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N715-EA

AT Commands Manual

Issue 1.0 Date 2023-03-03

Notice

This document provides guide for users to use N715-EA.

This document is intended for system engineers (SEs), development engineers, and test engineers.

THIS DOCUMENT PROVIDES INSTRUCTIONS FOR CUSTOMERS TO DESIGN THEIR APPLICATIONS. PLEASE FOLLOW THE RULES AND PARAMETERS IN THIS GUIDE TO DESIGN AND COMMISSION. NEOWAY WILL NOT TAKE ANY RESPONSIBILITY OF BODILY HURT OR ASSET LOSS CAUSED BY IMPROPER OPERATIONS.

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Contents

About This Document

Scope

This document is applicable to N715-EA.

Audience

This document is intended for system engineers (SEs), development engineers, and test engineers.

Change History

Issue	Date	Change	Changed By
1.0	2023-01	Initial draft	Tao Wenhong

Conventions

Symbol	Indication
	This warning symbol means danger. You are in a situation that could cause fatal device damage or even bodily damage.
	Means reader be careful. In this situation, you might perform an action that could result in module or product damages.
	Means note or tips for readers to use the module

1 Boot LOG Instruction

The UART outputs **\r\n+PBREADY\r\n** after the phonebook is available.

If the module is booted in automatic baudrate detection mode, send **AT** 10 seconds after the module is powered up to check if the AT function is initialized. The UART responds with **OK** if AT is initialized and outputs **+PBREADY** after the phonebook is available.

Network indicator status

- Off: No network found.
- On: the module finds a network and the PDP context is not activated.
- Blinks (on for 0.2 seconds and off for 1.8 seconds): the PDP context is activated successfully.

2 AT Syntax

2.1 Symbols

- <CR>: carriage return character
- <LF>: linefeed character
- <..>: parameter name, the angle brackets do not appear in the command line.
- [..]: optional parameter, the square brackets do not appear in the command line.
- : space

2.2 Description

Prefix

AT or at

Command Line

Standard commands, in compliance with 3GPP 27007, 27005and ITU-T Recommendation V.250.

Extended commands, defined by Neoway

Joint Mark

+ or $, used between the prefix and a command line

Termination Character

<CR>, i.e. 0x0D

Response Syntax

<CR><LF>response<CR><LF>

Response can be one or multiple messages.

Result Syntax

<CR><LF>OK<CR><LF> indicates that a command is executed successfully.

<CR><LF>ERROR<CR><LF> indicates that a command fails to be executed.

For the error codes, see Appendix A.

2.3 Command Types

Type	Syntax	Response	Function
Set	AT+CMD=<VALUE><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>	Store a value or values for later use
Execute	AT+CMD[=<VALUE>]<CR>	[<CR><LF>response] <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>	Invoke a function of the module.
Test	AT+CMD=?<CR>	[<CR><LF>response] <CR><LF>OK<CR><LF>	Determine the range of parameter values or parameter lengths that are supported
Query	AT+CMD?<CR>	[<CR><LF>response] <CR><LF>OK<CR><LF>	Determine the current value or values stored
Unsolicited result code	<CR><LF>+CMD: <VALUE><CR><LF>	N/A	Report the status change and data receiving
Remarks	Symbols are not displayed in AT commands. All commands comply with the rules in this chapter.		

2.4 Command Response Time-Out

Every command issued to the Neoway module returns a result response and the time needed to

process the given command and return the response varies, depending on the command type.

Commands that do not interact with the SIM or the network, and only involve internal setups or readings, have an immediate response, and the maximum response timeout is default to 300 ms. Commands that interact with the SIM/USIM, the network, or the peripherals could take many seconds to send a response, depending on SIM configuration (e.g., number of contacts stored in the phonebook, number of stored SMS), on the network the command may interact with (e.g., network quality, network congestion, and so on), or on the peripheral type.

In the table below are listed only the commands whose interaction with the SIM, the network, or the peripheral could lead to long response timings. For other commands not listed in the table below, the maximum response time is 300 ms.

No.	Command	Estimated maximum time to get response (Seconds)
1	AT+COPS	180
2	AT+CLCK	15
3	ATD*99#	30
4	AT+CMGR	30
5	AT+CMGL	30
6	AT+CMGS	30
7	AT+XIIC	60
8	AT+TCPSETUP	60
9	AT+TCPSEND	30
10	AT+TCPCLOSE	5
11	AT+UDPSETUP	30
12	AT+UDPSEND	30
13	AT+TCPSENDS	30
14	AT+TCPTRANS	60
15	AT+FTPLOGIN	30
16	AT+FTPLOGOUT	30
17	AT+FTPGET	30
18	AT+FTPPUT	30
19	AT+FTPSIZE	30
20	AT+FILEFTPGET	60
21	AT+NWFTPRENAME	30
22	AT+NWFTPMKDIR	30
23	AT+NWFTPRMDIR	30
24	AT+NWFTPDEL	30
25	AT+HTTPSETUP	60
26	AT+HTTPACTION	60
27	AT+HTTPCLOSE	60
28	AT+HTTPGET	60
29	AT+HTTPSSETUP	60
30	AT+HTTPSACTION	60

31	AT+HTTPSCLOSE	60
32	AT+HTTPSGET	60
33	AT+FILEHTTPACTION	60
34	AT+FILEHTTPSACTION	60
35	ATD	60
36	AT+WIFIAPSCAN	30
37	AT+WIFIGSMLOC	30
38	AT+CLOUDSUB	30
39	AT+CLOUDPUB	30
40	AT+CLOUDUNSUB	30
41	AT+CLOUDDISCONN	30s+100ms
42	AT+MQTTWILLMSG	30
43	AT+MQTTSUB	10
44	AT+MQTTUNSUB	10
45	AT+MQTTPUB	30
46	AT+MQTTPUBS	30
47	AT+MQTTDISCONN	10
48	AT+AWSCONN	20
49	AT+CIPGSMLOC	10
50	AT+UPDATETIME	60
51	AT+FSWF	Customizing, 0 - 240
52	AT+MYCELLINFO	300
53	AT+CGACT	60
54	AT+NWFOTA	90

3 General Commands

3.1 ATI – Querying the Manufacturer Information

To query the manufacturer information, including manufacture, model, and version

Format

Type	Command	Response
Execute	ATI<CR>	<CR><LF><manufacturer> <CR><LF><module_version> <CR><LF><soft_version> <CR><LF>OK<CR><LF>

Parameter

<manufacturer>	Module manufacturer.
<module_version>	Module model
<soft_version>	software version

Example

```
ATI
NEOWAY                                          Manufacturer
N715                                            Module model
V001                                            Version
OK
```

3.2 AT+GMR – Querying the Firmware Version

To query the firmware version

Format

Type	Command	Response

Execute	AT+GMR<CR>	<CR><LF>+GMR: <reversion> <CR><LF>OK<CR><LF>

Parameter

<reversion>	Firmware version of the module.

Example

```
AT+GMR                                          Query the software version
+GMR: N715-R08-STD-BZ_V30-001
OK
```

3.3 AT+CSQ – Querying Signal Quality

To query the receiving signal strength indication (RSSI).

Format

Type	Command	Response
Execute	AT+CSQ<CR>	<CR><LF>+CSQ: <signal>,<ber> <CR><LF>OK<CR><LF>

Parameter

<signal> The following table shows the relationship between the signal (CSQ) and the RSSI.

	signal	rssi
0	<4 or 99	<-107 dBm or unknown
1	<10	< -93 dBm
2	<16	< -111 dBm
3	<22	< -69 dBm
4	<28	< -57 dBm
5	>=28	>=-57 dBm

<ber>

0...7	Refer to the value of RXQUAL in the table of GSM 05.08 8.2.4.
99	Not known or not detectable.

Example

```
AT+CSQ                          Query the signal quality.
+CSQ: 19,2
OK
AT+CSQ=?                        Query the signal quality value range of the module.
+CSQ: (0-31,99),(0-7,99)
OK
```

3.4 AT+CREG – Network Registration Status

Configures the network registration URC related to CS domain. Depending on the <n> parameter value, a URC can be issued:

- +CREG: <stat> if <n>=1.
- +CREG: <stat>[,<lac>,<ci>[,<AcT>]] if <n>=2.
- +CREG: <n>,<stat>[,[<lac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]] if <n>=3.

Format

Type	Command	Response
Execute	AT+CREG=[<n>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+CREG:<stat>[,<lac>,<ci>[,<Act>]]<CR><LF>
Query	AT+CREG?	<CR><LF>+CREG: <n>,<stat> <CR><LF>OK<CR><LF>
Test	AT+CREG=?	<CR><LF>+CREG: range of supported<n> <CR><LF>OK<CR><LF>

Parameter

<n>	0: Disable network registration unsolicited result code (default setting). 1: Enable network registration unsolicited result code +CREG: <stat>. 2: Enable network registration and location information (Cell ID, Local ID) unsolicited result code +CREG: <stat>[,[<lac>],[<ci>],[<AcT>]]
<stat>	0: Not registered, the module is not currently searching an operator to register to 1: Registered the home network 2: Not registered, but the module is currently trying to attach or searching an operator to register to

	3: Registration denied 4. Unknown code 5: Registered, roaming 6: ltesms only home 7: ltesms only roaming 8: EMER SVCE ONLY 9: CSFB NOT PREFER HOME 10: CSFB NOT PREFER ROAMING
<lac>	Two-byte location area code in hexadecimal format, string type.
<ci>	Four-byte cell ID in hexadecimal format, string type.
<Act>	0: GSM 1: GSM compact 2: UTRAN 3: GSM w/EGPRS 4: UTRAN w/HSDPA 5: UTRAN w/HSUPA 6: UTRAN w/HSDPA AND w/HSUPA 7: E-UTRAN 8: EC-GSM-IoT (A/Gb mode) 9: E-UTRAN (NB-S1 mode)
<cause_type>	Integer type, <reject_cause> type: 0: indicates that <reject_cause> contains an EMM cause value 1: indicates that <reject_cause> contains a manufacture-specific cause
<reject_cause>	Integer type, cause of the failed registration. The value is of type as defined by <cause_type>

Example

```
AT+CREG=1                    Enable network registration unsolicited codes.
OK
AT+CREG?                     Query the network registration status of the module.
+CREG: 0,1
OK
AT+CREG=?                    Query the value range of the network registration status
+CREG: (0-2)                 parameter.
OK
```

3.5 AT+CEREG – EPS Network Registration Status

To configures the network registration URC related to EPS domain. The URC assumes a different syntax depending on the network and the <n> parameter:

- +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN

- +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]] when <n>=2 and there is a change of the network cell in EUTRAN
- +CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]] when <n>=3 and the value of <stat> changes

Format

Type	Command	Response
Execute	AT+CEREG=[<n>]<CR>	<CR><LF>OK<CR><LF>
Query	AT+CEREG?<CR>	<CR><LF>+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,<cause_type>,<reject_cause>]]]<CR><LF>OK<CR><LF>
Test	AT+CEREG=?<CR>	<CR><LF>+CEREG: (list of supported<n>s) <CR><LF>OK<CR><LF>

Parameter

<n>	0: Disable network registration unsolicited result code (default setting). 1: Enable network registration unsolicited result code +CREG: <stat>. 2: Enable network registration and location information (Cell ID, Local ID) unsolicited result code +CREG: <stat>[,[<lac>],[<ci>],[<AcT>]] 4: Enable network registration unsolicited result codes containing Active-Time and Periodic-TAU
<stat>	0: Not registered, the module is not currently searching an operator to register to 1: Registered the home network 2: Not registered, but the module is currently trying to attach or searching an operator to register to 3: Registration denied 4. Unknown code 5: Registered, roaming
<tac>	Two-byte location area code in hexadecimal format, string type.
<ci>	Four-byte cell ID in hexadecimal format, string type.
<Act>	0: GSM 1: GSM compact 2: UTRAN 3: GSM w/EGPRS 4: UTRAN w/HSDPA 5: UTRAN w/HSUPA 6: UTRAN w/HSDPA and HSUPA 7: E-UTRAN 8: EC-GSM-IoT (A/Gb mode) (see NOTE 5) (not applicable) 9: E-UTRAN (NB-S1 mode) (see NOTE 6)

<cause_type>	Integer type, <reject_cause> type: 0: indicates that <reject_cause> contains an EMM cause value 1: indicates that <reject_cause> contains a manufacture-specific cause
<reject_cause>	Integer type, cause of the failed registration. The value is of type as defined by <cause_type>

Example

```
AT+CEREG?                Query the network registration status of the module.
+CEREG: 0,1              Registered the home network.
OK
AT+CEREG=1               Enable unsolicited codes of network registration.
OK
AT+CEREG=?               Query the value range of the network registration status
+CEREG: (0-2,4)          parameter.
OK
```

3.6 AT+COPS – Selecting an Operator

Forces an attempt to select and register with the GSM/UMTS/LTE network operator, that can be chosen in the list of network operators returned by the test command, that triggers a PLMN scan on all supported bands. Through <mode> parameter the network selection can automatically be performed or forced by this command: the access technology is indicated in <AcT> parameter (where supported).

Format

Type	Command	Response
Execute	AT+COPS=[<mode>[,<format>[,<oper>>[,<AcT>]]]]<CR>	<CR><LF>OK<CR><LF>
Query	AT+COPS?<CR>	<CR><LF>+COPS:<mode>[,<format>,<oper>[,<AcT>]]
Test	AT+COPS=?<CR>	<CR><LF>+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s][,,(list of supported<mode>s),(list of supported <format>s)]<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>	To set automatic network selection or manual selection.

	0: Automatic selection (ignore the parameter <oper>) 1: Manual selection 2: Deregister from the network 3: Set <format> only 4: Manual/automatic selection (if the manual selection fails, automatic mode starts)
<format>	0: Long alphanumeric <oper> (default). 1: Short format alphanumeric <oper> 2: Numeric <oper>
<oper>	It is given in <format>. This field may be in 16-character long alphanumeric format, 8-characters short alphanumeric format, or 5-character numeric format (MCC/MNC).
<AcT>	indicates the radio access technology and its value can be 0, 1, and 2. 0: GSM 1: GSM compact 3: GSM w/EGPRS 7: E-UTRAN

Example

```
AT+COPS=0,0                          Automatic network selection is enabled. Long
OK                                   alphanumeric mode.
AT+COPS=0,2                          Set to digital mode
OK
AT+COPS?                             China Mobile
+COPS: 0,0,"CHINAMOBILE",7
OK
AT+COPS?                             If it is set to digital mode, get the number 46000.
+COPS: 0,2,"46000",7
OK
AT+COPS?                             China Unicom
+COPS: 0,0,"CHINA UNICOM",7
OK
AT+COPS?                             If it is set to digital mode, then get the number
+COPS: 0,2,"46001",7                 46001.
OK
AT+COPS?                             China Telecom
+COPS: 0,0,"CHINA TELECOM",7
OK
AT+COPS?                             If it is set to digital mode, get the number 46011.
+COPS: 0,2,46011,7
OK
AT+COPS=2                            Deregister the network.
OK
```


3.7 AT+CIMI – Requesting International Mobile Subscriber Identity (IMSI)

Request the IMSI (International Mobile Subscriber Identity).

Format

Type	Command	Response
Execute	AT+CIMI<CR>	<CR><LF>+CIMI: <IMSI> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<IMSI>	International Mobile Subscriber Identity. IMSI is a character string of 15 digits and starts with 3-bits of MCC and 2-bits of MNC. It is used to authenticate the SIM card.

Example

```
AT+CIMI                                  Query the IMSI.
+CIMI: 460020188385503                   IMSI: 460022201575463
OK
AT+CIMI                                  Query the IMSI.
ERROR                                    No SIM card is installed.
```

3.8 AT+CGSN – Requesting Product Serial Number Identification

To obtain the product serial number, identified as the IMEI of the module.

Format

Type	Command	Response
Execute	AT+CGSN<CR>	<CR><LF>+CGSN: <IMEI> <CR><LF>OK<CR><LF>

Parameter

<IMEI>	Product serial number identification of the module.

Example

```
AT+CGSN                                          Read command
+CGSN: 355897043139120
OK
```

On a 3GPP2 network, the return code is an 8-digit ESN.

3.9 AT+GSN – Identifying IMEI

Returns the International Mobile Equipment Identity (IMEI) of the module.

Format

Type	Command	Response
Execute	AT+GSN<CR>	<CR><LF>+GSN: <IMEI> <CR><LF>OK<CR><LF>

Parameter

<IMEI>	Product serial number identification of the module, a character string of 15 digitals.

Example

```
AT+GSN                                           Query the IMEI number.
+GSN: 355897043139120
OK
```

3.10 AT+CCID – Obtaining ICCID of SIM Card

Returns the ICCID (Integrated Circuit Card ID) of the SIM card. ICCID is a serial number identifying the SIM.

To obtain the integrated circuit card identifier (ICCID) of the SIM Card.

Format

Type	Command	Response
Execute	AT+CCID<CR>	<CR><LF>+CCID: <ICCID> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<ICCID>	ICCID of the SIM card, a string of 20 digits.

Example

```
AT+CCID                                  Read command
+CCID: 89860002190810001367
OK
AT+CCID                                  The SIM card is not inserted.
ERROR
```

3.11 AT+CGMM – Requesting Model Identification

Text string identifying the model identification.

Format

Type	Command	Response
Execute	AT+CGMM<CR>	<CR><LF>+CGMM:<model> <CR><LF>OK<CR><LF>

Parameter

<model>	Name of module model

Example

```
AT+CGMM                                  Request model identification of the module.
+CGMM: N715_EA
OK
```

3.12 AT+GMM – Querying Module Model

Text string identifying the model identification.

Format

Type	Command	Response
Execute	AT+GMM<CR>	<CR><LF>+GMM:<model> <CR><LF>OK<CR><LF>

Parameter

<model> Name of module model

Example

```
AT+GMM                                   Request model identification
+GMM: N715_EA
OK
```

3.13 AT+IPR – Configuring UART Data Rate

Specifies the data rate at which the DCE accepts commands on the UART interface. The full range of data rates depends on HW or other criteria.

The module implements automatic baud rate detection by default.

Format

Type	Command	Response
Execute	AT+IPR=<baud rate><CR>	<CR><LF>OK<CR><LF>
Query	AT+IPR?<CR>	<CR><LF>+IPR: <baud rate>

		<CR><LF>OK<CR><LF>
Test	AT+IPR=?<CR>	<CR><LF>+IPR: (list of supported <baud rate>s) <CR><LF>OK<CR><LF>

Parameter

<baud rate>	Allowed baud rates expressed in b/s (0, if present, means autobauding): (0, 2400, 4800, 9600, 14400, 19200, 28800, 33600, 38400, 57600, 115200, 230400, 460800, 921600, 2166666)

Example

```
AT+IPR=115200                                  Set the baud rate to 115200 bps.
OK
AT+IPR?                                        Query the current baud rate.
+IPR: 115200
OK
AT+IPR=?                                       Query the available baud rate range.
+IPR:0,2400,4800,9600,14400,19200,28800,
33600,38400,57600,115200,2166666

OK
AT+IPR=100                                     Set the baud rate to 100. The value is not
ERROR                                          allowed.
```

3.14 AT+CFUN – Setting Module Functionality

To select the level of functionality of the module by setting <fun>. <fun>: only certain values are supported.

The setting is not saved after the module is powered off.

Format

Type	Command	Response
Execute	AT+CFUN=[<fun>[,<rst>]]<CR>	<CR><LF>+CFUN: (list of supported <fun>s),(list of supported <rst>s) <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CFUN?<CR>	<CR><LF>+CFUN:<fun> <CR><LF>OK<CR><LF>

Test	AT+CFUN=?<CR>	<CR><LF>+CFUN: (list of supported <fun>s),(range of supported <rst>) <CR><LF>OK<CR><LF>

Parameter

<fun>	0: sets the module to minimum functionality (disable both transmit and receive RF circuits by deactivating both CS and PS services) 1: sets the module to full functionality (default) 4: disables both transmit and receive RF circuits by deactivating both CS and PS services and sets the module into airplane mode.
<rst>	0: do not reset the module before setting it to <fun> power level 1: reset the module before setting it to <fun> power level

Example

```
AT+CFUN=1                                   Set full functionality.
OK
AT+CFUN?                                    Query current function level. Full functionality,
+CFUN: 1
OK
AT+CFUN=?                                   Query available parameter value ranges.
+CFUN: (0,1,4),(0,1)
OK
```

3.15 AT+CMUX – Enabling/Disabling Multiplexing Mode

This command is used to manage (enable or disable) the multiplexing protocol control channel.

The multiplexing protocol allows two or more virtual ports to be created on a physical port. Generally, three virtual ports are created: one is used for dialing network and the rest are used for AT command sending and receiving.

Executing AT+CMUX=0 to enable the multiplexing protocol control channel is recommended.

Format

Type	Command	Response
Execute	AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+CMUX=?<CR>	<CR><LF>+CMUX: (list of supported

	<mode>values),(list of supported <subset> values),(value range of<port_speed>),(value range of<N1>),(value range of<T1>),(value range of<N2>),(value range of<T2>),(value range of<T3>),(value range of<k>)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>	The mode of MUX that is enabled, integer type. 0: Basic option (default value) 1: Advanced option (not supported)
<subset>	Subset of frame format, integer type 0: UIH frames used only (default value). 1: UI frames used only (not supported currently)
<port_speed>	UART port rate, integer type 1: 9600 bit/s 2: 19200 bit/s 3: 38400 bit/s 4: 57600 bit/s 5: 115200 bit/s (default) 6: 230400 bit/s
<N1>	Maximum frame size. Integer type, ranging from 1 to 2048. The default value is 31. For Advanced option, the default value is 64.
<T1>	Acknowledgment timer in unite of ten milliseconds, integer type, ranging from 1 to 255, where 10 is default (equal to 100 ms).
<N2>	Maximum number of re-transmissions, integer type, ranging from 0 to 5. The default value is 3.
<T2>	Response timer for the multiplexer control channel in units of ten milliseconds, integer type. Ranging from 2 to 255. The default value is 30 (300 ms).
<T3>	Wake up response timer in seconds, integer type. Ranging from 1 to 255. 1 indicates 1 second. The default value is 10s. (Not supported)
<k>	Window size, integer type. (Not supported)

<T2> must be greater than <T1>.

Example

```
AT+CMUX=0                                                    Basic option
OK
```

```
AT+CMUX=2                                                    ERROR is returned because the set value
ERROR                                                        exceeds the parameter range.
AT+CMUX=0,0,,512,254,5,255                                   Basic option.
OK
AT+CMUX=1,0,,512,254,5,255                                   Advanced option.
OK
AT+CMUX=?
+CMUX: (0,1),(0),(1-6),(1-2048),(1-255),(0-                  Query the available range of parameters.
100),(2-255),(1-255),(1-7)
OK
AT+CMUX?                                                     The command format is incorrect.
ERROR
```

3.16 AT+CCLK – Clock

To set and query the real-time clock.

The settings are not saved after the module is powered off. The default clock is GMT+0.

Format

Type	Command	Response
Set	AT+CCLK=<time><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CCLK?<CR>	<CR><LF>+CCLK: <time> <CR><LF>OK<CR><LF>

Parameter

<time>	Character string in format of yy/MM/dd,hh:mm:ss[TZ].
TZ	A 2-digit number indicates the time difference between local time and GMT. This value is displayed only when the network is supported.

Example

```
AT+CCLK="18/07/01,14:54:01"                                  Set the real-time clock.
OK
AT+CCLK?
+CCLK: "18/07/01,14:54:10+32"                                Query the current clock.
OK
AT+CCLK=14/07/02,10:48:50                                    The parameter format of <time> is incorrect.
ERROR
```

3.17 AT+CPIN – Entering PIN Code

Enter PIN. If no PIN request is pending, the corresponding error code is returned.

After executing AT+CLCK="SC",1,"1234" and then restart the module, it will be locked. If a wrong PIN is given three times, the PUK must be inserted in place of the PIN, followed by the <newpin> which replaces the old pin in the SIM.

Format

Type	Command	Response
Execute	AT+CPIN=<pin>[,<newpin>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CPIN?<CR>	<CR><LF>+CPIN: <code> <CR><LF>OK<CR><LF>

Parameter

<pin>, <newpin>	String type
<code>	READY: ME is not pending for any password. SIM PIN: ME is waiting SIM PIN to be given. SIM PUK: ME is waiting SIM PUK to be given. SIM PIN2: ME is waiting SIM PIN2 to be given. SIM PUK2: ME is waiting SIM PUK2 to be given

Example

```
AT+CPIN?                                  Query whether PIN code is required.
+CPIN: READY                              You don't need to enter any password.
OK
AT+CPIN?                                  Query whether PIN code is required.
+CPIN: SIM PIN                            PIN code is required.
OK
AT+CPIN="1234"
OK                                        Correct PIN code is entered.

+PBREADY                                  The SIM card is unlocked.
AT+CPIN?                                  If PIN code is input incorrectly for three
+CPIN: SIM PUK                            times, PUK is required to unlock.
OK
AT+CPIN="12345678","4321"
OK                                        Enter PUK code and then enter the new PIN code.

+PBREADY                                  The SIM card is unlocked.
```


3.18 AT+CLCK – Facility Lock

To lock, unlock or interrogate a MT or a network facility <fac>. The setting by this command valid after the module is restarted.

Format

Type	Command	Response
Set	AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]<CR>	• When <mode>=2: <CR><LF>+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>[...]] <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> • When <mode>≠2: <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+CLCK=?<CR>	<CR><LF>+CLCK: (list of supported <fac> values) <CR><LF>OK<CR><LF>

Parameter

<fac>	Value with double quotes. "OI": Outgoing international calls "SC": SIM card "AO": All outgoing calls "OX": All outgoing international calls except to the home country "FD": Fixed dialing of the SIM card
<mode>	0: unlock 1: lock 2: registration
<status>	0: not active 1: active
<passwd>	Password or operation code; string type, string with double quotes.
<classx>	1: voice service 2: data service 4: fax service 8: SMS 16: data circuit sync 32: data circuit async 64: dedicated packet access

128: dedicated PAD access

Example

```
AT+CLCK="SC",2
+CLCK: 0
OK
AT+CLCK=?
+CLCK:("SC","FD","AO","OX","OI")        Query the network information related to the module.
OK
AT+CLCK="SC",1,"1234"                   Lock the current SIM card. "1234" is PIN code of
OK                                      current SIM card.
AT+CLCK="SC",0,"1234"                   Unlock the current SIM card. "1234" is PIN code of
OK                                      current SIM card.
AT+CLCK="SC",1,"2222"
ERROR                                   Incorrect PIN code is inputted.
```

3.19 AT+CPWD – Changing the Password

To set a new password for the facility lock function defined by command **Facility Lock**.

Before changing PIN code, lock the SIM card (running AT+CLCK="SC",1,"1234").

Format

Type	Command	Response
Set	AT+CPWD=<fac>,<oldpwd>,<newpwd><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+CPWD=?<CR>	<CR><LF>+CPWD:(list of supported (<fac>,<pwdlength>)s) <CR><LF>OK<CR><LF>

Parameter

<fac>	Value with double quotes. "P2": SIM PIN2 "SC": SIM card
<oldpwd>	string with double quotes; the old password or operation code.
<newpwd>	string with double quotes; the new password or operation code.

Example

```
AT+CPWD=?
+CPWD: ("SC",8),("P2",8)          Query the parameters range.
OK
AT+CPWD="SC","1234","0000"        Modify the PIN code of the current SIM card. "1234" is
OK                                the old PIN code and "0000" is the new PIN code.
AT+CPWD=SC,1234,0000              The command format is incorrect; a pair of quotation
ERROR                             marks is a must for the value.
```

3.20 AT+CGDCONT – Defining PDP Context

Defines the connection parameters for a PDP context, identified by the local context identification parameter <cid>. If the command is used only with parameter <cid>, the corresponding PDP context becomes undefined.

The query command shows the defined PDP context.

Format

Type	Command	Response
Set	AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CGDCONT?<CR>	<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CGDCONT=?<CR>	<CR><LF>+CGDCONT: [list of supported (<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>)] <CR><LF>OK<CR><LF>

Parameter

<cid>	integer type; 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 minimum value is 1).
<PDP_type>	string type; specifies the type of packet data protocol. “IP” Internet Protocol (IETFSTD 5)
<APN>	Access Point Name, string type; a logical name that is used to select the GGSN

	or the external packet data network.
<PDP_address>	String type, identifies the MT in the address space applicable to the PDP. TE will provide a value for this parameter after PDP starts if it is null or omitted. If TE fails to provide, a dynamic address is requested, and even if the address is assigned during the PDP startup process, it is returned empty when queried with this command.
<d_comp>	Integer type, controls PDP data compression (applicable for SNDCP only) 0 - off (if omitted, this parameter is the default value).
<h_comp>	integer type; controls PDP header compression 0 - off (default value)
<pd1>, … <pdN>	String type, their definitions are corresponding to <PDP_type>

Example

```
AT+CGDCONT=1,"IP","CMNET"                          Set the PDP type to IP and set the APN
OK                                                 name to CMNET.
AT+CGDCONT?
+CGDCONT: 1,"IP","CMNET","                         Query the current PDP format.
IPV4:0.0.0.0",0,0
OK
AT+CGDCONT=?
+CGDCONT: (1-7),(IP,IPV6,IPV4V6,PPP,Non-           Query the value range of the PDP format,
IP),(0-3),(0-4)                                    the number of parameters.
OK
```

3.21 AT+XGAUTH – PDP Authentication

PDP authentication.

Execute this command after AT+CGDCONT. Add this command execution operation into your code when using the internal protocol stack since the PDP authentication is required for the application that uses the private network.

The default user name and password of the China Unicom SIM card is “card” and “card”.

This <cid> parameter corresponds to the <cid> parameter of the +CGDCONT command.

Format

Type	Command	Response
Set	AT+XGAUTH=<cid>,<auth>[,<name>,<pwd>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+XGAUTH=?	<CR><LF>+XGAUTH: (list of supported <cid>),(value range of<auth>),(length of <name>),(length of <pwd>)

<CR><LF>OK<CR><LF>

Parameter

<cid>	(PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition. This <cid> parameter corresponds to the <cid> parameter of the +CGDCONT command.
<auth>	Authentication type 0: NONE 1: PAP (default) 2: CHAP When the PDP authentication typeb is NONE, the command contains the <name> and <pwd> parameters.
<name>	User name
<pwd>	Password

Example

```
AT+XGAUTH=1,1,”gsm”,”1234”                    Set the first PDP authentication.
OK
AT+XGAUTH=?
+XGAUTH: (1-7),(0-2),32,32                    Query the value range of the parameters.
OK
```

3.22 AT+CGATT – Setting GPRS Attach and Detach

To register (attach) the module to, or deregister (detach) the module from, the GPRS service. The setting by this command is not saved after the module is powered off.

If the initial PDP context is supported, the context with <cid>=0 is automatically defined at startup.

Ensure that the GPRS attach is set before the PPP connection is set up.

- It is recommended to add the AT+CGATT? command to your AT command process to query the GPRS status.
- If the module returns 1, set up a PPP connection directly; otherwise, set GPRS attach manually by executing the command AT+CGATT=1.

The query command returns the current GPRS attachment status.

Format

Type	Command	Response
Set	AT+CGATT=<state><CR>	<CR><LF>GPRS DISCONNECTION<CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CGATT?<CR>	<CR><LF>+CGATT: <state> <CR><LF>OK<CR><LF>
Test	AT+CGATT=?<CR>	<CR><LF>+CGATT: (value range of <state>) <CR><LF>OK<CR><LF>

Parameter

<state>	Indicates the state of GPRS attachment: 0: detached 1: attached

Example

```
AT+CGATT=1
OK                                          GPRS is attached successfully.
AT+CGATT=0
OK                                          GPRS is detached successfully.
AT+CGATT=0
GPRS DISCONNECTION                          Send the return value of this command after
                                            AT+XIIC=1 is executed to establish a PPP
                                            connection.
OK
AT+CGATT=0                                  The SERROR is returned because no SIM card is
ERROR                                       inserted.
AT+CGATT?                                   Query the current GPRS status.
+CGATT: 0
OK

AT+CGATT=?                                  Query the valid parameter values for the
+CGATT: (0-1)                               command.
OK
```

3.23 ATE－Enabling/Disabling the Terminal Display

To enable or disable the terminal display function of the AT commands.

The terminal display function is enabled by default.

The setting by this command is not saved after the module is powered off.

Format

Type	Command	Response
Set	ATE[<value>]<CR>	<CR><LF>OK<CR><LF>

Parameter

<value>	Whether to enable the terminal display function of AT commands 0: disabled (default) 1: enable

ATE = ATE0

Example

```
                                        Turn on the terminal display function.
ATE1
OK                                      Send "AT"
AT
OK                                      Serial tool displays "AT" and "OK"

ATE0                                    Turn off the terminal display function.
OK
                                        Send "AT"
OK                                      Serial tools displays only "OK".
```

3.24 ATD*99# – GPRS

To establish the communication between the module and the external PDP network through the PPP protocol.

Ensure that the module is registered with the network (through +CREG) and APN is set (through +CGGCONT) before dialing any number.

Format

Type	Command	Response
Execute	ATD*99#<CR>	<CR><LF>CONNECT<CR><LF>

Parameter

N/A.

Example

```
ATD*99#                                          Start a dial-up connection.
CONNECT                                          Successful
```

3.25 AT+ENPWRSAVE – Enabling or Disabling Sleep Mode

To enable or disable sleep mode. The settings by this command are not saved after the module is powered off.

Sleep mode is triggered by inputting low level at DTR by default.

After this command is sent and low (or high) level is input at DTR, the module can enter sleep mode unless circuit of each part inside the module allows.

Format

Type	Command	Response
Set	AT+ENPWRSAVE=<n>[,<usb>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+ENPWRSAVE?<CR>	<CR><LF>+ENPWRSAVE: <n><usb> <CR><LF>OK<CR><LF>

Parameter

<n>	0: Forbid sleep mode (default). 1: Allow sleep mode (Low level at DTR triggers sleep mode) 2: Allow sleep mode (High level at DTR triggers sleep mode)

<usb> 0: Forbid USB remote wake-up (default)
1: allow USB remote wakeup (the module enters sleep mode only after the USB host suspends the USB. After the USB host resumes the USB bus or there are network DL events (data, SMS, call), the module wakes up the USB host through the USB bus.)

