet of Things Certification	
Test Command AT+CLOUDAUTH=?	Response **+CLOUDAUTH: <Product Key>,<Device Name>,<Device Secret>** **OK**
Write Command AT+CLOUDAUTH=<product key>,<device name>,<device secret>	Response **OK** or **ERROR**

Defined Values

<product key>	Product key, the globally unique identifier issued by the IoT platform for the product you created
<device name>	Device name, unique identifier of the device within the product, used for device authentication and communication
<device secret>	Device key, the device key issued by the device on the IoT platform. It is used for authentication and encryption. It needs to be paired with DeviceName

Example

```
AT+CLOUDAUTH="a1Dy4Y0nVOv","a9800","FOTq22cHfGXEnT
```

```
kCVVtKVUROzvYLfakC"
OK
```

Note

- <product key>,<device name>,<device key>
  Register Alibaba Cloud account and real name on iot.console.aliyun.com, log in to the IoT platform, create products and devices, and query these three parameters in the device information

14.2.2 AT+CLOUDCONN Create an MQTT connection to Ali

AT+MQTTCONN Create an MQTT connection to Ali	
Test Command **AT+CLOUDCONN=?**	Response **+CLOUDCONN: <Keep Alive>,<Clean Session>,<Version>** **OK**
Write Command **AT+CLOUDCONN=<keepAlive>,<cleanSession>,<version>**	Response **OK** or **+CME ERROR: <err>**

Defined Values

<keepAlive>	MQTT connection keep-alive time, in seconds, range: 60-180
<cleanSession>	whether to clear the cache, 0 does not clear, 1 clear
<version>	MQTT version, only supports 4

Example

```
AT+CLOUDCONN=60,0,4
OK
```

Note

- Before using this command, you must perform authentication, see AT+CLOUDAUTH

14.2.3 AT+CLOUDSUB Subscribe MQTT topic

AT+CLOUDSUB Subscribe MQTT topic	
Test Command **AT+CLOUDSUB=?**	Response **+CLOUDSUB: <Topic>,<QoS>(0,1)** **OK**

Write Command	Response
AT+CLOUDSUB=<topic>,<qos>	**OK** or **+CME ERROR: <err>**

Defined Values

<topic>	MQTT topic
<qos>	QoS, range is 0-1

Example

```
AT+CLOUDSUB="/a1Dy4Y0nVOv/a9800/get",0
OK
```

Note

- You must create an MQTT connection before using this command, see AT+CLOUDCONN

14.2.4 AT+CLOUDUNSUB Unsubscribe MQTT topic

AT+CLOUDUNSUB Unsubscribe MQTT topic	
Test Command **AT+CLOUDUNSUB=?**	Response **+CLOUDUNSUB: <Topic>** **OK**
Write Command **AT+CLOUDUNSUB=<topic>**	Response **OK** or **+CME ERROR: <err>**

Defined Values

<topic>	MQTT topic

Example

```
AT+CLOUDUNSUB="/a1Dy4Y0nVOv/a9800/get"
OK
```

Note

- You must create an MQTT connection before using this command, see AT+CLOUDCONN

14.2.5 AT+CLOUDPUB Publish MQTT message on topic

AT+CLOUDPUB Publish MQTT message on topic	
Test Command **AT+CLOUDPUB=?**	Response **+CLOUDPUB: <Topic>,<QoS>,<Message>,[duplicate],[retain]** **OK**
Write Command **AT+CLOUDPUB=<topic>,<qos>,<message>**	Response **OK** or **+CME ERROR: <err>**

Defined Values

<topic>	topic of MQTT
<qos>	quality of service, range is 0-1
<message>	message to be published

Example

```
AT+CLOUDPUB="/a1Dy4Y0nVOv/a9800/get",0,"3456"
OK
```

Note

You must create an MQTT connection before using this command, see AT+CLOUDCONN

14.2.6 AT+CLOUDDISCONN Disconnect the MQTT connection

AT+CLOUDDISCONN Disconnect the MQTT connection	
Execute Command **AT+CLOUDDISCONN**	Response **OK** or **+CME ERROR: <err>**

Example

```
AT+CLOUDDISCONN
OK
```

15 File System Commands

15.1 Overview of File System Commands

Command	Description
AT+FSDWNFILE	Write File
AT+FSLSTFILE	List Files Information
AT+FSRDFILE	Read File
AT+FSRDBLOCK	Partial Read File
AT+FSDELFILE	Delete File

15.2 Detailed Information of File System Commands

15.2.1 AT+FSDWNFILE Write File

AT+FSDWNFILE Write File	
Test Command AT+FSDWNFILE=?	Response +FSDWNFILE: file_name,size OK
Write Command AT+FSDWNFILE=<filename>,<size>	Response > <text> OK

Defined Values

<filename>	File name, maximum of 47 characters
<size>	File size expressed in bytes,with a value range of 0-5120.
<text>	Byte stream

Example

```
AT+FSDWNFILE=”test”,10
> 1234567890

OK
```

15.2.2 AT+FSLSTFILE List Files Information

AT+FSLSTFILE List Files Information	
Write Command **AT+FSLSTFILE=<op_code>[,<filename>]**	Response <op_code> is 0, **+FSLSTFILE:[<filename1>[,<filename2>[...[,<filenameN>]]]]** **OK** <op_code> is 1, **+FSLSTFILE: <free_fs_space>** **OK** <op_code> is 2, **+FSLSTFILE: <file_size>** **OK**

Defined Values

<op_code>	Option code 0 List all files 1 Get free space 2 Get the file size in bytes
<filename1~N>	File name
<free_fs_space>	Free space on FS (in bytes)
<file_size>	Size of the file specified by <filename>parameter

Example

```
AT+FSLSTFILE=0
+FSLSTFILE:
AT_CFG_TCPIP.BIN,AT_CFG_0.BIN,AT_CFG_AUTOSAVE.BIN,s
ms_dm_nv.bin,cfw_nv.bin

OK
AT+FSLSTFILE=1
+FSLSTFILE:353408

OK
AT+FSLSTFILE=2,"cfw_nv.bin"
+FSLSTFILE: 2468

OK
```

15.2.3 AT+FSRDFILE Read File

AT+FSRDFILE Read File	
Write Command AT+FSRDFILE=<filename>	Response +FSRDFILE: <filename>,<size>,<data> OK

Defined Values

<filename>	File name
<size>	File content
<data>	File size in bytes

Example

```
AT+FSRDFILE="test"
+FSRDFILE: test,10,
1234567890

OK
```

15.2.4 AT+FSRDBLOCK Partial Read File

AT+FSRDBLOCK Partial Read File	
Write Command AT+FSRDBLOCK=<filename>,<offset>,<size>	Response +FSRDBLOCK: <filename>,<size>,<data> OK

Defined Values

<filename>	File name
<offset>	Offset from the beginning of the file (in bytes)
<size>	Number of bytes read from <offset>
<data>	Read file contents

Example

```
AT+FSRDBLOCK="test",5,5
```

```
+FSRDBLOCK: test,5,

67890
OK
```

15.2.5 AT+FSDELFILE Delete File

AT+FSDELFILE Delete File	
Write Command **AT+FSRDELFILE=<filename>**	Response **OK**

Defined Values

<filename>	File name

Example

```
AT+FSDELFILE=”test”
OK
```

16 AYLA Commands

16.1 Overview of AYLA Commands

Command	Description
AT+LSAYLACFG	Config Ayla Parameters
AT+LSAYLACFGCHECK	Check the set parameters
AT+LSAYLASET	Synchronize data with properties in the cloud template
AT+LSAYLASTATUS	the status of the connection
AT+LSAYLASERVICE	Set the open mode of Ayla
AT+LSAYLATEMPLATE	Set properties in template

16.2 Detailed Information of AYLA Commands

16.2.1 AT+LSAYLACFG Config Ayla Parameters

AT+LSAYLACFG Config Ayla Parameters	
Read Command **AT+LSAYLACFG=conf,show,all** **AT+LSAYLACFG=<feature>** **AT+LSAYLACFG=show,version**	Response **<data> (**Feature should be" factory_dsn"and" factory_rsa_pub_key"**)**
Write Command **At+LSAYLACFG=<feature>[[,<id/mod>],<data/level>]**	Response **OK** or **ERROR**

Defined Values

<feature>	"factory_dsn" : Set DSN for factory production "factory_rsa_pub_key" : The factory_rsa_pub_key is set at the time of factory production. Note: factory_dsn and factory_rsa_pub_key are one-to-one corresponding. Data can be entered at once, and can also be entered in batches .Data input up to 76 characters ata time, and input in five. The second parameter is the serial number, and the third parameter is pubkey "oem" : Set up oem id， oem id Need to be behind "model" : Set up oem model, oem model Need to be behind

	"key" : Set up oem key， oem key Need to be behind region : Used for input areas, "cn" for China and "us" for the United States. log : Set the rank of log,mod,level effective, for example: at+lsaylacfg=log,all,debug2 keepalive_min : Set the minimum value for notify keepalive
<mod>	all,mod,client,ssl,notify,sched,test Indicates modules printed by log, and all represents all modules
<level>	fail,pass,warn,error,debug,debug2 Indicates the level of log printing. No symbol indicates the level of log printing.
<id>	1~5 An id is required only when " factory_rsa_pub_key" is entered in batches, representing the factory_rsa_pub_key's serial number.Because each factory_rsa_pub_key has 360 bytes, the original files are entered five times.
<data>	Value should be determined according to the needs of different features

