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N27

AT Commands Manual

Issue 1.2 Date 2020-07-28

Notice

This document provides guide for users to use N27.

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

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Contents

About This Document

Scope

This document is applicable to N27.

Audience

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

Change History

Issue	Date	Change	Changed By
1.0	2019-12	Initial draft	Tao Wenhong
1.1	2020-07	• Added network registration state • Modified the example of AT+CPMS • Updated the parameter of AT+CSCS • Updated the parameters of AT+CMGR and AT+CMGL • Updated the parameter and example of AT+CSCA • Added AT+SMSWHITELIST • Added AT+CELLINFO • Added AT+NETINFO • Updated the parameter of AT+NETCFG • Added AT+ CGDCONT • Updated the example of AT+XIIC • Updated the parameter of AT+RECVMODE • Modified the parameters of AT+TCPSEND • Added AT+TCPACK • Added AT+TRANSCLOSE • Updated the format and parameter of AT+FTPLOGIN • Updated the example of AT+FTPLOGOUT • Updated the value of <size> in AT+FTPPUT • Added remote FTP commands • Updated the parameter of AT+HTTPPARA • Updated the example of AT+HTTPRECV	Li Tingxuan

		• Added HTTPS commands • Updated the response of AT+GNSSNMEA • Updated the parameter of AT+GNSSSEL • Deleted AT+GNSSDEL • Updated the parameter of AT+CPSMS • Added AT+ENPWRSAVE • Added AT+NEOFOTA • Added AT +NEOFOTAURC	
1.2	2020-07	• Modified the response of +CGMR • Modified the response of +CIMI • Modified the response of +CGMM • Modified the response, parameter, and example of +FTPGET • Updated the example of +UPDATETIME • Added MQTT commands • Added Alibaba Cloud MQTT commands • Added AT+NSIMLOCK	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

Related Documents

Neoway_N27_Datasheet

Neoway_N27_Product_Specifications

Neoway_N27_HW_User_Guide

Neoway_N27_EVK_User_Guide

Boot LOG Instruction

The UART outputs **+PBREADY** 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.

1 AT Syntax

1.1 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

1.2 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 B.

1.3 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 report	<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 General Commands

2.1 ATI – Querying the Manufacturer Information

To query the manufacturer information, including manufacturer, 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>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<manufacturer>	module manufacturer
<module_version>	module model
<soft_version>	software version

Example

```
ATI
NEOWAY                                  Manufacturer
N27                                     Module model
01                                      Version

OK
```

2.2 AT+CGMR – Querying the Software Version

To query the software version

Format

Type	Command	Response
Execute	AT+CGMR<CR>	<CR><LF><version><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<version> software version

Example

```
AT+CGMR
N27-WW-NWY-001

OK
```

2.3 AT+CGSN – Querying IMEI

To query the International Mobile Equipment Identity (IMEI) of the module

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<IMEI> International Mobile Equipment Identity, a character string of 15 digits

Example

```
AT+CGSN
+CGSN: 355910044336974

OK
```

2.4 AT+CIMI – Querying the IMSI

To query the international mobile subscriber identification (IMSI)

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<IMSI> International mobile subscriber identification, a character string of 15 digits that starts with 3-bit MCC and 2-bit MNC.
It is used to authenticate the SIM card.

Example

```
AT+CIMI                                    Obtain the IMSI number.
460022201575463

OK
AT+CIMI                                    Query the IMSI.
```

```
ERROR                                   No SIM card is installed.
```

2.5 AT+CCID – Obtaining the ICCID of the SIM Card

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> <CR><LF>OK<CR><LF> **Or** <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

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

Example

```
AT+CCID                                 Read command
+CCID: 89860002190810001367

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

2.6 AT+CGMM – Querying the Module Model

To query the module model

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<model> module model

Example

```
AT+CGMM                                    Query the product model.
N27

OK
```

3 UE Control and Status Report

3.1 AT+CREG – Querying Network Registration Status

To query the network registration status of the module

Format

Type	Command	Response
Execute	AT+CREG=[<n>]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+CREG?<CR>	<CR><LF>+CREG: <n><stat>[,<lac>,<ci>[,<Act>]]<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CREG=?<CR>	<CR><LF>+CREG: (value range of <n>)<CR><LF> <CR><LF>OK<CR><LF>
Unsolicited report	<CR><LF>+CREG: <stat>[,<lac>,<ci>[,<Act>]]<CR><LF>	

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<n> Specifies whether to enable unsolicited result codes for network registration.
0: disable network registration unsolicited result code (default).
1: enable network registration unsolicited result code `+CREG: <stat>`.
2: enable network registration unsolicited result code with location information (Cell ID, Local ID) `+CREG: <stat>[,[<lac>],[<ci>],[<AcT>]]`

<stat> Network registration status
0: not registered, the module is not currently searching for an operator to register to
1: registered with a home network
2: not registered, but the module is currently trying to attach or searching for an operator to register to
3: registration denied

4. unknown code
5: registered, roaming

<lac> Two-byte location area code in hexadecimal format, string type

<ci> Four-byte cell ID in hexadecimal format, string type

<Act> The access technology of the serving cell, integer type
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: ECGSM
9: NB-IoT

Example

```
AT+CREG=1                                   Enable unsolicited codes of network registration.
OK
AT+CREG?                                    Query the network registration status of the
+CREG: 0,1                                  module.

OK
AT+CREG=?                                   Query the value range of the network registration
+CREG: (0-2)                                status parameter.