Example

```
AT+ENPWRSAVE=1,1                Set the module to allow sleep mode. Allow USB remote
OK                              wakeup.
AT+ENPWRSAVE?
+ENPWRSAVE: 1,0                 Query current sleep mode status.
OK
```

3.26 AT+SIGNAL－Setting Blinking Status Signal Indicator

To set the different blinking status of the signal indicator.

The default status setting is 7.

If the status is set to 0 to 6, the indicator will be always on when there is an incoming call or SMS in sleep mode.

The settings by this command are saved after the module is powered off. Setting of 8, 9, or 10 are not saved.

Format

Type	Command	Response
Set	AT+SIGNAL=<value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SIGNAL?<CR>	<CR><LF>+SIGNAL: <value> <CR><LF>OK<CR><LF>
Test	AT+SIGNAL=?<CR>	<CR><LF>+SIGNAL: (value range of <value>) <CR><LF>OK<CR><LF>

Parameter

<value> Integer type, ranging from 0 to 11.
0: Blink once every second in normal situation. Being off or on if any abnormality occurs.

1: Blink once every second after the module is connected to the GPRS network. Being off in any other situations.
2: Flash and blink. Flash every 250 ms for the GPRS data service and blink every second in other normal situations.
3: Be on after the GPRS network is connected and blink every second in other situations.
4: Be on after the GPRS network is connected and being off in other situations.
5: Be off if the SIM card cannot be detected after the module is started, blink every second if the SIM card is detected,
and be on after the GPRS network is connected.
6: Four indicator states:
If no SIM card is installed or the SIM card does not register network, the indicator blinks every one second and is on for 0.1 second.
If the SIM card registered network, the indicator blinks every three second and is on for 0.1 second.
If the GPRS network is connected, the indicator blinks every 250 ms and is on for 0.1 second.
The indicator is always on during a call.
7: Four indicator states:
Off: No SIM card, not registered
On: registered network
On for 0.2 second and off for 1.8 second: Obtained the IP address
On for 1.8 second and off for 0.2 second: Connected to the server
8: Be off all the time
9: Be on all the time
10: custom on/off interval, which is defined in <low_interval>/<high_interval>.
Indicator off time, ranging from 10 to 65535, unit: ms
On time, ranging from 10 to 65535, unit: ms
11: Be off all the time: no register network
On for 100 ms and off for 100 ms: searching the network
On for 100 ms and off for 3000 ms: register network
On for 100 ms and off for 300 ms: GPRS network is connected.

Example

```
AT+SIGNAL?                  The current signal indicator status is 2.
+SIGNAL: 2
OK
AT+SIGNAL=3                 Set current signal indicator status to 3.
OK
AT+SIGNAL=100               Incorrect parameter settings, the parameter value is out of
ERROR                       range.
AT+SIGNAL=?                 The available value of the signal indicator status ranges from 0
+SIGNAL: (0-11)             to 7.
OK
```


3.27 AT+CESQ – Extended Signal Quality

To query the extended signal quality.

- If the current registered network is not 2G, <rxlev>, <ber> are 99;
- If 3G is not supported, <rscp>,<ecno> are 255.
- If the current registrated network is not 4G, <rsrq>,<rsrp> are 255.
- If 5G is not supported, <ss_rsrq>, <ss_rsrp>, and <ss_sinr> are not displayed.

For the detailed rule, see the 3GPP TS 27.007 8.69.

- If the current serving cell is not a GERAN cell, <rxlev> and <ber> are set to value 99.
- If the current serving cell is not a UTRA FDD or UTRA TDD cell, <rscp> and <ecno> are set to 255.
- If the current serving cell is not an AUTRA FDD cell, <ecno> is set to 255.
- If the current serving cell is not an E-UTRA cell, <rsrq> and <rsrp> are set to 255.
- If the current serving cell is not an NR cell, <ss_rsrq>, <ss_rsrp> and <ss_sinr> are not displayed.

Format

Type	Command	Response
Execute	AT+CESQ<CR>	<CR><LF>+CESQ: <rxlev>,<ber>,<rscp>,<ecno>, <rsrq>,<rsrp>,<ss_rsrq>,<ss_rsrp>,<ss_sinr> <CR><LF>OK<CR><LF>
Test	AT+CESQ=?<CR>	<CR><LF>+CESQ: (list of supported <rxlev>s),(list of supported <ber>s),(list of supported <rscp>s),(list of supported <ecno>s),(list of supported <rsrq>s),(list of supported <rsrp>s),(list of supported <ss_rsrq>s),(list of supported <ss_rsrp>s),(list of supported <ss_sinr>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<rxlev> integer type, received signal strength level

0	rssi < -110 dBm	
1	-110 dBm	rssi < -109 dBm
2	-109 dBm	rssi < -108 dBm
:	:	
61	-50 dBm	rssi < -49 dBm
62	-49 dBm	rssi < -48 dBm

63 -48 dBm rssi
99 not known or not detectable

<ber> Bit Error Rate (BER):

- 0..7: as the RXQUAL values described in GSM TS 05.08 [25]
- 99: not known or not detectable

<rscp> Received Signal Code Power (RSCP):

- 0 rscp < -120 dBm
- 1 -120 dBm rscp < -119 dBm
- 2 -119 dBm rscp < -118 dBm
  : : : :
- 94 -27 dBm rscp < -26 dBm
- 95 -26 dBm rscp < -25 dBm
- 96 - 25 dBm rscp
- 255 not known or not detectable

<ecno> Ratio of received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133 [84] subclause):

- 0 Ec/Io < -24 dB
- 1 -24 dB Ec/Io < -23.5 dB
- 2 -23.5 dB Ec/Io < -23 dB
  : : : :
- 47 -1 dB Ec/Io < -0.5 dB
- 48 -0.5 dB Ec/Io < 0 dB
- 49 0 dB Ec/Io
- 255 not known or not detectable

<rsrq> Reference Signal Received Quality (RSRQ): When data needs to be sent, RSRQ is recommended to be greater than -10 dB.

- 0 rsrq < -19.5 dB
- 1 -19.5 dB rsrq < -19 dB
- 2 -19 dB rsrq < -18.5 dB
  : : : :
- 32 -4 dB rsrq < -3.5 dB
- 33 -3.5 dB rsrq < -3 dB
- 34 -3 dB rsrq
- 255 not known or not detectable

<rsrp> reference signal received power

- 0 rsrp < -140 dBm
- 1 -140 dBm ≤ rsrp < -139 dBm
- 2 -139 dBm ≤ rsrp < -138 dBm
  : : : :
- 95 -46 dBm ≤ rsrp < -45 dBm
- 96 -45 dBm ≤ rsrp < -44 dBm
- 97 -44 dBm ≤ rsrp
- 255 not known or not detectable

<ss_rsrq> reference signal command (based on synchronization signal)

- 0 ss_rsrq < -43 dB

- 1 -43 dB ≤ ss_rsrq < -42.5 dB
- 2 -42.5 dB ≤ ss_rsrq < -42 dB
  : : : :
- 124 18.5 dB ≤ ss_rsrq < 19 dB
- 125 19 dB ≤ ss_rsrq < 19.5 dB
- 126 19.5 dB ≤ ss_rsrq < 20 dB

<ss_rsrp> reference signal received power (based on synchronization signal)

- 0 ss_rsrp < -156 dBm
- 1 -156 dBm ≤ ss_rsrp < -155 dBm
- 2 -155 dBm ≤ ss_rsrp < -154 dBm
  : : : :
- 125 -32 dBm ≤ ss_rsrp < -31 dBm
- 126 -31 dBm ≤ ss_rsrp
- 255 not known or not detectable

<ss_sinr> signal-to-noise and interference ratio (based on synchronization signal)

- 0 ss_sinr < -23 dB
- 1 -23 dB ≤ ss_sinr < -22.5 dB
- 2 -22.5 dB ≤ ss_sinr < -22 dB
  : : : :
- 125 39 dB ≤ ss_sinr < 39.5 dBm
- 126 39.5 dB ≤ ss_sinr < 40 dB
- 127 40 dB ≤ ss_sinr
- 255 not known or not detectable

Example

```
AT+CESQ                                                    Query the signal quality.
+CESQ: 99,99,255,255,16,47
OK
AT+CESQ=?                                                  Signal display range
+CESQ: (0-62,99),(0-7,99),(255),(255),(0-
34,255),(0-97,255)
OK
```

3.28 AT+NWDNS – Parsing the Domain Name

To query the DNS parsing result after the module establishes a dial-up connection using the internal protocol stack successfully.

Before executing this command, ensure that the dial-up connection is established through the AT+XIIC command successfully.

Ensure that the entered content is correct since its correctness is not verified.

Currently the query command only retrieves the IPv4 address.

Format

Type	Command	Response
Execute	AT+NWDNS=<hostname><CR>	<CR><LF>+NWDNS: <Sign>,<IP><CR><LF> <CR><LF>+NWDNS: <Sign>,<IP><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NWDNS?<CR>	<CR><LF>+NWDNS: <Sign>,<IP><CR><LF> <CR><LF>+NWDNS: <Sign>,<IP><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<hostname>	Hostname, character type, 128 bytes in length at most; double quotation marks are required.
<IP>	IP address, string type
<Sign>	IPv4 or IPv4, string type

Example

```
AT+NWDNS="WWW.BAIDU.COM"          An empty string is returned because there is no IPv6
+NWDNS:                           address.
IPV4,"220.181.112.244"

+NWDNS: IPV6,""

OK
AT+NWDNS="www.google.com"
ERROR                             Querying of the google domain name times out.
AT+NWDNS="www.google.com"         No dialing; the returned value indicates that PDP is not
ERROR                             activated.
AT+NWDNS?
+NWDNS:
IPV4,"220.181.112.244"
                                  Query the obtained IP address.
+NWDNS: IPV6,""

OK
```

4 SMS Commands

4.1 AT+CSMS – Selecting SMS Services

To check the message types supported by the module. There are three message types: mobile-originated SMS messages (SMS-MO), mobile-terminated SMS messages (SMS-MT) and cell broadcast messages (SMS-CB).

Format

Type	Command	Response
Execute	AT+CSMS=<service><CR>	<CR><LF>+CSMS: <mt>,<mo>,<bm><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSMS?<CR>	<CR><LF>+CSMS: <service>,<mt>,<mo>,<bm><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CSMS=?<CR>	<CR><LF>+CSMS: (list of supported <service>s) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<service>	0: GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2 1: GSM 03.40 and 03.41 (the syntax of SMS AT commands is compatible with GSM 07.05 Phase 2+
<mt>,<mo>,<bm>	0: Not support 1: support

The default value is 0,1,1,1.

Example

```
AT+CSMS=1
+CSMS: 1,1,1                          Set SMS service to 1.
OK
AT+CSMS?
+CSMS: 1,1,1,1                        Query the current parameter values.
OK
AT+CSMS=?
+CSMS: (0-1)                          Query the value range of SMS service.
OK
```

4.2 AT+CPMS – Setting Preferred SMS Storage

To set preferred SMS storage.

Format

Type	Command	Response
Execute	AT+CPMS=<mem1>[,<mem2>[,<mem3>]]<CR>	<CR><LF>+CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,<total3><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CPMS?<CR>	<CR><LF>+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>, <mem3>,<used3>,<total3><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CPMS=?<CR>	<CR><LF>+CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s) <CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mem1>	Memory from which SMS messages are read and deleted, string type
<mem2>	Memory to which writing and sending operations are made, string type
<mem3>	memory to which received SMS are preferred to be stored (unless forwarded
"SM":	directly to TE; refer command New Message Indications +CNMI)
"ME":	SIM message storage
"MT":	ME message storage
	any of the storages associated with ME
<mem1>	String type, for example, “SM”, “ME”

	"SM": SIM only "ME": ME only
<used>	number of messages currently in memory.
<total>	total number of message locations in memory.

The received SMS message is stored in SM by default.

Example

```
AT+CPMS="SM"                                                    Set the SMS storage to "SM", that is,
+CPMS: 0,50,0,50,0,50                                           store SMS messages in SIM card.
OK
AT+CPMS?                                                        Query the capacity of current SMS
+CPMS: "SM", 0, 50, "SM", 0, 50,"SM", 0, 50                     storage.
OK
AT+CPMS=?                                                       Query the memory that can be set.
+CPMS:
("ME","SM","MT"),("ME","SM","MT"),("ME","SM","MT")
OK
```

4.3 AT+CMGF – Setting Message Format

Set command tells the MT which input and output format of messages shall be used.

Format

Type	Command	Response
Set	AT+CMGF=[<mode>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CMGF?<CR>	<CR><LF>+CMGF: <mode><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CMGF=?<CR>	<CR><LF>+CMGF: (list of supported <mode>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode>	0: PDU mode (default) 1: text mode

Example

```
AT+CMGF=1                                   Set SMS to text mode.
OK
AT+CMGF?
+CMGF: 1                                    Query the current mode of SMS message input.
OK
AT+CMGF=?
+CMGF: (0-1)                                Query the value range of <mode>.
OK
```

4.4 AT+CSCS – Setting the TE Character Set

To set “TE” character set.

Format

Type	Command	Response
Set	AT+CSCS[=<chest>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSCS?<CR>	<CR><LF>+CSCS: <chset> <CR><LF>OK<CR><LF>
Test	AT+CSCS=?<CR>	<CR><LF>+CSCS: (list of supported <chset>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<chset> "GSM": default GSM alphabet (GSM03.38.6.2.1).
"IRA": international reference alphabet)(ITU-T T.50).
"UCS2":16-bit universal multiple-octet coded character set (USO/IEC10646). UCS2 character strings are
converted to hexadecimal numbers from 0x0000 to 0xFFFF. UCS2 encoding is used only in some character string of the statement; the rest of the commands and responses are still in the IRA alphabet format.
"PCCP936": the same as the GBK encoding format.
"IRA": international reference alphabet) (ITU-T T.50).

The default character set is "PCCP936".

Example

```
AT+CSCS="GSM"                                  Set "TRA" character.
OK
AT+CSCS?
+CSCS: "PCCP936"                               Query the format of current character set.
OK
AT+CSCS=?                                      Query the character set formats that the module
+CSCS:                                         supports.
("GSM","HEX","PCCP936","UCS2")                 A list of character set formats are returned.
OK
```

4.5 AT+CNMI – New Message Indications to TE

To set the mode how the module informs users of new SMS messages received from the network.

Format

Type	Command	Response
Set	AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CNMI?<CR>	<CR><LF>+CNMI: [<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CNMI=?<CR>	<CR><LF>+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<mode> Set the instruction mode after receiving SMS messages.
0: SMS instruction codes can be saved in the buffer of the module. If the TA is full, the old codes can be saved in other place or replaced with new codes.
1: when the module is online, it will discard saved SMS instruction codes and reject new codes. In other situations, the codes are displayed on the end device.
2: when the module is online, the SMS instruction codes are saved in the buffer of the module. After the connection is released, the SMS instruction codes are output through UART. In other situations, codes are directly displayed on the end device.
3: when the module is online, SMS indicator code and other data are transmitted together and the code will be displayed on the device.

<mt> Set the format of the new SMS instruction codes. The default value is 0.

0: SMS instruction codes will not be sent to the end device.
1: The format of the new SMS instruction codes is +CMTI: "MT" ,<index>. The SMS message is stored rather than directly displayed.
2: The format of the new SMS instruction codes is +CMT :
<oa>,<scts>,<tooa>,<lang>,<encod>,<priority>
[,<cbn>],<length><CR><LF><data>(text mode), SMS messages are directly displayed rather than stored.
3: Use the report codes defined by <mt>=2 to transmit SMS instruction codes to the end device. The SMS instruction codes in other modes are the same as that of <mt>=1.

<bm> Set the format of the new cell broadcast codes, default value is 1.
0: not send the instruction information of new cell broadcast. The cell broadcast will not be stored.
2: the format of the new cell broadcast instruction codes is +CBM:
<oa>,[<alpha>,]<scts>[,<tooa>,<length>]
<CR><LF><data> (text mode). The cell broadcast will be directly displayed rather than stored.

<ds> report status of SMS message sending. The default value is 1.
0: no status report of SMS message sending.
1: the format of the SMS sending status report is +CDS:
<fo>,<mr>,[<ra>],[<tora>],<scts>,
<dt>,<st> (text mode).

<bfr> The default value is 0.
0: when <mode> is set to 1 or 2, codes defined by this command and stored in TA will be sent to TE. The module will return OK before transmitting the codes.
1: when <mode> is set to 1 or 2, the codes defined by this command and stored in TA will be cleared.

- The default value is 0, 0, 0, 0, 0;
- The recommended setting is +CNMI: 2,1,0,0,0 (new messages are stored on SIM card rather than displayed directly) or +CNMI: 2,2,0,0,0 (new messages are displayed rather than stored on SIM card).
- SMS message types:
- Class 0: Displayed not stored
- Class 1: Stored in ME
- Class 2: Stored in SIM
- Class 3: Sent to TE

Example

```
AT+CNMI=1,1,0,0,0                          Set the SMS message indication mode.
OK
AT+CNMI=?
+CNMI: (0-3),(0-3),(0,2),(0-1),(0-1)       Query the range of command parameters that can
OK                                         be set.
```

```
AT+CNMI?
+CNMI: 1,1,0,0,0                          Query the current setting of the parameters.
OK
```

4.6 AT+CMGR – Reading SMS Message

To read SMS messages stored in current memory (use the AT+CPMS command to specify the current memory)

If the received message is unread, its status in the storage changes to received read after executing this command.

Format

Type	Command	Response
Execute	AT+CMGR=<index><CR>	TEXT mode (+CMGF=1) • The command is executed successfully and the command belongs to SMS-DELIVER: <CR><LF>+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>, <pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> • The command is executed successfully and the command belongs to SMS-SUBMIT: <CR><LF>+CMGR: <stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>, <dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> • The command is executed successfully and the command belongs to SMS-STATUS REPORT: <CR><LF>+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st> • The command is executed successfully and the command belongs to SMS-COMMAND: <CR><LF>+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>], [<toda>],<length><CR><LF><cdata>] • The command is executed successfully and the command belongs to CBM-STORAGE: <CR><LF>+CMGR: <stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> When PDU mode (+CMGF=0) and the command is

	executed successfully: <CR><LF>+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu> • Failed to execute the command: <CR><LF>ERROR<CR><LF>

Parameter

<index>	location value <index> from preferred message storage <mem1> to the TE. The SMS message CMGR reads is from <mem1>.
<stat>	• TEXT mode “REC UNREAD": received unread "REC UNREAD": received read "STO UNSENT": stored unsent "STO SENT": stored sent • PDU mode 0: received unread 1: received read 2: stored unsent 3: stored sent
<alpha>	String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook.
<length>	The number of octets of the given TP-level data unit (octets that do not contain the service center address)
<pdu>	PDU data

Example

```
AT+CMGR=1                                                          Read the message
+CMGR: "REC READ","66421",,"11/09/13,16: 37: 59+32"                indexed as 1.
050003140401E27778592EA7E7EBE9373C3C279BCF68F59AADC7FED62779BA596
D7EBAEB5B91EBD16A5D46C35F98406A744E311A95C32594DA75688B50EADACA6D
689150EADF1B2BC5E579AD575E5B5582D5EABD5624C36A3D56C375C0E1693CD68
35DB0D9783A15C91D2E06BDAA558AC1F60C52B937CADCD2B747AA9021BDEC627E
8E9441BD42655DEF446
OK

AT+CMGF=0                                                          Set PDU mode.
OK
AT+CSCS="UCS2"
OK

+CMTI: "SM",39
AT+CMGR=39                                                         Incoming SMS.
+CMGR: 0,,23                                                       Read the SMS
0891683110501905F0240BA18177377949F500004130623125032304683 41A0D  message.
OK

AT+CMGF=1                                                          Set the text mode.
```

```
OK
AT+CSCS="GSM"
OK
                                                                    Incoming SMS.
+CMTI: "SM",40                                                      Read the SMS
AT+CMGR=40                                                          message.
+CMGR: "REC UNREAD","18777397945",,"14/03/26,13: 57: 58+32"
hello world
OK
```

4.7 AT+CMGL – SMS Message List

To read SMS messages of one type from the current memory specified by the +CPMS command.

Format

Type	Command	Response
Execute	AT+CMGL[=<stat>]<CR>	TEXT mode (+CMGF=1) • The command is executed successfully SMS-SUBMITs or SMS-DELIVERs: <CR><LF>+CMGL: <index>,<stat>,<oa/da>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF> <data>[<CR><LF>+CMGL: <index>,<stat>,<da/oa>,[<alpha>],[<scts>][,<tooa/toda>,<length>]<CR><LF><data>[...]] • The command is executed successfully and the command belongs to SMS-STATUS-REPORTs: <CR><LF>+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[<CR><LF>+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[...]] • The command is executed successfully and the command belongs to SMS-COMMANDs: <CR><LF>+CMGL: <index>,<stat>,<fo>,<ct>[<CR><LF>+CMGL: index>,<stat>,<fo>,<ct>[...]] • The command is executed successfully and the command belongs to CBM storage: <CR><LF>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><LF><data>[<CR><LF>+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages><CR><

		LF><data>[...]] When PDU mode (+CMGF=0) and the command is executed successfully: <CR><LF>+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[<CR><LF>+CMGL: <index>,<stat>,[<alpha>],<length><CR><LF><pdu>[...]] Failed to execute the command: <CR><LF>ERROR<CR><LF>
Test	AT+CMGL=?<CR>	<CR><LF>+CMGL: (list of supported <stat>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<stat>	String type or numeric type. When AT+CMGF=1: "REC UNREAD": received unread "REC UNREAD": received read "STO UNSENT": stored unsent "STO SENT": stored sent "ALL": all SMS messages When AT+CMGF=0: 0: received unread 1: received read 2: Stored unsent SMS messages 3: Stored sent SMS messages 4: All SMS messages

Example

```
AT+CMGL="ALL"
+CMGL: 1,"REC READ","66421","","2011/09/13 16: 37: 59+32"
050003140401E27778592EA7E7EBE9373C3C279BCF68F59AADC78FED62779BA596D7EBAEB5B91EBD16A5D46C35F
98406A744E311A95C32594DA75688B50EADACA6D689150EADF1B2BC5E579AD575E5B5582D5EABD5624C36A3D56C
375C0E1693CD6835DB0D9783A15C91D2E06BDAA558AC1F60C52B937CADCD2B747AA9021BDEC627E8E9441BD4265
5DEF446
+CMGL: 14,"STO SENT","66045","",
050003010401E27778592EA7E7EBE9373C3C279BCF68F59AADC78FED62779BA596D7EBAEB5B91EBD16A5D46C35F
98406A744E311A95C32594DA75688B50EADACA6D689150EADF1B2BC5E579AD575E5B5582D5EABD5624C36A3D56C
375C0E1693CD6835DB0D9783A15C91D2E06BDAA558AC1F60C52B937CADCD2B747AA9021BDEC627E8E9441BD4265
5DEF446
+CMGL: 44,"REC UNREAD","8615719556937","","2011/09/30 03: 00: 55+32"
5E7F4E1C79FB52A863D0919260A8003A4E2D536B752862370031003500370031003900350035003600390033003
77ED960A86765753500326B21002C6700540E4E006B21572800320039002F00300039002000320030003A003400
38002C60A853EF6309901A8BDD952E621690099879952E76F463A556DE62E8
OK
```

```
AT+CMGL=?                                                    Query in text format (AT+CMGF=1).
+CMGL: ("REC UNREAD", "REC READ", "STO UNSENT",
"STO SENT", "ALL")
OK
AT+CMGL=?                                                    Query in PDU format (AT+CMGF=0).
+CMGL: (0-4)
OK
AT+CMGL=ALL                                                  A pair of quotation marks ("") is
ERROR                                                        required for the parameter.
AT+CMGF=1
OK
AT+CMGL=4                                                    The parameter should be set to 0.
ERROR
AT+CMGF=0
OK
AT+CMGL="ALL"                                                The parameter should be set to 1.
ERROR
```

4.8 AT+CMGS – Sending SMS Messages

To send an SMS message from the module to the network. The network will return reference value <mr> to the module after the SMS message is sent successfully.

Format

Type	Command	Response
Execute	Text mode: AT+CMGS=<da>[,<toda>]<CR>text is entered<Ctrl+Z/ESC> PDU mode: AT+CMGS=<length><CR>PDU is given<Ctrl+Z/ESC>	Sent successfully in Text mode: <CR><LF>+CMGS: <mr>[,<scts>]<CR><LF> <CR><LF>OK<CR><LF> Sent successfully in PDU mode: <CR><LF>+CMGS: <mr>[,<ackpdu>]<CR><LF> <CR><LF>OK<CR><LF> Failed to execute the command: <CR><LF>ERROR<CR><LF>

Parameter

<da>	The destination number of the SMS messages.
<text>	SMS message content in text mode.
<length>	the byte length of the SMS message content in PDU mode.
<mr>	Message reference number
<CR>	end character.
<Ctrl+Z>	indicates the end of the input message, ➔ in the example.
<ESC>	indicates giving up the input message.

<scts>	Service center time stamp
<ackpdu>	GPP 23.040 RP-User-Data element of RP-ACK PDU

Example

```
AT+CMGS="66358"                                                    Text mode(+CMGF=1)
> This is the text→                                                "→" is the symbol after
+CMGS: 171                                                         pressing Ctrl+Z.
OK

AT+CMGS="15889758493"                                              AT+CMGF=1 might not be executed.
> This is the text→
ERROR
AT+CMGS=33                                                         PDU mode(+CMGF=0)
>0891683108705505F001000B815118784271F20008146DF15733
5E025B9D5B89533A59276D6A80545EFA→
+CMGS: 119
OK
```

4.9 AT+CMGW – Writing SMS Messages

To write an SMS message into the memory. The location information <index> will be returned after the message is saved correctly.

Format

Type	Command	Response
Execute	• Text mode: AT+CMGW[=<oa/da>[,<tooa/toda>[,<stat>]]]<CR>text is entered<Ctrl+Z/ESC> • PDU mode: AT+CMGW=<length>[,<stat>]<CR>PDU is given<Ctrl+Z/ESC>	<CR><LF>+CMGW: <index><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<da>	The destination number of the SMS messages.
<text>	SMS message content in text mode.
<length>	the byte length of the SMS message content in PDU mode.
<index>	Location information
<CR>	end character.
<Ctrl+Z>	indicates the end of the input message, → in the example.

<ESC> indicates giving up the input message.

If you use the serial-port commissioning tool to send PDU SMS, please press the carriage return character manually after the AT+CMGS command, or send <CR> in hexadecimal.

Example

```
AT+CMGW="091137880"                                                    TEXT mode (+CMGF=1).
>This is the text<Ctrl+Z>
+CMGW: 15
OK

                                                                       the number in text mode
AT+CMGW=091137880                                                      must be enclosed with
ERROR                                                                  double quotation marks.

AT+CMGW=31
>                                                                      PDU mode (+CMGF=0)
0891683108705505F001000B813124248536F30008120040002600 2A53
5A53D153A653C1532052C7<Ctrl+Z>
+CMGW: 1
OK
```

4.10 AT+CMSS – Sending Messages from Storage

To send an SMS message specified by <index> in the memory (SMS-SUBMIT).
The network returns reference value <mr> to the end device after the SMS message is sent successfully.

Format

Type	Command	Response
Execute	AT+CMSS=<index>[,<da>[,<toda>]]<CR>	Sent successfully in Text mode: <CR><LF>+CMSS: <mr>[,<scts>]<CR><LF> <CR><LF>OK<CR><LF> Sent successfully in PDU mode: <CR><LF>+CMSS: <mr>[,<ackpdu>]<CR><LF> <CR><LF>OK<CR><LF> Failed to execute the command: <CR><LF>ERROR<CR><LF>

Parameter

<index>	Indicates message location
<da>	The destination number of the SMS messages.
<toda>	Type of address
<mr>	Message reference number
<scts>	Service center time stamp
<ackpdu>	3GPP 23.040 RP-User-Data element of RP-ACK PDU

Example

```
AT+CMSS=2
+CMSS: <mr>          Send the SMS messages stored in memory 2.
OK
AT+CMSS=2            No SMS message is stored in memory 2 or the SMS message number in
ERROR                memory 2 is incorrect.
```

4.11 AT+CMGD – Deleting SMS Messages

To delete SMS messages from the current memory.

Format

Type	Command	Response
Execute	AT+CMGD=<index>[,<delflag>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+CMGD=?<CR>	<CR><LF>+CMGD: (list of supported <index>s, list of supported <delflag>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<index>	The recording number of the stored SMS messages.
<delflag>	Integer type 0: delete the SMS messages with the specified recording numbers. 1: delete all read SMS messages. 2: delete all read and sent SMS messages. 3: delete all read, sent, and unsent SMS messages. 4: delete all messages.

If the <delflag> parameter has been set, the <index> parameter will be ignored.

Example

```
AT+CMGD=0,3                    Delete all read, sent, and unsent SMS messages.
OK                             Deleted successfully.
AT+CMGD=?
+CMGD:(1-40),(0-4)             Query the value ranges of parameters.
OK
AT+CMGD=5
ERROR                          The 5th message does not exist.
```

4.12 AT+CSCA – Service Center Address

To set the SMSC address. N715 does not supports this command while in CDMA mode.

Format

Type	Command	Response
Set	AT+CSCA=<sca>[,<tosca>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSCA?<CR>	<CR><LF>+CSCA: <sca>,<tosca><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<sca>	SC address, string with double quotes.
<tosca>	The format of the SMS center number. 129 indicates national number. 145 indicates international number.

Example

```
AT+CSCA="+8613800755500",145
OK                             Set an international SMSC address.
AT+CSCA?
+CSCA: "+8613800755500",145    Query the SMSC address.
OK
```

4.13 AT+CSMP – Setting Text Mode Parameters

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

Format

Type	Command	Response
Set	AT+CSMP[=<fo>[,<vp>[,<pid>[,<dcs>]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSMP?<CR>	<CR><LF>+CSMP: <fo>,<vp>,<pid>,<dcs><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<fo> depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER SMSSUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format.

<vp>

value	validity period
0-143	(vp+1)*5mins, 12 hours at most
144-167	12hours +((vp–143)*30mins), 24 hours at most
168-196	(vp–166)*1day
197-255	(vp-192)*1week

<pid> TP-Protocol-Identifier in integer format (default 0)

<dcs> Cell Broadcast Data Coding Scheme in integer format (default 0).

The default value is 17,167,0,0.

Example

```
AT+CSMP=17,167,0,0          Set the text mode parameters to 17,167,0,0.
OK                          No status report; the validity period of the information is 24
                            hours; Only messages in text format can be sent.
AT+CSMP?                    Query the current settings of the text mode.
```

```
+CSMP: 17,167,0,0
OK
```

4.14 AT+CSDH – Showing Text Mode Parameters

To control whether detailed header information is shown in text mode result codes. This command is valid in text mode, which can be set by AT+CMGF=1.

Format

Type	Command	Response
Set	AT+CSDH[=<show>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSDH?<CR>	<CR><LF>+CSDH: <show><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CSDH=?<CR>	<CR><LF>+CSDH: (list of supported <show>s)<CR><LF> <CR><LF>OK<CR><LF>

Parameter

<show>	0: not display (default) 1: display

Example

```
AT+CSDH=0
OK
AT+CMGR=0
+CMGR: "RECREAD","13510895077",,"15/07/23,20: 58:
28
+32"
abc
OK
AT+CSDH=1
OK
AT+CMGR=0
+CMGR: "RECREAD","13510895077",,"15/07/23,20: 58:
28
+32",161,36,0,0,"+8613010888500",145,3
abc
OK
```

Set the header information to not display.
Read the 0th message.

Set the detailed header information to display.
Read the 0th message.

```
AT+CSDH?                                    Query the current parameter
+CSDH: 0                                    setting of the command.
OK
AT+CSDH=?                                   Query the value range of parameter
+CSDH: (0-1)                                in the command.
OK
```

5 TCP/UDP Client Commands

5.1 AT+NETAPN – Setting Network APN

To set the network APN.

Format

Type	Command	Response
Set	AT+NETAPN="APN","username","password"<CR>	<CR><LF>OK<CR><LF>
Query	AT+NETAPN?<CR>	<CR><LF>+NETAPN: "APN","username","password" <CR><LF>OK<CR><LF>

Parameter

APN	GPRS network access point
username	GPRS user name
password	GPRS password

Example

```
AT+NETAPN="CMNET","",""          Set GPRS APN to CMNET and leave user account and
OK                               password blank.
AT+NETAPN=CMNET,,                A pair of quotation marks is required for each
ERROR                            parameter.
AT+NETAPN?
+NETAPN:"","",""                 Query the current settings of APN parameter.
OK
```

5.2 AT+XIIC – Setting up a PPP Link

To set up a PPP link.

Format

Type	Command	Response
Execute	AT+XIIC=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+XIIC?<CR>	<CR><LF>+XIIC: <state>,<ip> <CR><LF>OK<CR><LF>

Parameter

<n>	0: Disconnect the PPP link 1: Activate the PPP link.
<state>	0: PPP connection is closed. 1: PPP connection is activated.
<ip>	IP address

Example

```
AT+XIIC=1                          Set up the first PPP link.
OK
AT+XIIC?                           The PPP link is set up successfully and the IP
+XIIC:1,10.107.216.162             address is 10.107.216.162.
OK                                 There are four spaces before 1.
AT+XIIC?
+XIIC:0,0.0.0.0                    The PPP link is not set up successfully.
OK                                 There are four spaces before 0.
```

- Before executing this command, use the AT+CGDCONT command to set the parameters including <APN>.
- Ensure that the module registers the network before using the AT+XIIC=1 command to set up PPP link. Use AT+GREG? to check whether the module registers the network or not. If +CREG: 0,1 or +CREG: 0,5 is returned, the module did not register to the network.

5.3 AT+TCPSETUP – Setting up a TCP Connection

To set up a TCP connection.