Example

```
AT+LSAYLACFG="factory_dsn","SC000W000019255"
OK
AT+LSAYLACFG="factory_rsa_pub_key",1,MIIBCgKCAQEAhLT
NvoUy2nXLeW+LVNxxvdol011iDnptLsqDenODoeYtb1tMv8e3Ra
07vS7r+4JJ
OK
AT+LSAYLACFG="factory_rsa_pub_key",2,SYdmEss1AfJlRxaQ
gDVAZUxAPVTrqRFkfPIQiV9IbkgIUciXl+9hzihGsibLDD54lwN79
kkhS+En
OK
AT+LSAYLACFG="factory_rsa_pub_key",3,4vxqyEbp1NKOMaO
N+Q7HszA5fF1oFPQ++jlx/xZyoWOf2Uwv0Dz8jpjJD+MGTcN/gO
eSKhEheB5g
OK
AT+LSAYLACFG="factory_rsa_pub_key",4,bJl8ClUJcSDsHkOx
Oimb/abntL2CRJPV4cwk85swl0uMwVQzTqIvvrus95lYEcmRhq1
HpUhyNzCA
OK
AT+LSAYLACFG="factory_rsa_pub_key",5,8U1yL7g//L+V60F60
CZZq9VNcyeyDTnLbYdcFjzS+ggmvaXVowIDAQAB
OK
AT+LSAYLACFG="factory_rsa_pub_key","MIIBCgKCAQEAhLT
NvoUy2nXLeW+LVNxxvdol011iDnptLsqDenODoeYtb1tMv8e3Ra
07vS7r+4JJSYdmEss1AfJlRxaQgDVAZUxAPVTrqRFkfPIQiV9Ib
```

kglUciXl+9hzihGsibLDD54lwN79kkhS+En4vxqyEbp1NKOMaON
+Q7HszA5fF1oFPQ++jlx/xZyoWOf2Uwv0Dz8jpjJD+MGTcN/gOe
SKhEheB5gbJl8ClUJcSDsHkOxOimb/abntL2CRJPV4cwk85swl
0uMwVQzTqlvvrus95lYEcmRhq1HpUhyNzCA8U1yL7g//L+V60F
60CZZq9VNcyeyDTnLbYdcFjzS+ggmvaXVowlDAQAB"
OK
AT+LSAYLACFG="model","a9800"
OK
AT+LSAYLACFG="oem","4333ad18"
OK
AT+LSAYLACFG="oem","model"," a9800"
OK
AT+LSAYLACFG="key","2227647138d5aa41d775c5352641cf44"
OK

16.2.2 AT+LSAYLACFGCHECK Check the set parameters

AT+LSAYLACFGCHECK	Check the set parameters
Write Command AT+LSAYLACFGCHECK=<command> [,<id>],<data>	Response **1 or 0** **OK** or **ERROR**

Defined Values

<command>	"factory_dsn" : Set DSN to check factory production "factory_rsa_pub_key" : A factory_rsa_pub_key for checking Settings. Data can be entered at once, and can also be entered in batches .Data input up to 76 characters ata time, and input in five. The second parameter is the serial number, and the third parameter is pubkey. "oem" : Check the OEM id for Settings "model" : Check the OEM model for Settings "key" : The OEM key used to check the Settings region : The area used to check the input.
<id>	1~5 You need to enter an id when you enter " factory_rsa_pub_key " to indicate the factory_rsa_pub_key 's serial number.Because each pubkey has 360 bytes, the input is divided into five, with 76,76,76,76,56-bytes, respectively

Example

```
AT+LSAYLACFGCHECK="factory_rsa_pub_key","MIIBCgKCAQ
EAhLTNvoUy2nXLeW+LVNxxvdol011iDnptLsqDenODoeYtb1tM
v8e3Ra07vS7r+4JJSYdmEss1AfJlRxaQgDVAZUxAPVTrqRFkfPI
QiV9lbkgIUciXl+9hzihGsibLDD54lwN79kkhS+En4vxqyEbp1NK
OMaON+Q7HszA5fF1oFPQ++jlx/xZyoWOf2Uwv0Dz8jpjJD+MGT
cN/gOeSKhEheB5gbJl8ClUJcSDsHkOxOimb/abntL2CRJPV4cw
k85swl0uMwVQzTqlvvrus95lYEcmRhq1HpUhyNzCA8U1yL7g//L
+V60F60CZZq9VNcyeyDTnLbYdcFjzS+ggmvaXVowIDAQAB"
OK
```

16.2.3 AT+LSAYLASET Synchronize data with properties in the cloud template

Synchronize data with properties in the cloud template. The data can be sent to the cloud via command, and the updated data can be seen in the template of the cloud after successful sending.When the attribute value in the cloud changes, the AP side data change is notified by URC.After the custom template is defined, the name item is a custom name.

AT+LSAYLASET Synchronize data with properties in the cloud template	
Write Command **AT+LSAYLASET=<name>,[<totalcount>,<index>,]<data>**	Response **OK** Active report, **+LSAYLASET: <name>,<data>**

Defined Values

<name>	The name of the property in the custom template.
<data>	The send type follows the type of the defined property.The maximum value of an Int is 99999999.Note: when sending string types of more than 60 characters, more than one string can be sent. <total count> and <index> are valid.Other than the last one, the data needs to be 60 characters
<total count>	Integer type, Represents the total number of items to be sent, with a maximum of 16
<index>	Integer, Represents the current index, starting at 1.

Example

```
AT+LSAYLASET="output",999900
OK
```

16.2.4 AT+LSAYLASTATUS Query the status of the connection

AT+LSAYLASTATUS Query the status of the connection	
Read Command AT+LSAYLASTATUS?	Response **+LSAYLASTATUS: <status>[,<reason>]** **OK** Active report, **+LSAYLASTATUS: <status>**

Defined Values

<status>	0 disconnected 1 connecting 2 connected
<reason>	0 No reason 1 Dns parse failure 2 Ssl connection failed 3 Manual disconnection 4 Cause of internet

16.2.5 AT+LSAYLASERVICE Set the open mode of Ayla

Set the open mode of the ayla system.The set value can be stored in flash, and the driver then decides whether to automatically connect to the ayla server based on this value.

AT+LSAYLASERVICE Set the open mode of Ayla	
Write Command AT+LSAYLASERVICE=<data>	Response **OK**

Defined Values

<data>	0 The ayla system is not started at boot time, and this value will be stored in flash 1 Start the ayla system at boot time. This value will be stored in flash and will be valid when boot. 2 Turn on the ayla system. This command returns a failure if the system is already on 3 Shut down the ayla system

Example

```
AT+LSAYLASERVICE=1
OK
```

16.2.6 AT+LSAYLATEMPLATE Set properties in template

AT+LSAYLATEMPLATE	Set properties in template
Write Command **AT+LSAYLATEMPLATE=<oper>[,<name>[,type,direct]]**	Response **OK**

Defined Values

<oper>	"Oem_host_version" : Sets the version of the template.Note: "1.0" has been occupied "add" : Add a property, name,type,direct as required "del" : Delete the template's properties.When deleting a property, the name item is mandatory.Delete the entire template when no arguments follow
<name>	String type, ASCII characters, the first character needs to be a letter.The maximum character length is 27
<type>	0 Integer 1 Char 2 Bool
<direction>	0 The uplink data is sent from the device to the cloud 1 Two-way data can be sent from the cloud to the device or from the device to the cloud.

Example

```
AT+LSAYLATEMPLATE="oem_host_version","2.4"
OK
AT+LSAYLATEMPLATE="add","name1",0,1
OK
```

17 FOTA Commands

17.1 Overview of FOTA Commands

Command	Description
AT+UPDATE	Fota upgrade by UART
AT+UPGRADE	Fota upgrage by HTTP

17.2 Detailed Information of FOTA Commands

17.2.1 AT+UPDATE Fota upgrade by UART

AT+UPDATE Fota upgrade by UART	
Test Command AT+UPDATE=?	Response +CME ERROR: 3
Read Command AT+UPDATE?	Response +CME ERROR: 3
Write Command AT+UPDATE=<size>	Response OK or ERROR

Defined Values

<size>	Fota file size, unit is byte. Value range is 1~327680。

Example

```
AT+UPDATE=43722
<text>
OK
```

17.2.2 AT+UPGRADE Fota Upgrade by HTTP

AT+UPGRADE Fota upgrage by HTTP	
Test Command AT+UPGRADE=?	Response +UPGRADE: <url>,<size of fota.pack>

	OK
Read Command **AT+UPGRADE?**	Response **+CME ERROR: 58**
Write Command **At+UPGRADE=<url>,<size>**	Response **will restart** **OK** or **upgrade failure,fota.pack error** **OK**

Defined Values

<url>	Fota file network addres, type is string and max length is 255。
<size>	Fota file size, unit is byte and range is 1~327680。

Example

```
AT+UPGRADE=”http://183.230.174.137:6004/fota.pack”,43722
will restart

OK
```

18 AT Commands for TCPIP

18.1 Overview of AT Commands for TCPIP

Command	Description
AT+NETOPEN	Start TCPIP service
AT+NETCLOSE	Stop TCPIP service
AT+CIPOPEN	Setup TCP/UDP client socket connection
AT+CIPCLOSE	Destroy TCP/UDP client socket connection
AT+CIPSEND	Send TCP/UDP data
AT+CIPRXGET	Retrieve TCP/UDP buffered data
AT+CIPMODE	Select TCP/IP application mode
AT+SERVERSTART	Startup TCP server
AT+SERVERSTOP	Stop TCP server
AT+CDNSGIP	Query the IP address of given domain name
AT+CPINGSTOP	Stop an ongoing ping session
AT+CSOCKSETPN	Set PDP Context Information

18.2 Detailed Description of AT Commands for TCPIP

18.2.1 AT+NETOPEN Start TCPIP service

AT+NETOPEN Start TCPIP service	
Read Command AT+NETOPEN?	Response **+NETOPEN: <net_state>** **OK**
Execution Command AT+NETOPEN	Response If the PDP context has not been activated or the network closed abnormally, response: **OK**

	+NETOPEN: <err> when the PDP context has been activated successfully, if you execute AT+NETOPEN again, response: **+IP ERROR: Network is already opened** **ERROR** other: **ERROR**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<net_state>	Integer type, which indicates the state of PDP context activation. 0 network close (deactivated) 1 network open(activated)
<err>	Integer type, the result of operation. 0 is success, other value is failure.