OK
```

3.2 AT+CGREG –Network Registration

To control the presentation of an unsolicited result code of the module's network registration status

Format

Type	Command	Response
Set	AT+CGREG=[<n>]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+CGREG?<CR>	<CR><LF>+CGREG: <n>,<stat>[,<lac>,<ci>[,<Act>]]<CR><LF>

		<CR><LF>OK<CR><LF>
Test	AT+CGREG=?<CR>	<CR><LF>+CGREG: (list of supported <n>s)<CR><LF> <CR><LF>OK<CR><LF>
Unsolicited report	<CR><LF>+CGREG: <CR><LF>	<stat>[,<lac>,<ci>[,<Act>,<rac>[,<SubAct>]]]

Timeout

The command times out if the module does not respond in 300 ms.

Parameters

<n> Specifies whether to enable network registration unsolicited result code
0: Disable network registration unsolicited result code (default)
1: Enable network registration unsolicited result code +CGREG: <stat>
2: Enable network registration and location information unsolicited result code +CGREG: <stat>[,<lac>,<ci>[,<Act>]]

<stat> GPRS registration status, integer type
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

<lac> Two-byte location area code in hexadecimal format, string type

<ci> Four-byte GERAN/UTRAN cell ID in hexadecimal format, string type

<Act> The access technology of the serving cell, integer type
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: ECGSM
9: NB-IOT

<rac> Routing Area Code, one-byte character string in hexadecimal format
0 is displayed if no proper RAC

<subAct> 0: TDD_SUBACT
1: FDD_SUBACT

If subACT is omitted, TDD and FDD are supported both when ACT is E-UTRAN and only TD-SCDMA is supported when ACT is UTRAN.

Example

```
AT+CGREG=1                                  Enable network registration result code.

OK
AT+CGREG?                                   Query the current GPRS network registration
+CGREG: 0,1                                 status. The network registration unsolicited
                                            result code is disabled.
OK
AT+CGREG=?                                  Query the available parameter range.
+CGREG: (0,1,2)

OK
```

3.3 AT+CEREG – Querying EPS Network Registration Status

To query the EPS network registration status of the module

Format

Type	Command	Response
Execute	AT+CEREG=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CEREG?<CR>	<n>=0, 1, 2: <CR><LF>+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>]]<CR><LF> <n>=4: <CR><LF>+CEREG:<n>,<stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]<CR><LF>
Test	AT+CEREG=?<CR>	<CR><LF>+CEREG: (value range of <n>) <CR><LF>OK<CR><LF>
Unsolicited report	• <n>=1 <CR><LF>+CEREG: <stat><CR><LF> • <n>=2	

	<CR><LF>+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>]]<CR><LF> • <n>=4 <CR><LF>+CEREG: <stat>[,[<tac>],[<ci>],[<AcT>][,,[,[<Active-Time>],[<Periodic-TAU>]]]]<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<n>	Specifies whether to enable network registration unsolicited result code. 0: disable network registration unsolicited result code (default). 1: enable network registration unsolicited result code. 2: enable network registration and location information (Cell ID, Local ID) unsolicited result code 4: enable network registration unsolicited result codes containing **Active-Time** and **Periodic-TAU**
<stat>	Network status 0: not registered, the module is not currently searching for a new operator to register 1: registered to the home network 2: not registered, but the module is currently trying to searching for a base station 3: registration denied 4. Unknown code 5: registered, roaming 6: QCN file is not imported or wrong QCN file is imported
<tac>	Two-byte tracking area code in hexadecimal format, string type
<ci>	Four-byte cell ID in hexadecimal format, string type
<Act>	the access technology of the serving cell, integer type 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: ECGSM 9: NB-IOT
<Active-Time>	8-bit unibyte Requested Active Time on GERAN/UTRAN network (T3324) Bit8-Bit6: unit 000 – 2 seconds 001 – 1 minute

	010 – 6 minutes 111 - T3324 invalid **Bit5-Bit1**: binary-code time e.g. 00000001 indicates two seconds
<Periodic-TAU>	8-bit unibyte Requested periodic-TAU cycle on GERAN/UTRAN network (T3412) Bit8-Bit6: unit 000 – 10 minutes 001 – 1 hour 010 – 10 hours 011 – 2 seconds 100 – 30 seconds 101 – 1 minute 110 – 320 hours 111 - T3412 invalid Bit5-Bit1: binary-code time e.g. 00100010 indicates 2 hours

Example

```
AT+CEREG?                                   Query the network registration status of the
+CEREG: 0,1                                 module.

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

OK
```

3.4 ATE1/ATE0 – Enabling & Disabling the Terminal Display

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

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

If the command is sent after dialing up to connect the network, terminal display is disabled automatically.

ATE is equal to ATE1.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<value> 0: disable the terminal display
1: enable the terminal display (default)

Example

```
ATE1                                    Turn on module AT command echo function
OK                                      Send AT, serial tools show "AT" and "OK".
AT
OK
ATE0                                    Turn off the module AT command echo function
OK
                                        Send AT, and the serial tool displays only "OK"
OK
```

3.5 ATQ – Setting the Code Result Suppression Mode

To set the mode whether to suppress the code result

- After mode set to the code result suppression mode, the module does not output **OK** or **ERROR** to commands.
- The setting by this command is not saved after the module is powered down. The setting is valid only for the GSM commands and invalid for customized commands.
- ATQ is equal to ATQ0.

Format

Type	Command	Response
Execute	ATQ[<value>]<CR>	<CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<value> 0: Output the code result (default)
1: Suppress the code result

Example

```
ATQ1                                    Set to code result suppress mode. (The module does not
                                        return OK after this command is executed successfully.)
AT+CSQ                                  After the mode is set, the return value to AT+CSQ does not
+CSQ: 31, 99                            contain the code result OK.
ATQ0
OK                                      Set to the code result output mode.
                                        After the mode is set, the return value to AT contains the
AT                                      code result OK.
OK
```

3.6 ATV – Setting the Response Format of the Device

To set the response format of the device ATE is equal to ATE1.

- ATV is equal to ATV1.
- After **ATV0** is executed, the module returns 0 if a command is sent in correct format (default setting is OK) and returns 4 if a command is sent in incorrect format (default setting is ERROR).
- The settings by this command are not be saved after the module is powered down.

Format

Type	Command	Response
Execute	ATV[<value>]<CR>	<CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<value> 0: Set the response format to output with only some header, footer, and digit text.
1: Set the response format to output with all headers, footers, and detailed response text (default).

Example

```
ATV1                                    Set the response format to output with all
OK                                      headers, footers, and detailed response text.