Format

Type	Command	Response
Execute	AT+TCPSETUP=<n>,<ip>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
URC	+TCPSETUP: 0,<result>	

Parameter

<n>	Socket ID, ranging from 0 to 5.
<ip>	destination IP address, in form of xx.xx.xx.xx or www.xxxxxx.com (domain name with or without quotation marks).
<port>	Destination port ID in decimal ASCII code.
<result>	Result code OK FAIL

Example

```
AT+TCPSETUP=0,220.199.66.56,6800
OK

+TCPSETUP: 0,OK
```
Set up a connection to 220.199.66.56,6800 on socket 0.
Successful

```
AT+TCPSETUP=0,neowayjsr.oicp.net,60010
OK

+TCPSETUP: 0,OK
```
Set up a connection to neowayjsr.oicp.net,60010 on socket 0.

```
+TCPCLOSE: 0,Link Closed
```
Set up a connection to neowayjsr.oicp.net, 60010 on socket 0.
The socket is closed.

```
AT+TCPSETUP=1,192.168.20.6,7000
OK

+TCPSETUP: 1,FAIL
```
Failed to set up a connection to 192.168.20.6,7000 on socket 1. The server may be not started; the IP address or the port number may be incorrect; the SIM card fee may be overdue.

```
AT+TCPSETUP=0,neowayjsr.oicp.net,60010
+TCPSETUP: 0, ERROR1
```
A TCP/UDP connection has been set up on socket 0.

```
AT+TCPSETUP=6,192.168.20.6,7000
+TCPSETUP: ERROR
```
Parameters are set incorrectly.

```
AT+TCPSETUP=0.58.60.184.213.10012
+TCPSETUP: ERROR
```
Parameters are set incorrectly.

```
AT+TCPSET=0,58.60.184.213,10012
ERROR
```
The AT command is not complete.

5.4 AT+TCPSEND－Sending TCP Data

To send TCP data.

This command support data sending in command mode and buffer mode as well as in ASCII and HEX format. The module will return > after this command is sent. Send UDP data 50 ms to 100 ms later.

The mode setting is not saved. Set it before sending data.

- Ensure that a TCP connection has been set up before sending TCP data.
- Run AT+IPSTATUS to check the buffer size before sending data.
- When ASCII data in command mode is required to be sent, length of the <content> parameter must be less than or equal to 1024 bytes.
- To send data containing more than 15 commas, use buffer mode.

Format

Type	Command	Response
Execute	AT+TCPSEND=<n>,<length>[[,<content>][,mode]]<CR>	<CR><LF>><content> <CR><LF>OK<CR><LF> Or <CR><LF>OK<CR><LF> Or <CR><LF>+TCPSEND: ERROR<CR><LF> Or <CR><LF>+TCPSEND: <n>, OPERATION EXPIRED<CR><LF> Or <CR><LF>+TCPSEND: SOCKET ID OPEN FAILED<CR><LF> Or <CR><LF>+TCPSEND: DATA LENGTH ERROR<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5. A TCP connection is established on the socket.
<length>	Length of the data to be sent, unit: byte. 1 to 4096 for ASCII data sent in buffer mode.

	1 to 2018 for HEX data sent in buffer mode. 1 to 512 for data sent in command mode (HEX). 1 to 512 for data sent in command mode (ASCII).
<content>	data sent in command mode with a length ranging from 0 to 1024.
<mode>	data format 0: ASCII (default) 1: HEX

Example

```
AT+TCPSEND=0,1
>
OK                                  Send 1-byte data on socket 0.
                                    Successful

+TCPSEND: 0,1
AT+TCPSEND=0,1024,,1                Send 1024-byte data in hexadecimal format in buffer
>                                   mode.
OK

+TCPSEND: 0,1024                    Successful
AT+TCPSEND=0,6,"123459"
OK                                  Command mode (Only plain text can be sent, not special
                                    symbols.)
+TCPSEND: 0,6
AT+TCPSEND=0,3,”313233”,1           Send data in hexadecimal format in command mode.
OK

                                    Successfully
+TCPSEND: 0,3
AT+TCPSEND=0,10                     No data is input within 30 seconds after > is
>                                   displayed.
+TCPSEND: 0,OPERATION EXPIRED
AT+TCPSEND=0,1                      One-byte data fails to be sent on socket 0 because the
+TCPSEND: SOCKET ID OPEN            socket is not opened.
FAILED
AT+TCPSEND=0,4097                   4097-byte data fails to be sent on socket 0 because
+TCPSEND: DATA LENGTH ERROR         data length exceeds the limit.
```

5.5 AT+RECVMODE – Setting Receive Mode

To set the receive mode of TCP and UDP data. The setting by this command is not saved after the module is powered off.

Do not send this command during communication because it will clear the buffer. This command also works for UDP data.

Format

Type	Command	Response
Set	AT+RECVMODE=<n>[,<mode>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+RECVMODE?<CR>	<CR><LF>+RECVMODE: <n>,<mode> <CR><LF>OK<CR><LF>
Test	AT+RECVMODE=?<CR>	<CR><LF>+RECVMODE: (list of supported <n>s), (list of supported <mode>s) <CR><LF>OK<CR><LF>

Parameter

<n>	receive mode 0: buffer the TCP or UDP data received and sending command to read the data by MCU is required. 1: print the TCP or UDP data received to UART directly (default).
<mode>	report format 0: ASCII report (default). 1: Hexadecimal

Example

```
AT+RECVMODE=0                                   Set the receive mode to 0.
OK
AT+RECVMODE=1,1                                 Print data and report data in HEX format.
OK
AT+RECVMODE=?                                   Query the value range can be set.
+RECVMODE: (0-1),(0-1)
OK
```

5.6 +TCPRECV – URC Notifying Data Received from Server

To notify TCP data received from the TCP server.

Format

Type	Command
URC	+TCPRECV: <n>,<length>,<data><CR>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	Length of the data received.
<data>	data received, end with 0x0d 0x0a; users can determine the end according to the <message_len>.

Example

```
+TCPRECV: 0,10,1234567890          10-byte data is successfully received on socket 0.
                                   The data is 1234567890.
```

5.7 A+TCPREAD – Reading TCP Data

To read TCP data.

Format

Type	Command	Response
Execute	AT+TCPREAD=<n>,<length><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	maximum length of data allowed to read, ranging from 1 to 2048.

Example

```
+TCPRECV: 0                        RECVMODE=0
AT+TCPREAD=0,100                   Data received on socket 0.
+TCPREAD: 0,10,1234567890          Read data.
OK                                 The data read is 1234567890.
```

The receive mode is set by the +RECVMODE command.

5.8 AT+TCPCLOSE – Closing the TCP Connection

To close the TCP connection.

Format

Type	Command	Response
Execute	AT+TCPCLOSE=<n><CR>	<CR><LF>+TCPCLOSE: <n>,OK<CR><LF> Or <CR><LF>+TCPCLOSE: ERROR<CR><LF>
URC	+TCPCLOSE:0,Link Closed	

Parameter

<n> socket ID, ranging from 0 to 5.

Example

```
AT+TCPCLOSE=1                    Close the TCP connection on socket 1.
+TCPCLOSE: 1,OK                  Successfully.
AT+TCPCLOSE=2                    Socket number error
+TCPCLOSE: ERROR
+TCPCLOSE: 0,Link Closed          The TCP connection is closed.
                                 The server sends closing command or the network
                                 encounters abnormality or weak signals.
```

5.9 AT+UDPSETUP – Setting up a UDP Connection

To set up a UDP connection.

Use the AT+XIIC=1 command to set up a PPP link before running this command.

Format

Type	Command	Response
Execute	AT+UDPSETUP=<n>,<ip>,<port><CR>	<CR><LF>OK<CR><LF>

	<CR><LF>+UDPSETUP: <n>,<result><CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+UDPSETUP: ERROR<CR><LF>

- If the parameter is incorrect, +UDPSETUP: ERROR is prompted.
- If the socket ID is used, for example, socket 0, +UDPSETUP: 0,ERROR1 is prompted.

Parameter

<n>	Socket ID, ranging from 0 to 5.
<ip>	destination IP address, in form of xx.xx.xx.xx or www.xxxxxx.com (domain name)
<port>	Destination port ID in decimal ASCII code.
<result>	Result codes OK FAIL ERROR1: a connection is already set up on the socket.

Example

```
AT+UDPSETUP=1,220.199.66.56,7000
OK                                          Set up a connection to 220.199.66.56,7000
                                            Successfully

+UDPSETUP: 1,OK
AT+UDPSETUP=0,neowayjsr.oicp.net,60010      Set up a connection to neowayjsr.oicp.net,60010 on
OK                                          socket 0
                                            Successfully
+UDPSETUP: 0,OK
AT+UDPSETUP=0,58.60.184.213,11008           A TCP/UDP connection is set up on socket 0.
+UDPSETUP: 0, ERROR1
AT+UDPSETUP=1,192.168.20.6,7000
OK                                          Failed to set up a connection to 192.168.20.6,7000

+UDPSETUP: 1,FAIL

AT+UDPSETUP=6,192.168.20.6,6800             Socket number error
+UDPSETUP: ERROR
AT+UDPSETUP=0.58.60.184.213.10012           The punctuations in the command are incorrect.
+UDPSETUP: ERROR
AT+UDPSET=0,58.60.184.213,10012             The AT command is not complete.
ERROR
```

5.10 AT+UDPSEND – Sending UDP Data

To send UDP data.

Ensure that the UDP link is set up before sending UDP data. Set it when sending data. In Buffer mode, the module will return > after this command is sent. Send UDP data 50 ms to 100 ms later.

- In buffer mode, at most 2048 bytes can be sent in HEX format and at most 4096 bytes can be sent in ASCII format.
- To decrease the packet loss rate, do not send data more than 1472 bytes each time.
- For how to send quotation marks and backslash in command mode, see the Example.
- The mode parameter can be omitted. Data in ASCII format supports escape mode by default.
- When ASCII data in command mode is required to be sent, length of the <content> parameter must be less than or equal to 102 bytes.

Format

Type	Command	Response
Execute	AT+UDPSEND=<n>,<length>[[,<content>][,mode]]<CR>	<CR><LF>> <CR><LF>OK<CR><LF> <CR><LF>+UDPSEND: <n>,<length> Or <CR><LF>+UDPSEND: <n>,OPERATION EXPIRED<CR><LF> Or <CR><LF>+UDPSEND: DATA LENGTH ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5. A UDP connection is established on the socket.
<length>	Length of the data to be sent, unit: byte. 1 to 2018 for HEX data sent in buffer mode. 1 to 4096 for ASCII data sent in buffer mode. 1 to 512 for data sent in command mode (HEX). 1 to 512 for data sent in command mode (ASCII).
<content>	data sent in command mode, ranging from 0 to 1024. To send data containing more than 15 commas, use buffer mode.
<mode>	data format 0: ASCII 1: HEX

Example

```
AT+UDPSEND =0,1024,,1
>                                       Send 1024-byte data in hexadecimal format in buffer
OK                                      mode.

+UDPSEND: 0,1024                        Successfully
AT+UDPSEND=0,10,"DEGHHRFRRD",0
                                        In command mode, send data in ASCII mode.
OK
                                        Successfully
+UDPSEND: 0,10
AT+UDPSEND=0,4097                       4097-byte data fails to be sent on socket 0 because
+UDPSEND: DATA LENGTH ERROR             data length exceeds the limit.
AT+UDPSEND=1,6,”313233343536”,1
OK                                      Send data in hexadecimal format in command mode.

+UDPSEND: 0,6                           Successfully
AT+UDPSEND=0,10                         After the data sending command is input and > is
>                                       returned, no more data is entered in 30 seconds. Then
+UDPSEND: 0,OPERATION EXPIRED           the expiration information is displayed.
```

5.11 +UDPRECV – Receiving UDP Data

To indicate that UDP data has been received.

Format

Type	Command
URC	+UDPRECV: <n>,<length>[,<data>]<CR>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	Length of the data received.
<data>	data received. Add 0x0d 0x0a to the end of the data. You can identify the end based on <length>.

Example

```
+UDPRECV: 0,10,1234567890           10-byte of data is received on socket 0. The data is 1234567890.
```

5.12 AT+UDPREAD – Reading UDP Data

To read UDP data. Executing the +RECVMODE command to select the receive mode is required.

Format

Type	Command	Response
Execute	AT+UDPREAD=<n>[,<length>]<CR>	<CR><LF>+UDPREAD: <n>,<length>,<data> <CR><LF>OK<CR><LF> Or <CR><LF>+UDPREAD:SOCKET ID OPEN FAILED<CR><LF> Or <CR><LF>+UDPREAD: ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	maximum length of data allowed to read, ranging from 1 to 1024.
<data>	UDP data read

Example

```
+UDPRECV: 0
AT+UDPREAD=0,100
+UDPREAD: 0,10,1234567890
OK
AT+UDPREAD=1,100
+UDPREAD: SOCKET ID OPEN FAILED
AT+UDPREAD=0,0
+UDPREAD: ERROR
```

```
Data received on socket 0.
Read data.
The data read is 1234567890.

No connection is set up on socket 1.

Parameters are set incorrectly.
```

5.13 AT+UDPCLOSE – Closing UDP Link

To close the UDP connection.

Format

Type	Command	Response
Execute	AT+UDPCLOSE=<n><CR>	<CR><LF>+UDPCLOSE: <n>,OK<CR><LF> Or

	<CR><LF>+UDPCLOSE: ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.

Example

```
AT+UDPCLOSE=1                          The TCP link on socket 1 is closed successfully.
+UDPCLOSE: 1,OK
AT+UDPCLOSE=6
+UDPCLOSE: ERROR                       Socket number error
```

5.14 AT+IPSTATUS－Querying the Transparent TCP/UDP Socket Status

To query the transparent TCP/UDP socket status.

Due to the characteristic of UDP, this command only queries whether a link has been established by the command, and does not represent the true status of the link.

Format

Type	Command	Response
Execute	AT+IPSTATUS=<n><CR>	<CR><LF>+IPSTATUS: <n>,<CONNECT or DISCONNECT >[,<TCP or UDP>,<send-buffer-size>] <CR><LF>OK<CR><LF> Or <CR><LF>+IPSTATUS: 1,DISCONNECT<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<STATUS>	Socket type, value: CONNECT or DISCONNECT.
<CONNECT or DISCONNECT>	Socket type, value: CONNECT or DISCONNECT; CONNECTING or DISCONNECTING
<TCP or UDP>	socket type, value: TCP or UDP
<send-buffer-size>	The size of the available send buffer on the module, in decimal ASCII mode. Unit: byte.

Example

```
AT+IPSTATUS=0                          A TCP connection is set up on socket 0 and the buffer
+IPSTATUS: 0,CONNECT,TCP,4096          size is 4096 bytes.
AT+IPSTATUS=0                          Currently the UDP connection is only established on
+IPSTATUS: 0,CONNECT,UDP,0             socket 0.
AT+IPSTATUS=1
+IPSTATUS: 1,DISCONNECT                No TCP or UDP connection is set up on socket 1.
AT+IPSTATU
ERROR                                  The AT command is not complete.
AT+IPSTATUS=6
ERROR                                  The socket number in the command is incorrect.
```

Querying of the <send-buffer-size> parameter is not supported on the UDP link.

5.15 AT+TCPACK – Querying Status of Data Sent by TCP Socket

To query the size of data successfully sent by the TCP server and the size of the data successfully received.

Format

Type	Command	Response
Execute	AT+TCPACK<CR>	<CR><LF>+TCPACK: <n>,<data_sent>,<acked_recv><CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+TCPACK: <n>,DISCONNECT<CR><LF> Or <CR><LF>+TCPACK: NO TCP LINK<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<data_sent>	Size of data successfully sent through this socket, unsigned 64-bit integer in decimal ASCII. Unit: byte
<acked_recv>	Size of data acknowledged by the receiver, unsigned 64-bit integer in decimal ASCII. Unit: byte

Example

```
AT+TCPACK=0                          20-byte data is transmitted from socket 0 and
+TCPACK: 0,20,20                     the receiver acknowledges 20-byte data.
AT+TCPACK=0                          128-byte data is transmitted from socket 0 and
+TCPACK: 0,128,120                   the receiver acknowledges 120-byte data.
AT+TCPACK=1
+TCPACK: 1,DISCONNECT                No connection is set up on socket 1.
AT+TCPACK=2
+TCPACK: NO TCP LINK                 A UDP connection  is set up on socket 2.
AT+TCPACK=6
ERROR                                The socket number in the command is incorrect.
```

5.16 AT+DNSSERVER – Setting DNS Server

To set primary and secondary DNS servers.

In general, you do not have to set DNS server, which will be issued by base station during PPP negotiation.

Format

Type	Command	Response
Set	AT+DNSSERVER=<n>,<dns-ip><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+DNSSERVER?<CR>	<CR><LF>+DNSSERVER: dns1:<dns-ip1>;dns2: <dns-ip2><CR><LF>

Parameter

<n>	DNS server number 1: primary DNS server 2: secondary DNS server
<dns-ip>	IP address of the DNS server.

Example

```
AT+DNSSERVER=1,114.114.114.114                  Set the DNS.
OK
AT+DNSSERVER?
+DNSSERVER: dns1:114.114.114.114;dns2:0.0.0.0   Query the DNS.
```

5.17 AT+PDPKEEPALIVE – Setting PDP Keepalive Heartbeat

To set PDP keepalive heartbeat.

Set up a PPP connection before setting the domain name parameters.

Activate PDP before sending this command.

Format

Type	Command	Response
Set	AT+PDPKEEPALIVE=<onoff>,<inerval><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+PDPKEEPALIVE?<CR>	<CR><LF>+CMEE: <n> <CR><LF>OK<CR><LF>

Parameter

<onoff>	Heartbeat switch 0: disable (default) 1: enable
<inerval>	Heartbeat interval, unit:s, ranging from 1 to 65535.

Example

```
AT+PDPKEEPALIVE?                Query the heartbeat setting.
+PDPKEEPALIVE: 1,5
OK
AT+PDPKEEPALIVE=1,60            Enable the heartbeat function; set its interval to 60s.
OK
```

5.18 AT+PDPSTATUS – Querying PDP Status

To query the status of PDP.

The status is returned immediately if PDP keepalive heartbeat is enabled.

If PDP keepalive heartbeat is disabled, the status is returned after a delay (200 ms to 10000 ms, depending on network conditions).

Format

Type	Command	Response
Execute	AT+PDPSTATUS<CR>	<CR><LF>+PDPSTATUS: <status><CR><LF>

Parameter

<status>	CONNET DISCONNECT PSEUDO_CONNECT

Example

```
AT+PDPSTATUS                                PDP connected
+PDPSTATUS: CONNECT
AT+PDPSTATUS                                PDP disconnected
+PDPSTATUS: DISCONNECT
AT+PDPSTATUS                                PDP activated, but in pseudo_connect state
+PDPSTATUS: PSEUDO_CONNECT
```

5.19 AT+TCPKEEPALIVE – Setting TCP Keepalive Heartbeat

To set the TCP keepalive heartbeat.

The settings by this command are not saved after the module is powered off. Execute this command before setting up a TCP connection. It is valid for all connections. DO NOT send it after establishing a TCP connection.

This function consumes data traffic.

Format

Type	Command	Response
Set	AT+TCPKEEPALIVE=<mode>[,<time>[,<interval>[,<keepcount>]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+TCPKEEPALIVE? <CR>	<CR><LF>+TCPKEEPALIVE:

		<mode>,<time>,<interval>,<keepcount> <CR><LF>OK<CR><LF>
Test	AT+TCPKEEPALIVE=?<CR>	<CR><LF>+TCPKEEPALIVE: (range of supported <mode>),(range of supported <time>),(range of supported <interval>),(range of supported <keepcount>) <CR><LF>OK<CR><LF>

Parameter

<mode>	0: disable 1: enabled
<time>	Interval for which the TCP is idle before the module sends the KEEPALIVE packet to the remote server. A value between 30 seconds to 7200 seconds is recommended and the default value is 120 seconds.
<interval>	Interval for the module to resend the KEEPALIVE packet since it sends last time and does not receive response. The value ranges from 1s to 1800s, and the default value is 75s.
<keepcount>	Count of retransmissions, ranging from 1 to 15, and the default value is 9.

- The <time> for sending heartbeat packets varies with the network environment. Set <time> according to the network environment. If the value of < time> is too large, the terminal may have a false connection, and the <interval> time exceeds <time> will not be resent; if the values of <time> and <interval> are too short, the terminal may disconnect due to the hibernation mechanism of the module air port. If the interval is too short and multiple heartbeat packets are sent during the hibernation period, the heartbeat packets will be sent out together after waking up. The receiving side thinks that the sticky packet data is invalid and does not reply to the acknowledgement message, and if the terminal does not receive the acknowledgement message several times, it thinks that the connection is invalid and disconnects actively.
- Recommended ranges:
  <time>: 120 - 300s
  <interval>: 40 - 100s

Example

```
AT+TCPKEEPALIVE=1                          Enable the KEEPALIVE function.
OK

AT+TCPKEEPALIVE=1,120,75,9                 Enable and set the KEEPALIVE parameters.
OK
AT+TCPKEEPALIVE=0                          Disable the KEEPALIVE function.
OK
```

```
AT+TCPKEEPALIVE?                                    Query the setting of the KEEPALIVE
+TCPKEEPALIVE: 1,120,75,9                           parameters.
OK
AT+TCPKEEPALIVE=?
+TCPKEEPALIVE: (0-1),(30-7200),(1-
1800),(0-15)
OK
```

6 TCP Server Commands

6.1 AT+TCPLISTEN – Setting TCP Listening for the Server

To set the TCP listening function of the server.

Format

Type	Command	Response
Set	AT+TCPLISTEN=<port><CR>	<CR><LF>+TCPLISTEN: <socket>,OK Or <CR><LF>+TCPLISTEN: <status><CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+TCPLISTEN?<CR>	<CR><LF>+TCPLISTEN: <status><CR><LF>

Parameter

<port>	Port ID
<socket>	Socket ID
<status>	Listening… bind error not listening listening status

Example

```
AT+TCPLISTEN=6800                       Listening port ID: 6800
+TCPLISTEN: 0,OK                        The server starts to listen.
AT+TCPLISTEN=6800                       Listening port ID: 6800
+TCPLISTEN: bind error                  The server fails to bind.
AT+TCPLISTEN=6800
+TCPLISTEN: Listening...                Transparent listening is set already.
AT+TCPLISTEN?                           Query the listening status. Here the server is in the
+TCPLISTEN: listening status            listening status.
AT+TCPLISTEN?                           Query the listening status. Here the server is not in
+TCPLISTEN: not listening               the listening status.
```

```
Connect                                  Receive the connection request from the client.
AcceptSocket=1,ClientAddr=119.123.77.133 AcceptSocket indicates the socket ID on the module,
,ClientPort=8000                         and 119.123.77.133 is the IP address of the client.
```

6.2 AT+CLOSELISTEN – Closing Listening Socket

To close the socket connection.

Format

Type	Command	Response
Execute	AT+CLOSELISTEN<CR>	<CR><LF>+CLOSELISTEN: <socket_id>,local link closed
URC	+CLOSELISTEN:<socket_id>,local link closed	

Parameter

<socket_id> Socket ID

Example

```
    +CLOSELISTEN: 0,local link          The host closes the socket or network abnormalities
    closed                              occur.
    AT+CLOSELISTEN
    +CLOSELISTEN: 0,local link          The connections to client are closed.
    closed
    AT+CLOSELISTEN
    +CLOSECLIENT: All remote link
    closed
                                        The connections to client are closed.
    +CLOSELISTEN: 0,local link
    closed
    AT+TCPSRVTRANS?
    +TCPSRVTRANS: not listening         Failed to close the connection since there is no a
    AT+CLOSELISTEN                      listening socket.
    ERROR
```

6.3 AT+CLOSECLIENT – Closing Remote Socket

To close remote sockets.

Format

Type	Command	Response
Execute	AT+CLOSECLIENT[=<socket>]<CR>	<CR><LF>+CLOSECLIENT: <socket>,remote link closed<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+CLOSECLIENT: All remote link closed<CR><LF>

Parameter

<socket>	Socket ID

Example

```
AT+CLOSECLIENT
+CLOSECLIENT: 1,remote link closed          There is no parameter in this command. Remote
                                           sockets are closed successfully.
+CLOSECLIENT: 2,remote link closed
AT+CLOSECLIENT=1                           The command contains parameters. One remote socket
+CLOSECLIENT: 1,remote link closed         is closed successfully.
AT+CLOSECLIENT=1
                                           No client connected to socket 1.
ERROR
AT+CLOSECLIENT
                                           All clients are closed.
+CLOSECLIENT: All remote link closed
```

6.4 +TCPRECV(S) – Receiving Data from the Client

To indicate data received from the client.

Format

Type	Command
URC	+TCPRECV(S): <n>,<length>,<data><CR>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	Length of the data received.

<data>	data received. Add 0x0d 0x0a to the end of the data. Identify the end based on <length>.

Example

```
+TCPRECV(S): 1,10,1234567899        Socket 1 receives 10-byte data in character format from the
                                    client.
```

Additional (s) makes this command different from the receive mode of the client mode in format.

Note that the parameters are different from that of the client mode.

6.5 AT+TCPREADS – Reading TCP Data from the Client

To read TCP data from the client.

Format

Type	Command	Response
Execute	AT+TCPREADS=<n>,<length><CR>	<CR><LF> +TCPREADS:<n>,<length>,<content> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	maximum length of data allowed to read, ranging from 1 to 2048.
<content>	data read

Example

```
+TCPRECV(S): 1                      RECVMODE=0
AT+TCPREADS=1,100                   Socket 1 receives 10-byte data in character format from the
+TCPREADS: 1,10,1234567890          client.
OK
```

6.6 AT+TCPSENDS－Sending Data to the Client

To send data to the client.

Ensure that a TCP connection has been set up before sending TCP data.

Format

Type	Command	Response
Execute	AT+TCPSENDS=<socket>[,<length>]<CR>	<CR><LF>> <CR><LF>OK<CR><LF> <CR><LF>+TCPSENDS:<socket>[,<length>]<CR><LF> Or <CR><LF>> <CR><LF>+TCPSENDS: Buffer not enough,439<CR><LF> Or <CR><LF>+TCPSENDS: <socket> is not link<CR><LF> Or <CR><LF>+TCPSENDS: <socket>, OPERATION EXPIRED<CR><LF>

Parameter

<socket>	Value of AcceptSocket, that is, the socket of the module. See the description of the AT+TCPLISTEN command.
<length>	Length of the data to be sent, ranging from 1 to 4096, unit: byte.

Example

```
AT+TCPSENDS=0,10
>                                   Send 10-byte data on socket 0.
OK                                  (E.g.: 1234567890).

+TCPSENDS: 0,10
AT+TCPSENDS=0
>                                   Send 21-byte data on socket 0.
OK                                  (E.g.: 012345678901234567890).
                                    The command ends with Ctrl+Z if no data length is contained.
+TCPSENDS: 0,21                     The data length should not exceed 4096 bytes.
AT+TCPSENDS=0,5
>                                   No data is input within 30 seconds after > is displayed.
+TCPSENDS: 0,OPERATION
EXPIRED
```

6.7 AT+CLIENTSTATUS – Querying Client Connection Status

To query the connection status of the client.

Format

Type	Command	Response
Execute	AT+CLIENTSTATUS=<cid><CR>	<CR><LF>+CLIENTSTATUS: <socket>,<CONNECTor DISCONNECT>,<TCP orINVALID>, <send-buffer-size><CR><LF>

Parameter

<channel>	Value of AcceptSocket, that is, the socket of the module. See the description of the AT+TCPLISTEN command.
<CONNECT or DISCONNECT>	Socket type, value: CONNECT or DISCONNECT.
<TCP or INVALID>	Socket type, value: TCP or INVALID.
<send-buffer-size>	The size of the available send buffer on the module, in decimal ASCII mode. Unit: byte.

If the socket is invalid, it may be the listen socket of TCP/UDP client or server.

Example

```
AT+CLIENTSTATUS=0                          A TCP connection to the client has been set up on
+CLIENTSTATUS: 0,CONNECT,TCP,61440         the socket 0 and the buffer size is 61440 bytes.
AT+CLIENTSTATUS=4                          No connection is set up on socket 4.
+CLIENTSTATUS: 4,DISCONNECT
AT+CLIENTSTATUS=1                          Type of the connection on socket 1 is invalid. It
+CLIENTSTATUS: 1,CONNECT,INVALID           is not a TCP connection.
```

6.8 AT+TCPACKS – Querying Status of Data Sent by TCP Server

To query the size of data successfully sent and received over the TCP connection.

Format

Type	Command	Response
Execute	AT+TCPACKS=<socket><CR>	<CR><LF>+TCPACKS: <socket>,<data_sent>,<acked_recv> Or <CR><LF>+TCPACKS: <socket>,<DISCONNECT> Or <CR><LF>ERROR<CR><LF>

Parameter

<socket>	Value of AcceptSocket detected, that is, the socket used by the server to establish a connection with the module. It ranges from 0 to 5.
<data_sent>	Size of data successfully sent to the client.
<acked_recv>	Size of data acknowledged by the client.

The values of <data_sent> and <acked_recv> are unsigned 64-bit integers in decimal ASCII. The unit is byte.

Example

```
AT+TCPACKS=0                  The module sends 20-byte data to client through socket 0 and the
+TCPACKS: 0,20,20             client acknowledges 20-byte data.
AT+TCPACKS=0                  The module sends 128-byte data to client through socket 0 and the
+TCPACKS:0,128,120            client acknowledges 120-byte data.
AT+TCPACKS=1                  No connection is set up on socket 1.
+TCPACKS: 1,DISCONNECT
AT+TCPACKS=6                  The socket ID is incorrect.
ERROR
```

7 TCP/UDP Transparent Commands

7.1 AT+TCPTRANS – Setting up a Transparent TCP Connection

To set up a transparent TCP connection.

- The UART does not display the data transmitted to the server after the transparent TCP connection is set up successfully.
- Use +++ to switch the server to the command mode and ATO to switch it to the data mode.
- Do not establish non-transparent data services when using the transparent command, since the transparent command conflicts with other non-transparent data services.
- The module exits from the transparent connection if a call or message is incoming.
- At most 2048-byte data can be sent or received per packet in transparent mode.
- To make the settings take effect, <cfgt> and <cfgp> are required to be set simultaneously.
- TCP data can be transparently transmitted after the TCP connection is set up successfully and +TCPTRANS:OK is returned.

Format

Type	Command	Response
Set	AT+TCPTRANS=<ip>,<port>[,<cfgt>,cfgp]<CR>	<CR><LF>OK<CR><LF> <CR><LF>+TCPTRANS:<result><CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<ip>	destination IP address, in form of xx.xx.xx.xx or www.xxxxxx.com (domain name with or without quotation marks).
<port>	Destination port ID in decimal ASCII code.
<cfgt>	Time to wait per packet sent, ranging from 1 to 65535, 100 by default, unit:ms.

<cfgp>	Threshold value of data packet to be transmitted, ranging from 1 to 2048. The default value is 2048.
<result>	Result codes OK FAIL

Example

```
AT+TCPTRANS=neowayjsr.oicp.net,60010
OK

+TCPTRANS:OK
AT+TCPTRANS=220.199.66.56,6800
OK

+TCPTRANS:FAIL

AT+TCPTRANS=220.199.66.56,6800
ERROR

AT+TCPTRANS=220.199.66.56,
+TCPTRANS:ERROR
+TCPTRANS: Link Closed
```

```
Set up a connection to neowayjsr.oicp.net,
60010.
Successfully.

Set up a connection to neowayjsr.oicp.net, 6800.
Failed, because the port number 6800 is out of
range.

ERROR is returned after the command is executed
because a transparent (TCP, UDP, TCP server)
connection is already set up.

The command format is incorrect.

The connection is closed passively.
```

7.2 AT+UDPTRANS – Setting up a Transparent UDP Connection

To set up a transparent UDP connection.

- The UART does not display the data transmitted to the server after the transparent UDP connection is set up successfully.
- Use +++ to switch the server to the command mode and ATO to switch it to the data mode.
- Do not establish non-transparent data services when using the transparent command, since the transparent command conflicts with other non-transparent data services.
- The module exits from the transparent connection if a call or message is incoming.
- At most 2048-byte data can be sent or received per packet in transparent mode.
- To make the settings take effect, <cfgt> and <cfgp> are required to be set simultaneously.
- UDP data can be transparently transmitted after the UDP connection is set up successfully and +UDPTRANS:OK is returned.

Format

Type	Command	Response
Set	AT+UDPTRANS=<ip>,<port>[,<cfgt>,cfgp]<CR>	<CR><LF>OK<CR><LF> <CR><LF>+UDPTRANS:<result><CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<ip>	destination IP address, in form of xx.xx.xx.xx or www.xxxxxx.com (domain name with or without quotation marks).
<port>	Destination port ID in decimal ASCII code.
<cfgt>	Time to wait per packet sent, ranging from 1 to 65535, 100 by default, unit:ms.
<cfgp>	Threshold value of data packet to be transmitted, ranging from 1 to 2048. The default value is 2048.
<ip>	destination IP address, in form of xx.xx.xx.xx or www.xxxxxx.com (domain name with or without quotation marks).
<result>	Result codes OK FAIL

Example

```
AT+UDPTRANS=220.199.66.56,6800
OK

+UDPTRANS: OK
AT+UDPTRANS=neowayjsr.oicp.net,60010
OK

+UDPTRANS:OK
AT+UDPTRANS=220.199.66.56,
ERROR

AT+UDPTRANS=220.199.66.56,6800
+UDPTRANS: ERROR
```

```
Set up a transparent UDP connection.

Successfully.

Set up a transparent UDP connection by using
domain name
Successfully.

The command format is incorrect.

ERROR is returned after the command is executed
because a transparent (TCP, UDP, TCP server)
connection is already set up.
```

7.3 AT+TCPACK－Querying of Data Transmitted Status

To query the size of data successfully sent and received over the transparent TCP connection.

Format

Type	Command	Response
Execute	AT+TCPACK<CR>	<CR><LF>+TCPACK:<data_sent>,<acked_recv><CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+TCPACK: DISCONNECT<CR><LF> Or <CR><LF>+TCPACK: NO TCP LINK<CR><LF>

Parameter

<data_send>	Size of data successfully sent transparently through this socket, unsigned 64-bit integer in decimal ASCII. Unit: byte
<acked_recv>	Size of data successfully acknowledged transparently by the receiver, unsigned 64-bit integer in decimal ASCII. Unit: byte

Example

```
AT+TCPACK                       1024-byte data is transmitted from socket 0 and the receiver
+TCPACK: 1024,1024              acknowledges 1024-byte data.
AT+TCPACK
+TCPACK: DISCONNECT             No transparent connection is set up.
AT+TCPACK
+TCPACK: NO TCP LINK            Only a transparent UDP connection is established.
```

7.4 AT+IPSTATUS – Querying the TCP/UDP Socket Status

To query the transparent TCP/UDP socket status.