Example

```
AT+NETOPEN
OK

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

OK
```

NOTE

You must execute AT+NETOPEN before any other TCP/UDP related operations

18.2.2 AT+NETCLOSE Stop TCPIP service

AT+NETCLOSE Stop TCPIP service	
Execution Command **AT+NETCLOSE**	Response If the PDP context has been activated, response: **OK**

	+NETCLOSE: <err> If the PDP context has not been activated, response: **+NETCLOSE: <err>** **ERROR** other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+NETCLOSE
OK

+NETCLOSE: 0
```

NOTE

"AT+NETCLOSE" can close all the opened socket connections when you didn't close these connections by "AT+CIPCLOSE".

18.2.3 AT+CIPOPEN Setup TCP/UDP client socket connection

AT+CIPOPEN Setup TCP/UDP client socket connection	
Test Command **AT+CIPOPEN=?**	Response **+CIPOPEN: (0-6),("TCP","UDP")** **OK**
Read Command **AT+CIPOPEN?**	Response **+CIPOPEN: <link_num> [,<type>,<serverIP>,<serverPort>,<index>]** **+CIPOPEN: <link_num> [,<type>,<serverIP>,<serverPort>,<index>]** **[…]**

	OK If a connection identified by <link_num>has not been established successfully, +CIPOPEN: <link_num> will be returned.
Write Command TCP connection **AT+CIPOPEN=<link_num>,"TCP",<serverIP>,<serverPort>,[,<localPort>]**	Response if PDP context has been activated successfully, response: **OK** **+CIPOPEN: <link_num>,<err>** when the <link_num> is greater than 6, response: **+IP ERROR: Invalid parameter** **ERROR** If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: **+CIPOPEN: <link_num>,<err>** **ERROR** Transparent mode for TCP connection: When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. if success **CONNECT [<text>]** if failure **CONNECT FAIL** other: **ERROR**
Write Command UDP connection **AT+CIPOPEN=<link_num>,"UDP",,,<localPort>**	if PDP context has been activated successfully, response: **+CIPOPEN: <link_num>,0** **OK** when the <link_num> is greater than 6, response: **+IP ERROR: Invalid parameter** **ERROR** If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: **+CIPOPEN: <link_num>,<err>** **ERROR**

	Transparent mode for UDP connection: When you want to use transparent mode to transmit UDP data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. <serverIP> and <serverPort> should be set if AT+CIPMODE=1. if success **CONNECT [<text>]** if failure **CONNECT FAIL** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	-

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-6. If AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0.
<type>	String type, identifies the type of transmission protocol. TCP Transmission Control Protocol UDP User Datagram Protocol
<serverIP>	String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here. **NOTE:** If the domain name is inputted here, the timeout value for the **AT+CIPOPEN** shall be decided by **AT+CIPDNSSET.**
<serverPort>	Integer type, identifies the port of TCP server, range is 0-65535. **NOTE:** When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port. But, for Qualcomm, connecting the port 0 is regarded as an invalid operation.
<localPort>	Integer type, identifies the port of local socket, range is 0-65535.
<index>	Integer type, which indicates whether the module is used as a client or server. When used as server, the range is 0.<index> is the server index to which the client is linked. (-1) – TCP/UDP client (0) – TCP server index
<text>	String type, which indicates CONNECT result code. Please refer to

	ATX/AT\V/AT&E command for the string formats.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+CIPOPEN=0,"TCP","116.228.221.51",100
OK

+CIPOPEN: 0,0
AT+CIPOPEN=1,"UDP",,,8080
+CIPOPEN: 1,0

OK
AT+CIPOPEN=?
+CIPOPEN: (0-6),("TCP","UDP")

OK
AT+CIPOPEN?
+CIPOPEN: 0,"TCP","116.228.221.51",100,-1
+CIPOPEN: 1
+CIPOPEN: 2
+CIPOPEN: 3
+CIPOPEN: 4
+CIPOPEN: 5
+CIPOPEN: 6

OK
```

18.2.4 AT+CIPCLOSE Destroy TCP/UDP client socket connection

AT+CIPCLOSE Destroy TCP/UDP client socket connection	
Test Command **AT+CIPCLOSE=?**	Response **+CIPCLOSE: (0-6)** **OK**
Read Command **AT+CIPCLOSE?**	Response **+CIPCLOSE:** **<link0_state>,<link1_state>,<link2_state>,<link3_state>,<link4_state>,<link5_state>,<link6_state>**

	OK
Write Command **AT+CIPCLOSE=<link_num>**	Response If service type is TCP and the connection identified by <link_num> has been established, response: **OK** **+CIPCLOSE: <link_num>,<err>** If service type is TCP and the access mode is transparent mode, response: **OK** **CLOSED** **+CIPCLOSE: <link_num>,<err>** If service type is UDP and the connection identified by <link_num> has been established, response: **+CIPCLOSE: <link_num>,0** **OK** If service type is UDP and access mode is transparent mode, response: **CLOSED** **+CIPCLOSE: <link_num>,<err>** **OK** If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPCLOSE: <link_num>,<err>** **ERROR** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<link_num>	Integer type, which identifies a connection. Range is 0-6.
<link_state>	Integer type, which indicates the state ofconnection identified by <link_num>. Range is 0-1. 0 – disconnected 1 – connected

<err>	Integer type,the result of operation.0 is success, other value is failure

Example

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

OK
AT+CIPCLOSE=?
+CIPCLOSE: (0-6)

OK
AT+CIPCLOSE=0
OK

+CIPCLOSE: 0,0
```

18.2.5 AT+CIPSEND Send TCP/UDP data

AT+CIPSEND Send TCP/UDP data	
Test Command **AT+CIPSEND=?**	Response **+CIPSEND: (0-6),(1-1500)** **OK**
Write Command If service type is "TCP", send data with changeable length **AT+CIPSEND=<link_num>,** Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation	Response If the connection identified by <link_num> has been established successfully, response: > <**input data**> **CTRL+Z** **OK** **+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR**

	Other: **ERROR**
Write Command If service type is "TCP", send data with fixed length **AT+CIPSEND=<link_num>,<length>** Response ">", type data until the data length is equal to <length>	Response: If the connection identified by <link_num> has been established successfully, response: > <**input data with specified length**> **OK** **+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** Other: **ERROR**
Write Command If service type is "UDP", send data with changeable length **AT+CIPSEND=<link_num>,,<serverIP>,<serverPort>** Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation	Response: If the connection identified by <link_num> has been established successfully, response: > <**input data**> **CTRL+Z** **OK** **+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** Other: **ERROR**
Write Command If service type is "UDP", send data with fixed length **AT+CIPSEND=<link_num>,<length>,<serverIP>,<server**	Response: If the connection identified by <link_num> has been established successfully, response: > <**input data with specified length**> **OK**

Port> Response ">", type data until the data length is equal to <length>	**+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>** If the connection has not been established, abnormally closed, or parameter is incorrect, response: **+CIPERROR: <err>** **ERROR** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	120000ms
Reference	

Defined Values

<link_num>	Integer type, identifies a connection. Range is 0-6.
<length>	Integer type, indicates the length of sending data, range is 1-1500.
<serverIP>	String type, which identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD".
<serverPort>	Integer type, identifies the port of TCP server, range is 0-65535. **NOTE:** When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port. But, for Qualcomm, connecting the port 0 is regarded as an invalid operation.
<reqSendlength>	Integer type,the length of the data requested to be sent
<cnfSendLength>	Integer type, the length of the data confirmed to have been sent. -1 the connection is disconnected. 0 own send buffer or other side's congestion window are full. Note: If the <cnfSendLength> is not equal to the <reqSendLength>, the socket then cannot be used further.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+CIPSEND=0,1
>S
OK

+CIPSEND: 0,1,1
AT+CIPSEND=1,1,"116.236.221.75",6775
>S
```

```
OK

+CIPSEND: 1,1,1
AT+CIPSEND=2,
>Hello<Ctrl+Z>
OK

+CIPSEND: 2,5,5
AT+CIPSEND=3,,"116.236.221.75",6775
>Hello World<Ctrl+Z>
OK

+CIPSEND: 3,11,11
AT+CIPSEND=2,
>Hello<ESC>
ERROR
AT+CIPSEND=?
+CIPSEND: (0-6),(1-1500)

OK
```

NOTE

Each <Ctrl+Z> character present in the data should be coded as <ETX><Ctrl+Z>. Each <ESC> character present in the data should be coded as <ETX><ESC>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the input data. Single <ESC> is used to cancel the sending.
<ETX> is 0x03, and <Ctrl+Z> is 0x1Aand<ESC> is 0x1B.