AT+CSQ
+CSQ: 31, 99

OK
ATV0                                    Set the response format to output with only some
0                                       header, footer, and digit text. The module returns
                                        0 after the format is set successfully.
AT+CSQ
+CSQ: 31, 99

0
```

3.7 AT&F – Resetting the Module to Factory Settings

To reset the module to the factory settings

- If the module is set to the code result suppression mode (ATQ1), reset it to factory settings by sending this command.
- The following commands are supported: ATE, +CMEE, ATV, ATQ, CEREG, IPR.

Format

Type	Command	Response
Execute	AT&F<CR>	<CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

N/A

Example

```
AT&F                                                    Reset the module to factory settings.
OK
```

3.8 AT+CMUX – Activating Multiplexing Mode

To activate multiplexing mode

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 up to network and the other two are used for AT command sending and receiving.

It is recommended to send AT+CMUX=0 to activate the multiplexing mode.

Format

Type	Command	Response
Set	AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+CMUX?<CR>	<CR><LF>+CMUX: <mode>,[<subset>], <port_speed>,<N1>,<T1>,<N2>, <T2>,<T3>[,<k>]<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CMUX=?<CR>	<CR><LF>+CMUX: (value rang of <mode>),(value range of <subset>),(value range of <port_speed>),(value range of <N1>),(r value range of <T1>),(value range of <N2>),(value range of <T2>),(value range of <T3> value supported),(value range of <k>)<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<mode>	The mode of MUX that is enabled, integer type 0: basic option (default) 1: advanced option (not supported)
<subnet>	Subset of frame format, integer type 0: UIH frames used only (default) 1: UI frames used only (not supported currently)
<port_speed>	UART port rate, integer type 1: 9600bit/s 2: 19200bit/s 3: 38400bit/s 4: 57600bit/s 5: 115200bit/s (not supported currently) 6: 230400bit/s (not supported currently)
<N1>	Maximum frame size, integer type, ranging from 1 to 32768. The value that are supported currently ranges from 1 to 2048.
<T1>	Acknowledgement timer in unit of ten milliseconds, integer type, ranging from 1 to 255, where 10 is default (equal to 100 ms).
<N2>	Maximum number of re-connections, integer type, ranging from 0 to 100. The default value is 3 and the value that are supported currently ranges from 0 to 5.
<T2>	Response timer for the multiplexer control channel in unit of ten milliseconds, integer type, ranging from 2 to 255. The default value is 30. Indicating 300 ms. <T2> must be greater than <T1>
<T3>	Wake up response timer in seconds, integer type, ranging from 1 to 255. The default value is 10, indicating 10 seconds.
<k>	Window size, integer type, ranging from 1 to 7. The default value is 2. This parameter is used in advanced mode in which error restore is supported.

Example

```
AT+CMUX=0,0,4,512,254,5,255                          Basic option. Other parameters are left out.
OK
AT+CMUX=7                                            The parameter value exceeds available range
ERROR
AT+CMUX=?                                            Query the available range of parameters.
+CMUX: (0),(0-2),(1-6),(1-32768),(1-255),(0-
100),(2-255),(1-255),(1-7)
OK
AT+CMUX?                                             Query the current settings.
+CMUX: 0,0,1,31,10,3,30,10,2
```



```
OK
```

3.9 AT+CFUN – Setting Module Functionality

To select the level of functionality of the module by setting **<fun>**

The settings by this command are not saved after the module is powered down.

Do NOT use this command if you send +ENPWRSAVE already.

Format

Type	Command	Response
Set	AT+CFUN=[<fun>[,<rst>]]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+CFUN?<CR>	<CR><LF>+CFUN: <fun><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CFUN=?<CR>	<CR><LF>+CFUN: (value range of <fun>),(value range of <rst>)<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<fun> Power saving function mode
0: turn off radio and SIM power
1: full functionality (default)
4: turn off the RF circuit (flight mode)
5: factory test mode
6: restart the module
7: offline mode

<rst> Specifies whether to restart the module
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.
+CFUN: 1                                    Full functionality

OK
AT+CFUN=?                                   Query available parameter value ranges.
+CFUN: (0-1,4-7),(0-1)

OK
```

3.10 AT+IPR – Setting Baud Rate

To set the baud rate of the module

The baud rate is detected automatically by default. The setting by this command is not saved after the module is powered down.

Format

Type	Command	Response
Set	AT+IPR=<baud rate><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+IPR?<CR>	<CR><LF>+IPR: <baud rate><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+IPR=?<CR>	<CR><LF>+IPR: (list of supported <baud rate>s)<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<baud rate> The value can be 0, 2400, 4800, 9600, 19200, 38400, 57600, 115200
The default value is 0, indicating automatic baud rate detection.

Example

```
AT+IPR=57600                                          Set the baud rate to 115200 bps.
OK
AT+IPR?                                               Query the current baud rate.
+IPR: 57600

OK
AT+IPR=?                                              Query the available baud rate range.
+IPR: (0,2400,4800,9600,19200,38400,57600,115200)

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

3.11 AT+CCLK – Clock

To set and query the real-time clock

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

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<time>	Character string in format of "YY/MM/DD,hh:mm:ss[+TZ]".
TZ	The time lag between the local time and the GMT time, two digits.

Example

```
AT+CCLK="18/07/01,14:54:01"                    Set the real-time clock of the module.
OK
AT+CCLK?                                       Query the setting of the real-time clock.
+CCLK: "18/07/01,14:54:10"
OK
AT+CCLK=14/07/02,10:48:50                      Incorrect command syntax.
ERROR
```

3.12 AT+CPIN – Entering PIN Code

To query the PIN status and enter PIN code

To enter PIN code, lock current SIM card (send AT+CLCK="SC",1,"1234") and then restart the module.

If the PIN code is input incorrectly for three times, PUK is required to unlock the SIM card.

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<pin>, <newpin>	String type
<code>	**READY**: no password **SIMPIN**: enter PIN code. **SIMPUK**: enter PUK code. **SIMPIN2**: enter PIN2 code. **SIMPUK2**: enter PUK2 code.

Example