Format

Type	Command	Response
Execute	AT+IPSTATUS<CR>	<CR><LF>+IPSTATUS:<state>[,<type>,<send-buffer-size>]<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<state>	Connection status CONNECT DISCONNECT CONNECTING DISCONNECTING
<type>	Connection type (optional) TCP UDP
<send-buffer-size>	The size of the available send buffer on the module, in decimal ASCII mode. Unit: byte. (Optional)

Example

```
AT+IPSTATU                                  The AT command is not complete.
ERROR
AT+IPSTATUS                                 The transparent TCP connection is set up, and the
+IPSTATUS:CONNECT,TCP,61440                 available buffer size is 61440 bytes.
AT+IPSTATUS                                 A transparent UDP connection is established, and
+IPSTATUS:CONNECT,UDP,61440                 the available buffer size is 61440 bytes.
AT+IPSTATUS
+IPSTATUS:DISCONNECT                        No transparent connection is set up.
```

7.5 AT+TRANSCLOSE – Closing the Transparent Connection

To close the transparent transmission connection.

Format

Type	Command	Response
Execute	AT+TRANSCLOSE<CR>	<CR><LF>+TRANSCLOSE:<n>,OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+UDPTRANS:Link Closed Or <CR><LF>+TCPTRANS:Link Closed

Parameter

<n>	0: actively close the transparent TCP connection. 1: proactively close the transparent UDP connection.

Example

```
AT+TRANSCLOSE                       Actively close the transparent TCP connection.
+TRANSCLOSE: 0,OK
AT+TRANSCLOSE                       Fail to set up a transparent TCP/UDP connection.
ERROR

AT+TRANSCLOSE                       Proactively close the transparent UDP connection.
+TRANSCLOSE: 0,OK                   Successful
+TCPTRANS:Link Closed               The transparent TCP connection is closed passively.
+UDPTRANS:Link Closed               The transparent UDP connection is closed passively.
```

8 TCP Transparent Transmission Server Commands

8.1 AT+TCPSRVTRANS – Setting Listening for Transparent TCP

To set transparent listening for the TCP server.

A connection must be set up between the server and the client through a socket before the server transparently transmits TCP data.

Use +++ to switch the server to the command mode and ATO to switch it to the data mode.

Only the SIM cards with fixed IP addresses can be used as servers.

Do not establish non-transparent data services when using the transparent command, since the transparent command conflicts with other non-transparent data services.

The server set up in transparent mode can be connected to only one TCP client (transparent mode or non-transparent mode).

To make the settings take effect, <cfgt> and <cfgp> are required to be set simultaneously.

The module will automatically disconnect from the client if a call or message is incoming.

Format

Type	Command	Response
Set	AT+TCPSRVTRANS=<port>[[,<cfgt>][,cfgp]]<CR>	<CR><LF>+TCPSRVTRANS:<status><CR><LF>
Query	AT+TCPSRVTRANS?<CR>	<CR><LF>+TCPSRVTRANS:<status><CR><LF>

Parameter

<port>	Port ID
<cfgt>	Time to wait per packet sent, ranging from 1 to 65535, 500 by default, unit:ms.
<cfgp>	Threshold value of data packet to be transmitted, ranging from 1 to 2048. The default value is 2048.

<status>	Listening… bind error not listening listening status OK GPRS DISCONNECTION

Example

```
AT+TCPSRVTRANS=6800
+TCPSRVTRANS: OK

AT+TCPSRVTRANS=6800
+TCPSRVTRANS:bind error
AT+TCPSRVTRANS=6800
+TCPSRVTRANS:Listening...

AT+TCPSRVTRANS?
+TCPSRVTRANS:listening status

AT+TCPSRVTRANS?
+TCPSRVTRANS:not listening

AT+TCPSRVTRANS=5000
+TCPSRVTRANS:GPRS DISCONNECTION
Connect
AcceptSocket=1,ClientAddr=119.123.77.133,ClientPort=8000

Receive the connection request from the client.
AcceptSocket indicates the socket ID on the module, and
119.123.77.133 is the IP address of the client.
```

```
Listening port ID: 6800
The transparent listening of
the TCP server is started.

The server fails to bind.

Transparent listening is set
already.
Query the listening status.
Here the server is in the
listening status.
Query the listening status.
Here the server is not in
the listening status.

PDP is not activated
```

8.2 AT+CLIENTSTATUS – Querying the Status of the Transparent Client Connection

To query the status of the transparent connection to the client.

Format

Type	Command	Response
Execute	AT+CLIENTSTATUS<CR>	<CR><LF>+CLIENTSTATUS: <state>,<type>, <send-buffer-size><CR><LF>

Parameter

<state>	Connection status CONNECT DISCONNECT
<type>	Connection type TCP
<send-buffer-size>	The size of the available send buffer on the module, in decimal ASCII mode. Unit: byte.

Example

```
AT+CLIENTSTATUS                          The transparent TCP connection is set up, and
+CLIENTSTATUS: CONNECT,TCP,61440         the available buffer size is 61440 bytes.
AT+CLIENTSTATUS
+CLIENTSTATUS:DISCONNECT,TCP,            The transparent TCP connection is not set up,
61440                                    and the available buffer size is 61440 bytes.
```

9 FTP Commands

9.1 AT+FTPSCFG – Configuring FTPS Parameter

To configure SSL encryption options

Format

Type	Command	Response
Set	AT+FTPSCFG=<type>,<type_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+FTPSCFG?<CR>	<CR><LF>+FTPSCFG:<sslversion>,<authmode>, <cacert>,<clientcert>,<clientkey> <CR><LF>OK<CR><LF>
Test	AT+FTPSCFG=?<CR>	<CR><LF>+FTPSCFG:<type>,<type_name> <CR><LF>OK<CR><LF>

Parameter

<type>	SSL options **sslversion**: SSL version **authmode**: authentication mode **ciphersuite**: Cipher suite **cacert**: CA certificate **clientcert**: Client certificate **clientkey**: Client key
<type_name>	setting of SSL sslversion: 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 Authmode: **0**: No authentication **1**: Manage server authentication

2: Manage server and client authentication if requested by the remote server
Cacert: string type, CA certificate
Clientcert: string type, client certificate
Clientkey: string type, client key

If **authmode** is set to **0**, you do not have to set **cacert**, **clientcert**, or **clientkey**.

Exemple

```
AT+FTPSCFG="sslversion",0                    Set the SSL version to ssl3.0.
OK
AT+FTPSCFG="authmode",0                      Set no authentication.
OK
AT+FTPSCFG="cacert",ca.pem                   Set the name of the CA certificate (the
OK                                           certificate needs to be added in
                                             advance.)
AT+FTPSCFG?
+FTPSCFG: 0,1,ca.pem,cc.pem,ck.pem           Query current SSL settings.
OK
AT+FTPSCFG =?
+FTPSCFG: <type>,<type_name>                 Query the value range of the parameter.
OK
```

9.2 AT+FTPLOGIN – Logging in to the FTP Server

To log in to the FTP server.

- The FTP functions can be used together with the internal protocol stack TCP/UDP function.
- Before performing the FTP operation, you need to log in to the FTP server.
- The FTP function is in passive mode by default.

Format

Type	Command	Response
Execute	AT+FTPLOGIN=<ip>,<port>,<user>,<pwd>[,<ftpmode>]<CR>	<CR><LF>OK<CR><LF> <CR><LF>+FTPLOGIN: <result> Or <CR><LF>OK<CR><LF> <CR><LF>+FTP: Server Control Link

		Disconnect<CR><LF> Or <CR><LF>ERROR<CR><LF>
URC	+FTPLOGIN:<result>	

Parameter

<ip>	IP address of the FTP server.
<port>	Port number of the FTP server; generally it is 21.
<user>	User name used to log in to the FTP server. Its length cannot be larger than 100 ASCII codes and it cannot contains any comma.
<pwd>	Password used to log in to the FTP server. Its length cannot be larger than 100 ASCII codes and it cannot contains a comma.
<ftpmode>	FTP mode: 0: PASV (passive mode, default) 1: PORT (active mode)
<result>	Result codes **Have Logged In**: The user has logged in to the FTP server. **AT Busy**: Last FTP AT command has not been executed completely. **User logged in**: The user logs in to the FTP server successfully. **530 Not logged in**: The user fails to log in to the FTP server because the user account or password is incorrect. **GPRS DISCONNECTION**: The user logged in to the FTP server before a PPP link is set up.

Example

```
AT+FTPLOGIN=219.134.179.52,21,user1,pwd2009
OK                                                  Log in to the server.

+FTPLOGIN: User logged in
AT+FTPLOGIN=183.239.240.40,12150,pp,123
OK                                                  Fail to log in to the server; the user
                                                    account or password is incorrect.
+FTPLOGIN: 530 Not logged in
AT+FTPLOGIN=58.60.184.213,21,neoway,neoway
OK
                                                    Failed to log in to the FTP server.
+FTPLOGIN: FAIL
+FTP:Server Control Link Disconnect                  The FTP control link closes.
+FTP: Server Data Link Disconnect                    The FTP data link closes.
```


9.3 AT+FTPLOGOUT – Logging Out from the FTP Server

To log out from the FTP server.

Format

Type	Command	Response
Execute	AT+FTPLOGOUT<CR>	<CR><LF>+FTPLOGOUT:User logged out <CR><LF>OK<CR><LF> Or <CR><LF>+CME ERROR: INVALID SOCKET ID<CR><LF> <CR><LF>ERROR<CR><LF>

Example

```
AT+FTPLOGOUT
+FTPLOGOUT:User logged out          Exit from the FTP server.
OK
AT+FTPLOGOUT
+CME ERROR: INVALID SOCKET ID       Log out of the FTP server because the FTP server is
                                    offline.
ERROR
```

9.4 AT+FTPGET – Downloading Data from the FTP Server

To download data from the FTP server.

Format

Type	Command	Response
Execute	AT+FTPGET=<dir&filename>,<type>,<Content or Info>[,offset[,lenth]] <CR>	<CR><LF>+FTPGET: Error Not Login<CR><LF> Or <CR><LF>+FTPGET: Error TimeOut<CR><LF> Or <CR><LF>+FTPGET: <length>,<data><CR><LF> Or <CR><LF>+FTPGET: OK.total length is <n><CR><LF> Or <CR><LF>ERROR<CR><LF>

URC	+FTPSTATE: <result>

Parameter

<dir&filename>	Path and name of the file to be read. The file path is relative to the FTP root path.
<type>	File transmission mode 1: ASCII 2: Binary
<Content or Info>	File content or file (or specified directory) information 1: Obtain the file content 2: Obtain the information of the file or the specified path
<offset>	Specifies offset of file content.
<lenth>	Length of file downloaded from the start point, ranging from 1 to 8192
<length>	Data length
<data>	Data content
<n>	The module reads data successfully and the data length is n.

Example

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

+FTPGET:446,drw-rw-rw-   1 user
group       0 Apr 14 15:55 .
drw-rw-rw-   1 user    group
0 Apr 14 15:55 ..
-rw-rw-rw-   1 user    group
1238528 Jan 14 10:36 1M.doc
-rw-rw-rw-   1 user    group
10 Jan 15 15:01 test.txt
+FTPGET: OK.total length is 446                  Obtain information under the root directory.

+FTP:Server Data Link Disconnect
AT+FTPGET=test.txt,1,2
OK

+FTPGET:65,-rw-rw-rw-   1 user
group    10 Jan 15 15:01 test.txt
+FTPGET:OK.total length is 65                    Obtain information of test.txt.

+FTP:Server Data Link Disconnect
AT+FTPGET=123.txt,1,1
+FTPGET: File Not Found                          The file is inexistent.
AT+FTPPUT=test.txt,1,2,10
>                                                10-byte data is successfully uploaded.
+FTPPUT: OK,10
AT+FTPGET=test.txt,1,1
+FTPGET:10,0123456789                            Read all data.
+FTPGET: OK.total length is 10
```

```
+FTP:Server Data Link Disconnect
AT+FTPGET=test.txt,1,1,2
+FTPGET:8,23456789
+FTPGET:OK.total length is 8                    Offset 2 bytes, read all data after the third byte.

+FTP:Server Data Link Disconnect
AT+FTPGET=test.txt,1,1,2,4
+FTPGET:4,2345
+FTPGET:OK.total length is 4                    Offset 2 bytes, read 4-byte data after the third byte.
```

9.5 AT+FTPPUT – Uploading Data to the FTP Server

To upload data to the FTP Server.

Format

Type	Command	Response
Execute	AT+FTPPUT=<filename>,<type>,<mode>[,<size>]<CR>	In non-transparent mode <CR><LF>+FTPPUT: OK,<size><CR><LF> In transparent mode: <CR><LF>CONNECT <CR><LF>+FTPPUT: OK,<size><CR><LF> Or <CR><LF>+FTPPUT:Error Not Login<CR><LF> Or <CR><LF>+FTPPUT:AT Busy<CR><LF> Or <CR><LF>+FTPPUT:SIZE Error (non-transparent mode) Or <CR><LF>+FTPPUT:OK,<n><CR><LF> Or <CR><LF>+FTPPUT:Delete File OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

- In transparent mode, after data is transmitted completely, you can execute +++ (excluding <CR><LF>) to end the upload process.
- Executing +++ (excluding <CR><LF>) can end the upload process anytime.

Parameter

<filename>	Name of the file to be uploaded. The file path is relative to the FTP root path.
<type>	File transmission mode 1: ASCII 2: Binary
<mode>	Operating mode 1: STOR mode Create a file in the server and write data into the file; if the file exists already, overwriting the original file. 2: APPE mode Create a file in the server and write data into the file; if the file exists already, write the data at the end of the file. 3: DELE mode Delete a file.
<size>	Data length, ranging from 1 to 8192. Transparent mode is used if this parameter is omitted.
<n>	Length of the file sent.

- **+FTPPUT: AT Busy**: Last FTP-related AT command has not been executed completely.
- Executing +++ (excluding <CR><LF>) to exit from transparent mode and end the uploading.
- If the file you upload over a connection in transparent mode is large, the port will be occupied all the time that affects the sending and receiving of other commands. So, it is recommended to transmit files in buffer mode; when you need to send large files, use APPE mode to send them in segment.

Example

```
AT+FTPPUT=test.txt,1,1,10                Upload the 10-byte test.txt file in ASCII mode and the
> 1234567890                             operation is
+FTPPUT:OK,10                            in STOR mode.

AT+FTPPUT=test.txt,1,2,10                Upload the 10-byte test.txt file in ASCII mode and the
> 1234567890                             operation is
+FTPPUT:OK,10                            in APPE mode.

AT+FTPPUT=test.txt,1,3,0                 Delete the test.txt file.
+FTPPUT:Delete File OK
AT+FTPPUT=test.txt,1,1
CONNECT                                  Transparent mode, upload the 10-byte test.txt file in ASCII
1234567890                               mode and the operation is in STOR mode.
+FTPPUT:OK,10
AT+FTPPUT=test.txt,1,2
CONNECT                                  Transparent mode, upload the 10-byte test.txt file in ASCII
1234567890                               mode and the operation is in APPE mode.
+FTPPUT:OK,10
AT+FTPPUT=test.txt,1,3
+FTPPUT:Delete File OK                   Transparent mode; delete the test.txt file.
```

9.6 AT+FTPSIZE – Obtaining the FTP File Size

To obtain the size of the specified file on the FTP server.

Format

Type	Command	Response
Execute	AT+FTPSIZE=<filename><CR>	<CR><LF>+FTPSIZE: <size> <CR><LF>OK<CR><LF> Or <CR><LF>+FTPSIZE: File Not Found<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<filename>	Name of the file to be uploaded.
<size>	The actual file size

Example

```
AT+TPSIZE=test_500k.txt
+FTPSIZE: 512000                          The file size is 512000 bytes.
OK
AT+FTPSIZE=test.txt
+FTPSIZE: File Not Found                  The queried file is inexistent.
AT+FTPSIZE=test_500.txt,100
ERROR                                     The format of the AT command is incorrect
```

9.7 AT+FTPSTATUS – Querying the FTP Connection Status

To query the FTP connection status.

Format

Type	Command	Response
Execute	AT+FTPSTATUS<CR>	<CR><LF>+FTPSTATUS: <status>,<ip>,<port><CR><LF>

Parameter

<status>	0: FTP connection is not set up. 1: FTP connection is set up.
<ip>	IP address of the FTP server.
<port>	Port number of the FTP server.

Example

```
AT+FTPSTATUS                              Query the FTP link status.
+FTPSTATUS:1,119.139.221.66,21            Set up an FTP link, and display the IP address
                                          and port ID of the server.
AT+FTPSTATUS                              Query the FTP link status.
+FTPSTATUS:0,0.0.0.0,21                   The FTP connection is not set up yet.
```

9.8 AT+FILEFTPGET – Downloading Files to the File System

To download files to the file system. Offset download is supported.

In the download process, ensure that the file system has sufficient free space. You can run the AT+FSLS command to query the size of the free space.

Before download, run the +FTPLOGIN command to set up an FTP link.

After download, run the +FTPLOGOUT command to close the FTP link.

Format

Type	Command	Response
Execute	AT+FILEFTPGET=<dir&filename>[,<offset>[,<length>]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+FILEFTPGET?<CR>	<CR><LF>OK<CR><LF>
Test	AT+FILEFTPGET=?<CR>	<CR><LF>OK<CR><LF>

Parameter

<dir&filename>	Path and name of the file to be read(Note: The file path is relative to the FTP root path.)
<offset>	Offset of the file content, ranging from 0 to 2097152

<length>	Length in bytes of the file content that is read. The value ranges from 1 to 20480. If <offset> and <lenth> are not specified, the entire file is downloaded.

Example

```
AT+FILEFTPGET=text.txt                  Download the text.txt file. The command is executed
OK                                      successfully, and download starts.

+FILEFTPSTAT:1,1024                     Download is completed. The length of the file content is
                                        1024.
AT+FILEFTPGET=text.txt,1,2              Download the text.txt file. The command is executed
OK                                      successfully, and download starts.

+FILEFTPSTAT:1,2                        Download is completed. The length of the file content is
                                        2.
AT+FILEFTPGET=text.txt                  Download the text.txt file. The command is executed
OK                                      successfully, and download starts.
```

9.9 AT+FILEFTPPUT – Uploading Files to the FTP Server

To upload a file to the file system.

Before uploading a file, ensure that the file exists.

You can query the local file list by the AT+FSLIST? command.

"OK" or "ERROR" is prompted within 300 ms after a command execution. But the process of getting upload result is asynchronous and its response time depends on the size of the uploaded file and the network condition.

Format

Type	Command	Response
Execute	AT+FILEFTPPUT=<filename>[,<offset>[,<length>]]<CR>	<CR><CF>OK<CR><CF> <CR><LF>+FILEFTPSTAT:<result>,<len><CR><LF> Or <CR><CF>ERROR<CR><CF>

Parameter

<filename>	Name of the file to be uploaded
<offset>	File offset, ranging from 0 to 2097152.

<length>	Length of the file to be uploaded, ranging from 1 to 8192.
<result>	Upload result 0: failed 1: successful
<len>	Length of the uploaded file.

Example

```
AT+FILEFTPPUT="test.txt"                    Upload  the test.txt file to the FTP server.
OK

                                            The file has been uploaded successfully.
+FILEFTPSTAT: 1,51000
AT+FILEFTPPUT="test.bin"
OK                                          Failed to upload the test.bin file. 1024-byte data has
                                            been uploaded.
+FILEFTPSTAT: 0,1024

AT+FILEFTPPUT="1111"                        Failed to upload the file since the file does not
ERROR                                       exist, the parameters are incorrect, or the module
                                            does not log in to the FTP server.
AT+FILEFTPPUT=test.txt,100,100
OK                                          The file offset is 100.

+FILEFTPSTAT: 1,100
```

9.10 AT+NWFTPRENAME – Renaming the FTP Server File or Folder

To rename the FTP server file or file folder.

Format

Type	Command	Response
Execute	AT+NWFTPRENAME=<old_name>,<new_name><CR>	<CR><LF>OK<CR><LF> <CR><LF>+NWFTPRENAME: <err>,<protocol_error><CR><LF> Or <CR><LF>ERROR<CR><LF> <CR><LF>+NWFTPRENAME: <err>,<protocol_error><CR><LF>

Parameter

<old_name>	String character type.

	Old name of the file or file folder in the FTP(S) server (directory supported). 255 bytes at most.
<new_name>	New name of the file or file folder of the FTP(S) folder (directory supported). 255 bytes at most.
<err>	0 indicates successful execution Another value: failed execution For details, see Appendix D .
<protocol_error>	Integer type Original error codes of the FTP(S) server. These error codes are defined in FTP(S) protocol; they are only for reference. For details, see Appendix E . 0 indicates invalid.

Example

```
AT+NWFTPRENAME="old_name.txt","new_name.txt"                    Modify the FTP file name.
OK

+NWFTPRENAME: 0,200
AT+NWFTPRENAME="test/old_test.txt","test/new_test.txt"
OK                                                              Modify the name of the file
                                                                under the test directory in
+NWFTPRENAME: 0,200                                             the FTP server.
AT+NWFTPRENAME="test_old_dir","test_new_dir"                    Modify the FTP folder name.
OK

+NWFTPRENAME: 0,200
```

9.11 AT+NWFTPMKDIR – Creating an FTP Server Folder

To create a folder in the FTP server

Format

Type	Command	Response
Execute	AT+NWFTPMKDIR=<folder_name><CR>	<CR><LF>OK<CR><LF> <CR><LF>+NWFTPMKDIR: <err>,<protocol_error><CR><LF> Or <CR><LF>ERROR<CR><LF> <CR><LF>+NWFTPMKDIR: <err>,<protocol_error><CR><LF>

Parameter

<folder_name>	Character string type, name of the folder in the FTP server. 255 bytes at most.
<err>	0 indicates successful execution Another value: failed execution For details, see Appendix D .
<protocol_error>	Integer type Original error codes of the FTP(S) server. These error codes are defined in FTP(S) protocol; they are only for reference. For details, see Appendix E . 0 indicates invalid.

Example

```
AT+NWFTPMKDIR="test_dir"                    Create a folder in the FTP server
OK

+NWFTPMKDIR: 0,200
```

9.12 AT+NWFTPRMDIR – Deleting an FTP Server Folder

To delete a folder in the FTP server.

Format

Type	Command	Response
Execute	AT+NWFTPRMDIR=<folder_name><CR>	<CR><LF>OK<CR><LF> <CR><LF>+NWFTPRMDIR: <err>,<protocol_error><CR><LF> Or <CR><LF>ERROR<CR><LF> <CR><LF>+NWFTPRMDIR: <err>,<protocol_error><CR><LF>

Parameter

<folder_name>	Character string type, name of the folder in the FTP server. 255 bytes at most.
<err>	0 indicates successful execution Another value: failed execution For details, see Appendix D .
<protocol_error>	Integer type Original error codes of the FTP(S) server.

These error codes are defined in FTP(S) protocol; they are only for reference. For details, see Appendix E . 0 indicates invalid.

Exemple

```
AT+NWFTPRMDIR="test_dir"                    Delete a folder in the FTP server
OK

+NWFTPRMDIR: 0,200
```

9.13 AT+NWFTPDEL –Deleting an FTP Server File

To delete a file in the FTP server.

Format

Type	Command	Response
Execute	AT+NWFTPDEL=<file_name><CR>	<CR><LF>OK<CR><LF> <CR><LF>+NWFTPDEL: <err>,<protocol_error><CR><LF> Or <CR><LF>ERROR<CR><LF> <CR><LF>+NWFTPDEL: <err>,<protocol_error><CR><LF>

Parameter

<file_name>	Character string type, name of the file in the FTP server. 255 bytes at most.
<err>	0 indicates successful execution Another value: failed execution For details, see Appendix D .
<protocol_error>	Integer type Original error codes of the FTP(S) server. These error codes are defined in FTP(S) protocol; they are only for reference. For details, see Appendix E . 0 indicates invalid.

Exemple

```
AT+NWFTPDEL="test.txt"       Delete an FTP server in the FTP server
OK

+NWFTPDEL: 0,200
```

10 HTTP/HTTPS Commands

10.1 AT+HTTPPARA – Setting HTTP Parameters

To set HTTP parameters.

Format

Type	Command	Response
Set	AT+HTTPPARA=<para>,<para_value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<para>	HTTP parameters, supporting the following parameters: url: destination address port: destination port ID (no default value) keepalive: used to set the HTTP long connection. When para_value=0 (default), the long connection is disabled. When para_value=1, the long connection is enabled. recvmode: Receive mode: para_value=0 indicates receive mode by default; one HTTP response only contains one +HTTPPRECV: header identification; para_value=1 indicates data is displayed in the +HTTPRECV: <length>,<data> format.
<para_value>	The value of the <para>, 2048 bytes at most for url; 443 by default for port.

Example

```
AT+HTTPPARA=url,”www.neoway.com.cn/en/index.aspx”
OK                                                  Setthe Neoway homepage as the URL. The URL supports domain name translation.

AT+HTTPPARA=url,”121.15.200.97/Service1.asmx/GetNote”
OK                                                  Set URL.

AT+HTTPPARA=url,
ERROR                                               The AT command format is incorrect.

AT+HTTPPARA=port,80                                 Set the destination port to 80.
```

```
OK

AT+HTTPPARA=port,8080                    Set the destination port to
OK                                       8080.
```

10.2 AT+HTTPSETUP – Setting up an HTTP Connection

To set up an HTTP connection.

- An HTTP connection is set up successfully only after the destination address and port ID are set correctly.
- Before setting up an HTTP Connection, ensure that a dial-up connection (AT+XIIC=1) is set up successfully.

Format

Type	Command	Response
Execute	AT+HTTPSETUP<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>+HTTPSETUP: FAIL<CR><LF>

Parameter

N/A.

Example

```
AT+HTTPSETUP                    Set up an HTTP connection.
OK                              Successful
AT+HTTPSETUP                    Set up an HTTP connection.
+HTTPSETUP: FAIL                Failed
```

10.3 AT+HTTPACTION – HTTP Request

To execute the HTTP request.

Format

Type	Command	Response
Execute	• AT+HTTPACTION=<mode>[,<length>[,<type>]]<CR> • AT+HTTPACTION=<mode>[,<offset>,<size>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+HTTPACTION:SOCKET ID OPEN FAILED<CR><LF> Or <CR><LF>+HTTPSEND: ERROR<CR><LF>

Parameter

<mode>	HTTP request mode 0: GET 1: HEAD 2: POST 99: OPEN_MODE, custom packet mode
<length>	The length of the POST content or user-defined packet length, maximum value 2048.
<type>	POST request data type. 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode. Specify the starting location of the download.
<size>	Size of file to be downloaded in GET mode.

- Comply with the HTTP protocol when defining packets.
- Add a carriage return to the end of the packets if the HTTP request is set to custom packet mode.

Example

```
AT+HTTPPARA=url,"www.neoway.com.cn/en/index.aspx"          Set the destination address.
OK                                                         The default port is 80.
AT+HTTPSETUP
OK                                                         Set up an HTTP connection.
AT+HTTPACTION=0
OK                                                         GET request

+HTTPRECV:
```

```
HTTP/1.1 200 OK                                          Receive the response from the
Cache-Control: private                                   HTTP server.
Content-Type: text/html; charset=utf-8
Server: Microsoft-IIS/7.5
Set-Cookie:
ASP.NET_SessionId=rh3fjg554ufzb145aevgzz45; path=/;
HttpOnly
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
X-UA-Compatible: IE=EmulateIE7
Date: Thu, 28 Nov 2013 03: 06: 57 GMT
Connection: close
Content-Length: 13842

/*neoway homepage, html format, 13842 bytes*/
……..
/* neoway homepage*/

+HTTPCLOSED: HTTP Link Closed

                                                         The server finishes the
                                                         response and disconnects the
                                                         connection.
                                                         Set the destination address.
AT+HTTPPARA=url,”www.neoway.com.cn/en/index.aspx”        The default port is 80.
OK
AT+HTTPSETUP                                             Set up an HTTP connection.
OK
AT+HTTPACTION=1                                          HEAD request
OK

+HTTPRECV:                                               The HTTP server responds.
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 13842
Content-Type: text/html; charset=utf-8
Server: Microsoft-IIS/7.5
Set-Cookie:
ASP.NET_SessionId=znt4fqabqsuclz55pvfufn55; path=/;
HttpOnly
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
X-UA-Compatible: IE=EmulateIE7
Date: Thu, 28 Nov 2013 03: 32: 35 GMT
Connection: close


+HTTPCLOSED: HTTP Link Closed

AT+HTTPPARA=url,”121.15.200.97/Service1.asmx/GetNote”    Set URL.
OK
AT+HTTPPARA=port,8080                                    Set the destination port to
OK                                                       8080.
AT+HTTPSETUP
OK                                                       Set up an HTTP connection.
AT+HTTPACTION=2,25
>MAC=NEOWAY&DATA=0123456                                 POST request. Send 23 bytes;
                                                         enter the contents to be
OK                                                       uploaded after > is displayed.
```

```
+HTTPRECV:
HTTP/1.1 200 OK
Cache-Control: private, max-age=0
Content-Type: text/xml; charset=utf-8
Server: Microsoft-IIS/7.5
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
Date: Thu, 28 Nov 2013 03: 41: 52 GMT
Connection: close
Content-Length: 98

<?xml version="1.0" encoding="utf-8"?>
<string xmlns="http: //wsliu.cn/">NEOWAY+0123456
</string>

+HTTPCLOSED: HTTP Link Closed
```

Receive the response from the HTTP server.

The server replies an XML file containing the uploaded content NEOWAY and 0123456.

The server disconnected with the module after it finished responding.

Set URL.

```
AT+HTTPPARA=url,”www.neoway.com.cn/en/index.aspx”
OK
AT+HTTPSETUP
OK
AT+HTTPACTION=99,76
>HEAD /en/index.aspx HTTP/1.1
connection: close
HOST: www.neoway.com.cn

OK

+HTTPRECV:
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 13842
Content-Type: text/html; charset=utf-8
Server: Microsoft-IIS/7.5
Set-Cookie:
ASP.NET SessionId=pvlaai3fizxg44eyvyqsyenk; path=/;
HttpOnly
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
X-UA-Compatible: IE=EmulateIE7
Date: Thu, 28 Nov 2013 05: 40: 24 GMT
Connection: close


+HTTPCLOSED: HTTP Link Closed
```

Use the default port 80 to set up an HTTP connection.

Use custom packet mode to send 76-byte packets.

Receive the response from the HTTP server.

The server finishes responding and close the connection.

```
AT+HTTPACTION=0
+HTTPACTION:SOCKET ID OPEN FAILED
AT+HTTPACTION=0
```

PPP is not enabled or SOC connection encounters an error.

Failed to send data.

```
+HTTPSEND: ERROR
AT+HTTPACTION=2,adasd                                          Other errors
ERROR
```

10.4 AT+HTTPCLOSE – Closing the Socket of an HTTP Client

To close the socket of an HTTP client.

Format

Type	Command	Response
Execute	AT+HTTPCLOSE<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
URC	+HTTPCLOSE: <result>	

Parameter

<result> HTTP Link Closed: HTTP link is closed

- After the +HTTPCLOSE command is sent, the HTTP socket is closed and the setting of +HTTPPARA is cleared.
- Only OK is returned after running this command if the HTTP socket is not connecting.

Example

```
AT+HTTPCLOSE
OK                                                    Close the HTTP connection.

+HTTPCLOSE: HTTP Link Closed
AT+HTTPCLOSE
OK                                                    OK is returned.
```

10.5 +HTTPRECV – Receiving HTTP Data

To indicate data received from the HTTP connection.

Format

Type	Command
URC	<CR><LF>+HTTPRECV: <datas> <CR><LF>+HTTPRECV: <length>,<datas>

Parameter

<length>	Data length.
<datas>	Data received from the HTTP/HTTPS connection.

Example

```
+HTTPRECV: HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 13842
Content-Type: text/html; charset=utf-8
Server: Microsoft-IIS/7.5
Set-Cookie: ASP.NET SessionId=pvlaai3fizxg44eyvyqsyenk;
path=/; HttpOnly                                          Receive data from the
X-AspNet-Version: 2.0.50727                               HTTP connection.
X-Powered-By: ASP.NET
X-UA-Compatible: IE=EmulateIE7
Date: Thu, 28 Nov 2013 05:40:24 GMT
Connection: close

+HTTPCLOSED: HTTP Link Closed
+HTTPRECV: 803,HTTP/1.1 206 Partial Content
Cache-Control: no-cache
Connection: Keep-Alive
Content-Length: 10
Content-Range: bytes 0-9/14615
Content-Type: text/html
Date: Tue, 10 Jul 2018 00:55:30 GMT
Etag: "5b3c3650-3917"
Last-Modified: Wed, 04 Jul 2018 02:52:00 GMT
P3p: CP=" OTI DSP COR IVA OUR IND COM "
Pragma: no-cache
Server: BWS/1.1                                           Format of the received
Set-Cookie: BAIDUID=F18E6894A34321D8CF9AAF28C14FACC9:FG=1; data when RECVMODE is
expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647;  set to 1.
path=/; domain=.baidu.com
Set-Cookie: BIDUPSID=F18E6894A34321D8CF9AAF28C14FACC9;
expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647;
path=/; domain=.baidu.com
Set-Cookie: PSTM=1531184130; expires=Thu, 31-Dec-37 23:55:55
GMT; max-age=2147483647; path=/; domain=.baidu.com
Vary: Accept-Encoding
X-Ua-Compatible: IE=Edge,chrome=1

<!DOCTYPE
```

10.6 AT+HTTPGET – Downloading HTTP Files

To download HTTP files.

- This is an asynchronous command. OK is returned immediately after the command is executed. The downloading, decompressing, and verification processes are done in background.
- When <check_type> and <check_value> are ignored, no verification will be performed after the download is complete.
- When setting <dir_mode>, the <check_type> and <check_value> parameters can be omitted. The external flash should be initialized by +NWYSPIFLASH first.
- The downloading, decompressing, and verification results are reported through +HTTPGETSTAT. For details, see its definitions.
- This command is dedicated for a specified customer. To save the module's memory space, executing this command will delete the file downloaded in Flash last time by this command.

Format

Type	Command	Response
Execute	AT+HTTPGET=<type>[,<check_type>,<check_value>[,<dir_mode>]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<type>	Decompression type 0: unzip (default) 1: zip (unsupported) 2 to 99: reserved.
<check_type>	Type of checking the integrity of compressed passage. 0: MD5 (default) 1 - 99: reserved
<check_value>	Check code, used with <check_type>.
<dir_mode>	Select the storage location 0: local (default) 1: external flash

Example

```
AT+HTTPPARA=url,120.86.64.161/0.2M.txt                    Download the file.
OK
AT+HTTPPARA=port,10141
OK
AT+HTTPSETUP
OK
AT+HTTPGET=0
OK

+HTTPGETRPT: 10

+HTTPCLOSED: HTTP Link Closed
AT+HTTPGET=0,0,eaf84487e190bc79af55c972bbc63e3f
OK                                                        The file is downloaded successfully.