18.2.6 AT+CIPRXGET Retrieve TCP/UDP buffered data

AT+CIPRXGET Retrieve TCP/UDP buffered data	
Test Command AT+CIPRXGET=?	Response **+CIPRXGET: (0-4),(0-6),(1-1500)** **OK**
Read Command AT+CIPRXGET?	Response **+CIPRXGET: <mode>** **OK**

Write Command **AT+CIPRXGET=<mode>** In this case, <mode> can only be 0 or 1	Response If the parameter is correct, response: **OK** Else, response: **ERROR**
Write Command **AT+CIPRXGET=2,<link_num>[,<len>]** Retrieve data in ACSII form	Response: If <length> field is empty, the default value to read is 1500. If the buffer is not empty, response: **+CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len>** <**data**>**ACSII form** **OK** If the buffer is empty, response: **+IP ERROR: No data** **ERROR** If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR** Other: **ERROR**
Write Command **AT+CIPRXGET=3,<link_num>[,<len>]** Retrieve data in hex form	Response: If <length> field is empty, the default value to read is 750. If the buffer is not empty, response: **+CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len>** <**data**>**hex form** **OK** If the buffer is empty, response: **+IP ERROR: No data** **ERROR** If the parameter is incorrect or other error, response: **+IP ERROR: <err_info>** **ERROR** Other: **ERROR**
Write Command **AT+CIPRXGET=4,<link_num>**	Response: If the parameter is correct, response: **+CIPRXGET: 4,<link_num>,<rest_len>** **OK** If the parameter is incorrect or other error, response:

	+IP ERROR: <err_info> **ERROR** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<mode>	Integer type, sets the mode to retrieve data. 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
<link_num>	Integer type, identifies a connection. Range is 0-6.
<len>	Integer type, the data length to be read. Not required, the default value is 1500 when <mode>=2, and 750 when <mode>=3.
<read_len>	Integer type, the length of data that has been read.
<rest_len>	Integer type, the length of data which has not been read in the buffer.
<err_info>	String type, displays the cause of occurring error, please refer to Chapter 11.5 for details.

Example

```
AT+CIPRXGET=?
+CIPRXGET: (0-4),(0-6),(1-1500)

OK
AT+CIPRXGET?
+CIPRXGET: 1

OK
AT+CIPRXGET=1
OK
AT+CIPRXGET=2,0,100
+CIPRXGET: 2,0,100,1300
012345678901234567890123456789012345678
901234567890123456789012345678901234567
8901234567890123456789012345678901234567
```

OK

AT+CIPRXGET=3,0,100

+CIPRXGET: 3,0,100,1200

303132333435363738393031323334353637383930313233343536373839303132333435363738393031323334353637383930313233343536373839303132333435363738393031323334353637383930313233343536373839303132333435363738393031323334353637383930313233343536373839303132333435363738393031323334353637383930313233343536373839303132333435363738393031323334353637383930313233343536373839

OK

AT+CIPRXGET=4,0

+CIPRXGET: 4,0,1200

OK

NOTE

If set <mode> to 1, after receiving data, the module will buffer it and report a URC as "+CIPRXGET: 1, <link_num>" to notify the host. Then host can retrieve data by AT+CIPRXGET.
If set <mode> to 0, the received data will be outputted to COM port directly by URC as "RECV FROM: <IP ADDRESS>: <PORT><CR><LF>+IPD(data length)<CR><LF><data>".
If the buffer is not empty, and the module receives data again, then it will not report a new URC until all the received data has been retrieved by AT+CIPRXGET from buffer.
The default value of <mode> is 0.When <mode> is set to 1 and the 2-4 mode will take effect.
If initially set <mode> to 1, after doing some data transmitting , set <mode> to 0, then the buffered data of the previously established connection will be output to the serial port directly, and the maximum length of output data at a time is 1500.

18.2.7 AT+CIPMODE Select TCP/IP application mode

AT+CIPMODE Select TCP/IP application mode	
Test Command **AT+CIPMODE=?**	Response **+CIPMODE: (0-1)** **OK**
Read Command **AT+CIPMODE?**	Response **+CIPMODE: <mode>** **OK**

Write Command **AT+CIPMODE=<mode>**	Response If the parameter is correct, response: **OK** Else, response: **ERROR**
Execution Command **AT+CIPMODE**	Response: Set default value:(<mode>=0) **OK**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<mode>	Integer type, sets TCP/IP application mode. Default value is 0. 0 – Non transparent mode 1 – Transparent mode

Example

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

OK
AT+CIPMODE=1
OK
```

18.2.8 AT+SERVERSTART Startup TCP server

AT+SERVERSTART Startup TCP server	
Test Command **AT+SERVERSTART=?**	Response **+SERVERSTART: (0-65535),(0)** **OK**
Read Command **AT+SERVERSTART?**	Response If the PDP context has not been activated successfully, response: **+CIPERROR: <err>** **ERROR** If there exists opened server, response: [**+SERVERSTART: <server_index>,<port>**

	...] **OK** Other: **ERROR**
Write Command **AT+SERVERSTART=<port>,<server_index>**	Response If there is no error, response: **OK** If the PDP context has not been activated, or the server identified by <server_index> has been opened, or the parameter is not correct, or other errors, response: **+CIPERROR: <err>** **ERROR** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<port>	Integer type, identifies the listening port of module when used as a TCP server. Range is 0-65535.
<server_index>	Integer type, the TCP server index, range is 0.

Example

```
AT+SERVERSTART=?
+SERVERSTART: (0-65535),(0)

OK
AT+SERVERSTART=8080,1
OK
```

NOTE

After the "AT+SERVERSTART" executes successfully, an unsolicited result code is returned when a client tries to connect with module and module accepts request. The unsolicited result code is+CLIENT: <link_num>,<server_index>,<client_IP>:<port>.

18.2.9 AT+SERVERSTOP Stop TCP server

AT+SERVERSTOP Stop TCP server	
Write Command **AT+SERVERSTOP=<server_index>**	Response If there exists open connection with the server identified by <server_index>, or the server identified by <server_index> has not been opened, or the parameter is incorrect, response: **+SERVERSTOP: <server_index>,<err>** **ERROR** If the server socket is closed immediately, response: **+SERVERSTOP: <server_index>,0** **OK** (In general, the result is shown as below.) If the server socket starts to close, response: **OK** **+SERVERSTOP: <server_index>,<err>** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<server_index>	Integer type, the TCP server index, range is 0.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+SERVERSTOP=0
+SERVERSTOP: 0,0

OK
```

NOTE

Before stopping a TCP server, all sockets <server_index> of which equals to the closing TCP server index must be closed first.

18.2.10 AT+CDNSGIP Query the IP address of given domain name

AT+CDNSGIP Query the IP address of given domain name	
Test Command **AT+CDNSGIP=?**	Response **OK**
Write Command **AT+CDNSGIP=<domain name>**	Response If the given domain name has related IP, response: **+CDNSGIP: 1,<domain name>,<IP address>** **OK** If the given name has no related IP, response: **+CDNSGIP: 0,<dns error code>** **ERROR** Other: **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<domain name>	String type (string should be included in quotation marks), indicates the domain name. The maximum length of domain name is 254. Valid characters allowed in the domain name area-z, A-Z, 0-9, "-" (hyphen) and ".". A domain name is made up of onelabel name or more label names separated by "." (e.g. AT+CDNSGIP="aa.bb.cc"). For labelnames separated by ".", length of each label must be no more than 63 characters. The beginning character of the domain name and of labels should be an alphanumeric character.
<IP address>	String type, indicates the IP address corresponding to the domain name.
<dns error code>	Integer type, indicates the error code. 10 DNS GENERAL ERROR

Example

```
AT+CDNSGIP="www.baidu.com"
+CDNSGIP: 1,"www.baidu.com","61.135.169.21"

OK
```

18.2.11 AT+CSOCKSETPN Set PDP Context Information

AT+CSOCKSETPN Set PDP Context Information	
Test Command **AT+CSOCKSETPN=?**	Response **+CSOCKSETPN: (1-7,1-6)** **OK**
Read Command **AT+CSOCKSETPN?**	Response **+CSOCKSETPN: <cid>** **OK**
Write Command **AT+CSOCKSETPN=<cid>[,<pdp_type>]**	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<cid>	Integer type, PDP context id, range is 1-7. Now it only supports value 1.
<pdp_type>	Integer type, support IPV4 and IPV6 6 IPV6 Other IPV4