```
AT+CPIN?                                  Query whether PIN code is required.
+CPIN: READY                              No password is required.
OK
AT+CPIN?                                  Query whether PIN code is required.
+CPIN: SIM PIN                            A password is required.
OK
AT+CPIN="1234"                            Input the correct PIN code
OK

+PBREADY                                  Unlock
AT+CPIN?                                  Query whether PIN code is required.
+CPIN: SIM PUK                            The pin code is input incorrectly for three
OK                                        times and the PUK code is required.
AT+CPIN="12345678","4321"                 Input the PUK code and a new PIN code.
OK

+PBREADY                                  Unlock
```

3.13 AT+CLCK – Locking/Unlocing Module

To lock, unlock or interrogate the module

The settings by this command take effect after the module is restarted.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<fac>	A pair of quotation marks are required for the value. "OI": Outgoing international calls "AI": All incoming calls "IR": Incoming calls when roaming outside the homing country "SC": lock SIM card "AO": All outgoing calls "OX": All outgoing international calls except to the home country "AB": All calling services "AG": All outgoing call services "AC": All incoming call services "FD": Fixed dialing of the SIM card "PS": Lock phone to the SIM card "PN": Network authentication "PU": Network subsystem authentication "PP": Service provider authentication "PC": Corporate authentication
<mode>	0: unlock 1: lock 2: query the status
<status>	0: not active 1: active
<passwd>	Password or code, character string type A pair of quotation marks are required for the value.
<class>	1: voice service 2: data service 4: fax service 8: SMS 16: synchronous data service 32: asynchronous data service 64: dedicated packet access 128: dedicated PAD access

Example

```
AT+CLCK="SC",2
+CLCK: 0
OK
AT+CLCK=?                                          Query the services that supports the lock
                                                   function.
```



```
+CLCK: ("AB","AC","AG","AI","AO","IR","OI","OX",
"SC","FD", "PN","PU","PP","PC","PF")
OK
AT+CLCK="SC",1,"1234"                          Lock the current SIM card. "1234" is the
OK                                             PIN code.
AT+CLCK="SC",0,"1234"                          Unlock the current SIM card. "1234" is
OK                                             the PIN code.
AT+CLCK="SC",1,"2222"                          The PIN code is incorrect.
ERROR
```

3.14 AT+CPWD – Modifying Password

To modify the password of the lock function of the module

To modify the PIN code, lock the SIM card (send **AT+CLCK="SC",1,"1234"**).

Format

Type	Command	Response
Execute	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>, maximum <pwdlength>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<fac> A pair of quotation marks is required for the value.
"P2": SIM PIN2
"OI": Outgoing international calls
"AI": All incoming calls
"IR": Incoming calls when roaming outside the homing place
"SC": SIM card
"AO": All outgoing calls
"OX": All outgoing international calls except to the home country
"AB": All calling services

	"AG": All outgoing call services "AC": All incoming call services "FD": Fixed dialing of the SIM card "PS": Lock phone to the SIM card "PN": Network authentication "PU": Network subsystem authentication "PP": Service provider authentication "PC": Corporate authentication
<oldpwd>	Old password or code, string type. A pair of quotation marks is required for the value.
<newpwd>	New password or code, string type. A pair of quotation marks is required for the value.

Example

```
AT+CPWD=?                                                    Query the service range of the PIN
+CPWD: ("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),         password allowed by the module.
("IR",4), ("OI",4),("OX",4),("SC",8),("P2",8)
OK

AT+CPWD="SC","1234","0000"                                   Change the PIN code from "1234" to
OK                                                           "0000".

AT+CPWD=SC,1234,0000                                         A pair of quotation marks ("") is
ERROR                                                        required for each parameter.
```

3.15 CMEE – Setting Error Information

To enable or disable the **+CME ERROR:<err>** result code

- The settings by this command are not be saved after the module is powered down.
- AT+CMEE=2 is recommended when debugging.

For error codes, refer to Appendix B.

Format

Type	Command	Response
Execute	AT+CMEE=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CMEE?<CR>	<CR><LF>+CMEE: <n><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CMEE=?<CR>	<CR><LF>+CMEE: (list of supported <n>s)<CR><LF>

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<value> 0: Disable the **+CME ERROR:<err>** result code and display **ERROR**. (default)
1: Enable the **+CME ERROR:<err>** result code and use the numeric **<err>** value.
2: Enable the **+CME ERROR:<err>** result code and use verbose **<err>** values.

Example

```
AT+CMEE=1                                          Enable the result code in digit format.
OK
AT+CMEE=?
+CMEE: (0,1,2)                                     Query the status range of error code.

OK
AT+CMEE?
+CMEE: 1                                           Query the status of the current result code.

OK
```

4 SMS Commands

4.1 AT+CSMS – Selecting SMS Services

To select an SMS service among SMS-MO, SMS-MT, and SMS-CB

This command is not supported on a CDMA network.

Format

Type	Command	Response
Set	AT+CSMS=<service><CR>	<CR><LF>+CSMS: <mt>,<mo>,<bm> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CSMS?<CR>	<CR><LF>+CSMS: <service>,<mt>,<mo>,<bm> <CR><LF>OK<CR><LF>
Test	AT+CSMS=?<CR>	<CR><LF>+CSMS: (value range of <service>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<service>	0: GSM03.40 and GSM03.41. SMS-related AT commands support GSM07.05 Phase 2. 1: GSM03.40 and GSM03.41. SMS-related AT commands support GSM07.05 Phase 2+.
<mt>,<mo>,<bm>	0: not support 1: support

The default settings of this command are 0, 1, 1, 1.

Example

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

4.2 AT+CPMS – Setting Preferred SMS Storage

To set preferred SMS storage

The settings by this command are saved after the module is powered down.

Format

Type	Command	Response
Set	AT+CPMS=<mem1>[,<mem2>, <mem3>]<CR>	<CR><LF>+CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> <CR><LF>OK<CR><LF>
Query	AT+CPMS?<CR>	<CR><LF>+CPMS: <mem1>, <used1>, <total1>, <mem2>, <used2>, <total2>, <mem3>, <used3>, <total3> <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>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<mem1> Memory from which SMS messages are read and deleted, string type
"SM": SIM only
"ME": ME only

	"MT": any of storages associated with ME (SIM first) "SR": Status Report Storage
<mem2>	Memory which SMS message are written into and sent from, string type "SM": SIM only "ME": ME only "MT": any of storages associated with ME (SIM first) "SR": Status Report Storage
<mem3>	Priority memory which received SMS messages are saved to "SM": SIM only (default) "ME": ME only "MT": any of storages associated with ME (SIM first) "SR": Status Report Storage
<used>	Used quantity
<total>	Total capacity of the storage

Example