+HTTPGETRPT: 30,303
AT+HTTPGET=0,0,eaf84487e190bc79af55c972bbc63e3f
OK

+APHTTPGETRPT: 31
AT+HTTPGET=0,,,1                                          Verification fails.
OK                                                        Download the file to the external
                                                          flash, no verification.
+HTTPGETRPT: 10
```

10.7 +HTTPGETRPT – URC Notifying Downloading Results

To notify downloading results.

- This command indicates the execution result of AT+HTTPGET.
- Different result codes are reported according different results during downloading, verification, and decompression processes.

Format

Type	Command
URC	<CR><LF>+HTTPGETRPT: <state_type>[,<err_code>]<CR><LF>

Parameter

<state_type>	Status type 10: successful download 11: failed download 20: successful decompression 21: failed decompression 30: successful verification 31: failed verification
<err_code>	Error response encountered during HTTP GET. 301 Moved Permanently 302 Found 303 See Other 304 Not Modified 305 Use Proxy 307 Temporary Redirect 400 Bad Request 401 Unauthorized 402 Payment Required 403 Forbidden 404 Not Found 405 Method Not Allowed 406 Not Acceptable 407 Proxy Authentication Required 408 Request Timeout 409 Conflict 410 Gone 411 Length Required 412 Precondition Failed 413 Payload Too Large 414 URI Too Long 415 Unsupported Media Type 416 Requested Range Not Satisfiable 417 Expectation Failed 500 Internal Server Error 501 Not Implemented 502 Bad Gateway 503 Service Unavailable 504 Gateway Timeout 505 HTTP Version Not Supported

Example

```
AT+HTTPPARA=url, mybank.icbc.com.cn/icbc/perbank/index.jsp          Download the file.

AT+HTTPGET=0
OK
```



```
+HTTPGETRPT: 10
AT+HTTPGET=1
OK

+HTTPGETRPT: 20

AT+HTTPGET=1,0,eaf84487e190bc79af55c972bbc63e3f
OK
+HTTPGETRPT: 30,303

AT+APHTTPGET=1,0,eaf84487e190bc79af55c972bbc63e3f
OK

+APHTTPGETRPT: 31
```

10.8 AT+HTTPGETSTAT? – Querying the HTTP Downloading Result

To query the HTTP GET process and the downloading result.

Format

Type	Command	Response
Query	AT+HTTPGETSTAT?<CR>	<CR><LF>+HTTPGETSTAT: <state_type>[,<err_code>]<CR><LF>

Parameter

<state_type> Status type

0: unknown result
10: successful download
11: failed download
20: successful decompression
21: failed decompression
30: successful verification
31: failed verification

<err_code> Error response encountered during HTTP GET.

301 Moved Permanently
302 Found
303 See Other
304 Not Modified
305 Use Proxy
307 Temporary Redirect

400 Bad Request
401 Unauthorized
402 Payment Required
403 Forbidden
404 Not Found
405 Method Not Allowed
406 Not Acceptable
407 Proxy Authentication Required
408 Request Timeout
409 Conflict
410 Gone
411 Length Required
412 Precondition Failed
413 Payload Too Large
414 URI Too Long
415 Unsupported Media Type
416 Requested Range Not Satisfiable 417 Expectation Failed
500 Internal Server Error
501 Not Implemented
502 Bad Gateway
503 Service Unavailable
504 Gateway Timeout
505 HTTP Version Not Supported

Example

```
AT+HTTPGET=0
OK
AT+HTTPGETSTAT?
+HTTPGETSTAT: 10
OK
AT+APHTTPGET=1
+HTTPGETSTAT: 30
OK
```

10.9 +HTTPCLOSED – URC Notifying the Socket of the HTTP Client is Closed

To notify the socket of an HTTP client is closed.

Format

Type	Command
URC	<CR><LF>+HTTPCLOSED: HTTP Link Closed<CR><LF>

Parameter

N/A.

Example

```
+HTTPCLOSED: HTTP Link Closed                    The HTTP connection closes.
```

10.10 AT+HTTPSCFG – Configuring SSL Parameters for HTTPS

To configure SSL parameters for HTTPS,

Format

Type	Command	Response
Set	AT+HTTPSCFG=<type>,<type_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+HTTPSCFG?<CR>	<CR><LF>+HTTPSCFG:<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey> <CR><LF>OK<CR><LF>
Test	AT+HTTPSCFG=?<CR>	<CR><LF>+HTTPSCFG:<type>,<type_name> <CR><LF>OK<CR><LF>

Parameter

<type>	SSL parameter options sslversion: SSL protocol version authmode: authentication mode cacert: CA certificate. clientcert: Client certificate clientkey: Client key

	sni: extended option of TLS Server Name Indication
<type_name>	Settings for SSL parameter, the relations between the <type> and <type_name> values are as follows:, sslversion 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 authmode 0: No authentication 1: Manage server authentication 2: Manage server and client authentication if requested by the remote server cacert: string type, CA certificate clientcert: string type, client certificate clientkey: string type, client key sni 0: disable 1: enabled

If the authmode is set to 0, you do not have to set other parameters, such as cacert, clientcert, and clientkey.

Example

```
AT+HTTPSCFG=”sslversion”,0              Set the SSL version to SSL3.0.
OK
AT+HTTPSCFG =”authmode”,0               Set the authentication mode to no authentication.
OK
AT+HTTPSCFG=”cacert”,ca.pem             Set the name of the CA certificate (adding the
OK                                      certificate in advance is required).
AT+HTTPSCFG?                            Query the current SSL settings.
+HTTPSCFG:
0,1,ca.pem,cc.pem,ck.pem
OK
AT+HTTPSCFG=?                           Query the available parameter value ranges.
+HTTPSCFG: <type>,<type_name>
OK
```

10.11 AT+HTTPSPARA – Setting HTTPS Parameters

To set HTTPS parameters.

Format

Type	Command	Response
Set	AT+HTTPSPARA=<para>,<para_value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<para>	HTTPS parameters, supporting the following two parameters: url: destination address port: destination port ID keepalive: used to set the long-time connection. recvmode: Receive mode: para_value=0 indicates receive mode by default; one HTTP response only contains one +HTTPPRECV: header identification; para_value=1 indicates data is displayed in the +HTTPRECV: <length>,<data> format.
<para_value>	Corresponding to the value of <para>, 512 bytes at most for URL; 443 by default for port.URLsupport domain name resolution.

- To send new HTTPS request, set new HTTPS parameters.
- After the +HTTPSCLOSE command is sent, the connection is closed and parameter settings will not be cleared.

Example

```
AT+HTTPSPARA=url,mybank.icbc.com.cn/icbc/perbank/index.jsp
OK
```
Set the ICBC homepage as the URL. The URL supports domain name resolution.

```
AT+HTTPSPARA=url,132.188.73.13/prodreg/beginRegistration.action
OK
```
Set the destination address to 132.188.73.13.

```
AT+HTTPSPARA=port,443
OK
```
Set the destination port to 443.

10.12 AT+HTTPSSETUP – Setting up an HTTPS Connection

To set up an HTTPS connection.

- An HTTP connection is set up successfully only after the destination address and port ID are set correctly.
- Before setting up an HTTP Connection, ensure that a dial-up connection (AT+XIIC=1) is set up successfully.

Format

Type	Command	Response
Execute	AT+HTTPSSETUP<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

N/A.

Example

```
AT+HTTPSSETUP                          Set up an HTTPS connection.
OK                                     Successful
AT+HTTPSSETUP
+HTTPSSETUP: OK                        The FTP connection is established.
AT+HTTPSSETUP                          Set up an HTTPS connection.
ERROR                                  Successful
```

10.13 AT+HTTPSACTION – Sending an HTTPS Request

To send an HTTPS request.

Format

Type	Command	Response
Execute	• AT+HTTPSACTION=<mode>[,<length>[,<type>]<CR> • AT+HTTPSACTION=<mode>[,<offset>,<size>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<mode>	HTTPS request mode 0: GET 1: HEAD 2: POST 99: OPEN_MODE, custom packet mode
<length>	The length of the POST content or user-defined packet length, maximum value 2048. This parameter cannot be omitted when <mode> is set to POST or OPEN_MODE.
<type>	POST request data type. 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode. Specify the starting location of the download.
<size>	Size of file to be downloaded in GET mode.

- Comply with the HTTP protocol when defining packets.
- When using user-defined packet, pay attention to whether the tool you are using comes with carriage return and line feed characters.

Example

```
AT+HTTPSPARA=url,support.cdmatech.com/login/                Set the destination path.
OK
AT+HTTPSPARA=port,443                                       Set the destination port to
OK                                                          443.
AT+HTTPSSETUP
OK                                                          To set up an HTTPS connection.
AT+HTTPSACTION=0
OK

+HTTPSRECV:                                                 GET request
HTTP/1.1 200 OK
```

```
Server: QUALCOMM                                          Receive the response from the
X-Powered-By: Servlet/2.5 JSP/2.1                         HTTPS server.
Content-Type: text/html; charset=ISO-8859-1
Date: Sat, 15 Feb 2014 05:58:54 GMT
Content-Length: 7630
Connection: close
Set-Cookie:
JSESSIONID=8V1dS1CpzlPcyNl2LzJZLQgDxWclpMJzP3FHZhVhpG
b83GVM02sn!1955538012; path=/; HttpOnly
/*home page, html format*/
……..
/*Homepage content*/                                      The server finishes the
+HTTPSCLOSED: HTTPS Link Closed                           response and disconnects the
                                                          connection.
AT+HTTPSPARA=url,support.cdmatech.com/login/
OK
AT+HTTPSPARA=port,443
OK
AT+HTTPSSETUP
OK                                                        Set the destination path.
AT+HTTPSACTION=1
OK                                                        Set the destination port to
                                                          443.
+HTTPSRECV:
HTTP/1.1 200 OK                                           To set up an HTTPS connection.
Server: QUALCOMM
X-Powered-By: Servlet/2.5 JSP/2.1
Content-Type: text/html; charset=ISO-8859-1
Date: Sat, 15 Feb 2014 6:05:39 AM GMT                     HEAD request
Content-Length: 0
Connection: close                                         HTTPS server responses.
Set-Cookie:
JSESSIONID=qyNVS1DSmnjS9cvh72yW1xz1jtjBBRj0yv0zTmMy2L
VyBG7HK02b!1955538012; path=/; HttpOnly

+HTTPSCLOSED: HTTPS Link Closed
AT+HTTPSPARA=url,mybank.icbc.com.cn/icbc/perbank/inde
x.jsp
OK
AT+HTTPSPARA=port,443
OK
AT+HTTPSSETUP
OK
AT+HTTPSACTION=99,500
>POST /icbc/perbank/index.jsp HTTP/1.1<CRLF> /*custom
header information*/                                      OPEN_MODE, user-defined packet
Connection: close<CRLF>   /*custom header                 mode. Note that the packet
information*/                                             length contains the user-
Host: mybank.icbc.com.cn<CRLF>   /*custom header          defined header information.
information*/
Content-Length: 10<CRLF>    /*custom header
information*/
Content-Type: application/x-www-form-urlencoded<CRLF>
/*custom header information*/
<CRLF><CRLF>
 /*Content to be sent*/
……
```

```
+HTTPSRECV:
/*home page, html format*/
……..
/*Homepage content*/
+HTTPSCLOSED: HTTPS Link Closed
```

10.14 AT+HTTPSCLOSE – Closing an HTTP Connection Proactively

To actively close an HTTPS connection.

After the +HTTPSCLOSE command is sent, the HTTPS socket is closed and the setting of +HTTPPARA is kept.

Format

Type	Command	Response
Execute	AT+HTTPSCLOSE<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
URC	+HTTPSCLOSE: <state>	

Parameter

<state>	HTTPS Link Closed	Close the HTTPS connection.

Example

```
AT+HTTPSCLOSE
OK
                                                    Close the HTTPS connection.

+HTTPSCLOSE: HTTPS Link Closed
```

10.15 +HTTPSRECV – URC Notifying HTTPS Data Received

To notify data received over the HTTPS connection.

Format

Type	Command
URC	<CR><LF>+HTTPSRECV: <CR><LF><datas> <CR><LF>+HTTPSRECV: <length>,<datas>

Parameter

<datas>	Data received from the HTTP/HTTPS connection.
<length>	Length of the data received.

Example

```
+HTTPSRECV:
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 13842
Content-Type: text/html; charset=utf-8
Server: Microsoft-IIS/7.5
Set-Cookie: ASP.NET SessionId=pvlaai3fizxg44eyvyqsyenk;
path=/; HttpOnly
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
X-UA-Compatible: IE=EmulateIE7
Date: Thu, 28 Nov 2013 05:40:24 GMT
Connection: close
```

Data received over the HTTPS connection.

```
+HTTPSCLOSED: HTTPS Link Closed
+HTTPSRECV: 832,HTTP/1.1 206 Partial Content
Server: Tengine/2.1.0
Date: Tue, 10 Jul 2018 1:09:25 AM GMT
Content-Type: text/html; charset=utf-8
Content-Length: 10
Connection: keep-alive
x-server-id: 40-5005
request-id: 0bea4b2215311849654971530e6674
Accept-Ranges: bytes
set-cookie: ctoken=MBHI38pHhdL6q0ltGFqjkviz; path=/;
domain=.alipay.com; secure
set-cookie:
ALIPAYJSESSIONID=jMi6e4Q2JmIN8HRk68wm53KXisfnB5H0homepro
xy; path=/; domain=.alipay.com
x-frame-options: SAMEORIGIN
x-xss-protection: 1; mode=block
x-content-type-options: nosniff
x-download-options: noopen
strict-transport-security: max-age=31536000
Content-Range: bytes 0-9/21651
x-readtime: 2
Set-Cookie: ssl_upgrade=0;path=/;secure;
```

Format of the received data when RECVMODE is set to 1.

```
Set-Cookie:
spanner=aGuTtGMbvBcOy1dCyZ/e4JI97JSiPcR1Xt2T4qEYgj0=;pat
h=/;secure;
Via: spanner-internet-g2-35.em14[206]
```

10.16 AT+HTTPSGET – Download HTTPS Files

To download HTTPS files.

Format

Type	Command	Response
Execute	AT+HTTPSGET=<type>[,<check_type>,<check_value>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<type>	Decompression type 0: unzip (default) 1: zip (unsupported) 2 - 99: reserved
<check_type>	Type of checking the integrity of compressed passage. 0: MD5 (default) 1 - 99: reserved
<check_value>	Check code, used with <check_type>.

- This is an asynchronous command. OK is returned immediately after the command is executed. The downloading, decompressing, and verification processes are done in background.
- When <check_type> and <check_value> are ignored, no verification will be performed after the download is complete.
- When setting <dir_mode>, the <check_type> and <check_value> parameters can be omitted. The external flash should be initialized by +NWYSPIFLASH first.
- The downloading, decompressing, and verification results are reported through +HTTPGETSTAT. For details, see its definitions.

Example

```
AT+HTTPSPARA=url, mybank.icbc.com.cn/icbc/perbank/index.jsp        Download the file.
OK
AT+HTTPSGET=0
OK
+HTTPSGETRPT: 10
AT+HTTPSGET=0,0,eaf84487e190bc79af55c972bbc63e3f
OK
+HTTPSGETRPT: 30,303

AT+HTTPSGET=0,0,eaf84487e190bc79af55c972bbc63e3f
OK
+APHTTPSGETRPT: 31
AT+HTTPSGET=0,,,1                                                  Download the file to the
OK                                                                 external flash. No
                                                                   verification.
+HTTPSGETRPT: 10
```

10.17 +HTTPSGETRPT – URC Notifying Downloading Result

To notify HTTPS downloading results in GET method.

- This command indicates the execution result of AT+HTTPGET.
- Different result codes are reported according different results during downloading, verification, and decompression processes.

Format

Type	Command
URC	<CR><LF>+HTTPSGETRPT: <state_type>[,<err_code>]<CR><LF>

Parameter

<state_type>	Status type 10: successful download 11: failed download 20: successful decompression 21: failed decompression 30: successful verification

	31: failed verification
<err_code>	Error response encountered during HTTP GET.
	301 Moved Permanently
	302 Found
	303 See Other
	304 Not Modified
	305 Use Proxy
	307 Temporary Redirect
	400 Bad Request
	401 Unauthorized
	402 Payment Required
	403 Forbidden
	404 Not Found
	405 Method Not Allowed
	406 Not Acceptable
	407 Proxy Authentication Required
	408 Request Timeout
	409 Conflict
	410 Gone
	411 Length Required
	412 Precondition Failed
	413 Payload Too Large
	414 URI Too Long
	415 Unsupported Media Type
	416 Requested Range Not Satisfiable
	417 Expectation Failed
	500 Internal Server Error
	501 Not Implemented
	502 Bad Gateway
	503 Service Unavailable
	504 Gateway Timeout
	505 HTTP Version Not Supported

Example

```
AT+HTTPSPARA=url, mybank.icbc.com.cn/icbc/perbank/index.jsp        Download the file.
OK

AT+HTTPSGET=0
OK

+APHTTPSGETRPT: 10

AT+HTTPSGET=1
OK
+HTTPSGETRPT: 20

AT+HTTPSGET=1,0,eaf84487e190bc79af55c972bbc63e3f
```

```
OK
+HTTPSGETRPT: 30,303

AT+HTTPSGET=1,0,eaf84487e190bc79af55c972bbc63e3f
OK
+HTTPSGETRPT: 31
```

10.18 AT+HTTPSGETSTAT? – Querying the Download Result

To query the HTTPS GET process and the download result.

Format

Type	Command	Response
Execute	AT+HTTPSGETSTAT?<CR>	<CR><LF>+HTTPSGETSTAT: <state_type>[,<err_code>]<CR><LF>

Parameter

<state_type> Status type

0: unknown result
10: successful download
11: failed download
20: successful decompression
21: failed decompression
30: successful verification
31: failed verification

<err_code> Error response encountered during HTTP GET.

301 Moved Permanently
302 Found
303 See Other
304 Not Modified
305 Use Proxy
307 Temporary Redirect
400 Bad Request
401 Unauthorized
402 Payment Required
403 Forbidden
404 Not Found
405 Method Not Allowed
406 Not Acceptable

407 Proxy Authentication Required
408 Request Timeout
409 Conflict
410 Gone
411 Length Required
412 Precondition Failed
413 Payload Too Large
414 URI Too Long
415 Unsupported Media Type
416 Requested Range Not Satisfiable 417 Expectation Failed
500 Internal Server Error
501 Not Implemented
502 Bad Gateway
503 Service Unavailable
504 Gateway Timeout
505 HTTP Version Not Supported

Example

```
AT+HTTPSGET=0
OK

AT+HTTPSGETSTAT?
+HTTPSGETSTAT: 10,303
OK

AT+APHTTPSGET=1
OK

+HTTPSGETSTAT: 30,303
OK
```

10.19 AT+FILEHTTPACTION – HTTP Request in File System

HTTP Request in File System

- Establish an HTTP connection before executing this command.
- Before downloading files through HTTP GET, ensure that there are enough remaining space in the file system.

Format

Type	Command	Response
Execute	AT+FILEHTTPACTION=<mode>,<length>,<type>,<dir&filename><CR> AT+FILEHTTPACTION=<mode>,<offset>,<size>[,dir&filename]<CR>	<CR><LF>OK<CR><LF> Or AT+CMEE=0 <CR><LF>ERROR<CR><LF> Or AT+CMEE=1 <CR><LF>+CME ERROR:<errcode><CR><LF> Or <CR><LF>+CME ERROR:<errtext><CR><LF>

Parameter

<mode>	HTTP request mode 0: GET 1: POST
<length>	Length of the POST content, supports 524288 bytes at most.
<type>	POST request data type. 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode. Specify the starting location of the download.
<size>	Length of file downloaded in GET method. Generally, the maximum value of <size> is 524288. When an external flash is connected, the value of <size> supports 2166720 bytes at most.
<dir&filename>	Path and name of the file needed. When mode=0, you can specify the name of the file saved locally.
<errcode>	The corresponding values of A and B are as follows: 49 -- The Execute Command Not Support 51 -- No Memory 53 -- Parameters are Invalid 66 -- File too Large 300 -- Netif is Error 301 -- HTTPACTION is Needed First 303 -- HTTPPARA CID Invalid 303 -- HTTPPARA CID Invalid 1001 -- PDP Not Active
<errtext>	See the description in <errcode>.

Example

```
AT+FILEHTTPACTION=0,0,524288                Read 512 KB data starting from the first byte.
OK

                                            The 512 KB data is downloaded successfully.
+FILEHTTPSTAT: 0,1,524288
AT+FILEHTTPACTION=1,524288,0,text.txt       The file with 524288 data length
OK

                                            is posted successfully.
+FILEHTTPSTAT: 1,1,524288
AT+FILEHTTPACTION=0,0,524288                Failed command execution. 1001 indicates PDP
+CME ERROR: 1001                            not active.
```

10.20 AT+FILEHTTPACTION – HTTPS Request in File System

HTTPS Request in File System

- Establish an HTTP connection before executing this command.
- Before downloading files through HTTP GET, ensure that there are enough remaining space in the file system.

Format

Type	Command	Response
Execute	AT+FILEHTTPSACTION=<mode>,<length>,<type>,<dir&filename><CR> AT+FILEHTTPSACTION=<mode>,<offset>,<size><CR>	<CR><LF>OK<CR><LF> Or AT+CMEE=0 <CR><LF>ERROR<CR><LF> Or AT+CMEE=1 <CR><LF>+CMEERROR:<errcode><CR><LF> Or AT+CMEE=2 <CR><LF>+CME ERROR:<errtext><CR><LF>

Parameter

<mode>	HTTP request mode 0: GET 1: POST

<length>	Length of the POST content, supports 524288 bytes at most.
<type>	POST request data type. 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode. Specify the starting location of the download.
<size>	Size of file to be downloaded in GET mode. The value supports 524288 bytes at most.
<dir&filename>	Path and name of the file needed. The file path is relative to the root path of the file system.
<errcode>	The corresponding values of A and B are as follows: 49 -- The Execute Command Not Support 51 -- No Memory 53 -- Parameters are Invalid 66 -- File too Large 300 -- Netif is Error 301 -- HTTPACTION is Needed First 303 -- HTTPPARA CID Invalid 1001 -- PDP Not Active
<errtext>	See the description in <errcode>.

Example

```
AT+FILEHTTPSACTION=0,0,524288                Read 512 KB data starting from the first byte.
OK

                                             The 512 KB data is downloaded successfully.

+FILEHTTPSTAT: 0,1,524288
AT+FILEHTTPSACTION=1,524288,0,text.txt       The file with 524288 data length
OK

                                             is posted successfully.

+FILEHTTPSTAT: 1,1,524288
AT+FILEHTTPSACTION=0,0,524288                Failed command execution. 1001 indicates PDP
+CME ERROR: 1001                             not active.
```

10.21 +FILEHTTPSTAT – URC Notifying the HTTP(S) Uploading/Downloading Result

To notify the HTTP(S) uploading/downloading result.

Format

Type	Command
URC	<CR><LF>+FILEHTTPSTAT: <mode>,<stat>[,<length>]<CR><LF> <CR><LF>+FILEHTTPSTAT: <stat>,<errcode><CR><LF>

Parameter

<mode>	HTTP(S) request type 0: HTTP(S) GET 1: HTTP(S) POST
<stat>	Downloading/uploading result code 0: Downloading/uploading failed 1: Downloading/uploading successful
<length>	Length of file downloaded/uploaded, unit: byte.

Example

```
AT+FILEHTTPSACTION=0,0,524288                Read 512 KB data starting from the first byte.
OK

                                             The 512 KB data is downloaded successfully.
+FILEHTTPSTAT: 0,1,524288


AT+FILEHTTPSACTION=1,524288,0,text.txt       The file with 524288 data length
OK

                                             is posted successfully.
+FILEHTTPSTAT: 1,1,524288
```

10.22 +HTTPSCLOSED – URC Notifying HTTPS Link Closed

To notify the HTTPS link is closed.

Format

Type	Command
URC	<CR><LF>+HTTPSCLOSED: Link Closed <CR><LF>

Parameter

N/A.

Example

```
+HTTPSCLOSED: HTTPS Link Closed                    The HTTPS connection is disconnected.
```

11 Call Control Commands

11.1 ATD – Dialing Command

To initialize a voice call; the dialing string consists of numbers and modifiers and must end with a semicolon.

voice call: ATD<dial string>;

Format

Type	Command	Response
Execute	• ATD<dial string>[;]<CR> • ATD><n>;<CR> • ATD>"name";<CR>	<CR><LF>OK<CR><LF> <CR><LF><result><CR><LF>

Parameter

<dial string>	Phone number
<n>	Phonebook entry index number
name	name in current phonebook.
<result>	CONNECT: the callee answers the call. NO CARRIER: the callee hangs up the call or the call times out.

Example

```
ATD10010;                       Make a call.
OK

CONNECT                         The callee answers.
ATD>4;                          Use the Phonebook entry index number to make a call.
OK

CONNECT
ATH
OK
ATD>"Comneon";                  Use the name in the phonebook to make a call. The callee
OK                              answers and then hangs up the call.

CONNECT
```

```
NO CARRIER
```

11.2 ATA – Call Answering

To answer the call and establish a call connection.

The return codes containing RING or +CRING indicate an incoming call.

Format

Type	Command	Response
Execute	ATA<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>BUSY<CR><LF>

Parameter

N/A.

Example

```
ATA                                          Answer a call (voice).
OK
```

11.3 ATH – Hanging up Calls

To hang up all calls.

Format

Type	Command	Response
Execute	ATH<CR>	<CR><LF>OK<CR><LF>

Parameter

N/A.

Example

```
ATH                                          End the call connection.
OK
ATH                                          Reject the incoming call (hang up the call).
OK
```

11.4 AT+CLIP – Caller ID

To enable or disable caller ID.

Format

Type	Command	Response
Set	AT+CLIP=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CLIP?<CR>	<CR><LF>+CLIP: <n>,<m> <CR><LF>OK<CR><LF>
Test	AT+CLIP=?<CR>	<CR><LF>+CLIP: (value range of <n>) <CR><LF>OK<CR><LF>
URC	<CR><LF>+CLIP: <phone number>,<tosca>	

Parameter

<n>	0: disable caller ID (default value)
	1: enable caller ID
<m>	0: CLIP not provisioned
	1: CLIP provisioned
	2: unknown (e.g. no network, etc.)
<tosca>	The format of the SMS center number.

Example

```
AT+CLIP=1                                    Enable the caller ID function.
OK
RING                                         An incoming call from 136********.

+CLIP: "136********",161,"",0,"",0
AT+CLIP?                                     Query the setting of the caller ID.
+CLIP: 1,1                                   (default)
OK
```

```
AT+CLIP=?                                   Query the value range of caller ID function.
+CLIP: (0-1)
OK
```

11.5 ATS0 – Auto-Answer

To control the auto-answer mode of the module.

If **ATS0=0**, the auto-answer function is not enabled; otherwise, the module will automatically answer the call after ringing for certain times.

Format

Type	Command	Response
Set	ATS0=<value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	ATS0?<CR>	<CR><LF><value> <CR><LF>OK<CR><LF>

Parameter

<value>	Integer type, ranging from 0 to 255. The default value is 000.

Example

```
ATS0=1                          Set the auto-answer for one ring.
OK
ATS0?                           Query the status of the auto-answer function.
001
OK
```

11.6 AT+CLVL – Setting the Voice Volume

To set the level of the voice volume, which is valid before a call or during a call.

The setting by this command are not saved after the module is powered off.

Format

Type	Command	Response
Set	AT+CLVL=<level><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CLVL?<CR>	<CR><LF>+CLVL: <level> <CR><LF>OK<CR><LF>
Test	AT+CLVL=?<CR>	<CR><LF>+CLVL: (range of <level> value) <CR><LF>OK<CR><LF>

Parameter

<level>	Integer type, ranging from 0 to 100; the smaller the parameter value, the smaller the level. The default value is 60.

Example

```
AT+CLVL=4                          Set the level of the voice volume to 4.
OK
AT+CLVL?                           Query the level of voice volume of the module.
+CLVL: 4
OK
AT+CLVL=?                          Query the valid voice volume level for the module.
+CLVL: (0-100)
OK
```

11.7 AT+CMUT – Mute Control

To set mute control of the voice calls.

The setting is only valid during a call.

Format

Type	Command	Response
Set	AT+CMUT=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CMUT?<CR>	<CR><LF>+CMUT: <n>,<m> <CR><LF>OK<CR><LF>

Test	AT+CMUT=?<CR>	<CR><LF>+CMUT: (value range of <n>),(value range of <m>) <CR><LF>OK<CR><LF>

Parameter

<n>	0: Mute off output (default value) 1: Mute on output
<m>	0: Mute off input (default value) 1: Mute on input

Example

```
AT+CMUT=0,0                          Disable the mute mode.
OK
AT+CMUT=1                            Enable mute control before a call.
OK
AT+CMUT?                             Query whether the mute mode is enabled.
+CMUT: 0,0
OK
AT+CMUT=?                            Query the value range of mute mode function.
+CMUT: (0-1)
OK
```

11.8 AT+CLCC – Querying Current Calls

To query current calls and their status.

Format

Type	Command	Response
Execute	AT+CLCC<CR>	<CR><LF>[+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,[<number>,<type>,[<alpha>]]] <CR><LF>[+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,[<number>,<type>,[<alpha>]]] <CR><LF>[...]]] <CR><LF>OK<CR><LF>

Parameter

<idx>	Caller ID descripted in section 4.5.5.1 of 3GPP TS 22.030 [19], integer, this digit can be used in the +CHLD command.

<dir>	0: mobile originated calls
	1: mobile terminated calls
<stat>	Call status
	0: active
	1: held
	2: dialing
	3: alerting
	4: incoming
	5: waiting
<mode>	Call types
	0: voice
	1: data
	2: fax
<mpty>	Multiparty calls
	0: Non-multiparty calls
	1: one of the multiparty calls
<number>	phone number
<type>	Number type
	145 international numbering schemes (contains the character "+")
	129 national numbering schemes
<alpha>	Phonebook number entry; the character format is set based on the setting in +CSCS.

Example

```
AT+CLCC                                          Incoming call
+CLCC: 1,1,4,0,0,"13596722590",129
OK
AT+CLCC                                          Initiate a call
+CLCC: 1,0,2,0,0,"13596722590",129
OK
```

11.9 AT+SETVOLTE – Setting VoLTE Switch

To set the VoLTE switch.

Format

Type	Command	Response
Set	AT+SETVOLTE=<onoff><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SETVOLTE?	<CR><LF>+SETVOLTE: <onoff>

	<CR><LF>OK<CR><LF>

Parameter

<onoff>	0: Disable VoLTE 1: Enable VoLTE (default)

Example

```
AT+SETVOLTE=0                                   Disable VoLTE.
OK
AT+SETVOLTE=1                                   Enable VoLTE.
OK
AT+SETVOLTE?                                    Query whether VoLTE is enabled.
+SETVOLTE: 1
OK
```

12 Wi-Fi Function

12.1 AT+WIFIAPSCAN – Wi-Fi Hotspot Scanning

To scan for Wi-Fi hotspots around the module.

Format

Type	Command	Response
Execute	AT+WIFIAPSCAN<CR>	<CR><LF>+WIFIAPSCAN:<MAC Address>,<rssi>,<channel> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<MAC Address>	Physical address
<rssi>	signal strength.
<channel>	Channel number

Example

```
AT+WIFIAPSCAN                                   Start to scan hotspot and output all the scanning
+WIFIAPSCAN: ec6c9f4be889,-93,1                 results.
+WIFIAPSCAN: ec6c9f4be880,-99,1
+WIFIAPSCAN: ec6c9f4be87a,-96,1
OK
```

12.2 AT+WIFIGSMLOC – Wi-Fi Positioning

To perform Wi-Fi positioning function.

Before positioning, you need to scan Wi-Fi hot spot and then make a dial-up connection.

Format

Type	Command	Response
Execute	AT+WIFIGSMLOC =<n><CR>	<CR><LF>FIGSMLOC: <fail_string><CR><LF> Or <CR><LF>+WIFIGSMLOC: {<result_string>} <CR><LF>+WIFIGSMLOC: OK<CR><LF> Or <CR><LF><code> <CR><LF>+WIFIGSMLOC: FAIL<CR><LF> Or <CR><LF>OK <CR><LF>+WIFIGSMLOC: TIMEOUT<CR><LF>

Parameter

<fail_string>	GPRS DISCONNECTION ERROR LINK NOT FREE
<result_string>	String containing latitude and longitude
<code>	401: Unauthorized 400: Bad Request 404: Not Found 408: Request Timeout 500: Server Error

Example

```
AT+WIFIGSMLOC=1+WIFIGSMLOC:                                          Positioning
{"location":{"lat":34.2060764,"lng":108.8360664},"accuracy":50.0}    successfully.
+WIFIGSMLOC: OK
```

13 SSL TCP Data Service

13.1 AT+SSLTCPCFG – Configuring SSL Parameters for TCP

To configure SSL encryption options.

Format

Type	Command	Response
Set	AT+SSLTCPCFG=<type>,<type_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SSLTCPCFG?<CR>	<CR><LF>+SSLTCPCFG:<sslversiontype_name>,<authmodetype_name>,<ciphersuitetype_name>,<cacerttype_name>,<clientcerttype_name>,<clientkeytype_name> <CR><LF>OK<CR><LF>
Test	AT+SSLTCPCFG=?<CR>	<CR><LF>+SSLTCPCFG: <type>,<type_name> <CR><LF>OK<CR><LF>

Parameter

<type> SSL parameter options
sslversion: SSL protocol version
authmode: authentication mode
ciphersuite: Cupher cuite
cacert: CA certificate
clientcert: Client certificate
clientkey: Client key

<type_name> Settings for SSL parameter, the relations between the <type> and <type_name> values are as follows:,

- sslversion
  0: SSL3.0
  1: TLS1.0
  2: TLS1.1
  3: TLS1.2

- authmode
  0: no authentication, indicating
  +
  you do not have to set other parameters, such as cacert, clientcert, and clientkey.
  1: Manage server authentication
  2: Manage server and client authentication if requested by the remote server
- ciphersuite: reserved.
- cacert: string, CA certificate
- clientcert: string, client certificate
- clientkeyClientkey: string, client key

Example

```
AT+SSLTCPCFG="sslversion",0                    Set the SSL version to SSL3.0.
OK
AT+SSLTCPCFG="authmode",0                      Set the authentication mode to no
OK                                             authentication.
AT+SSLTCPCFG?
+SSLTCPCFG:0,1,ca.pem,cc.pem,ck.pem            Query the current SSL settings.
OK
AT+SSLTCPCFG=?
+SSLTCPCFG: <type>,<type_name>                 Query the available parameter value
OK                                             ranges.
```

13.2 AT+SSLTCPSETUP – Setting up a TCP Connection over SSL

To set up a TCP connection over SSL.

Do not establish non-transparent data services when using the transparent command, since the transparent command conflicts with other non-transparent data services.

Format

Type	Command	Response
Execute	AT+SSLTCPSETUP=<n>,<ip>,<port>,<mode><CR>	<CR><LF>OK<CR><LF> <CR><LF>+SSLTCPSETUP: <n>,<status> Or <CR><LF>CONNECT Or <CR><LF>+SSLTCPSETUP: ERROR Or

		<CR><LF>+SSLTCPSETUP: DISCONNECTION	GPRS
Query	AT+SSLTCPSETUP?	<CR><LF>+SSLTCPSETUP: <socket_id>,<ip>,<port>,<mode> [<CR><LF>+SSLTCPSETUP: <socket_id>,<ip>,<port>,<mode>]… <CR><LF>OK<CR><LF>	
Test	AT+SSLTCPSETUP=?	<CR><LF>+SSLTCPSETUP:<socket_id>,<ip>,<port>,<mode><CR><LF>	

Parameter

<n>	socket ID, ranging from 0 to 5, used to identify the connection to the server.
<ip>	IP address or domain name of the server.
<port>	server port.
<mode>	transmission mode 0: non-transparent 1: transparent
<status>	OK ERROR1 AUTHFAIL FAIL

Example

```
AT+SSLTCPSETUP=0,183,239.240,45,4451,0
OK

+SSLTCPSETUP: 0,OK

AT+SSLTCPSETUP=0,183,239.240,45,4451,1
CONNECT

AT+SSLTCPSETUP=0,183,239.240,45,4451,0
OK

+SSLTCPSETUP: 0,FAIL
AT+SSLTCPSETUP=0,183,239.240,45,4451,0
OK

+SSLTCPSETUP: 0,AUTHFAIL
AT+SSLTCPSETUP?
+SSLTCPSETUP: 0,183.239.240.45,4451,0
+SSLTCPSETUP: 1,183.239.240.45,4452,0
OK
```

```
Set up a non-transparent connection to
183.239.240.45 on socket 0. The port number is
4451.