Example

```
AT+CSOCKSETPN=?
+CSOCKSETPN: (1-7,1-6)

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

NOTE

1. AT+CGDCONT should be called before AT+CSOCKSETPN
2. AT+CSOCKSETPN should be called before AT+NETOPEN

18.3 Information Elements related to TCP/IP

Information	Description
+CIPEVENT: NETWORK CLOSED UNEXPECTEDLY	Network is closed for network error (Out of service, etc). When this event happens, user's application needs to check and close all opened sockets, and then uses AT+NETCLOSE to release the network library if "AT+NETOPEN?" shows the network library is still opened.
+IPCLOSE: <client_index>,<close_reason>	Socket is closed passively. <client_index> is the link number. <close_reason>: 0 - Closed by local, active 1 - Closed by remote, passive 2 - Closed for sending timeout
+CLIENT: <link_num>,<server_index>,<client_IP>:<port>	While TCP server accepted a new socket client, the index is<link_num>. The TCP server index is <server_index>. The peer IP address is <client_IP>. The peer port is <port>.

18.4 Description of <err_info>

The default is displayed with string value.

Numeric Value	String Value
21	Operation failed
0	Connection time out
1	Bind port failed
2	Port overflow
3	Create socket failed
4	Network is already opened
5	Network is already closed
6	No clients connected
7	No active client
8	Network not opened
9	Client index overflow
10	Connection is already created
11	Connection is not created
12	Invalid parameter
13	Operation not supported
14	DNS query failed

15	TCP busy
16	Netclose failed for socket opened
17	Sending time out
18	Sending failure for network error
19	Open failure for network error
20	Server is already listening
22	No data

18.5 Description of <err>

<err>	Description of <err>
0	Operation succeeded
1	Network failure
2	Network not opened
3	Wrong parameter
4	Operation not supported
5	Failed to create socket
6	Failed to bind socket
7	TCP server is already listening
8	Busy
9	Sockets opened
10	Timeout
11	DNS parse failed for AT+CIPOPEN
12	Unknown error

19 AT Commands for COAP

19.1 Overview of AT Commands for COAP

Command	Description
AT^COAPGET	Get the resource from COAP server
AT^COAPPUT	Update the resource from COAP server
AT^COAPPOST	Create the resource on the server
AT^COAPDELETE	Delete the resource on the server
AT^COAPDATA	Input the data from serial port
AT^COAPREG	Configuration data register to the server

19.2 Detailed Description of AT Commands for COAP

19.2.1 AT^COAPGET Get the Resource from COAP Server

AT^COAPGET Get the resource from the COAP server	
Write Command AT^COAPGET=<url>,<cmdline>[,<timer>]	Response **+COAP(<length>):** **"CONTENTS"** **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer>+5 seconds.
Reference	-

Defined Values

<url>	String type, which is the address of the resource. The <url> usually includes uri-host,uri-port,uri-path and uri-path. Uri doesn't need tag but

	must be at the end of cmdline. <url> length range is 2~128 bytes.
<**cmdline**>	String type, which indicates COAP command line. <cmdline> includes many optional parameters, each optional parameter must be followed by an optional flag. <cmdline> length range is 2~128 bytes.
<**timer**>	Integer type, which indicates the execution cycle of the request. And if timeout the request must be terminated and cleared. <timer> value range is 1~120 seconds.
<**length**>	Integer type, which indicates resource length.
<**err**>	Integer type, the result of operation. 0 is success, other value is failure.

Example

```
AT^COAPGET="coap://californium.eclipse.org:5683/","-p 5683",100
+COAP(48):
************************************************************
CoAP RFC 7252 Cf 2.0.0-SNAPSHOT
************************************************************
This server is using the Eclipse Californium (Cf) CoAP framework published
under EPL+EDL: http://www.eclipse.org/californium/(c) 2014, 2015, 2016
Institute for Pervasive Computing, ETH Zurich and others
************************************************************
OK
```

NOTE

GPRS or WIFI must be connected before AT^COAPGET executed.
General tag: -t content-format –p port -k psk –u userId
Content-format supports the following payload type of the coap message.
• 1: plain
• 2: text/plain
• 3: link
• 4: link-format
• 5: application/link-format
• 6: xml
• 7: binary
• 8: octet-stream
• 9: application/octet-stream
• 10: exit
• 11: application/exi
• 12: json
• 13: application/json
psk
Pre-shared key for the specified user. This argument required with PSK to be available
usrid

User identity for pre-shared key mode. This argument requires DTLS with PSK to be available

port

The coap default port is 5683. While coaps default port is 5684 which requires DTLS to be available

url

The address of the resource:

- 1: Uri-Host Option specifies the Internet host of the resource being requested.
- 2: Uri-Port Option specifies the transport-layer port number of the resource.
- 3: Uri-Path Option specifies one segment of the absolute path to the resource.
- 4: Uri-Query Option specifies one argument parameterizing the resource

Server response error

- Client Error 4.xx
- 4.00 Bad Resuest
- 4.01 Unauthorized
- 4.02 Bad Option
- 4.03 Forbidden
- 4.04 Not Found
- 4.05 Method Not Allowed
- 4.06 Not Acceptable
- 4.12 Precondition Failed
- 4.13 Request Entity Too Large
- 4.15 Unsupported Content-Format
- Server Error 5.xx
- 5.00 Internal Server Error
- 5.01 Not Implemented
- 5.02 Bad Gateway
- 5.03 Service Unavailable
- 5.05 Proxying Not Supported

19.2.2 AT^COAPPUT Update the Resource from COAP Server

AT^COAPPUT Update the resource from COAP server	
Write Command **AT^COAPPUT=<url>,<cmdline>[,<timer>[,<data>]]**	Response If the PDP context has been activated, response: **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer>+5 seconds.
Reference	-

Defined Values

<**url**>	String type, which is the address of the resource. The <url> usually includes uri-host,uri-port,uri-path and uri-path. <url> length range is 2~128 bytes.
<**cmdline**>	String type, which indicates COAP command line. <cmdline> includes many optional parameters, each optional parameter must be followed by an optional flag. <cmdline> length range is 2~128 bytes.
<**timer**>	Integer type, which indicates the execution cycle of the request. And if timeout the request must be terminated and cleared. <timer> value range is 1~120 seconds.
<**data**>	Integer type, which indicates whether need data input. 0 – No need data input 1 – Need data input
<**err**>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT^COAPDATA=11
testforpost
OK
AT^COAPPUT="coap://californium.eclipse.org:5683/large-update","-t text/plain –p 5683",20,1
OK
```

NOTE

Before executed AT^COAPPUT needs GPRS or WIFI connects and data input. Customer could use AT^COAPDATA to prepare the input resource data.

19.2.3 AT^COAPPOST Create The Resource on The Server

AT^COAPPOST Create the resource on the server	
Write Command **AT^COAPPOST=<url>,<cmdline>[,<timer>[,<data>]]**	Response **+COAP(<length>):"CONTENTS"** **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer>+5 seconds.

Reference	-

Defined Values

<**url**>	String type, which is the address of the resource. The <url> usually includes uri-host,uri-port,uri-path and uri-path. <url> length range is 2~128 bytes.
<**cmdline**>	String type, which indicates COAP command line. <cmdline> includes many optional parameters, each optional parameter must be followed by an optional flag. <cmdline> length range is 2~128 bytes.
<**timer**>	Integer type, which indicates the execution cycle of the request. And if timeout the request must be terminated and cleared. <timer> value range is 1~120 seconds.
<**data**>	Integer type, which indicates whether need data input. 0 – No need data input 1 – Need data input
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT^COAPPOST="coap://californium.eclipse.
org:5683/large-post","-t text/plain –p
5683",20,1
+COAP(11):TESTFORPOST
OK
```

NOTE

Before executed AT^COAPPOST needs GPRS or WIFI connects and data input. Customer could use AT^COAPDATA to prepare the input resource data.

19.2.4 AT^COAPDELETE Delete The Resource on The Server

AT^COAPDELETE Delete the resource on the server	
Write Command **AT^COAPDELETE=<url>,<cmdline>[,<timer>]**	Response If success, **OK** Other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer>+5 seconds.
Reference	-

Defined Values

<**url**>	String type, which is the address of the resource. The <url> usually includes uri-host,uri-port,uri-path and uri-path. <url> length range is 2~128 bytes.
<**cmdline**>	String type, which indicates COAP command line. <cmdline> includes many optional parameters, each optional parameter must be followed by an optional flag. <cmdline> length range is 2~128 bytes.
<**timer**>	Integer type, which indicates the execution cycle of the request. And if timeout the request must be terminated and cleared. <timer> value range is 1~120 seconds.
<err>	Integer type,the result of operation.0 is success, other value is failure

Example

```
AT^COAPDELETE="coap://californium.eclip
se.org:5683/obs","–p 5683",20,1
OK
```

NOTE

Before executed AT^COAPDELETE needs GPRS or WIFI to be connected.

19.2.5 AT^COAPDATA Input The Data from Serial Port

AT^COAPDATA Input the data from serial port	
Test Command **AT^COAPDATA=?**	Response: **+COAPDATA:[1-32768][,[1-120]]** **OK**
Read Command **AT^COAPDATA?**	Response: **+COAPDATA: <length>** **OK**
Write Command **AT^COAPDATA=<length>[,<timer>]**	Response **DATA** **OK** Other: **+CME ERROR: <err>**

Execution Command **AT^COAPDATA**	Response **DATA** **CTRL+Z** **OK** Other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer> seconds.
Reference	

Defined Values

<length>	Integer type, which indicates length of data input. Value range is 1-65535.
<timer>	Integer type, which indicates the execution cycle of the request. And if timeout the request must be terminated and cleared. <timer> value range is 1~120 seconds.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT^COAPDATA=11
testforpost
OK
```

NOTE

ut end with resource or length or timer, if manual end with CTRL+Z

19.2.6 AT^COAPREG Configuration Data Register to The Server

AT^COAPREG Configuration data register to the server	
Write Command **AT^COAPREG=<reset>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-