```
AT+CPMS="SM"                                                    Set the SMS storage to "SM", that
+CPMS: 0, 50, 0, 50, 0, 50                                      is, 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 available storages.
+CPMS: ("ME","MT","SM","SR"),("ME","MT","SM","SR"),
("ME","MT","SM","SR")
OK

AT+CPMS="SM"                                                    No SIM card is inserted.
+CMS ERROR: 500
```

4.3 AT+CMGF – Setting SMS Inputting Mode

To set the SMS inputting mode

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>OK<CR><LF>

Test	AT+CMGF=?<CR>	<CR><LF>+CMGF: (range of supported <mode>s) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

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

Example

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

4.4 AT+CSCS – Setting the TE Character Set

To set the format of the TE character set

Format

Type	Command	Response
Set	AT+CSCS=[<chset>]<CR>	<CR><LF>OK<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>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<chset>
- "GSM": default GSM alphabet (GSM03.38.6.2.1)
- "IRA": international reference alphabet (ITU-T T.50) (default)
- "UCS2": 16-bit universal multiple-octet coded character set (USO/IEC10646). The UCS2 character string is converted into a hexadecimal number (ranging from 0x0000 to 0xFFFF). UCS2 encoding is used only in some character string of the statement.

Example

```
AT+CSCS="IRA"                              Set IRA character set.
OK
AT+CSCS?                                   Query the format of current character set.
+CSCS: "IRA"
OK
AT+CSCS=?                                  Query the character set formats that the module
+CSCS: ("IRA","GSM","UCS2")                supports.
OK
```

4.5 AT+CNMI – Setting SMS Indication Mode

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>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>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<mode> Set the instruction mode after receiving SMS messages. The default value is 0.
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. (default)
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.

<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 (default)
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. The default value is **0**.
0: not send the instruction information of new cell broadcast. The cell broadcast will not be stored.
1: the cell broadcast instruction code is **+CBMI:"BC" ,<index>** and the cell broadcast is stored. (default)
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 0.
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).
2: if a status report is stored, then the following unsolicited result code is sent:
+CDSI: <memr>,<index>

<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.

- **+CNMI: 2,1,0,0,0** is recommended (new messages are stored on SIM card rather than displayed directly).
- 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=?                                           Query the value ranges of the paramters.
+CNMI: (0,1,2),(0,1,2,3),(0,2),(0,1,2),(0,1)
OK
AT+CNMI?                                            Query the current setting of the parameters.
+CNMI: 1, 1, 0, 0, 0
OK
```

4.6 AT+CMGR – Reading SMS Messages

To read SMS messages stored in current memory (use the **AT+CPMS** command to specify the current memory)
If the received message is unread, it 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) • SMS-DELIVER <CR><LF>+CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>, <pid>,<dcs>,<sca>,<tosca>,<length>] <CR><LF><data> <CR><LF>OK<CR><LF> • SMS-SUBMIT: <CR><LF>+CMGR: <stat>,<da>,[<alpha>][,<toda>,

	<fo>,<pid>, <dcs>,[<vp>],<sca>,<tosca>,<length> <CR><LF><data> • SMS-STATUS-REPORT: <CR><LF>+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st> • SMS-COMMAND: <CR><LF>+CMGR: <stat>,<fo>,<ct>[,<pid>,[<mn>], [<da>], [<toda>],<length> <CR><LF><data>] • CBM-STORAGE: <CR><LF>+CMGR: <stat>,<sn>,<mid>,<dcs>, <page>,<pages> <CR><LF><data> PDU mode (+CMGF=0) <CR><LF>+CMGR: <stat>,[<alpha>],<length> <CR><LF><pdu><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<index> location value **<index>** from preferred message storage **<mem1>** to the TE

<stat> Status of SMS messages in the storage

- 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

<oa> String type, 3GPP TS 23.040 TP-Originating-Address Address-Value field. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to AT+CSCS command in 3GPP TS 27.007). The type of address is given by **<tooa>**.

<alpha> String type alphanumeric representation of **<da>** or **<oa>** corresponding to the entry

found in MT phonebook. Implementation of this feature is manufacturer specified. The used character set should be the one selected with AT+CSCS command (see definition of this command in 3GPP TS 27.007).

<scts> String type, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp (refer to **<dt>**).

<tooa> Integer type, 3GPP TS 24.011 TP-Originating-Address Type-of-Address octet (default refer to **<toda>**).

<fo> Depending on the command or result code: First octet of 3GPP TS 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND in integer format. If a valid value has been entered once, the parameter can be omitted.

<pid> 3GPP TS 23.040 TP-Protocol-Identifier in integer format (default 0).

<dcs> Depending on the command or result code: 3GPP TS 23.038 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format.

<sca> 3GPP TS 24.011 RP SC address Address-Value field in string format. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to AT+CSCS command in 3GPP TS 27.007). The type of address is given by **<tosca>**.

<tosca> Integer type, 3GPP TS 24.011 RP SC address Type-of-Address octet (default refer to **<toda>**).

<length> Integer type, indicating in the text mode (AT+CMGF=1) the length of the message body **<data>** in characters, or in PDU mode (AT+CMGF=0) the length of the actual TP data unit in octets (i.e. the RP layer SMSC address octets are not counted in the length).