Set up a non-transparent connection to
183.239.240.45 on socket 0. The port number is
4451.
Set up a non-transparent connection to
183.239.240.45 on socket 0. The port number is
4451.
Fails because of timeout.
Set up a non-transparent connection to
183.239.240.45 on socket 0. The port number is
4451.
Failed to authenticate.

Query the connection status.
A transparent TCP connection has been set up
on socket 0 and socket 1.
```

13.3 AT+SSLTCPCLOSE – Closing TCP Connection over SSL

To close a TCP connection over SSL.

Format

Type	Command	Response
Execute	AT+SSLTCPCLOSE=<socket_id>	<CR><LF>+SSLTCPCLOSE: <socket_id>,<result> Or <CR><LF>+SSLTCPCLOSE: ERROR
URC	+SSLTCPCLOSE: <socket_id>,Link Closed	

Parameter

<n>	socket ID, ranging from 0 to 5.
<result>	OK ERROR Link Closed

Example

```
AT+SSLTCPCLOSE=0                          Close the TCP connection on socket 0.
+SSLTCPCLOSE: 0,OK
AT+SSLTCPCLOSE=0
+SSLTCPCLOSE: ERROR                       The TCP connection on socket 0 is closed.
+SSLTCPCLOSE: 0,Link Closed                The TCP connection on socket 0 is closed.
```

13.4 AT+SSLTCPSEND – Sending TCP Data over SSL

To send TCP data over SSL.

Format

Type	Command	Response
Execute	AT+SSLTCPSEND=<socket_id>,<data_length>	<CR><LF>> <CR><LF>+SSLTCPSEND: <socket_id>,<result>

		Or <CR><LF>+SSLTCPSEND: Data length error<CR><LF>
Test	AT+SSLTCPSEND=?	<CR><LF>+SSLTCPSEND: (value range of<n>),(value range of<data_length>)<CR><LF>

Parameter

<socket>	ranging from 0 to 5, used to identify the connection to the server.
<data_length>	data length, ranging from 1 to 4096.
<result>	OK FAIL

Example

```
AT+SSLTCPSEND=0,20
>                                          Send 20-byte data to the server through socket
+SSLTCPSEND: 0,OK                          1.
AT+SSLTCPSEND=0,1024
>                                          Failed to send.
+SSLTCPSEND: 0,FAIL

AT+SSLTCPSEND=0,4097                       Send 4097-byte data to the server through socket
+SSLTCPSEND: Data length error             0.
                                           Fail because buffer is full.
AT+SSLTCPSEND=?
+SSLTCPSEND: (0-5),(1-4096)                Query the value range of the parameters.
OK
```

13.5 +SSLTCPRECV – URC Notifying SSLTCP Data Received

To notify SSLTCP data is received.

Format

Type	Command
URC	<CR><LF>+SSLTCPRECV: <socket_id>,<data_length>,<data><CR><LF>

Parameter

<socket_id>	ranging from 0 to 5, used to identify the connection to the server. This value shall

	be the same with the socket value set in the SSLTCPSETUP command.
<data_length>	Length of the data received.
<data>	data received.

Example

```
+SSLTCPRECV:
1,20,12345678901234567890                    Receive 20-byte data over socket 0.
```

13.6 AT+NWCERTEENABLE –Enabling Encryption of the Certificate

To enable encryption of the certificate. Only after the AWS certificate encryption is enabled, can the certificate be successfully encrypted and added to the module by executing the AT+CERTADD command (type=1, current only AWS MQTT certificate is supported).

Format

Type	Command	Response
Execute	AT+NWCERTEENABLE=<type>,<enable><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<type>	1	AWS certificate
	2	TCPS certificate
	3	HTTPS certificate
<enable>	0	unencrypted
	1	encrypted

Example

```
AT+NWCERTEENABLE=1,1
                                             Enable AWS certificate encryption.
OK
```

13.7 AT+CERTADD – Adding SSL Certificate

To add an SSL certificate to the module.

The writing process can be interrupted by +++.

Currently, only the AWS MQTT certificate can be encrypted. That is, to add an SSL certificate you must execute AT+NWCERTEENABLE=1,1 first and then execute the AT+CERTADD (<type> =1) command.

Format

Type	Command	Response
Execute	AT+CERTADD=<file_name>,<length>[,<type>]<CR>	<CR><LF>CONNECT<CR><LF> <CR><LF>+CERTADD: <length>,OK<CR><LF> Or <CR><LF>+CERTADD: ERROR<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name>	Name of the certificate written to the module
<length>	Certificate file name
<type>	1: AWS certificate 2: TCPS certificate 3: HTTPS certificate

Example

```
AT+CERTADD=ca_cert.pem,1428                  Write the 1428-byte ca_cert.pem certificate to the
CONNECT                                      module.
+CERTADD: 1428,OK
AT+CERTADD=client_cert.pem,1938              Write a 1938-byte client_cert.pem certificate to the
CONNECT                                      module.
+CERTADD: 1938,OK
AT+CERTADD=client key.pem,1097               Write a 1097-byte client cert.pem certificate to the
CONNECT                                      module.
+CERTADD: 1097,OK
```

13.8 AT+CERTCHECK – Checking the SSL Certificate

To check the SSL certificate.

Format

Type	Command	Response
Execute	AT+CERTCHECK=<file_name><CR>	<CR><LF>+CERTCHECK: <file_name>,OK Or <CR><LF>+CERTCHECK: ERROR
Query	AT+CERTCHECK?<CR>	<CR><LF><file_name>[<CR><LF><file_name>] <CR><LF>OK<CR><LF>

Parameter

<file_name> Certificate file name to be confirmed.

Example

```
AT+CERTCHECK=ca_cert.pem                    Check the ca_cert.pem certificate.
+CERTCHECK: ca_cert.pem,OK
AT+CERTCHECK=client_cert.pem                Check the client_cert.pem certificate.
+CERTCHECK: client cert.pem,OK
AT+CERTCHECK=client key.pem                 The client_key.pem certificate does not exist.
+CERTCHECK: ERROR
AT+CERTCHECKT?
cacert.pem                                  Query the added file.
keycert.pem
OK
```

13.9 AT+CERTDEL – Deleting an SSL Certificate

To delete an SSL certificate.

Format

Type	Command	Response
Execute	AT+CERTDEL[=<file_name>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name> Certificate file name to be deleted.

Example

```
AT+CERTDEL=ca_cert.pem                          Delete the ca_cert.pem certificate.
OK
AT+CERTDEL=client_cert.pem                      Delete the client_cert.pem certificate.
OK
AT+CERTDEL=client_key.pem                       Delete the client_key.pem certificate.
OK
AT+CERTDEL                                      Delete all the added certificates.
OK
```

13.10 AT+SSLTCPCFGA – Configuring SSL Parameters for TCP

To configure SSL encryption options.

Before configuring the SSL encryption options, you need to import the certificate in advance. Use the AT+CERTADD command to import the certificate. The certificate can be set to null.

Format

Type	Command	Response
Set	AT+SSLTCPCFGA=<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SSLTCPCFGA?<CR>	<CR><LF>+SSLTCPCFGA: <sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey> <CR><LF>OK<CR><LF>
Test	AT+SSLTCPCFGA=?<CR>	<CR><LF>+SSLTCPCFGA:<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey> <CR><LF>OK<CR><LF>

Parameter

<sslversion>	SSL protocol version 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2
<authmode>	authentication mode 0: No authentication

	1: Require authentication server 2: Two-way authentication
<cacert>	CA certificate.
<clientcert>	Client certificate
<clientkey>	Client key

Example

```
AT+SSLTCPCFGA=3,1,"ca.pem","",""                    Set TLS1.2.
OK                                                  Verifying the server is required.
                                                    Set the CA certificate to ca.pem.
                                                    Other certificates are null.

AT+SSLTCPCFGA?                                      Query the current SSL settings.
+SSLTCPCFGA: 0,1,ca.pem,cc.pem,ck.pem
OK
```

13.11 AT+SSLTCPREAD－Reading SSL TCP Data

To read SSL TCP data.

Format

Type	Command	Response
Execute	AT+SSLTCPREAD=<n>,<length><CR><LF>	<CR><LF>+SSLTCPREAD:<id>,<len>,<data> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<n>	Socket ID, ranging from 0 to 5.
<length>	Length of data read, ranging from 1 to 2048.
<len>	The length of data read.
<data>	data read

Example

```
AT+SSLTCPSETUP=0,58.60.184.213,12004,0
OK
+SSLTCPSETUP: 0,OK
AT+SSLTCPSEND=0,10                                  Data received on socket 0.
>                                                   Read data.
+SSLTCPSEND: 0,OK                                   The data read is 1234567890.

+SSLTCPRECV: 0
```

```
AT+SSLTCPREAD=0,2048
+SSLTCPREAD: 0,10,1111111111
OK
```

13.12 AT+SSLCIPHERSET – Removing Weak Algorithm from the SSLTCP Connection

To remove the weak algorithm from the SSL TCP connection.

Format

Type	Command	Response
Set	AT+SSLCIPHERSET=<enable><CR><LF>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SSLCIPHERSET?<CR>	<CR><LF>+SSLTCPCFGA: <enable><CR><LF>OK<CR><LF>
Test	AT+SSLCIPHERSET=?<CR>	<CR><LF>OK<CR><LF>

Parameter

<enable> Whether to remove the weak algorithm. Integer type, ranging from 0 to 1.
0: disable (default)
1: enable

Example

```
AT+SSLCIPHERSET=1           Remove the weak algorithm from the SSL TCP connection
OK                          successfully.
AT+SSLCIPHERSET?
+SSLCIPHERSET: 1            Query the current setting.
OK
```

- Additional (s) makes this command different from the receive mode of the client mode in format.
- Note that the parameters are different from that of the client mode.

14 MQTT Commands

14.1 AT+MQTTTLS – Configuring TLS Parameters

To configure MQTT TLS parameters.

Add the certificate through the AT+CERTADD command.

Format

Type	Command	Response
Set	AT+MQTTTLS=<type>,<type_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+MQTTTLS?<CR>	<CR><LF>+MQTTTLS:<sslmode>,<authmode>,<rootca_name>,<clientcert_name>,<clientkey_name> <CR><LF>OK<CR><LF>
Test	AT+MQTTTLS=?<CR>	<CR><LF>+MQTTTLS: <type>,<value> <CR><LF>OK<CR><LF>

Parameter

<type> Parameter type.
sslmode: Whether to enable authentication mode.
authmode: authentication mode
rootca: CA certificate.
clientcert: Client certificate
clientkey: client key
sslversion: SSL protocol version

<type_name> Corresponding parameter value
The relations between the <type> and <type_name> values are as follows:,

- sslmode
  0: not authentication
  1: authentication
- authmode
  0: verify optional
  1: verify required

Note: this parameter is valid only when sslmode=1.

- rootca: string: CA certificate.
- clientcert: string, name of the client certificate
- clientkey: clientkey: string, name of the client key
- sslversion: The default value is 3.
  0: SSL3.0
  1: TLS1.0
  2: TLS1.1
  3: TLS1.2

Example

```
AT+MQTTTLS=authmode,1                          Set the authentication mode to verify required.
OK
AT+MQTTTLS?                                    Query the current SSL settings.
+MQTTTLS: 1,1,ca.pem,cc.pem,ck.pem,3
OK
AT+MQTTTLS=?                                   Query the available parameter value ranges.
+MQTTTLS: <type>,<type_name>
OK
```

14.2 AT+MQTTCONNPARAM – Setting User Parameters

To set the ID, user name, password parameters.

The user name and password can be null.

Format

Type	Command	Response
Set	AT+MQTTCONNPARAM=<”clientdID”>,<”username”>,<”password”><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+MQTTCONNPARAM?<CR>	<CR><LF>+MQTTCONNPARAM:<"clientID">,<"username">,<"password"><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+MQTTCONNPARAM=?<CR>	<CR><LF>+MQTTCONNPARAM:<cliendid>,<username>,<password> <CR><LF>OK<CR><LF>

Parameter

<clientID> Client ID, 256 bytes at most.

<username>	User name, 512 bytes at most.
<password>	Password, 256 bytes at most.

Example

```
AT+MQTTCONNPARAM="C_201801021127","lixytest/thing0        Parameters are set successfully.
1","0lSoY/eYnlSqUeAsbAKKQ/ACmipZwEw9H7Ff0h1kOps="
OK
```

14.3 AT+MQTTWILLPARAM – Setting Will

To set will parameters.

These parameters cannot be set when the MQTT connection is established. The parameters set by this command is not saved, you need to reset them after the module is powered off.

Format

Type	Command	Response
Set	AT+MQTTWILLPARAM=<retained>,<qos>,<”topicname”>,<”message”><CR>	<CR><LF>+GNSSSTATE: <status><CR><LF> Or <CR><LF>OK<CR><LF>
Query	AT+MQTTWILLPARAM?<CR>	<CR><LF>+MQTTWILLPARAM:<retained>,<qos>,<"topicname">,<"message"> <CR><LF>OK<CR><LF>
Test	AT+MQTTWILLPARAM=?<CR>	<CR><LF>+MQTTWILLPARAM:<retained>,<qos>,<topicname>,<message> <CR><LF>OK<CR><LF>

Parameter

<retained>	Retain mark, digit type.
<qos>	quality of service, 0 to 1.
<”topicname”>	Will topic name, 128 at most.
<”message”>	Will Message, 1024 at most.

Example

```
AT+MQTTWILLPARAM=0,1,"neoway02",”byby”
OK                                          The will is set successfully.
```

14.4 AT+MQTTWILLMSG – Setting Long Will Messages

To set long will messages or will messages of non-character string by specifying retained, qos, topic, and message length.

Format

Type	Command	Response
Set	AT+MQTTWILLMSG=<retained>,<qos>,<"topic"> ,<msg_length><CR>	<CR><LF>> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<retained>	Retain mark, digit type, 0 and 1.
<qos>	QoS of the published message.
<"topic">	Topic that is published.
<willmsg_length>	Length of the message body, 10240 bytes at most. Enter the message content of the length specified by after>.

Example

```
AT+MQTTWILLMSG =1,1,"neoway02",10                    Set will message.
>                                                    Successful

OK
AT+MQTTWILLMSG=1,1,"neoway02",10                     Set will message.
>                                                    Failed

+MQTTWILLMSG: Timeout!
```

14.5 AT+MQTTCONN – Connection Command

To connect to the MQTT server.

Wait for the return value during the module is connecting to the server. You cannot perform the connection operation again if no value is return.

After the connection is set up successfully, if the module reports **+MQTTDISCONNED:Link Close**d while you have not send the connection close command set up the connection manually.

Format

Type	Command	Response
Execute	AT+MQTTCONN=<"host">,<clean>,<keep_alive><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+MQTTCONN?<CR>	<CR><LF>+MQTTCONN:<"ip:port">,<clean>,<keep_alive> <CR><LF>OK<CR><LF>
Test	AT+MQTTCONN=?<CR>	<CR><LF>+MQTTCONN:<host>,<clean>,<keep_alive> <CR><LF>OK<CR><LF>

Parameter

<"host">	Server address (URL:port).
<clean>	Whether to clean session, digit type. 0: Not clean (default) 1: Clean
<keep_alive>	timeout period, ranging from 20 to 180, unit: s

Example

```
AT+MQTTCONN="121.43.166.63:1883",0,60                    The connection is set up successfully.
OK
```

14.6 AT+MQTTSUB – Subscribing a Topic

To subscribe to a topic.

If the subscription is failed perform the operation again after querying the MQTT connection and network connection status. When the network is poor, the return value is slow.

The query command is valid only when the connection is set up. You can only query the latest subscribed QoS and topic.

Format

Type	Command	Response
Execute	AT+MQTTSUB=<"topicnam	<CR><LF>OK<CR><LF>

	e">,<qos><CR>	Or <CR><LF>ERROR<CR><LF>
Query	AT+MQTTSUB?<CR>	<CR><LF>+MQTTSUB:<"topicname">,<qos> <CR><LF>OK<CR><LF>
Test	AT+MQTTSUB=?<CR>	<CR><LF>+MQTTSUB:<topicname>,<qos> <CR><LF>OK<CR><LF>

Parameter

<"topicname">	Topic name, 128 at most.
<qos>	Quality of service, 0,1 to 2

Example

```
AT+MQTTSUB="neoway02",1                          Subscribe to the topic successfully.
OK                                               The server issues the topic retained
                                                 last time.
+MQTTSUB:9,"neoway02",11,neoway mqtt
AT+MQTTSUB= neoway02,1                           Subscribed to the topic successfully.
OK
```

14.7 AT+MQTTUNSUB – Canceling a Subscription

To cancel a subscription of the specified topic.

When you fail to cancel the subscription, query the network status. When the network is poor, the return value is slow.

Format

Type	Command	Response
Execute	AT+MQTTUNSUB=<"topicname"><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<"topicname">	Name of the topic to be unsubscribed to, 128 at most.

Example

```
AT+MQTTUNSUB="neoway02"                                    Cancel a subscription.
OK
```

14.8 AT+MQTTPUB – Publishing a Topic

To publish a topic.

When the network is poor, the return value is slow.

It is recommended to publish topic containing the "\" character using the AT+MQTTPUBS command since "\" is an escape character.

Format

Type	Command	Response
Execute	AT+MQTTPUB=<retained>,<qos>,<"topicname">,<"message"><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<retained>	Retain mark, digit type, 0 and 1.
<qos>	quality of service, 0, 1, 2.
<"topicname">	Name of the topic that is published, 128 at most.
<"message">	Message that is published, 1024 at most.

Example

```
AT+MQTTPUB=1,1,"neoway02",”neoway mqtt”                    The topic is published successfully.
OK
AT+MQTTPUB=1,1,"neoway02",”neoway mqtt”
OK                                                         The topic is published successfully. The
                                                           server issues the topic.
+MQTTSUB:5,"neoway02",11, neowaymqtt
```

14.9 AT+MQTTPUBS – Publishing a Topic with Long Message

To publishing a topic with long message.

Format

Type	Command	Response
Execute	AT+MQTTPUBS=<retained>,<qos>,<"topic">,<msg_length><CR>	<CR><LF>> <CR><LF>OK<CR><LF> Or <CR><LF>><CR><LF> <CR><LF>+MQTTPUBS: Timeout!<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<retained>	Retain mark, digit type, 0 and 1.
<qos>	QoS of the published message.
<"topic">	Topic that is published.
<msg_length>	Length of the message body, 10240 bytes at most. Enter the message content of the length specified by after >.

Example

```
AT+MQTTPUBS=1,1,"lixytopic",10       The message is published successfully.
>
OK
AT+MQTTPUBS=0,1,"lixytopic",12       Failed to publish the message, the writing operation
>                                    times out.
+MQTTPUBS: Timeout!
```

14.10 AT+MQTTDISCONN – Disconnecting to the MQTT Server

To close the MQTT connection.

The device disconnects to the MQTT server proactively and releases the MQTT resources. Then the MQTT resources are released. If you need to publish messages, you need to reset the MQTT

connection parameters and set up the connection again.

Format

Type	Command	Response
Execute	AT+MQTTDISCONN<CR>	<CR><LF>OK<CR><LF>

Parameter

N/A.

Example

```
AT+MQTTDISCONN                                          To close the MQTT connection.
OK
```

14.11 +MQTTSUB – Receiving Message

To receive the topic. When the network is poor, the return value is slow.

Format

Type	Command
URC	+MQTTSUB:<message_id>,<"topicname">,<message_len>,<message><CR>

Parameter

<message_id>	Message ID
<"topicname">	Will topic, value with double quotes.
<message_len>	Length of the data received.
<message>	data received.

Example

```
+MQTTSUB:":1,"neoway02",5,12345                         Receive the topic.
```

14.12 AT+MQTTSTATE – Query the MQTT Connection Status

To query the MQTT connection status.

The setting by this command is not saved after the module is powered off.
Every tine you set up an MQTT connection, enable the URC of MQTT connection status.

Format

Type	Command	Response
Query	AT+MQTTSTATE?<CR>	<CR><LF>+MQTTSTATE: <state><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<state>	Reconnection status 0: the connection has been closed 1: the connection is established.

Example

```
AT+MQTTSTATE?                  Query the MQTT connection state.
+MQTTSTATE: 1                  1 indicates the MQTT connection is established successfully.
OK
AT+MQTTSTATE?                  Query the MQTT connection state.
+MQTTSTATE: 0                  0 indicates the MQTT connection is closed.
OK
```

15 AWS MQTT Commands

15.1 AT+AWSTLSCFG – Configuring AWS TLS Parameters

To configure AWS TLS parameters.

Add the certificate through the AT+CERTADD command.

Format

Type	Command	Response
Set	AT+AWSTLSCFG=<type>,<value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+AWSTLSCFG?<CR>	<CR><LF>+AWSTLSCFG:<authmode>,<rootca_name>,<clientcert_name>,<clientkey_name> <CR><LF>OK<CR><LF>
Test	AT+AWSTLSCFG=?<CR>	<CR><LF>+AWSTLSCFG:<type>,<value> <CR><LF>OK<CR><LF>

Parameter

<type>	Parameter type.
<value>	Corresponding parameter value
<authmode>	authentication mode 0: verify optional 1: verify required
<rootca>	string, CA certificate
<clientcert>	string, client certificate
<clientkey>	string, client key

Example

```
AT+AWSTLSCFG=authmode,1                    Set the authentication mode to verify required.
OK
```

```
AT+AWSTLSCFG?                                Query the current SSL settings.
+AWSTLSCFG: 1,ca.pem,cc.pem,ck.pem
OK
AT+AWSTLSCFG=?                               Query the available parameter value ranges.
+AWSTLSCFG: <type>,<value>
OK
```

15.2 AT+AWSAUTHPARAM – Setting User Parameters

To set the ID, user name, password parameters.

The current version 2.3.0 does not require the username and password parameters. They are optional.

Format

Type	Command	Response
Set	AT+AWSAUTHPARAM=<cliendID>,<username>,<password><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<cliendID>	Client ID, 128 bytes at most.
<username>	User name, 512 bytes at most.
<password>	Password, 256 bytes at most.

Example

```
AT+AWSAUTHPARAM=1234567890,test,test          Parameters are set successfully.
OK
```

15.3 AT+AWSCONNPARAM – Setting the AWS Connection Parameter

To set the AWS connection parameter.

Format

Type	Command	Response
Set	AT+AWSCONNPARAM=<host>,<enable_reconnect><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<host>	Server address (URL:port).
<enable_reconnect>	Whether to enable reconnecting after a disconnection. 0: disable 1: enable

Example

```
AT+AWSCONNPARAM=a1epg1vh6w7hlk.iot.us-east-2.amazonaws.com:443,1
OK

The connection parameters are set successfully.
```

15.4 AT+AWSCONN – Setting up the AWS MQTT Connection

To set up the AWS MQTT connection.

The current SDK version is 2.3.0 and only clean =1 and version=4 are supported.

Format

Type	Command	Response
Execute	AT+AWSCONN=<keepAlive>,<clean>,<version><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<keepAlive>	Keepalive interval, ranging from 30 to 1200s; 60s by default
<clean>	whether to clean session, numeric type, 0: Not clean

	1: Clean
<version>	MQTT version 4 = 3.1 1

Example

```
AT+AWSCONN=60,1,4                                    The connection is set up
                                                     successfully.
OK
```

15.5 AT+AWSSUB – Subscribing to a Topic

To subscribe to a topic.

Format

Type	Command	Response
Execute	AT+AWSSUB=<topicname>,<qos><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<topicname>	Topic name, 128 at most.
<qos>	quality of service, 0 to 1.

Example

```
AT+AWSSUB=nwy test/01,1                              Subscribed to the topic
OK                                                   successfully.
```

15.6 AT+AWSUNSUB – Canceling a Subscription

To cancel a subscription of the specified topic.

Format

Type	Command	Response
Execute	AT+AWSUNSUB=<topicname><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<topicname>	Name of the topic to be unsubscribed to, 128 at most.

Example

```
AT+AWSUNSUB=nwy_test/01                                    Cancel a subscription.
OK
```

15.7 AT+AWSPUB – Publishing a Topic

To publish a topic.

Format

Type	Command	Response
Execute	AT+AWSPUB=<retained>,<qos>,<topicname>,<length><CR>	<CR><LF>> <CR><LF>OK<CR><LF> Or <CR><LF>> <CR><LF>OK <CR><LF>+AWSPUB: OK<CR><LF> Or <CR><LF>+AWSPUB: ERROR<CR><LF>

Parameter

<retained>	Retain mark, digit type, 0 and 1. The current SDK version is 2.3.0 and only retained=0 is supported.
<qos>	quality of service, 0 to 1.
<topicname>	Name of the topic that is published, 128 at most.
<length>	Length of the message body, 10240 bytes at most. Enter the message content of the length specified by after >.

Example

```
AT+AWSPUB=1,1," nwy_test/01",11              The topic is published successfully.
>
OK
AT+AWSPUB=1,1," nwy_test/01",11              The topic is published successfully. The
>                                            server issues the topic.
OK
+AWSPUB: OK

+AWSSUBRECV:5,"nwy_test/01",11,12332ELO
```

15.8 AT+AWSDISCONN – Closing the AWS MQTT Connection

To close the AWS MQTT connection.

Format

Type	Command	Response
Execute	AT+AWSDISCONN<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

N/A.

Example

```
AT+AWSDISCONN                                    Disconnect to the MQTT server.
OK
```

15.9 +AWSSUBRECV – Receiving the Topic

To receive the topic.

Format

Type	Command
URC	+AWSSUBRECV: <message_id>,<"topicname">,<message_len>,<message>

Parameter

<message_id>	Message ID
<topicname>	Topic name
<message_len>	Length of the data received.
<message>	data received

Example

```
+AWSSUBRECV: 5,"nwy_test/01",5,12345                    Receive the topic.
```

15.10 AT+AWSSTATE – Querying the MQTT Connection State

To query the MQTT connection status.

Format

Type	Command	Response
Execute	AT+AWSSTATE?<CR>	<CR><LF>+AWSSTATE: <n><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n> Connection status
0: the connection is closed
1: the connection is set up

Example

```
AT+AWSSTATE?            Query the MQTT connection state.
+AWSSTATE: 1            1 indicates the MQTT connection is established successfully.
OK
```

```
AT+AWSSTATE?            Query the MQTT connection state.
+AWSSTATE: 0            0 indicates the MQTT connection is closed.
OK
```

16 GSM Location Command

16.1 AT+CIPGSMLOC – Obtaining the Location of the Module

Obtain the base station location information of the module.

The obtained data is GPS coordinates.

The current coordinates of latitude and longitude are valid and precision is reserved (0.0 by default).

Format

Type	Command	Response
Execute	AT+CIPGSMLOC[=<n>]<CR>	<CR><LF>+CIPGSMLOC: <fail_string><CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: {<result_string>} <CR><LF>+CIPGSMLOC: OK<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: <code><CR><LF> <CR><LF>+CIPGSMLOC: FAIL<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: TIMEOUT<CR><LF>

Parameter

<n>	Request selection 0: close positioning request 1: enable positioning through multiple base stations
<fail_string>	Prompt strings for request failure CONTACT FAIL LINK FAIL LINK NOT FREE
<result_string>	String containing latitude and longitude
<code>	Respond code of the server after the request is successful and no latitude and

longitude data is returned.
401: Unauthorized
400: Bad Request
404: Not Found
408: Request Timeout
500: Server Error

Example

```
AT+CIPGSMLOC                                                    The command is executed
OK                                                              successfully.

+CIPGSMLOC:{"location":{"lat":22.69083,"lng":113.985228},
"accuracy":0.0}                                                 Report the location
+CIPGSMLOC: OK                                                  information of the module.
AT+CIPGSMLOC                                                    Failed to translate the
+CIPGSMLOC: CONTACT FAIL                                        server DNS name.
AT+CIPGSMLOC                                                    Failed to connect to the
+CIPGSMLOC: LINK FAIL                                           server.
AT+CIPGSMLOC                                                    Location request succeeded.
OK

                                                                Since the base station
+CIPGSMLOC: 404                                                 queried is not included,
                                                                the result cannot be
+CIPGSMLOC: FAIL                                                calculated.
                                                                Request multiple base
                                                                stations positioning.
AT+CIPGSMLOC=1                                                  The last request has not
OK                                                              been responded to, and the
AT+CIPGSMLOC=1                                                  link has not been released.
+CIPGSMLOC: LINK NOT FREE                                       Request again, prompting
                                                                that the link is occupied.
AT+CIPGSMLOC=0                                                  Close the request.
OK                                                              The link is released.
AT+CIPGSMLOC=1                                                  positioning through
OK                                                              multiple base stations is
                                                                requested successfully.
+CIPGSMLOC: {"location": {"lat": 22.689646628671216,
"lng":113.98586121790129},"accuracy":0.0}                       The module reports the
+CIPGSMLOC: OK                                                  position coordinates.
```


17 Time Synchronization Commands

17.1 AT+UPDATETIME – Updating Time to Network

To update the module time to the network time.

Set up a PPP link (AT+XIIC=1) before sending this command. Send AT+CCLK? to query whether RTC is synchronized to the current network time after this command is sent successfully.

The following time servers support time update: time.windows.com, time.nist.gov, etc.

The settings by this command are not saved after the module is powered off.

Format

Type	Command	Response
Execute	AT+UPDATETIME=<mode>[,<serv_ip>,<time>[[,<TZ>][,<DST>]]]<CR>	<mode>=0 <CR><LF>+UPDATETIME: Last Update Time yyyy-mm-dd,hh:mm:ss <CR><LF>OK<CR><LF> <mode>=1 <CR><LF>OK<CR><LF> <CR><LF>+UPDATETIME:<result code><CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>Time Updating,Please Wait...<CR><LF> <CR><LF>+UPDATETIME: Update To yyyy-mm-dd,hh:mm:ss<CR><LF>
Query	AT+UPDATETIME?<CR>	<CR><LF>+UPDATETIME: <serv_ip>,<time>,<TZ>,<DST> <CR><LF>OK<CR><LF>
Test	AT+UPDATETIME=?<CR>	<CR><LF>+UPDATETIME: (value range of <mode>),,(value range of <time>),,(value range of <DST>) <CR><LF>OK<CR><LF>

Parameter

<mode>	0: Query mode. Query when the time was updated to the network time last time. 1: Setting mode. Synchronize the time to the network time.
<serv_ip>	The IP address of the time server, in form of xx.xx.xx.xx or domain name.
<time>	the timeout period, ranging from 1 to 60, unit: second.
<TZ>	Time zone, in format of E/W+digits; E8 by default. E: east time zone, 0 to 13 W: west time zone, 0 to 12 0: Zero time zone
<DST>	Daylight Saving Time 1: Select DST auto-adjustment 0: Not select (by default)
<result code>	No PPP Link Time Out Time Data Is Null Send Request Fail Domain Name Invalid Socket Error

Example

```
AT+UPDATETIME=0                                  Query when the time was updated last
+UPDATETIME:Last Update Time 2014-03-            time.
31,11:10:26
OK                                               The updated time: 2014-03-31,11:10:26
AT+UPDATETIME=0                                  Query when the time was updated last
+UPDATETIME: Last Update Time 0000-00-           time.
00,00:00:00
OK                                               The time was not updated.
AT+UPDATETIME=1,210.72.145.44,10
+UPDATETIME: No PPP Link                         No PPP connection is set up.