Max Response Time	If <timer> is not set, the max response time 90 seconds. If <timer> is set, the max response time <timer> seconds.
Reference	-

Defined Values

<reset>	Integer type, which indicates whether update ICCID. 0 – ICCID saved in NV item without updated 1 – ICCID saved in NV item should be updated
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT^COAPREG=0
OK
```

NOTE

GPRS or WIFI must be connected before AT^COAPREG executed

20 AT Commands for LWM2M

20.1 Overview of AT Commands for LWM2M

Command	Description
AT+LWM2MCREATE	Create basic communication suite instance
AT+LWM2MDELETE	Delete a basic communication suit instance
AT+LWM2MOPEN	Register to the platform
AT+LWM2MCLOSE	Deregister from the platform
AT+LWM2MADDOBJ	Add an object for communication suite instance
AT+LWM2MDELOBJ	Delete an object for communication suite instance
AT+LWM2MNOTIFY	Notify platform one value change
AT+LWM2MREADRSP	Read specific object resource value
AT+LWM2MWRITERSP	Change specific object resource value
AT+LWM2MEXECUTERSP	Perform an individual resources
AT+LWM2MUPDATE	Update register information
AT+LWM2MVER	Get communication suite instance version information

20.2 Detailed Description of AT Commands for LWM2M

20.2.1 AT+LWM2MCREATE Create basic Communication Suite Instance

AT+LWM2MCREATE Create basic communication suite instance	
Test Command AT+LWM2MCREATE=?	Response **OK**
Write Command AT+LWM2MCREATE=<cmdline>	Response **+LWM2MCREATE: 0** **OK** other: **+CME ERROR: <err>**

Execution Command **AT+LWM2MCREATE**	Response **+LWM2MCREATE: 0** **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<**cmdline**>	String type, which is LWM2M config command line. The length range is 1~255 bytes.
<**err**>	Integer type, the result of operation. 0 is success, other value is failure.

Example

```
AT+LWM2MCREATE
+LWM2MCREATE:0
OK
```

20.2.2 AT+LWM2MDELETE Delete a Basic Communication Suite Instance

AT+LWM2MDELETE Delete a basic communication suite instance	
Write Command **AT+LWM2MCREATE=<ref>**	Response If successfully, response: **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<**ref**>	Integer type, which indicates communication suite instance index. Value must be 0.
<**err**>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MDELETE
OK
```

20.2.3 AT+LWM2MOPEN Register to Platform

AT+LWM2MOPEN Register to platform	
Write Command AT+LWM2MCREATE=<ref>	Response **OK** other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	60 seconds
Reference	-

Defined Values

<**ref**>	Integer type, which indicates communication suite instance index. Value must be 0.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MOPEN=0
OK
+LWM2MEVENT: 0, 1
+LWM2MEVENT: 0, 2
+LWM2MEVENT: 0, 4
+LWM2MEVENT: 0, 6
```

NOTE

Register result will be reported with string +LWM2MEVENT: 0,<code>

20.2.4 AT+LWM2MCLOSE Deregister from Platform

AT+LWM2MDELETE Deregister from Platform	
Write Command	Response

AT+LWM2MDELETE=<ref>	If success, **OK** Other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<**ref**>	Integer type, which indicates communication suite instance index. Value must be 0.
<err>	Integer type,the result of operation.0 is success, other value is failure

Example

```
AT+LWM2MCLOSE=0
OK
```

20.2.5 AT+LWM2MADDOBJ Add an Object for Communication Suite Instance

AT+LWM2MADDOBJ Add an object for communication suite instance	
Write Command **AT+LWM2MADDOBJ=<ref>,<objectid>,<instancebitmap>**	Response **OK** Other: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<objectid>	Integer type, which indicates index of oebject. Value range is 1-65535.
<instancebitmap>	String type, which indicates how many instance the object need to create. Length range is 1~500 bytes.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MADDOBJ=0,3303,"11"
OK
AT+LWM2MADDOBJ=0,3306,"1"
OK
```

20.2.6 AT+LWM2MDELOBJ Delete an Object for Communication Suite Instance

AT+LWM2MDELOBJ Delete an object for communication suite instance	
Write Command **AT+LWM2MDELOBJ=<ref>,<objectid>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<objectid>	Integer type, which indicates index of oebject. Value range is 1-65535.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MDELOBJ=0,3303
OK
```

20.2.7 AT+LWM2MNOTIFY Notify Platform One Value Change

AT+LWM2MNOTIFY Notify platform one value change	
Write Command **AT+LWM2MNOTIFY=<ref>,<objectid>,<instanceid>,<resourceid>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-

Max Response Time	-
Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<objectid>	Integer type, which indicates index of oebject. Value range is 1-65535.
<instanceid>	Integer type, which indicates index of object instance. Value range is 1-65535.
<resourceid>	Integer type, which indicates index of object instance resource. Value range is 1-65535.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MNOTIFY=0,3303,0,5700
OK
```

20.2.8 AT+LWM2MREADRSP Read Specific Object Resource Value

AT+LWM2MREADRSP Read specific object resource value	
Write Command **AT+LWM2MREADRSP=<ref>,<objectid>,<instanceid>,<resourceid>,<value>,<flag>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<objectid>	Integer type, which indicates index of oebject. Value range is 1-65535.
<instanceid>	Integer type, which indicates index of object instance. Value range is 1-65535.
<resourceid>	Integer type, which indicates index of object instance resource. Value range is 1-65535.
<value>	String type, which indicates resource data.

<flag>	Integer type, which indicates message flag. 0 – Not End 1 - End
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

+LWM2MREAD: 0,3303,0,5700,1	// Platform asks to read resource from device
AT+LWM2MREADRSP=0,3303,0,5700,"6",0	// Device reports resource to platform
OK	

NOTE

After received the report information +LWM2MREAD, it will send this AT command

20.2.9 AT+LWM2MWRITERSP Change Specific Object Resource Value

AT+LWM2MWRITERSP	**Change specific object resource value**
Write Command **AT+LWM2MWRITERSP=<ref>,<result>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<result>	Integer type, which indicates write resource result. 0 – Error 1 – Success
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

+LWM2MWRITE: 0,3303,0,5700,"11",1	//Platform requests to write data in device
AT+LWM2MWRITERSP=0,1	// Device reports write result to platform
OK	

20.2.10 AT+LWM2MEXECUTERSP Perform on Individual Resources

AT+LWM2MEXECUTERSP	Perform on individual resourcres
Write Command **AT+LWM2MEXECUTERSP=<ref>,<result>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<result>	Integer type, which indicates write resource result. Value range is 0-255.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
+LWM2MEXEUTE: 0,3303,0,5700          // Platform requests device doing execute action
AT+LWM2MEXECUTERSP=0,1               // Device reports execute result to platform
OK
```

20.2.11 AT+LWM2MUPDATE Update Register Information

AT+LWM2MUPDATE	Update register information
Write Command **AT+LWM2MUPDATE=<ref>,<lifetime>,<withObjectFlag>**	Response If the parameter is correct, response: **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-

Reference	-

Defined Values

<ref>	Integer type, which indicates communication suite instance index. Value must be 0.
<lifetime>	Integer type, which indicates new lifetime. Value must be 0. Value range is 1-65525
<withObjectFlag>	Integer type, which indicates whether or not update the registered object. 0 – Not update 1 – Update
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MUPDATE=0,3600,0                    // Device request platform to update lifetime of dev
OK
+LWM2MEVENT: 0,11
```

20.2.12 AT+LWM2MVER Get Communication Suite Instances Version Information

AT+LWM2MVER Get communication suite instances version information	
Read Command **AT+LWM2MVER?**	Response If the parameter is correct, response: **+LWM2MVER: <version>** **OK** Else, response: **+CME ERROR: <err>**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

<version>	String type, which indicates communication suite instance version.
<err>	Integer type, the result of operation.0 is success, other value is failure.

Example

```
AT+LWM2MVER?
```

```
+LWM2MVER: 1
OK
```

21 AT Commands for Hardware

21.1 Overview of AT Commands for Hardware

Command	Description
AT+CCGIPIO	Control common GPIO PINs

21.2 AT+CCGIPO Control Common GPIO PINs

AT+CCGPIO Control common GPIO PINs	
Test Command AT+CCGPIO=?	Response **+CCGPIO: (1-7),(0,1),(0,1)** **OK**
Read Command AT+CCGPIO?	Response **OK**
Write Command AT+CCGPIO=<gpio_index>,<level>[,<direction>]	Response **OK** or **ERROR**
Parameter Saving Mode	-
Max Response Time	-
Reference	-

Defined Values

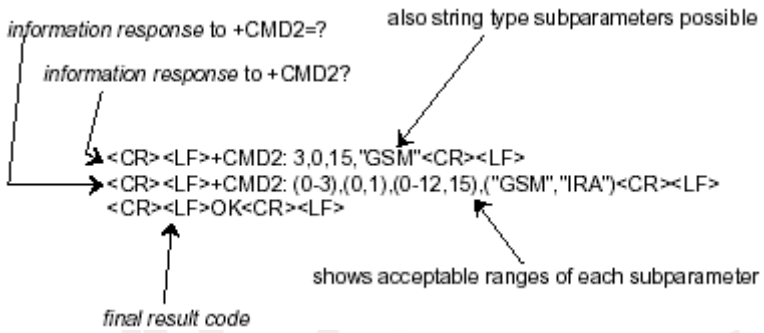
<gpio_index>	Integer type, which indicates GPIO index, and value range is 1-7.
<level>	Integer type, which indicates power level 0 low level 1 high level
<direction>	Integer type, which indicates GPIO direction. 0 Input 1 Output

Example

```
AT+CCGPIO=1,1
OK
```

22 Possible response and result code of information

The results of the porous response for each command, out, start and end with "<CR><LF>". As shown in Figure 2.