<data> If **<dcs>** indicates that GSM 03.38 default alphabet is used and **<fo>** indicates that GSM 03.40 TP-User-Data-Header-Indication is not set:

- ME/TA converts GSM alphabet into current TE character set when TE character set is not configured to HEX by +CSCS.
- ME/TA converts each 7-bit octet into hexadecimal numbers containing two IRA characters when TE character set is configured to HEX by +CSCS.

If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, or **<fo>** indicates that GSM 03.40 TP-User-Data-Header-Indication is set:
ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)

<da> String type, 3GPP TS 23.040 TP-Destination-Address Address-Value field. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to **AT+CSCS** command in 3GPP TS 27.007). The type of address is given by **<toda>**

<toda> Integer type, 3GPP TS 24.011 TP-Destination-Address Type-of-Address octet

<vp> GSM 03.40 TP-Validity-Period
Its format determined by **<fo>** of SMS-SUBMIT: integer (167 by default) or string type (refer to **<dt>**)

<mr> Integer type, GSM 03.40 TP-Message-Reference.

<ra> String type, GSM 03.40 TP-Recipient-Address, refer to **AT+CSCS**.

<tora> Integer type, GSM 04.11 TP-Recipient-Address Type-of-Address, refer to **<toda>**.

<dt> String type, GSM 03.40 TP-Discharge-Time, in format of yy/MM/dd,hh:mm:ss±zz

<st> Integer type, GSM 03.40 TP-Status

<ct>	Integer type, GSM 03.40 TP-Command-Type
<sn>	Integer type, GSM 03.41 CBM Serial Number.
<mid>	Integer type, GSM 03.41 CBM Message Identifier.
<page>	Integer type, GSM 03.41 CBM Page Parameter 4-7 bit
<pages>	Integer type, GSM 03.41 CBM Page Parameter 0-3 bit
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Example

```
AT+CMGR=1                                                          Read the message
+CMGR: "REC READ","66421",,"11/09/13,16: 37: 59+32"                indexed as 1.
050003140401E27778592EA7E7EBE9373C3C279BCF68F59AADC7FED62779BA596D7EBA
EB5B91EBD16A5D46C35F98406A744E311A95C32594DA75688B50EADACA6D689150EADF
1B2BC5E579AD575E5B5582D5EABD5624C36A3D56C375C0E1693CD6835DB0D9783A15C9
1D2E06BDAA558AC1F60C52B937CADCD2B747AA9021BDEC627E8E9441BD42655DEF446
OK
AT+CMGF=0                                                          Set PDU mode.
OK
AT+CSCS="UCS2"
OK

+CMTI: "SM",39
AT+CMGR=39                                                         Incoming SMM.
+CMGR: 0,,23                                                       Read the message.
0891683110501905F0240BA18177377949F500004130623125032304683 41A0D
OK
AT+CMGF=1                                                          Set the text mode.
OK
AT+CSCS="GSM"
OK

+CMTI: "SM",40                                                     Incoming SMS message.
AT+CMGR=40                                                         Read the SMS 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) • 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>[...]] • 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>[...]] • SMS-COMMANDs: <CR><LF>+CMGL: <index>,<stat>,<fo>,<ct> [<CR><LF>+CMGL: index>,<stat>,<fo>,<ct>[...]] • 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>[...]] PDU mode (+CMGF=0) <CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu> [<CR><LF>+CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu><CR><LF> [...]]
Test	AT+CMGL=?<CR>	<CR><LF>+CMGL: (list of supported <stat>) <CR><LF>OK <CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<stat> String type or numeric type
When set **AT+CMGF=1**,
"REC UNREAD": received unread
"REC UNREAD": received read

	"STO UNSENT": stored unsent "STO SENT": stored sent "ALL": all SMS messages When set AT**+CMGF=0**, 0: received unread 1: received read 2: stored unsent 3: stored sent 4: all SMS messages
<index>	Location value **<index>** from preferred message storage **<mem1>** to the TE
<oa>	String type, 3GPP TS 23.040 TP-Originating-Address Address-Value field. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to AT+CSCS command in 3GPP TS 27.007). The type of address is given by **<tooa>**.
<da>	String type, 3GPP TS 23.040 TP-Destination-Address Address-Value field. BCD numbers (or GSM 7-bit default alphabet characters) are converted to characters of the currently selected TE character set (refer to AT+CSCS command in 3GPP TS 27.007). The type of address is given by **<toda>**
<alpha>	String type alphanumeric representation of **<da>** or **<oa>** corresponding to the entry found in MT phonebook. Implementation of this feature is manufacturer specified. The used character set should be the one selected with **AT+CSCS** command (see definition of this command in 3GPP TS 27.007).
<scts>	String type, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp (refer to **<dt>**).
<tooa>	Integer type, 3GPP TS 24.011 TP-Originating-Address Type-of-Address octet (default refer to **<toda>**).
<toda>	Integer type, 3GPP TS 24.011 TP-Destination-Address Type-of-Address octet
<length>	Number of octets of the given TP-level data unit (octets that do not contain the service center address)
<data>	If **<dcs>** indicates that GSM 03.38 default alphabet is used and **<fo>** indicates that GSM 03.40 TP-User-Data-Header-Indication is not set: • ME/TA converts GSM alphabet into current TE character set when TE character set is not configured to HEX by +CSCS. • ME/TA converts each 7-bit octet into hexadecimal numbers containing two IRA characters when TE character set is configured to HEX by +CSCS. If **<dcs>** indicates that 8-bit or UCS2 data coding scheme is used, or **<fo>** indicates that GSM 03.40 TP-User-Data-Header-Indication is set: • ME/TA converts each 8-bit octet into hexadecimal numbers containing two IRA characters (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)
<fo>	Depending on the command or result code: First octet of 3GPP TS 23.040 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND in integer format. If a valid value has been entered once, the parameter can be omitted.
<mr>	Integer type, 3GPP TS 23.040 TP-Message-Reference
<ra>	String type, 3GPP TS 23.040 TP-Recipient-Address Address-Value field. BCD numbers (or GSM default alphabet characters) are converted to characters of the

	currently selected TE character set (refer to **AT+CSCS** command). The type of address is given by **<tora>**.
<tora>	Integer type, 3GPP TS 24.011 TP-Recipient-Address Type-of-Address octet (default refer to **<toda>**).
<scts>	String type, 3GPP TS 23.040 TP-Service-Centre-Time-Stamp (refer to **<dt>**).
<dt>	GSM 03.40 TP-Discharge-Time, in format of yy/MM/dd,hh:mm:ss±zz
<st>	Integer type, GSM 03.40 TP-Status.
<ct>	Integer type, GSM 03.40 TP-Command-Type
<sn>	Integer type, GSM 03.41 CBM Serial Number
<mid>	Integer type, GSM 03.41 CBM Message Identifier
<page>	Integer type, GSM 03.41 CBM Page Parameter 4-7 bit
<pages>	Integer type, GSM 03.41 CBM Page Parameter 0-3 bit
<pdu>	In the case of SMS: 3GPP TS 24.011 SC address followed by 3GPP TS 23.040 TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal number (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)).

Example