                                                 Synchronize with the network time of
AT+UPDATETIME=1,210.72.145.44,10                 210.72.145.44.
OK                                               Time out: 10s.
                                                 The default time zone is East 8.
Time Updating,Please Wait...                     Daylight saving time is not selected to
                                                 prompt.
+UPDATETIME: Time Out                            Synchronization times out because the
                                                 network is busy.
                                                 Update the time to that of the server
AT+UPDATETIME=1,128.138.141.172,10,"E8",0        128.138.141.172.
OK                                               Time out: 10s.
                                                 The time zone is set to East 8.
Time Updating,Please Wait...                     Daylight saving time is not selected to
                                                 prompt.
+UPDATETIME: Update To 2014-03-31,11:32:55       Time is updated successfully.
AT+UPDATETIME=1,time.windows.com,10,"W12",1       Synchronize with the network time of
OK                                               time.windows.com.
                                                 Time out: 10s.
Time Updating,Please Wait...                     The time zone is set to West 12.
```

+UPDATETIME: Update To 2014-04-12,15:17:48	Select daylight saving time.
AT+UPDATETIME=1,128.138.141.172,10,"W12",1 OK	Time is updated successfully.
+UPDATETIME: Send Request Fail	Time update request sending fails. The reason probably is bad network connection or inability to support time update.
AT+UPDATETIME=1,time.windows.com,10,"W12",1 +UPDATETIME: Domain Name Invalid	The domain name is invalid. The possible reason is the SIM (USIM) card is out of credit.
AT+UPDATETIME=1,time.windows.com,10,"W12",1 OK +UPDATETIME: Socket Error	Socket error. The possible reason might be network congestion.
AT+UPDATETIME? +UPDATETIME: 128.138.141.172,10,"E8",0 OK	Query the IP address of the server to which the time is updated and the timeout period, time zone, and DTS.
AT+UPDATETIME=? +UPDATETIME: (0-1),,(1-30),,(0-1) OK	Query available parameter value ranges.
AT+UPDATETIME=0 +UPDATETIME:Last Update Time 2014-03-31,11:10:26 OK	Query when the time was updated last time. Update to 2014-03-31,11:10:26
AT+UPDATETIME=0 +UPDATETIME: Last Update Time 0000-00-00,00:00:00 OK	Query when the time was updated last time. The time was not updated.
AT+UPDATETIME=1,210.72.145.44,10 +UPDATETIME: No PPP Link	No PPP connection is set up.
AT+UPDATETIME=1,210.72.145.44,10 OK Time Updating,Please Wait... +UPDATETIME: Time Out	Synchronize with the network time of 210.72.145.44. Time out: 10s. The default time zone is East 8. Daylight saving time is not selected to prompt. Synchronization times out because the network is busy.

18 Network Sharing Commands

18.1 AT+NETSHAREMODE – Selecting Network Sharing Mode

To select the network sharing mode.

The setting by this command is saved after the module is powered off and it is valid after restart.

Format

Type	Command	Response
Execute	AT+NETSHAREMODE=<share_mode><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NETSHAREMODE?	<CR><LF>+NETSHAREMODE: <share_mode> <CR><LF>OK<CR><LF>

Parameter

<share_mode>	0: RNDIS 1: ECM

Example

```
AT+NETSHAREMODE=1              Set the network sharing mode to ECM.
OK
AT+NETSHAREMODE?               Query what the network sharing mode is set.
+NETSHAREMODE: 1               The current network sharing mode is ECM.
OK
```

18.2 AT+NETSHAREACT – Enabling Network Sharing

To enable network sharing.

Format

Type	Command	Response
Set	AT+NETSHAREACT=<cid>,<action>,<auto>[,<APN>[,<username>[,<passwd>[,<authtype>[,<ip_family>]]]]]	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NETSHAREACT?	<CR><LF>+NETSHAREACT:<stat>,<auto>,<err_code>,<wx_stat>,<PDP_type>,<share_mode> <CR><LF>OK<CR><LF>
Test	AT+NETSHAREACT=?	<CR><LF>+NETSHAREACT:(range of supported<cid>),(range of supported<action>),(range of supported<auto>),<apn>,<username>,<passwd>,(list of supported<authtype>s,list of supported <ip_family>s) <CR><LF>OK<CR><LF>

Parameter

<cid>	PDP context, ranging from 2 to 7.
<action>	Action 0: stop 1: start
<auto>	Specifies whether to enable network sharing automatically after the module is powered on. 0: manual 1: auto
<APN>	Access Point Name, ranging from 0 to 99.
<user_name>	User name, ranging from 0 to 64.
<passwd>	Character string type, password, ranging from 0 to 64.
<auth_type>	Authentication type 0: NONE 1: PAP (default) 2: CHAP 3: PAP and CHAP
<ip_family>	IP family 4: IPv4 (default)

	6: IPv6
	10: IPv4_6
<stat>	0: disconnect
	1: connect
<atuo>	0: manual
	1: auto
<err_code>	not supported currently
<wx_stat>	not supported currently
<PDP_type>	IPv4
<share_mode>	RNDIS/ECM

Example

```
AT+NETSHAREACT=2,1,0,ctnet,card,card,1                  Enable USB network sharing. The
OK                                                      autostart function is not set.
AT+NETSHAREACT=?                                        Query the ranges of the parameters.
+NETSHAREACT: (2-7),(0-1),(0-
1),"apn","user","passwd",(0-3),(4,6,10)
OK
AT+NETSHAREACT?                                         Query network sharing status.
+NETSHAREACT: 0,0,,,"IPV4",RNDIS
OK
```

19 Statistics on Data Traffic

19.1 AT+FLOWCALC – Statistics on Total Data Traffic

To collect the statistics on total data bytes that the module transmits and receives.

This command is used to count the total amount of traffic currently passing through the module in byte.

This command supports only statistics on data that the module transmitted and received using external protocols.

V003 and the later version support this command.

Format

Type	Command	Response
Query	AT+FLOWCALC?<CR>	<CR><LF>+FLOWCALC: <rx_count>,<tx_count> <CR><LF>OK<CR><LF>

Parameter

<rx_count>	Total data the module received, unit: byte.
<tx_count>	Total data the module transmitted, unit byte.

Example

```
AT+FLOWCALC?                Query the total data that the module transmitted and received.
+FLOWCALC: 1355,1260
OK
AT+FLOWCALC?                Query the total data that the module transmitted and received.
+FLOWCALC: 0,0
OK
```

19.2 AT+RATECALC – Statistics on Transient Traffic

To collect statistics on transient data bytes that the module transmits and receives

within 100 ms.

This command supports only statistics on data that the module transmitted and received using external protocols.

V003 and the later version support this command.

Format

Type	Command	Response
Execute	AT+RATECALC?<CR>	<CR><LF>+RATECALC: <rx_count>,<tx_count> <CR><LF>OK<CR><LF>

Parameter

<rx_count>	Total data the module received, unit: byte.
<tx_count>	Total data the module transmitted, unit byte.

Example

```
AT+RATECALC?                                Query the total data that the module
+RATECALC: 1355,1260                        transmitted and received within 100ms.
OK
AT+RATECALC?                                Query the total data that the module
+RATECALC: 0,0                              transmitted and received within 100ms.
OK
```

20 File System Commands

20.1 AT+FSWF –Writing Data to File

To write data to a file.

Format

Type	Command	Response
Execute	AT+FSWF=<file_name>,<mode>,<size>,<time><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+FSWF: Timeout!<CR><LF>

Parameter

<file_name>	File name, at most 50 characters
<mode>	0: If the file already exists, new data is written to the start of the file and then it overwrites original data. 1: If the file already exists, new data is written to the end of the file.
<size>	Data size, ranging from 0 to 1024*1024, unit: byte. The data to be written should not exceed <size>.
<time>	timeout period, ranging from 0 to 240000, unit: ms

- The data to be written should not exceed <size>.
- The size of the user disk is 1M, i.e. the total size of the files that can be stored is 1M.
- If SD card is supported, the command with the value of <file_name> containing /sdcard can be used to operate SD card files.
- If external flash is supported, include **/dataflash** () in file name to operate files in the SD card.

Example

```
AT+FSWF="test.txt",1,1024,10000          Write 1024-byte data to the test.txt file.
```

```
>
OK
AT+FSWF="test.txt",1,1024,10000              The command times out after 10 seconds.
>
+FSWF: Timeout!
AT+FSWF="test.txt",1,1024,60001              ERROR is returned because the set value
ERROR                                        exceeds the parameter range.
AT+FSWF="/sdcard0/test.txt",1,10,60000       Write data to the test.txt file in SD card.
>
OK
AT+FSWF=/dataflash/test.txt,1,10,120000      Write data to the 10.txt file on the external
>                                            flash.
OK
```

20.2 AT+FSRF－Reading Data from a File

To read data from a file

Format

Type	Command	Response
Execute	AT+FSRF=<file_name>,<mode>,<size>[,<position>]<CR>	<CR><LF>+FSRF:<size>,<content><CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name>	File name, at most 50 characters
<mode>	0: read data from the beginning of the file. 1: read data starting from <position> of the file.
<size>	data size, not exceed the size of the file, 0 is valid.
<position>	the position in the file, where data to be read starts, valid when <mode> is set to 1. <Size> and <position> are determined by the file size.
<content>	Content of the file to be read.

- the specified data size cannot exceed the total size of the file.
- <size> and <position> is determined by the file size.
- If SD card is supported, the command with the value of <file_name> containing /sdcard can be used to operate SD card files.
- If external flash is supported, include **/dataflash** () in file name to operate files in the SD card.

Example

```
AT+FSRF="test.txt",0,10                Read 10-byte data from the beginning of the test.txt
+FSRF: 10, start01234                  file.
OK
AT+FSRF="test.txt",0,0                 Read 0-byte data from the beginning of the test.txt
+FSRF: 0,                              file.
OK
AT+FSRF="test.txt",0,1025              ERROR is returned because <size> exceeds the file
ERROR                                  size.
AT+FSRF="test.txt",1,20,2              Read 20-byte data from the second byte of the
+FSRF: 20, tart0123456789012345        test.txt file.
OK                                     The data is read successfully.
AT+FSRF="test.txt",1,0,2               Read 0-byte data from the second byte of the
+FSRF: 0,                              test.txt file.
OK
AT+FSRF="test.txt",1,10,1025           <Position> exceeds the file size.
ERROR
AT+FSRF="/sdcard0/test.txt",0,10       Read content of the test.txt file from the SD card.
+FSRF: 10, start01234
OK
AT+FSRF=/dataflash/test.txt,0,10       Read content of the test.txt file from the external
+FSRF: 10,aaaaaaaaaa                   flash.
OK
```

20.3 AT+FSRFEX – Reading File

To read a file.

Format

Type	Command	Response
Execute	AT+FSRFEX=<file_name>,<checksum_mode>,<mode>,<size>[,<position>]	<CR><LF>+FSRFEX: <lenth>,<checksum>,<content><CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name>	File name, the file length does not exceed 50 characters.
<checksum_mode>	Verification type 1: XOR check method 2 - 99: reserved
<mode>	0: read data from the beginning of the file. 1: to read data from the position specified in <position>.

<size>	data size, not exceed the size of the file, it cannot be set to 0.
<position>	the position in the file, where data to be read starts, valid when <mode> is set to 1, 0 is invalid. Currently 0x40000000 is supported at most.
<lenth>	Length of the file to be read.
<content>	Content of the file to be read.
<checksum>	Content of the file to be read.

- <size> cannot exceed the total size of the file.
- <size> and <position> is determined by the file size.
- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSRFEX="test.txt",1,0,10              Read 10-byte data from the beginning of the
+FSRFEX: 10,XXXX,start01234              test.txt file.
OK
AT+FSRFEX=/sdcard0/123.txt,1,0,10        Read 10-byte data from the beginning of the
+FSRFEX: 10,XXXX,1234567890              123.txt file from the SD card.
OK
AT+FSRFEX=/dataflash/test.txt,1,0,10     Read 10-byte data from the beginning of the
+FSRFEX: 10,6425,aaaaaaaaaa              test.txt file from the external flash.
OK
```

20.4 AT+FSDF – Deleting a File

To delete a file.

Format

Type	Command	Response
Execute	AT+FSDF=<file_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name> File name, the file length does not exceed 50 characters.

- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSDF="test.txt"                  Delete the text.txt file.
OK
AT+FSDF="123.txt"                   Delete the 123.txt file. ERROR is returned because the
ERROR                               file does not exist.
AT+FSDF=/sdcard0/1.txt              Delete 1.txt from SD card
OK
AT+FSDF=/dataflash/test.txt         Delete the test.txt file from the external flash.
OK
```

20.5 AT+FSLIST – Obtaining File List

To obtain the list of files in the file system.

Format

Type	Command	Response
Execute	AT+FSLIST=<directory><CR>	<CR><LF>OK<CR><LF>
Query	AT+FSLIST?<CR>	<CR><LF>OK<CR><LF> Or <CR><LF><file_name>,<size> <CR><LF><file_name>,<size> …… <CR><LF>OK<CR><LF>

Parameter

<directory> Specify the directory to use when querying the file list in the SD card or external flash.

- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSLIST?                              File name before comma
i.amr,6181                              File size after comma
file.txt,6000
OK
AT+FSLIST?                              No file in the file system
OK
AT+FSLIST=/sdcard0                      Query file list in /sdcard0
OK
AT+FSLIST=/dataflash                    Query the file list from the external flash.
+FSLIST: /dataflash/test.txt,10
OK
```

20.6 AT+FSFS – Obtaining the Size of a File

To obtain the size of a file.

Format

Type	Command	Response
Execute	AT+FSFS=<file_name><CR>	<CR><LF>+FSFS:<size> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<file_name>	File name, the file length does not exceed 50 characters.

- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSFS="test.txt"                    Obtain the size of the text.txt file.
+FSFS: 1024                           The size is 1024 bytes.
OK
AT+FSFS="123.txt"                     Obtain the size of the 123.txt file.
ERROR                                 ERROR is returned because the file does not exist.
AT+FSFS=/sdcard0/1.txt                Obtain the size of the 1.txt file in SD card.
+FSFS: 10
OK
AT+FSFS=/dataflash/test.txt           Query size of the test.txt file in the external
+FSFS: 10                             flash.
OK
```

20.7 AT+FSLS – Obtaining the Remaining Storage Size of User Disk

To obtain the remaining storage size of user disk.

Format

Type	Command	Response
Execute	AT+FSLS=<directory><CR>	<CR><LF>+FSLS:<size> <CR><LF>OK<CR><LF>
Query	AT+FSLS?<CR>	<CR><LF>+FSLS:<size> <CR><LF>OK<CR><LF> Or <CR><LF>+FSLS: DiskInfo Not Right!<CR><LF>

Parameter

<directory>	Specify the directory to use when querying the remaining size of the SD card or external flash.
<size>	Remaining storage size of user disk.

- The block size of the file system is 500 byte, based on the actual file occupied block size, SD card or external flash different models block size may be different.
- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then

include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSLS?                 The remaining storage size of user disk is 64500 bytes.
+FSLS: 64500             64500=500*129, that is, there are 129 data blocks (500
OK                       bytes/block).
AT+FSLS=/sdcard0         Query the remaining size of the SD card.
+FSLS: 1535345345
OK
AT+FSLS=/dataflash       Query the remaining size of the external flash.
+FSLS: 15878544
OK
```

20.8 AT+FSFAT – Formating the User Disk

To format the user disk.

Format

Type	Command	Response
Execute	AT+FSFAT[=<directory>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<directory> Specify the directory to use when formatting the SD card or external flash.

- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSFAT                  Format the user disk.
OK
AT+FSLS?                  The remaining storage size of user disk is 65536 bytes.
+FSLS: 65536
OK
AT+FSFAT                  The user disk is not ready.
ERROR
AT+FSFAT=/sdcard0         Format the SD card.
OK
AT+FSFAT=/dataflash       Format the external flash.
OK
```

20.9 AT+FSRN – Renaming the File

To rename the file.

If the file renamed exists, it will overwrite the original file.

If the file renamed does not exist, errors will be returned.

Format

Type	Command	Response
Execute	AT+FSRN=<src_file_name>,<dst_file_name><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<src_file_name>	File name to be renamed, at most 50 characters
<dst_file_name>	File name that after renaming, at most 50 characters

- If SD card is supported, the command with the value of <file_name> containing **/sdcard0** can be used to operate SD card files.
- If external flash is supported, execute the +NWYSPIFLASH command to perform initialization and then include **/dataflash** in file name to operate files in the SD card.

Example

```
AT+FSRN="test.txt","dst.txt"                          The file is renamed
OK                                                    successfully.
AT+FSRN="test1.txt","dst.txt"                         Failed to rename the file.
ERROR
AT+FSRN=/dataflash/test.txt,/dataflash/123.txt        Rename the file in the external
OK                                                    flash.
```

21 SIM Card Related Commands

21.1 AT+SIMCROSS – Switching SIM

To switch SIM. Card slot 1 is used by default at the first startup.

Currently N715 only supports dual cards single standby. If only one SIM card is used (ensure that it is valid) and the issue of failing to register network occurs, it is recommended to run the +SIMCROSS? command to query whether the correct SIM card slot is selected. Try to use this executed command to switch the SIM card slot if it an incorrect card slot is selected.

When only one SIM card is used, it is recommended to run the NWDSIMCFG command to query which of the card slot is valid before inserting the SIM card. Otherwise, the module may fail to register to the network due to wrong location of the SIM card.

When switching from the currently used card slot to another card slot, the command setting takes effect after the module restarts.

Format

Type	Command	Response
Execute	AT+SIMCROSS=<sim_id><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SIMCROSS?<CR>	<CR><LF>+SIMCROSS: <sim_id> <CR><LF>OK<CR><LF>
Test	AT+SIMCROSS=?<CR>	<CR><LF>+SIMCROSS: (range of <sim_id> value) <CR><LF>OK<CR><LF>

Parameter

<sim_id>	SIM card identification 1: SIM 1 (default setting upon first boot) 2: SIM 2

Example

```
AT+SIMCROSS=1                          Switch to SIM 1. This setting is valid after
OK                                     restart.
AT+SIMCROSS=?                          Query the range of SIM card selection.
+SIMCROSS: (1-2)
OK
AT+SIMCROSS?                           Query the current selected SIM card.
+SIMCROSS: 1
OK
```

22 Other Commands

22.1 AT$MYPOWEROFF – Powering off the Module

To power off the module.

Format

Type	Command	Response
Execute	AT$MYPOWEROFF<CR>	<CR><LF>OK<CR><LF>

Parameter

N/A.

Example

```
AT$MYPOWEROFF                                    Power off the module.
OK
```

22.2 AT+NRSP – Querying RSRP, RSRQ, SINR of Cells in a Neighbor of a Serving Cell on the LTE Network

To query RSRP, RSRQ, SINR in a neighbor of the LTE cell.

This command is valid only on LTE networks.

Format

Type	Command	Response
Execute	AT+NRSP<CR>	<CR><LF>+NRSP: <rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,…,<sinr> <CR><LF>OK<CR><LF>

Parameter

<rsrpN>	Reference Signal Received Quality, the unit is 0.1 dBm. It is valid only on LTE networks. N is the number of cells in a neighbor of the serving cell: <rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,…, <rsrpN>,<rsrqN>.
<sinr>	Signal-to-Interference-Plus-Noise Ratio, unit 0.1 dB, valid on an LTE network/

Example

```
AT+NRSP                                                    Read command
+NRSP: -920,-75,-930,-65,-870,-115,-780,-65,-880,-175,-990,-
135,107
OK
```

22.3 AT+NETMSG – Querying Network Registration Information

To query network registration information

This command works only after the module is registered with a network.

A predefined null message is returned when the module is not successfully registered to the network. If the network exception is that the Internet is not registered during the switching of network mode, the information returned at this time is also completely empty.

<LAC>,<BSIC> are compound query items, displaying the network location information of the current module.

Format

Type	Command	Response
Execute	AT+NETMSG<CR>	<CR><LF>+NETMSG: <MCC+MNC>, [<LAC>/<TAC>], [<CELL_ID>], [<BSIC><Phy_cellid>], <BAND>, <ARFCN>, <RX_dBm>, <TX_dBm>, <net_mode> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<MCC+MNC>	MCC: Mobile Country Code, decimal

	MNC: Mobile Network Code, decimal
[<LAC>/<TAC>]	Location Area Code, hexadecimal SID on CDMA1X networks TAC on LTE networks
[<CELL_ID>]	Cell ID, on other network modes, hexadecimal
[<BSIC>/<Phy_cellid>]	Decimal BSIC on GSM network, hexadecimal Phy_cellid on LTE networks, 0 on other networks
<BAND>	operating band GSM 900 DCS1800 PCS 1900 LTE BAND 1 … LTE BAND 43
<ARFCN>	Absolute radio-frequency channel number
<RX dBm>	RX power, unit: dBm (199 indicates invalid)
<TX dBm>	TX power, unit: dBm (199 indicates invalid)
<net_mode>	Mode of network registered with NONE GSM GPRS TDD LTE FDD LTE

Example

```
AT+NETMSG                                          Query the details used to register
+NETMSG: "460+00", 286F, 00000088, 95, LTE BAND    the network.
40, 38950, -46, 199, "TDD LTE"
OK
AT+NETMSG                                          Query the details used to register
+NETMSG: "460+00", 286F, 00000FCB, 26, GSM 900,    the network.
20, 32, -46, "GPRS"
OK
AT+NETMSG                                          The module has not been registered
+NETMSG: "0", 0, 0, 0, 0, 0, 0, 0, "NONE"          with any network or the network
OK                                                 encountered abnormalities.
                                                   No SIM card is inserted.
AT+NETMSG
ERROR
```

22.4 AT+NETDMSG – Querying Network Registration Information

To query the current network registration information.

This command works only after the module is registered with a network.

On a 3GPP network, there will be valid values in the fields of LAC, CELL_ID, and BSIC and the value in the SID, NID, and BID fields is 0.

RX power, RSRQ, and SINR are valid only on LTE networks.

Format

Type	Command	Response
Execute	AT+NETDMSG	<CR><LF>+NETDMSG:<MCC+MNC>,[<LAC>/<TAC>],<CELL_ID>, [<BSIC>/<Phy_cellid>],<net_mode>,<BAND>, <ARFCN>,<RX_dBm>,<TX_dBm>,<SID>,<NID>,<BID>, <RSRP>,<RSRQ>,<SINR><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<MCC+MNC>	MCC: Mobile Country Code, decimal MNC: Mobile Network Code, decimal
[<LAC>/<TAC>]	LAC on CDMA1X networks TAC on LTE networks Location Area Code on other network modes, hexadecimal
[<CELL_ID>]	NID on CDMA1X networks Cell ID, on other network modes, hexadecimal
[<BSIC>/<Phy_cellid>]	Base Station Identity Code/Physical Cell ID of LTE networks
<net_mode>	Net_mode: NONE GSM GPRS TDD LTE FDD LTE Network mode NONE GSM GPRS

	TDD LTE
	FDD LTE
<BAND>	operating band
	GSM 900
	GSM 1800
	GSM 1900
	LTE BAND 1
	…
	LTE BAND 43
<ARFCN>	Network Bands
<RX dBm>	RX power, unit: dBm (199 indicates invalid)
<TX dBm>	TX power, unit: dBm (199 indicates invalid)
<SID>	System Identity Number on a CDMA1X network
<NID>	Network Identity Number on a CDMA1X network
<BID>	BID on a CDMA1X network
<RSRP>	Reference Signal Received Power, unit 0.1 dBm, valid on an LTE network
<RSRQ>	Reference Signal Received Quality, unit 0.1 dB, valid on an LTE network
<SINR>	Signal-to-Interference-Plus-Noise Ratio, unit 0.1 dB, valid on an LTE network

Example

```
AT+NETDMSG                                                          Query the network
+NETDMSG: "460+00", 0x286F, 0x00000088, 95, "TDD LTE", LTE          registration
BAND 40, 38950, -49, -8, 0x0, 0x0, 0x0, -730, -55, 108              information on an LTE
OK                                                                  network.
AT+NETDMSG                                                          Query the network
+NETDMSG: "460+00", 0x286F, 0x00000FCB, 26, "GPRS", GSM 900,        registration
20, 26, -46, 0x0, 0x0, 0x0, 0, 0, 0                                 information on a non-
OK                                                                  LTE 3GPP network.
AT+NETDMSG                                                          The module has not been
+NETDMSG: “0”, 0, 0, 0, ”NONE”, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0       registered with any
OK                                                                  network or the network
                                                                    encountered
                                                                    abnormalities.
```

22.5 AT+NEOFOTA – FOTA Command

To control the firmware-over-the-air of the module.

Do not power down or restart the module during upgrade.

If the baud rate is set to automatic detection, issue AT\r\n to detect the baud rate and then the module returns the upgrade result.

If PDP context is not activated, +NWFOTA: GPRS DISCONNECTION is prompted.

Format

Type	Command	Response
Execute	AT+NEOFOTA=<server>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
URC	+NEOFOTA:<status>	

Parameter

<status> Upgrade status
0: no valid OTA packages
1: download the upgrade package successfully (download to RAM)
2: abnormal download network
3: start to perform a local upgrade.
4: the local upgrade is performed successfully.
5: fail to perform the local upgrade.
6: insufficient download space
7: fails to download upgrade package
8: fails to verify upgrade package

Example

```
AT+NEOFOTA=115.29.212.25/,80        Start to upgrade.
OK

                                    The upgrade package is downloaded successfully.
+NEOFOTA: 1                         Start to upgrade.
+NEOFOTA: 3                         After the upgrade is successful, the module restarts
OK                                  automatically.

+NEOFOTA: 4                         Upgrade successfully.
                                    AT+NEOFOTA=115.29.212.25/,80
AT+NEOFOTA=115.29.212.25/,80        OK
OK
+NEOFOTA: 0                         +NEOFOTA: 0
```

22.6 AT+NEOFOTAURC – FOTA Status Report

To control the status report during an FOTA upgrade.

This setting should be configured before upgrade and is not saved after the module is powered down.

Format

Type	Command	Response
Execute	AT+NEOFOTAURC=<result><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<result> Switch of status report

- 0: disable status report. Only upgrade result is reported.
  The upgrade results including the following:
  Upgrade successfully
  Failed to upgrade
  No upgrade package
  Failed to download
- 1: enable status report (default). All states are reported.

Example

```
AT+NEOFOTAURC=1                    All states are reported.
OK

AT+NEOFOTA=115.29.212.25/,80
OK

+NEOFOTA: 1                        The upgrade package is downloaded successfully.
+NEOFOTA: 3                        Start to upgrade.
OK                                 After the upgrade is successful, the module restarts
                                   automatically.
+NEOFOTA: 4
                                   Upgrade successfully.
AT+NEOFOTAURC=0                    Status reports during the disable process.
OK

AT+NEOFOTA=115.29.212.25/,80
OK

+NEOFOTA: 4                        The module is upgraded successfully.
```

22.7 +NWURCFOTA – URC Notifying FOTA Upgrade Status

To notify the FOTA upgrade status.

Format

Type	Response
Unsolicited result code	<CR><LF>+NWURCFOTA: <status><CR><LF>

Parameter

<status> Upgrade status
0: no valid OTA packages
1: start to download the OTA package
2: the OTA package is downloaded successfully.
3: failed to download the OTA package.
4: start to perform a local upgrade.
5: the local upgrade is performed successfully.
6: fail to perform the local upgrade.

Example

```
+NWURCFOTA: 1                          Start to download the OTA package.

+NWURCFOTA: 2                          The upgrade package is downloaded successfully.
                                       Start to perform the local upgrade.
+NWURCFOTA: 4                          After the upgrade is successful, the module
                                       restarts automatically.
+NWURCFOTA: 5
                                       no upgrade packages.
+NWURCFOTA: 0
```

22.8 AT+NWFOTA – Performing an FOTA Upgrade

To upgrade the module firmware over the air.

- Do not power down or restart the module during the upgrade process.
- After the module upgrade process is completed the module will restart automatically. After the restart, issue AT\r\n to the module for baud rate self-adaptation; only after the baud rate self-adaptation is performed, can **+NWFOTA: 5** notifying a successful upgrade be prompted.
- If PPP is not activated, +NWFOTA: NET DISCONNECTION is prompted.

Format

Type	Command	Response
Execute	AT+NWFOTA=<server>,<port>[,type]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<server>	FOTA address of the HTTP server, string type, maximum length is 1024 bytes.
<port>	Port number of the FOTA server, integer type.
〈type〉	Server protocol type, integer type. 0: HTTP protocol (default). 1: HTTPS protocol. (not supported currently)

Example

```
AT+NWFOTA=”fota.neoway.com”,80
OK

+NWURCFOTA: 1                          Start to download the OTA package.

+NWURCFOTA: 2                          The upgrade package is downloaded successfully.
                                       Start to perform the local upgrade.
+NWURCFOTA: 4
                                       After the upgrade is successful, the module restarts
+NWURCFOTA: 5                          automatically.
AT+NWFOTA=”fota.3rdparty.com/http/      Perform an upgrade via the third-party HTTP FOTA server
test.bin”,80,0
OK                                     Start to download an upgrade package

+NWURCFOTA: 1                          The upgrade package is downloaded successfully.

+NWURCFOTA: 2                          Start to perform a local upgrade.
                                       (after the upgrade process is completed, the module will
+NWURCFOTA: 4                          restarted automatically. And the following URC is prompted
                                       after the module is self-adapted).
                                       The module is upgraded successfully.