Picture 2: Command Possible response results

Note:
Except for the configuration of ATV0 and ATQ1, if the car is out of ATV0, the result of the command's possible response is 0<CR>. If the car is out of ATQ1, the command does not respond to any result

In this document, only the response of the specific Possible Response of the command is listed, and not every <CR><LF> is expressed.

If the syntax of the command is incorrect, a Possible response ERROR string will be used.

If the command syntax is correct, the parameter error will be Possible: +CME ERROR: <err> (for commands other than short message commands), or +CMS ERROR: <err> (for commands related to short messages).

<err>: Indicates the relevant error code.
If the command is correctly fed out, Possible response OK

In some cases, if a short message is received, a string of format will be sent to the terminal. When the corresponding command is explained later, a detailed description will be performed.
When the Possible response error message, you can set different Possible response results by AT+CMEE=<value>.

Table 3: AT+CMEE=<value> Command Description

<value>	description
0	Cancel +CME ERRORPossible response code
1	Activate the +CME ERRORPossible response code and use the wrong numeric value
2	Activate the +CME ERRORPossible response code and use the detailed

	description

The above table gives the error numeric value of the Possible Response and the detailed description (except for the short message)

Table 4: Error number and description

<value>	Error numeric value	Description
1	+CME ERROR:0	+CME ERROR: phone failure
2	+CME ERROR:1	+CME ERROR: no connection to phone
3	+CME ERROR:2	+CME ERROR: phone-adaptor link reserved
4	+CME ERROR:3	+CME ERROR: operation not allowed
5	+CME ERROR:4	+CME ERROR: operation not supported
6	+CME ERROR:5	+CME ERROR: PH-SIM PIN required
7	+CME ERROR:6	+CME ERROR: PH-FSIM PIN required
8	+CME ERROR:7	+CME ERROR: PH-FSIM PUK required
9	+CME ERROR:10	+CME ERROR: SIM not inserted
10	+CME ERROR:11	+CME ERROR: SIM PIN required
11	+CME ERROR:12	+CME ERROR: SIM PUK required
12	+CME ERROR:13	+CME ERROR: SIM failure
13	+CME ERROR:14	+CME ERROR: SIM busy
14	+CME ERROR:15	+CME ERROR: SIM wrong
15	+CME ERROR:16	+CME ERROR: incorrect password
16	+CME ERROR:17	+CME ERROR: SIM PIN2 required
17	+CME ERROR:18	+CME ERROR: SIM PUK2 required
18	+CME ERROR:20	+CME ERROR: memory full
19	+CME ERROR:21	+CME ERROR: invalid index
20	+CME ERROR:22	+CME ERROR: not found
21	+CME ERROR:23	+CME ERROR: Memory failure
22	+CME ERROR:24	+CME ERROR: text string too long
23	+CME ERROR:25	+CME ERROR: invalid characters in text string
24	+CME ERROR:26	+CME ERROR: dial string too long
25	+CME ERROR:27	+CME ERROR: invalid characters in dial string
26	+CME ERROR:28	+CME ERROR: GPRS operation failure
27	+CME ERROR:29	+CME ERROR: GPRS send data failure
28	+CME ERROR:30	+CME ERROR: no network service
29	+CME ERROR:31	+CME ERROR: Network timeout
30	+CME ERROR:32	+CME ERROR: Network not allowed emergency calls only
31	+CME ERROR:40	+CME ERROR: Network personalisation PIN required
32	+CME ERROR:41	+CME ERROR: Network personalisation PUK required
33	+CME ERROR:42	+CME ERROR: Network subset personalisation PIN required

34	+CME ERROR:43	+CME ERROR: Network subset personalisation PUK required
35	+CME ERROR:44	+CME ERROR: service provider personalisation PIN required
36	+CME ERROR:45	+CME ERROR: service provider personalisation PUK required
37	+CME ERROR:46	+CME ERROR: Corporate personalisation PIN required
38	+CME ERROR:47	+CME ERROR: Corporate personalisation PUK required
39	+CME ERROR:48	+CME ERROR: PH-SIM PUK required (PH-SIM PUK may also bereferred to as Master Phone Code. For further details
40	+CME ERROR:49	+CME ERROR: The excute command not support
41	+CME ERROR:50	+CME ERROR: Excute command failure
42	+CME ERROR:51	+CME ERROR: no memory
43	+CME ERROR:52	+CME ERROR: The command not support,check your input,pls
44	+CME ERROR:53	+CME ERROR: parameters are invalid
45	+CME ERROR:54	+CME ERROR: REG not exit in flash
46	+CME ERROR:55	+CME ERROR: SMS not eixt in flash
47	+CME ERROR:56	+CME ERROR: Phone book not eixt in flash
48	+CME ERROR:57	+CME ERROR: file system not eixt in flash
49	+CME ERROR:58	+CME ERROR: invalid command line
50	+CME ERROR:61	+CME ERROR: T-card is not exist or not supported
51	+CME ERROR:103	+CME ERROR: Illegal MS
52	+CME ERROR:106	+CME ERROR: Illegal ME
53	+CME ERROR:107	+CME ERROR: GPRS services not allowed
54	+CME ERROR:111	+CME ERROR: PLMN not allowed
55	+CME ERROR:112	+CME ERROR: Location area not allowed
56	+CME ERROR:113	+CME ERROR: Roaming not allowed in this location area
57	+CME ERROR:132	+CME ERROR: Service option not supported
58	+CME ERROR:133	+CME ERROR: Request service option not subscribed
59	+CME ERROR:134	+CME ERROR: Service option temprarily out of order
60	+CME ERROR:148	+CME ERROR: Unspecified GPRS error
61	+CME ERROR:149	+CME ERROR: PDP authentication failure
62	+CME ERROR:150	+CME ERROR: Invalid mobile class
63	+CME ERROR:181	+CME ERROR: Unsupproted QCI value
64	+CME ERROR:256	+CME ERROR: Operation temporarily not allowed
65	+CME ERROR:257	+CME ERROR: call barred
66	+CME ERROR:258	+CME ERROR: phone is busy
67	+CME ERROR:260	+CME ERROR: invalid dial string
68	+CME ERROR:264	+CME ERROR: SIM card verify failure
69	+CME ERROR:265	+CME ERROR: Unblock SIM card fail
70	+CME ERROR:266	+CME ERROR: Condition not fullfilled

71	+CME ERROR:267	+CME ERROR: Unblock SIM card failed, no rest time
72	+CME ERROR:268	+CME ERROR: Verify SIM card failed, no rest time
73	+CME ERROR:269	+CME ERROR: Input parameter is invalid
74	+CME ERROR:270	+CME ERROR: file is inconsistent with the command
75	+CME ERROR:271	+CME ERROR: wrong instruction class given in the command
76	+CME ERROR:272	+CME ERROR: SIM returned technical problem
77	+CME ERROR:273	+CME ERROR: CHV need unblock
78	+CME ERROR:274	+CME ERROR: NO SIM EF selected
79	+CME ERROR:275	+CME ERROR: SIM file unmatch command
80	+CME ERROR:276	+CME ERROR: contradiction CHV
81	+CME ERROR:277	+CME ERROR: contradiction invalidation
82	+CME ERROR:278	+CME ERROR: SIM MAX value reached
83	+CME ERROR:279	SIM returned pattern not found
84	+CME ERROR:280	+CME ERROR: SIM file ID not found
85	+CME ERROR:281	+CME ERROR: STK busy
86	+CME ERROR:282	+CME ERROR: SIM returned UNKNOWN
87	+CME ERROR:283	+CME ERROR: SIM profile ERR

The above table gives the error numeric value of the possible possible response of the short message and the description of the detailed description