```
AT+CMGL="ALL"
+CMGL: 1,"REC READ","10010",,"14/06/23,14:42:27+32"
0500034F0302672C77ED4FE14E2D768452694F596D4191CF5305542B53E052A053056D4191CFFF0C8BF76CE8610F533
A52064F7F7528FF093002672C6B2167E58BE27ED3679C5B5857285EF665F6FF0C8BF74EE551FA8D264E3A51C6300276
7B96468054901A624B673A84254E1A53850020007700610070002E00310030003000310030002E0063006F006D
+CMGL: 2,"REC READ","10010",,"14/06/23,14:42:27+32"
0500034F03016E2999A863D0793AFF0C622A6B62003667080032003265E5FF0C60A85F536708595799105185 6D4191C
F5DF24F7F752800340033002E00360031004D0042FF0C52694F596D4191CF003200350036002E00330039004D0042FF
08598260A88BA28D2D4E867EA256F4811662164E9196C0621660A6005400566D4191CF53E052A05305FF0C5219
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 required
ERROR                                              for the parameter.
AT+CMGF=1                                          The parameter should be set to 0.
OK
AT+CMGL=4
ERROR
AT+CMGF=0                                          The parameter should be set to 1.
OK
AT+CMGL="ALL"
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	• AT+CMGS=<da>[,<toda>]<CR> text is entered<Ctrl+Z/ESC> (Text mode) • AT+CMGS=<length><CR> PDU is given<Ctrl+Z/ESC> (PDU mode)	• Text mode (+CMGF=1): <CR><LF>+CMGS: <mr>[,<scts>] <CR><LF>OK<CR><LF> • PDU mode (+CMGF=0): <CR><LF>+CMGS: <mr>[,<ackpdu>] <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 120 s.

Parameter

<da>	The destination number to which the SMS message is sent in text mode
<toda>	Type of destination address.3GPP TS 24.011 TP-Destination-Address Type-of-Address octet in integer format.
<text>	SMS message content in text mode
<length>	the byte length of the SMS message content in PDU mode
<mr>	storage location
<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. 3GPP TS 23.040 TP-Service-Centre-Time-Stamp in time-string format (refer to <dt>).
<ackpdu>	3GPP 23.040 RP-User-Data element of RP-ACK PDU

Example

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



```
+CMGS: 171
OK
AT+CMGS="15889758493"<CR>                          AT+CMGF=1 might not be executed.
> This is the text→
ERROR
AT+CMGS=33<CR>                                     PDU mode (+CMGF=0)
>0891683108705505F001000B815118784271F20008146DF1
57335E025B9D5B89533A59276D6A80545EFA→
+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.

If PDU messages is sent through a UART debugging tool, press the **Enter** button or enter <CR> in hexadecimal format.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<da>	The destination number to which the SMS message is sent in text mode
<toda>	Type of destination address.3GPP TS 24.011 TP-Destination-Address Type-of-Address octet in integer format.
<stat>	Status of SMS messages in the storage
<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
<ESC>	Indicates giving up the input message

Example

```
AT+CMGW="091137880"<CR>                                   Text mode (+CMGF=1)
>"This is the text"<Ctrl+Z>
+CMGW: 15
OK
AT+CMGW=091137880                                         A pair of quotation marks ("") is
ERROR                                                     required for the number in text mode.
AT+CMGW=31<CR>                                            PDU mode (+CMGF=0)
>0891683108705505F001000B813124248536F3000812004
00026002A535A53D153A653C1532052C7<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>	• Text mode (+CMGF=1)]: <CR><LF>+CMSS: <mr>[,<scts>] <CR><LF>OK<CR><LF> • PDU mode (+CMGF=0): <CR><LF>+CMSS: <mr>[,<ackpdu>] <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<index>	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                                   Send the SMS messages stored in memory 2.
+CMSS: <mr>
OK
AT+CMSS=2                                   No SMS message is stored in memory 2 or the SMS
ERROR                                       message number in 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),(value range of <delflag>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<index>	The recording number of the stored SMS messages
<delflag>	Integer 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 **<delflag>** is set, ignore the parameter **<index>**.

Example

```
AT+CMGD=0,3                                    Delete all read, sent, and unsent SMS
OK                                             messages.
AT+CMGD=?                                      Query the value ranges of parameters.
+CMGD:(0,1,2,3),(0-4)
OK
AT+CMGD=5
ERROR                                          The 5th message does not exist.
```

4.12 AT+CSCA – Setting SMS Center Number

To set the SMS center number

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>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<sca> SMS center number

<tosca> The format of the SMS center number.
129 indicates national number.
145 indicates international number.

Example

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

4.13 AT+CSMP – Setting Text Mode Parameters

To select required values for the additional parameters in the text mode, and set the validity period since the message is received from the SMSC, or the absolute time defining the end of the validity period

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>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<fo> Determined by the command or the first 8 bits of the result code **GSM 03.40 SMS-DELIVER**;
SMS-SUBMIT (default value: 17); or adopt the integer-type SMS-COMMAND (default value: 2)

<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>	Integer-type TP-protocol-ID (default value: 0)	
<dcs>	Encoding plan for integer-type cell broadcast data (default value: 0)	

The default setting is**,,0,0** on a 3GPP network.