+NWURCFOTA: 5
```

22.9 AT+READADC – Reading ADC Value

To read the value from pins corresponding to the three ADC channels.

Refer to the pin definitions listed in *Neoway_N715_Hardware_User_Guide*.

Format

Type	Command	Response
Execute	AT+READADC=<channel>	<CR><LF>+READADC: <channel>,<value> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<channel>	1 2-pin88 2 4-VBAT
<value>	The corresponding ADC value.

Example

```
AT+READADC=1          To read the value from the pin corresponding to ADC 1 is unsupported.
ERROR

AT+READADC=2          Read the value from the pin corresponding to ADC 2.
+READADC:2,1810
OK
AT+READADC=3          Read ADC value of the VBAT channel
+READADC:3,3840
OK
```

22.10 AT+SIMHOTSWAP – Setting the Hotswapping Function

Enable the hot-swapping function for the SIM card.

This command function is valid only when the hardware supports hot-swapping. The setting by this command takes effect immediately after the module is powered off.

Format

Type	Command	Response
Set	AT+SIMHOTSWAP=<onoff><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SIMHOTSWAP?<CR>	<CR><LF>+SIMHOTSWAP: <onoff>

		<CR><LF>OK<CR><LF>
Test	AT+SIMHOTSWAP=?<CR>	<CR><LF>+SIMHOTSWAP: (range of supported <onoff>) <CR><LF>OK<CR><LF>

Parameter

<onoff>	0: disable 1: enable

Example

```
AT+SIMHOTSWAP=0                          Disable the hot-swapping function.
OK
AT+SIMHOTSWAP=1                          Enable the hot-swapping function.
OK
AT+SIMHOTSWAP?                           Query the hot-swapping status.
+SIMHOTSWAP: 1
OK
AT+SIMHOTSWAP=?                          Query the value range of the parameters.
+SIMHOTSWAP: (0-1)
OK
```

22.11 AT+BANDLOCK – Locking to Band

To lock to a frequency band.

The network mode will change as a frequency band is locked. E.g. the network mode will change to LTE ONLY after locking to LTE_B1.

The setting by this command will be saved after the module is powered off and is valid after the module is restarted.

If the frequency band currently locked is invalid, registration failure will occur.

Format

Type	Command	Response
Execute	AT+BANDLOCK=<band_string><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+BANDLOCK?<CR><CR>	<CR><LF>+BANDLOCK: <band_string>

		<CR><LF>OK<CR><LF> Or <CR><LF>+BANDLOCK:NONE <CR><LF>OK<CR><LF>
Test	AT+BANDLOCK=?<CR>	<CR><LF>+BANDLOCK: <band_string_list> <CR><LF>OK<CR><LF>

Parameter

<band_string>	Band in string type The value can be any band that the hardware supports. Issue a query command before locking to a frequency band to check the band supported.
<band_string_list>	List of frequency band supported, which is for reference only. Refer to the product specifications if required.

Example

```
AT+BANDLOCK=?                                                    Query the frequency bands
+BANDLOCK:                                                       supported.
GSM_900,GSM_850,GSM_1800,GSM_1900,LTE_B1,LTE_B3,LTE_B5,LTE_B7,
LTE_B8,LTE_B20,LTE_B28.BLTE_B38,LTE_B39,LTE_B40,LTE_B41,AUTO
OK
AT+BANDLOCK=LTE_B1                                               Lock to LTE_B1.
OK
AT+BANDLOCK?                                                     Query the frequency band locked
+BANDLOCK: LTE_B1                                                to.
OK
AT+BANDLOCK=AUTO                                                 Restore to auto frequency band
OK                                                               mode.
```

22.12 AT+MYCELLINFO – Obtaining Information of Neighbor Cells

To obtain the information of neighbor cells available for the module.

If the module is installed an SIM card, it might disconnect to the network since the module performs full bands scanning after executing this command.

Only LTE cell scanning is supported.

Format

Type	Command	Response
Execute	AT+MYCELLINFO<CR>	+MYCELLINFO: {<NcellNum>,(<NcellIndex>,<NcellMode>,<Nmcc>,<Nmnc>,<Nlac>,<Narfcn>,<Npci>,<NLTE_RSRP>,<NLTE_RSRQ>,<NrxLevl>)} <CR><LF>OK<CR><LF> Or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<NcellNum>	The number of neighbor cells
<NcellIndex>	The index of neighbor cells
<Smcc/Nmcc>	Mobile country code CDMA –SID, system ID
<Nmnc>	Mobile network code
<Nlac>	location area code LTE - tac, track area code
<Narfcn>	Absolute radio frequency channel code
<Npci>	CDMA/HDR - pn LTE – pci, physic cell identify
<NLTE_RSRP>	Optional parameter. 10 times the actual RSRP value in LTE mode, unit: dBm. The actual RSRP value ranges from -44 to -140.
<NLTE_RSRQ>	Optional parameter. 10 times the actual RSRP value in LTE mode, unit: dBm. The actual RSRP value ranges from -20.0 to -3.0.
<NrxLevl>	signal strength.
<LTE>	Signal strength, unit: dB

Example

```
AT+MYCELLINFO                                                    Obtain the information of all
+MYCELLINFO: {5, (0, 460, 01, 9547, 3765, 342, -760, -       LTE cells.
130, -91), (1, 460, 01, 9547, 1650, 344, -860, -110, -
86), (2, 460, 00, 10351, 38544, 90, -870, -90, -79),
(3, 460, 00, 10351, 37900, 29, -920, -110, -79), (4,
460, 00, 10351, 40936, 29, -940, -80, -75)}
OK
```

Description of the return value format:
Since there is too much information about all cells, the cell information results are output in a JSON-like format.

Command operation caution
This command is asynchronous so no code will be returned if the next command is sent when execution of the preceding command has not finish.
Do not perform other commands before the module returns any value to this command. Otherwise, the module might encounter network issues.
Restart the module if the module encounters any abnormality due to incorrect operations.

Command data accuracy caution
This command is only valid for stationary targets or slow-moving targets and the accuracy of the data is valid when the target has no major position changes.

22.13 AT+NBANDLOCK – Locking Multiple Frequency Bands

Lock one and more frequency bands by band mask.

After frequency bands are locked through this AT command, the network mode changes. For example, the network mode becomes LTE ONLY if you lock the frequency band to LTE B1. LTE and GSM cannot be locked simultaneously.

The setting by this command takes effect immediately and it is saved after the module is powered off.

If the frequency band currently locked is invalid, registration failure will occur.

This command can lock 5 frequencies at most at the same time.

For the band settings, see Appendix C Support Band List.

Format

Type	Command	Response
Set	AT+NBANDLOCK=<mode>[,<LTE_Bands>][,<GSM_Bands>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>+NBANDLOCK: <mode>,<SupportBandlist> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+NBANDLOCK: <err><CR><LF>
Query	AT+NBANDLOCK?<CR>	<CR><LF>+NBANDLOCK: <mode>,<Bandlist>

		<CR><LF>+NBANDLOCK: <mode>,<Bandlist> <CR><LF><CR><LF>OK<CR><LF> Or <CR><LF>+NBANDLOCK: NONE <CR><LF><CR><LF>OK<CR><LF>
Test	AT+NBANDLOCK=?<CR>	<CR><LF>+NBANDLOCK: (listofsupport<mode>s),(list of support <LTE_BAND>s),(list of support <GSM_BAND>s) <CR><LF><CR><LF>OK<CR><LF>

Parameter

<mode>	Network mode 0: unlock all 1: lock all band combinations under the LTE network 2: lock all band combinations under the GSM network
<LTE_Bands>	frequency bands supported by LTE protocol, displayed and input in hexadecimal format.
<GSM_Bands>	frequency bands supported by GSM protocol, displayed and input in hexadecimal format. Each bit indicates a band according to the setting of <mode>. 0 indicates disabled and 1 indicates enabled. For details about the match between bit and band, see the Appendix.

Example

```
AT+NBANDLOCK=1,1                Lock LTE BAND1.
OK
AT+NBANDLOCK=2,1                Lock GSM BAND1.
OK
AT+NBANDLOCK?                   Query the status of band locked. LTE band1 is locked.
+NBANDLOCK: 1,0x1               GSM bands are not locked.
+NBANDLOCK: 2,0x0

OK
AT+NBANDLOCK=?                  Query frequency band locked. Convert 0x1e0080800d5 to
+NBANDLOCK: 1,0x1e0080800d5     11100000000001000000010000000000011010101; it indicates that the
+NBANDLOCK: 2,0xec              module supports LTE_B1, LTE_B3, LTE_B5, LTE_B7, LTE_B8, LTE_B20,
                                LTE_B28, BLTE_B38, LTE_B39, LTE_B40, and LTE_B41.
OK                              Convert 0xec into 11101100; it indicates that the module supports
                                GSM_900P,GSM_900E,GSM_850,GSM_1800,GSM1900.
```

22.14 AT+NFREQLOCK – Locking the Specified Frequency

To lock a combination of frequencies.

When no band is locked, this command can lock any available frequency. When any band is locked, this command is only used to lock the available frequencies of the locked band. As the actual network environments are different, the correction and verification for the input frequency information is unsupported.

When locking a band, ERROR will be returned if you use this command to lock the frequencies that do not belong to the locked band.

When no band is locked, depending on the setting of the frequency, the network will be registered to the band corresponding to the best frequency.

The command supports to lock 9 frequencies at most. The setting is valid immediately after setting, and is saved after the module is powered off.

Format

Type	Command	Response
Execute	AT+NFREQLOCK=<mode>[,<frequency1>,<frequency2>,<frequency3>,<frequency4>,<frequency5>,<frequency6>,<frequency7>,<frequency8>,<frequency9>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+CME ERROR: <err><CR><LF>
Query	AT+NFREQLOCK?<CR>	<CR><LF>+NFREQLOCK: <mode>,<frequency1>,<frequency2>... … <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+CME ERROR: <err><CR><LF>

Parameter

<mode>	Network mode 0: unlock all 1: LTE (including FDD\TDD)

<frequency>	at most 9 frequencies can be input 1 - 65535: frequency range

Example

```
AT+NFREQLOCK=1,38950,38950      Lock the LTE frequency 38950.
OK
AT+NFREQLOCK?                   Query the frequency locking status.
+NFREQLOCK: 1,38950
OK
AT+NFREQLOCK=0                  Unlock all frequencies locked.
OK

AT+NFREQLOCK?
+NFREQLOCK: 1,0
OK
AT+NFREQLOCK=1,                 Lock the specific frequencies 38400 and 38950 of the same
38950,38400                     band in LTE network.
OK
AT+NFREQLOCK?
+NFREQLOCK: 1,38400,38950
OK
```

22.15 AT+IPINFO – Querying Socket Connection Information

To query the socket connection information.

Format

Type	Command	Response
Execute	AT+IPINFO<CR>	<CR><LD>+IPINFO: <SocketID>,<LocalIP>,<local_port>,<gate>,<DNS1>,<DNS2>,<type>,<dest_ip>,<dest_port> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Parameter

<LocalIP>	Local IP address, character type
<local_port>	Local port (varying with channels)
<gate>	Gateway

<DNS1>	Primary DNS server
<DNS2>	Standby DNS server
<type>	TCP Client/TCP Server/TCP Accept/UDP 0: TCP Client 1: UDP 2: TCP Server 3: UDP Accept
<dest_ip>	Destination IP address
<dest_port>	Destination port number

Example

```
AT+IPINFO                                                    Query the connection status on socket 0.
+IPINFO:
0,10.13.70.121,29492,0,202.96.134.33,202.96.128.1
66,0,58.60.184.213,12005
OK
AT+IPINFO                                                    No socket connection information.
OK
```

22.16 AT+SETTZ – Setting Clock Offset Time

To set the local clock offset time. Display the setting values through AT+CCLK?.

The settings by this command are saved after the module is powered off.

Format

Type	Command	Response
Set	AT+SETTZ=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SETTZ?<CR>	<CR><LF>+SETTZ:<n><CR><LF> <CR><LF>OK<CR><LF>

Parameter

<n>	Offset time, 15 minutes as a unit, ranging from -96 to 96.

Example

```
AT+SETTZ?                                          Query the current offset time.
+SETTZ: +32
OK
AT+SETTZ=+32                                       Query current status.
OK
AT+CCLK?
+CCLK: "80/01/06,00:56:50+32"
OK
```

22.17 AT+NCUSTSWITCH – Switch of Extended Functions

Switch of extended functions. The setting by this command is not saved after the module is powered off.

Execute this command before the TCP, HTTP, or MQTT (if standard MQTT data wake-ups are supported) connection is established.

- The general N715 firmware supports standard TCP and standard HTTP data wake-ups.
- The N715 firmware developed on 1.4 baseline (the firmware version containing "R08") supports standard TCP, standard HTTP, and standard MQTT data wake-ups.

  Executing the AT+GMR command can query the module firmware version.

Format

Type	Command	Response
Set	AT+NCUSTSWITCH=<typeX>,<modeX><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NCUSTSWITCH?<CR>	<CR><LF>+NCUSTSWITCH: <type1>,<mode1> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+NCUSTSWITCH=?<CR>	<CR><LF>+NCUSTSWITCH: (value range of <type>,value range of <mode>) <CR><LF>OK<CR><LF>

Parameter

<typeX> Extended functions
3: read TCP packets in segment format (read without receiving the segment)
4: configure the wake-up source
Currently, only type 3 and type 4 are supported.

<ModeX> 0: disable TCP Nagle algorithm
1: enable TCP Nagle algorithm (default)

<ModeX> 0: default, read the TCP packet in segment format
1: automatic packet merging

<ModeX>

Bit[X]	Bit[15~3]	Bit[2]	Bit[1]	Bit[0]
Ring report type	undefined	DATA	CALL	SMS
Enable	1	1	1	1
Disable	0	0	0	0

0X0001 only SMS status indication is enabled
0X0002 only CALL status indication is enabled
0X0003 a combination of CALL+SMS status indication is enabled
0X0004 only data status indication is enabled (data transmitted in the internal protocol stack services)
0X0005 a combination of DATA+SMS status indication is enabled
0X0006 a combination of DATA+CALL status indication is enabled
0X0007 a combination of DATA+CALL+SMS status indication is enabled (default)

<TypeX> reserved

<ModeX> reserved

Example

```
AT+NCUSTSWITCH=3,1                          Set automatic packet merging.
OK
AT+NCUSTSWITCH?
+NCUSTSWITCH: 3,1                           Query the parameters setting.
OK
AT+NCUSTSWITCH=?
+NCUSTSWITCH: (1-4),(0-7)                   Query the range of the parameters.
OK
AT+NCUSTSWITCH=4,1                          Set the ringing status; enable the URC of
OK                                          SMS status.
AT+NCUSTSWITCH?
+NCUSTSWITCH: 3,0                           Query the settings.
+NCUSTSWITCH: 4,7                           The URC of SMS status is enabled.
OK
```

22.18 AT+FTPGETF – FTP Upgrade Command

To upgrade the module over the air.

Format

Type	Command	Response
Set	AT+FTPGETF=<ip>,<port>,<mode>,<filename>,<user>,<pwd><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+FTPGETF:<result code><CR><LF>

Parameter

<ip>	IP address or domain name of the FTP server.
<port>	Port number of the FTP server.
<mode>	Mode, fixed to 0.
<filename>	File name of the upgrade package on the FTP server.
<user>	User name used to log in to the FTP server. Its length cannot be larger than 100 ASCII codes and it cannot contains a comma.
<pwd>	Password used to log in to the FTP server. Its length cannot be larger than 100 ASCII codes and it cannot contains a comma.
<result code>	LOGIN OK: the module logs in to the FTP server successfully. FILE END: the file is downloaded successfully. ERROR PPP: PPP is not activated. ERROR SOCKET: the module fails to obtain a SOCKET. ERROR EVENT: the module fails to set SOCKET properties. ERROR ADDR: the module fails to connect to the FTP IP address. ERROR DOMAIN: the module fails to connect to the FTP domain name. ERROR CONNECT: the module fails to connect to the FTP socket. ERROR LOGIN: the module fails to log into the FTP server. ERROR FSIZE: the module fails to obtain the file size. ERROR PASV: the module fails to establish a data connection ERROR PASV: the module fails to establish a data connection through FTP. ERROR HEADER: the download file fails in the header verification. ERROR LENGTH: the module fails to check the length of the downloaded file. ERROR DISCONNECT: the link is disconnected abnormally. ERROR TIMEOUT: timeout

Example

```
AT+FTPGETF=58.60.184.213,12006,0,111.h,test,test      Start to perform the upgrade.
OK

+FTPGETF: LOGIN OK                                    Log in to the FTP server
+FTPGETF: RATE 1400/13090716                          successfully.
…                                                     URC of the download progress
+FTPGETF: RATE 13090716/13090716
```

```
+FTPGETF: FILE END                                  Continuously report the download
                                                    progress.
                                                    URC of the download progress
                                                    Downloaded successfully.
AT+FTPGETF
=58.60.184.213,12006,0,111.h,test,test              No dial-up connection
+FTPGETF: ERROR PPP
AT+FTPGETF                                          Start to perform the upgrade.
=58.60.184.213,12006,0,111.h,test,test
OK
                                                    Log in to the FTP server
+FTPGETF: LOGIN OK                                  successfully.
+FTPGETF: ERROR CONNECT                             Report the error information.
```

22.19 AT+NWCHANNEL – Setting the Network Activation Channel

To set the channel number.

Format

Type	Command	Response
Set	AT+NWCHANNEL=<cid><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NWCHANNEL?<CR>	<CR><LF>+NWCHANNEL: <cid> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+NWCHANNEL=?<CR>	<CR><LF>+NWCHANNEL:(range of supported<cid>) <CR><LF>OK<CR><LF>

Parameter

<cid> A numeric value, 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 (the minimum value is 1; the specific value range is defined depends on the platform.) is returned by the test form of the command.

Example

```
AT+NWCHANNEL=1                          Set the activation channel to 1.
```

```
OK
AT+NWCHANNEL?
+NWCHANNEL: 1                          Query the value set.
OK
AT+NWCHANNEL=?                         Query the value range of the parameters.
+NWCHANNEL: (1-5)
OK
```

- This command is used to specify CID and the corresponding APN and local IP address before network connections at various transport and application layers are established.
- The relations among CID, APN, and the local IP address can be queried through AT+CGDCONT.

22.20 AT+CGACT – Activating/Deactivating PDP Context

To activate or deactivate the specified PDP context(s).

Before executing this command, use the AT+CGDCONT command to set the parameters including <APN> and ensure that the module registers to the network successfully.

Format

Type	Command	Response
Set	AT+CGACT=<state>[,<cid>[,cid]….]<CR>	<CR><LF>+CGACT: <cid>,<state> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CGACT?<CR>	<CR><LF>+CGACT:<cid>,<state> <CR><LF>OK<CR><LF>
Test	AT+CGACT=?<CR>	<CR><LF>+CGACT: (list of supported <state>s) <CR><LF>OK<CR><LF>

Parameter

<state>	Integer type 0: deactivated 1: activated
<cid>	PDP activation channel, ranging from 1 to 7. A maximum of 5 channels can be activated simultaneously.

Example

```
AT+CGACT=1,1                          Activate the PDP context of the first channel.
+CGACT: 1,1
OK
AT+CGACT?
+CGACT: 1,1                           Query the PDP channel activated.
OK
AT+CGACT=?                            Query the value range of <state>.
+CGACT: (0,1)
OK
```

22.21 AT+NWPMCFG – Auto-Startup after Voltage Rebounding

Sets the module to start up automatically after its voltage rebounds to the threshold value.

Format

Type	Command	Response
Set	AT+NWPMCFG=[<enable>[,<voltage>[,<period>]]]<CR>	<CR><LF>+NWPMCFG: <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+ NWPMCFG?<CR>	<CR><LF>+NWPMCFG: <enable>,<voltage>,<period> <CR><LF>OK<CR><LF>
Test	AT+ NWPMCFG =?<CR>	<CR><LF>+NWPMCFG: (value range of <n>) <CR><LF>OK<CR><LF>

Parameter

< enable >	specifies whether to display return codes 0: do not display return codes 1: display return codes 2: Cancel the request (not available for read command)
< voltage >	USSD string. If this parameter is not set, the module does not access network.
< period >	3GPP TS 23.038 [25] Cell Broadcast Data Coding Scheme in integer format (default 0).

Example

```
AT+NWPMCFG =1,3450,30
OK
```

After the voltage rebounds to, or exceeds 3.4 V, the module starts up automatically; the detection cycle is 30s.

A Error Codes

A.1 General Error Codes

Code(AT+CMEE=1)	Text(AT+CMEE=2)
0	PHONE FAILURE
1	NO CONNECTION TO PHONE
2	PHONE-ADAPTOR LINK RESERVED
3	OPERATION NOT ALLOWED
4	OPERATION NOT SUPPORTED
5	PH-SIM PIN REQUIRED
6	PH-FSIM PIN REQUIRED
7	PH-FSIM PUK REQUIRED
10	SIM NOT INSERTED (SEE NOTE 1)
11	SIM PIN REQUIRED
12	SIM PUK REQUIRED
13	SIM FAILURE (SEE NOTE 1)
14	SIM BUSY (SEE NOTE 1)
15	SIM WRONG (SEE NOTE 1)
16	INCORRECT PASSWORD
17	SIM PIN2 REQUIRED
18	SIM PUK2 REQUIRED
20	MEMORY FULL
21	INVALID INDEX
22	NOT FOUND
23	MEMORY FAILURE
24	TEXT STRING TOO LONG
25	INVALID CHARACTERS IN TEXT STRING
26	DIAL STRING TOO LONG
27	INVALID CHARACTERS IN DIAL STRING

30	NO NETWORK SERVICE
31	NETWORK TIMEOUT
32	NETWORK NOT ALLOWED - EMERGENCY CALLS ONLY
40	NETWORK PERSONALIZATION PIN REQUIRED
41	NETWORK PERSONALIZATION PUK REQUIRED
42	NETWORK SUBSET PERSONALIZATION PIN REQUIRED
43	NETWORK SUBSET PERSONALIZATION PUK REQUIRED
44	SERVICE PROVIDER PERSONALIZATION PIN REQUIRED
45	SERVICE PROVIDER PERSONALIZATION PUK REQUIRED
46	CORPORATE PERSONALIZATION PIN REQUIRED
47	CORPORATE PERSONALIZATION PUK REQUIRED
48	HIDDEN KEY REQUIRED (SEE NOTE 2)
49	EAP METHOD NOT SUPPORTED
50	INCORRECT PARAMETERS
51	COMMAND IMPLEMENTED BUT CURRENTLY DISABLED
52	COMMAND ABORTED BY USER
53	NOT ATTACHED TO NETWORK DUE TO MT FUNCTIONALITY RESTRICTIONS
54	MODEM NOT ALLOWED - MT RESTRICTED TO EMERGENCY CALLS ONLY
55	OPERATION NOT ALLOWED BECAUSE OF MT FUNCTIONALITY RESTRICTIONS
56	FIXED DIAL NUMBER ONLY ALLOWED - CALLED NUMBER IS NOT A FIXED DIAL NUMBER (REFER 3GPP TS 22.101 [147])
57	TEMPORARILY OUT OF SERVICE DUE TO OTHER MT USAGE
58	LANGUAGE/ALPHABET NOT SUPPORTED
59	UNEXPECTED DATA VALUE
60	SYSTEM FAILURE
61	DATA MISSING
62	CALL BARRED
63	MESSAGE WAITING INDICATION SUBSCRIPTION FAILURE
100	UNKNOWN

A.2 FTP Error Codes

Code(AT+CMEE=1)	Text(AT+CMEE=2)
421	SERVICES CANNOT BE PROVIDED. CLOSE THE CONTROL CONNECTION.
425	FAIL TO OPEN THE DATA CONNECTION.
426	CLOSE THE CONNECTION AND TERMINATE THE TRANSMISSION.
450	THE REQUESTED FILE OPERATION IS NOT EXECUTED.
451	TERMINATE THE REQUESTED OPERATION: A LOCAL ERROR OCCURS.
452	THE REQUESTED OPERATION IS NOT EXECUTED: INSUFFICIENT SYSTEM STORAGE SPACE.
500	THE COMMAND IS UNABLE TO IDENTIFY BECAUSE OF INCORRECT FORMAT.
501	SYNTAX ERROR.
502	COMMAND NOT EXECUTED.
503	COMMAND SEQUENCE ERROR.
504	THE COMMAND SPECIFYING THE PARAMETER IS NOT EXECUTED.
530	USERS DO NOT LOG IN.
532	ACCOUNT INFORMATION IS REQUIRED FOR FILE STORAGE.
550	THE REQUESTED OPERATION IS NOT EXECUTED.
551	THE REQUESTED OPERATION IS TERMINATED: UNKNOWN PAGE TYPE.
552	THE REQUESTED FILE OPERATION IS TERMINATED: STORAGE SPACE EXCEEDED.
553	THE REQUESTED OPERATION IS NOT EXECUTED: INVALID FILE NAME.
600	UNKNOWN ERROR.

A.3 HTTP(S) Error Codes

Code(AT+CMEE=1)	Text(AT+CMEE=2)
300	Multiple Choice
301	Moved Permanently

302	Found
303	See Other
304	Not Modified
305	Use Proxy
306	unused
307	Temporary Redirect
308	Permanent Redirect
400	Bad Request
401	Unauthorized
402	Payment Required
403	Forbidden
404	Not Found
405	Method Not Allowed
406	Not Acceptable
407	Proxy Authentication Required
408	Request Timeout
409	Conflict
410	Gone
411	Length Required
412	Precondition Failed
413	Payload Too Large
414	URI Too Long
415	Unsupported Media Type
416	Requested Range Not Satisfiable
417	Expectation Failed
418	I'm a teapot
421	Misdirected Request
422	Unprocessable Entity (WebDAV)
423	Locked (WebDAV)
424	Failed Dependency (WebDAV)
425	Too Early
426	Upgrade Required

428	Precondition Required
429	Too Many Requests
431	Request Header Fields Too Large
451	Unavailable For Legal Reasons
500	Internal Server Error
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout
505	HTTP Version Not Supported
506	Variant Also Negotiates
507	Insufficient Storage
508	Loop Detected (WebDAV)
510	Not Extended
511	Network Authentication Required

B Reference Process of AT Command Programming

B.1 Content of PDU SMS Messages

<PDU> SMS message sending format:

1>: 0891

08: indicates the length of the SMSC address information

91: indicates the format of the SMSC address

2>: Inversion of every two bits (add F if the bits are not sufficient) in SMSC number, fixed. For example, China Unicom 8613010888500 should be 683108705505F0 here.

3>: 0100

01: Indicates basic parameters

00: indicates message baseline value

4>: Convert the receiving number into hexadecimal. For example, the number length is 11 bits and then the hexadecimal length should be 0B.

5>: 81 (Receiving mode) there are multiple receiving modes. 81 indicates that the receiving mode is unknown.

6>: Inversion of every two bits (add F if the bits are not sufficient) in the recipient number. For example, 13421839693 should be 3124819396F3 after conversion.

7>: 0008

8>: The hexadecimal length of the SMS message content. For example, the UCS2 code of hello is 00080A00680065006C006C006F, that is 10 bits and the hexadecimal length is 0A.

9>: Message content, for example, the USC2 code of hello is 00080A00680065006C006C006F.

One PDU message contains the above 9 parts and the parameter values are determined by the actual situation.

If the SMSC address length is 0, replace 08 with 00 and the SMSC type and address fields must be omitted.

The following is an example of the PDU message whose SMSC address length is not 0:

0891683110808805F001000B813124819396F300080A00680065006C006C006F

Wherein,

0891

683108705505F0: SMSC number of China Unicom

0100

0B: the length of the recipient number

81: Receiving mode

3124819396F3: The number of recipient

0008

0A: The length of the content

00680065006C006C006F: SMS message content

Message content: hello

The SMS message content starts from 0100, so the value of LENGTH in **AT+CMGS=LENGTH** is **23**.

The following is an example of the PDU message whose SMSC address length is **0**:

0001000B813124819396F300080A00680065006C006C006F

Wherein,

00: SMSC address information length

SMSC number is not needed.

0100

0B: the length of the recipient number

81: Receiving mode

3124819396F3: The number of recipient

0008

0A: The length of the content

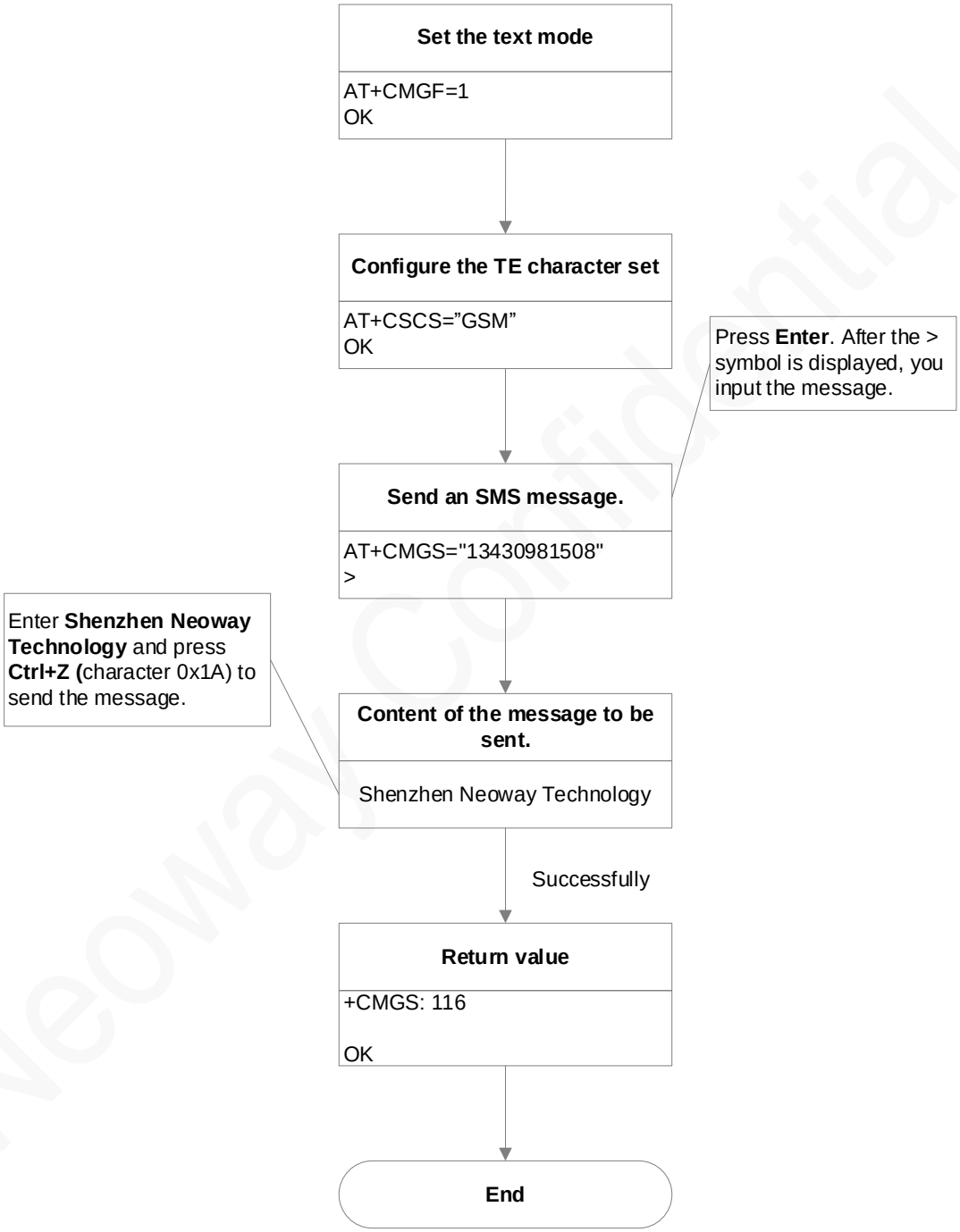
00680065006C006C006F: SMS message content

SMS message content: hello

The SMS message content starts from 0100, so the value of LENGTH in **AT+CMGS=LENGTH** is **23**.

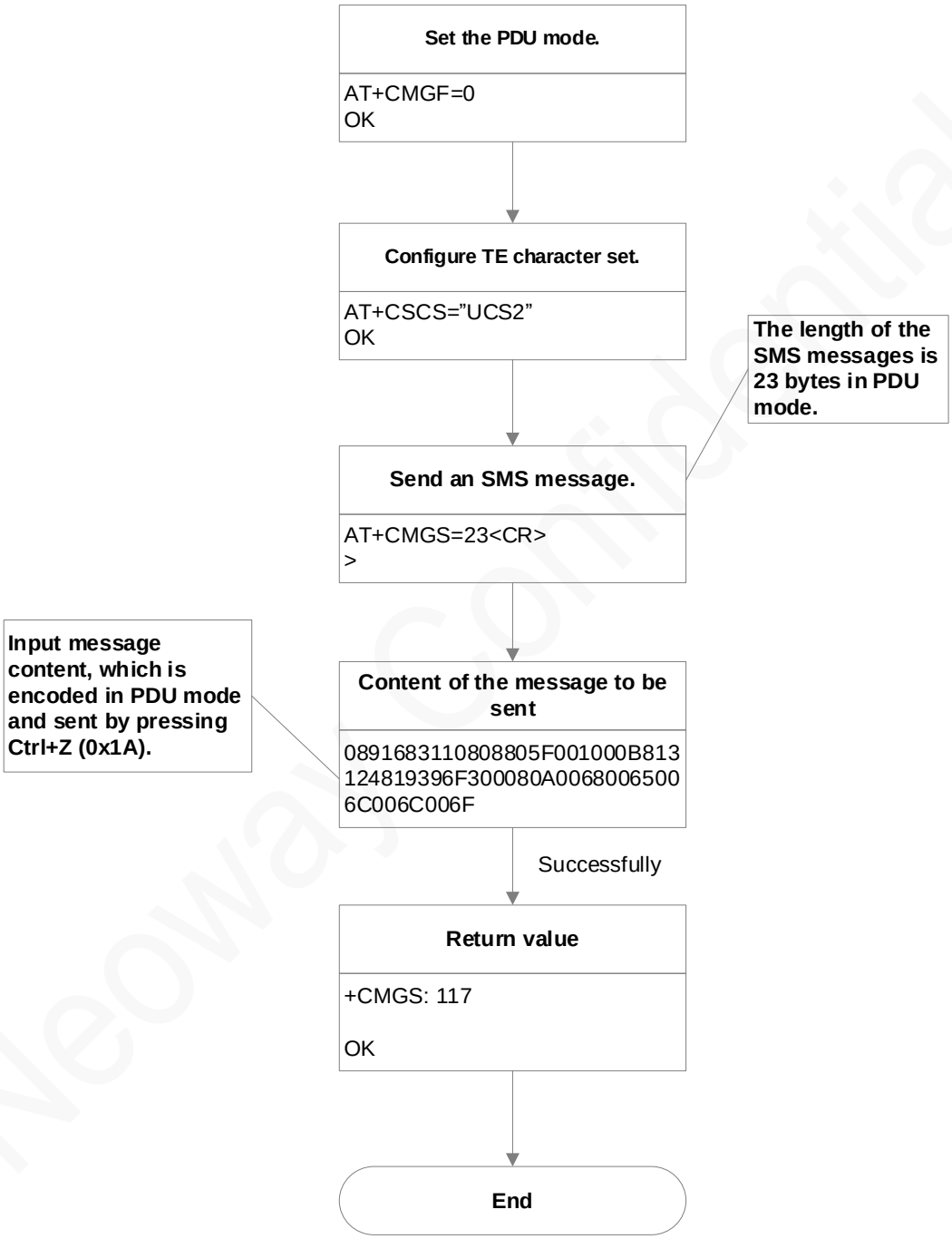
B.2 Flowchart of Sending Text SMS Messages (Through UART)

Figure B-1 Flowchart of sending text format SMS messages



B.3 Flowchart of Sending PDU SMS Messages (Through UART)

Figure B-2 Flowchart of Sending PDU SMS messages



C Support Band List

C.1 GSM Bands

GSM Band Name	Bit	HEX Band Mask
GSM_450	1	1
GSM_480	2	2
GSM_900P	3	4
GSM_900E	4	8
GSM_900R	5	10
GSM_850	6	20
GSM_1800	7	40
GSM_1900	8	80

C.2 LTE Bands

LTE Band Name	Bit	HEX Band Mask
EUTRAN_BAND1	1	1
EUTRAN_BAND2	2	2
EUTRAN_BAND3	3	4
EUTRAN_BAND4	4	8
EUTRAN_BAND5	5	10
EUTRAN_BAND6	6	20
EUTRAN_BAND7	7	40
EUTRAN_BAND8	8	80
EUTRAN_BAND9	9	100
EUTRAN_BAND10	10	200
EUTRAN_BAND11	11	400
EUTRAN_BAND12	12	800
EUTRAN_BAND13	13	1000

EUTRAN_BAND14	14	2000
EUTRAN_BAND17	17	10000
EUTRAN_BAND33	33	100000000
EUTRAN_BAND34	34	200000000
EUTRAN_BAND35	35	400000000
EUTRAN_BAND36	36	800000000
EUTRAN_BAND37	37	1000000000
EUTRAN_BAND38	38	2000000000
EUTRAN_BAND39	39	4000000000
EUTRAN_BAND40	40	8000000000
EUTRAN_BAND41	41	10000000000
EUTRAN_BAND42	42	20000000000
EUTRAN_BAND43	43	40000000000
EUTRAN_BAND44	44	80000000000
EUTRAN_BAND65	51	4000000000000
EUTRAN_BAND66	52	8000000000000
EUTRAN_BAND71	60	800000000000000
EUTRAN_BAND252	61	1000000000000000
EUTRAN_BAND253	62	2000000000000000
EUTRAN_BAND255	64	8000000000000000

D Result Codes

<err>	Description
0	Operation successful
601	Unknown error
602	FTP(S) server blocked
603	FTP(S) server busy
604	DNS parse failed DNS
605	Network error
606	Control connection closed.
607	Data connection closed
608	Socket closed by peer
609	Timeout error
610	Invalid parameter
611	Failed to open file
612	File position invalid
613	File error
614	Service not available, closing control connection
615	Open data connection failed
616	Connection closed; transfer aborted
617	Requested file action not taken
618	Requested action aborted: local error in processing
619	Requested action not taken: insufficient system storage
620	Syntax error, command unrecognized
621	Syntax error in parameters or arguments
622	Command not implemented
623	Bad sequence of commands
624	Command parameter not implemented
625	Not logged in
626	Need account for storing files

627	Requested action not taken
628	Requested action aborted: page type unknown
629	Requested file action aborted
631	SSL authentication failed SSL

E FTP(S) Error Codes

<protocol_error>	Description
0	Invalid result
200	Command okay
421	Service not available, closing control connection
425	Open data connection failed
426	Connection closed; transfer aborted
450	Requested file action not taken
451	Requested action aborted: local error in processing
452	Requested action not taken: insufficient system storage
500	Syntax error, command unrecognized
501	Syntax error in parameters or arguments
502	Command not implemented
503	Bad sequence of commands
504	Command parameter not implemented
530	Not logged in
532	Need account for storing files
550	Requested action not taken: file unavailable
551	Requested action aborted: page type unknown
552	Requested file action aborted: exceeded storage allocation
553	Requested action not taken: file name not allowed