Table 5: Short message related error numeric values and detaileddescription

<value>	Error numeric value	Description
1	+CMS ERROR:1	+CMS ERROR: Unassigned (unallocated) number
2	+CMS ERROR:8	+CMS ERROR: Operator determined barring
3	+CMS ERROR:10	+CMS ERROR: Call barred
4	+CMS ERROR:21	+CMS ERROR: Short message transfer rejected
5	+CMS ERROR:27	+CMS ERROR: Destination out of service
6	+CMS ERROR:28	+CMS ERROR: Unidentified subscriber
7	+CMS ERROR:29	+CMS ERROR: Facility rejected
8	+CMS ERROR:30	+CMS ERROR: Unknown subscriber
9	+CMS ERROR:38	+CMS ERROR: Network out of order
10	+CMS ERROR:41	+CMS ERROR: Temporary failure
11	+CMS ERROR:42	+CMS ERROR: Congestion
12	+CMS ERROR:47	+CMS ERROR: Resources unavailable, unspecified
13	+CMS ERROR:50	+CMS ERROR: Requested facility not subscribed
14	+CMS ERROR:69	+CMS ERROR: Requested facility not implemented
15	+CMS ERROR:81	+CMS ERROR: Invalid short message transfer reference

		value
16	+CMS ERROR:95	+CMS ERROR: Invalid message, unspecified
17	+CMS ERROR:96	+CMS ERROR: Invalid mandatory information
18	+CMS ERROR:97	+CMS ERROR: Message type non-existent or not implemented
19	+CMS ERROR:98	+CMS ERROR: Message not compatible with short message protocol state
20	+CMS ERROR:99	+CMS ERROR: Information element non-existent or not implemented
21	+CMS ERROR:111	+CMS ERROR: Protocol error, unspecified
22	+CMS ERROR:127	+CMS ERROR: Interworking, unspecified
23	+CMS ERROR:128	+CMS ERROR: Telematic interworking not supported
24	+CMS ERROR:129	+CMS ERROR: Short message Type 0 not supported
25	+CMS ERROR:130	+CMS ERROR: Cannot replace short message
26	+CMS ERROR:143	+CMS ERROR: Unspecified TP-PID error
27	+CMS ERROR:144	+CMS ERROR: Data coding scheme (alphabet) not supported
28	+CMS ERROR:145	+CMS ERROR: Message class not supported
29	+CMS ERROR:159	+CMS ERROR: Unspecified TP-DCS error
30	+CMS ERROR:160	+CMS ERROR: Command cannot be actioned
31	+CMS ERROR:161	+CMS ERROR: Command unsupported
32	+CMS ERROR:175	+CMS ERROR: Unspecified TP-Command error
33	+CMS ERROR:176	+CMS ERROR: TPDU not supported
34	+CMS ERROR:192	+CMS ERROR: SC busy
35	+CMS ERROR:193	+CMS ERROR: No SC subscription
36	+CMS ERROR:194	+CMS ERROR: SC system failure
37	+CMS ERROR:195	+CMS ERROR: Invalid SME address
38	+CMS ERROR:196	+CMS ERROR: Destination SME barred
39	+CMS ERROR:197	+CMS ERROR: SM Rejected-Duplicate SM
40	+CMS ERROR:198	+CMS ERROR: TP-VPF not supported
41	+CMS ERROR:199	+CMS ERROR: TP-VP not supported
42	+CMS ERROR:208	+CMS ERROR: D0 SIM SMS storage full
43	+CMS ERROR:209	+CMS ERROR: No SMS storage capability in SIM
44	+CMS ERROR:210	+CMS ERROR: Error in MS
45	+CMS ERROR:211	+CMS ERROR: Memory Capacity Exceeded
46	+CMS ERROR:212	+CMS ERROR: SIM Application Toolkit Busy
47	+CMS ERROR:213	+CMS ERROR: SIM data download error
48	+CMS ERROR:255	+CMS ERROR: Unspecified error cause
49	+CMS ERROR:300	+CMS ERROR: ME failure
50	+CMS ERROR:301	+CMS ERROR: SMS service of ME reserved
51	+CMS ERROR:302	+CMS ERROR: Operation not allowed
52	+CMS ERROR:303	+CMS ERROR: Operation not supported

53	+CMS ERROR:304	+CMS ERROR: Invalid PDU mode parameter
54	+CMS ERROR:305	+CMS ERROR: Invalid text mode parameter
55	+CMS ERROR:310	+CMS ERROR: SIM not inserted
56	+CMS ERROR:311	+CMS ERROR: SIM PIN required
57	+CMS ERROR:312	+CMS ERROR: PH-SIM PIN required
58	+CMS ERROR:313	+CMS ERROR: SIM failure
59	+CMS ERROR:314	+CMS ERROR: SIM busy
60	+CMS ERROR:315	+CMS ERROR: SIM wrong
61	+CMS ERROR:316	+CMS ERROR: SIM PUK required
62	+CMS ERROR:317	+CMS ERROR: SIM PIN2 required
63	+CMS ERROR:318	+CMS ERROR: SIM PUK2 required
64	+CMS ERROR:320	+CMS ERROR: Memory failure
65	+CMS ERROR:321	+CMS ERROR: Invalid memory index
66	+CMS ERROR:322	+CMS ERROR: SIM memory full
67	+CMS ERROR:330	+CMS ERROR: SMSC address unknown
68	+CMS ERROR:331	+CMS ERROR: no network service
69	+CMS ERROR:332	+CMS ERROR: Network timeout
70	+CMS ERROR:340	+CMS ERROR: NO +CNMA ACK EXPECTED
71	+CMS ERROR:500	+CMS ERROR: Unknown error
72	+CMS ERROR:512	+CMS ERROR: User abort
73	+CMS ERROR:513	+CMS ERROR: unable to store
74	+CMS ERROR:514	+CMS ERROR: invalid status
75	+CMS ERROR:515	+CMS ERROR: invalid character in address string
76	+CMS ERROR:516	+CMS ERROR: invalid length
77	+CMS ERROR:517	+CMS ERROR: invalid character in pdu
78	+CMS ERROR:518	+CMS ERROR: invalid parameter
79	+CMS ERROR:519	+CMS ERROR: invalid length or character
80	+CMS ERROR:520	+CMS ERROR: invalid character in text
81	+CMS ERROR:521	+CMS ERROR: timer expired

The table gives the error numeric value and the detailed description of the possible Possible response related to the extended error

Table 6: Error numeric value and detaileddescription related to extended errors

<value>	Error numeric value	Description
1	+CME ERROR:0	+CEER ERROR: no detail infomation
2	+CME ERROR:1	+CEER ERROR: unassigned number
3	+CME ERROR:3	+CEER ERROR: no route to destination
4	+CME ERROR:6	+CEER ERROR: unacceptable channel

5	+CME ERROR:8	+CEER ERROR: operator determinate barring
6	+CME ERROR:16	+CEER ERROR: normal clearing
7	+CME ERROR:17	+CEER ERROR: user busy
8	+CME ERROR:18	+CEER ERROR: no user responding
9	+CME ERROR:19	+CEER ERROR: alerting no answer
10	+CME ERROR:21	+CEER ERROR: call rejected
11	+CME ERROR:22	+CEER ERROR: number changed
12	+CME ERROR:26	+CEER ERROR: nonselect user clearing
13	+CME ERROR:27	+CEER ERROR: destination out of order
14	+CME ERROR:28	+CEER ERROR: invalid number format
15	+CME ERROR:29	+CEER ERROR: facility rejected
16	+CME ERROR:30	+CEER ERROR: response to status query
17	+CME ERROR:31	+CEER ERROR: normal unspecified
18	+CME ERROR:34	+CEER ERROR: no circuit channel available
19	+CME ERROR:38	+CEER ERROR: net out of order
20	+CME ERROR:41	+CEER ERROR: temporary failure
21	+CME ERROR:42	+CEER ERROR: switch congestion
22	+CME ERROR:43	+CEER ERROR: access information discarded
23	+CME ERROR:44	+CEER ERROR: request circuit channel unavailable
24	+CME ERROR:47	+CEER ERROR: resources unavailable
25	+CME ERROR:49	+CEER ERROR: QOS unavailable
26	+CME ERROR:50	+CEER ERROR: request facility not subscribe
27	+CME ERROR:55	+CEER ERROR: CUG incoming barred
28	+CME ERROR:57	+CEER ERROR: bear capability not authorization
29	+CME ERROR:58	+CEER ERROR: bear capability unavailable
30	+CME ERROR:63	+CEER ERROR: service unavailable
31	+CME ERROR:65	+CEER ERROR: bear service not implement
32	+CME ERROR:68	+CEER ERROR: ACM equal or great ACMMAX
33	+CME ERROR:69	+CEER ERROR: request facility not implement
34	+CME ERROR:70	+CEER ERROR: only restrict digital available
35	+CME ERROR:79	+CEER ERROR: service option not implement
36	+CME ERROR:81	+CEER ERROR: invalid ti
37	+CME ERROR:87	+CEER ERROR: user not in CUG
38	+CME ERROR:88	+CEER ERROR: incompatibility destination
39	+CME ERROR:91	+CEER ERROR: invalid transit net
40	+CME ERROR:95	+CEER ERROR: invalid message semantic
41	+CME ERROR:96	+CEER ERROR: mandatory IE error
42	+CME ERROR:97	+CEER ERROR: message nonexistent
43	+CME ERROR:98	+CEER ERROR: message uncompatbility error
44	+CME ERROR:99	+CEER ERROR: IE nonexistent
45	+CME ERROR:100	+CEER ERROR: invalid condition IE

46	+CME ERROR:101	+CEER ERROR: message incompatibility state
47	+CME ERROR:102	+CEER ERROR: recover on timer
48	+CME ERROR:111	+CEER ERROR: protocol error
49	+CME ERROR:127	+CEER ERROR: interworking
50	+CME ERROR:150	+CEER ERROR: authentication rejected
51	+CME ERROR:151	+CEER ERROR: emergency call only
52	+CME ERROR:152	+CEER ERROR: IMSI detach
53	+CME ERROR:153	+CEER ERROR: T3230 expiry
54	+CME ERROR:154	+CEER ERROR: rr connection error
55	+CME ERROR:171	+CEER ERROR: no network service
56	+CME ERROR:172	+CEER ERROR: emergency call only
57	+CME ERROR:173	+CEER ERROR: normal disconnect
58	+CME ERROR:174	+CEER ERROR: remote disconnect
59	+CME ERROR:175	+CEER ERROR: low failure
60	+CME ERROR:176	+CEER ERROR: network reject
61	+CME ERROR:177	+CEER ERROR: no cell
62	+CME ERROR:202	+CEER ERROR: supplement not provide