Example

```
AT+CSMP=17,167,0,0                  Text mode parameters:
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 – Displaying the Parameters of the Text Mode

To set whether the detailed header information is displayed in the result code in text mode

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>OK<CR><LF>
Test	AT+CSDH=?<CR>	<CR><LF>+CSDH: (value range of <show>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

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

Example

```
AT+CSDH=0                                                    Set the header information to
OK                                                           not display
AT+CMGR=0                                                    Read the 0th message.
+CMGR:"RECREAD","13510895077",,"15/07/23,20:58:28+32"
Abc
OK
AT+CSDH=1                                                    Set the detailed header
OK                                                           information to display.
AT+CMGR=0
+CMGR:"RECREAD","13510895077",,"15/07/23,20:58:28+32",       Read the 0th message.
161,36,0,0,"+8613010888500",145,3
Abc
OK
AT+CSDH?                                                     Query the current parameter
+CSDH: 0                                                     setting of the command.
OK
AT+CSDH=?                                                    Query the value range of
+CSDH: (0-1)                                                 parameter in the command.
OK
```

4.15 AT+CSAS – Save Settings

To save current settings

Only the parameter settings of **AT+CSCA**, **AT+CSMP**, and **AT+CSCB** can be saved by executing this command.

Format

Type	Command	Response
Execute	AT+CSAS[=<profile>]<CR>	<CR><LF>OK<CR><LF>

		Or <CR><LF>ERROR<CR><LF>
Test	AT+CSAS=?<CR>	<CR><LF>+CSAS: (list of supported <profile>s) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<profile> 0: save settings (or omit the parameter)

Example

```
AT+CSAS                                  Save settings
OK
AT+CSAS=0                                Save settings
OK
AT+CSAS=?                                Query the valid parameter values for the
+CSAS: 0                                 command.
OK
```

4.16 AT+SMSWHITELIST – Setting SMS Whitelist

To set SMS whitelist

The module can receive SMS messages only from the phone number in the whitelist.

Format

Type	Command	Response
Execute	AT+SMSWHITELIST=<n>[,<phone_num>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+SMSWHITELIST?<CR>	<CR><LF><n>,<phone_num><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+SMSWHITELIST=?<CR>	<CR><LF>+SMSWHITELIST: (list of supported

	<n>s),[<phone_num>]<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<n>	Quantity of phone numbers, ranging from 0 to 9. 0 indicates deleting all phone numbers from the whitelist and disable the whitelist function.
[<phone_num>]	Phone number in whitelist

Example

```
AT+SMSWHITELIST=1,13511111111                Set SMS whitelist.
OK
AT+SMSWHITELIST?
1,13511111111                                Query the current SMS whitelist.

OK
AT+SMSWHITELIST=?
+SMSWHITELIST:<0-9>,[<phone_num>]            Query the value ranges.

OK
```


5 Network Service

5.1 AT+CSQ – Querying Signal Quality

To query the receiving signal strength indication (RSSI) and bit error rate (BER) of the channel

Format

Type	Command	Response
Execute	AT+CSQ<CR>	<CR><LF>+CSQ: <signal>, <ber><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CSQ=?<CR>	<CR><LF>+CSQ: (list of supported <rssi>s),(list of supported <ber>s)<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

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

	signal	Rssi
0	<4 or 99	<-107 dBm or unknown
1	<10	<-93dBm
2	<16	<-71 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
+CSQ: 1,99                                          Query the strength of the current signal.

OK
AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)                            Query the value ranges of parameters.

OK
```

5.2 AT+COPS – Selecting and Registering With a Network

To select and register with a network

Format

Type	Command	Response
Set	AT+COPS=[<mode>[,<format>[,<oper>>[,<AcT>]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+COPS?<CR>	<CR><LF>+COPS: [<mode>[,<format>[,<oper>>[,<AcT>]]]]<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+COPS=?<CR>	<CR><LF>+COPS: (range of <mode> value supported),(range of <format> value supported),(range of <oper> value supported),(range of <AcT> value supported) <CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 10 minutes.

Parameter

<mode> Specifies the mode of network selection
0: automatic selection (ignore the parameter <per>)
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 value) 1: short format alphanumeric **<oper>** 2: numeric **<oper>**
<oper>	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 of the network selected manually 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: ECGSM 9: NB-IOT

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?
+COPS: 0,0,"China Mobile",9                  China Mobile

OK
AT+COPS?                                     If it is set to numeric mode, get the number 46000
+COPS: 0,2,"46000",9

OK
AT+COPS?
+COPS: 0,0,"China Unicom",9                  China Unicom

OK
AT+COPS?                                     If it is set to numeric mode, then get the number
+COPS: 0,2,"46001",9                         46001.

OK
AT+COPS=?                                    Query the values supported for network selection.
+COPS: (2,"ChinaMobile","CMCC","46000"),
(1,"ChinaTelecom","CT","46011"),
```



```
(1,"ChinaUnicom","UNICOM","46001"),,
(0,1,2,3,4),(0,1,2)

OK
AT+COPS=2                                   Deregister the network.
OK
```

5.3 AT+NETSTATE – Querying Network State

To query the current network registration state

Format

Type	Command	Response
Query	AT+NETSTATE?<CR>	<CR><LF>+NETSTATE: <net_type>,<net_band><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<net_type> Registered network mode
0: No network
1: CAT NB1
2: CAT M1
3: GSM

<net_band> Hexadecimal registered network band
0x0: Not registered to the network
The following values are returned if **<net_type>** is set to GSM:
0x1: GSM 900MHZ
0x2: GSM 1800MHZ
0x4: GMS 850MHZ
0x8: GSM 1900MHZ
The following values are returned if **<net_type>** is set to CAT NB1:
0x1: LTE B1
0x2: LTE B2
0x4: LTE B3
0x8: LTE B4
0x10: LTE B5

0x80: LTE B8
0x800: LTE B12
0x1000: LTE B13
0x20000: LTE B18
0x40000: LTE B19
0x80000: LTE B20
0x2000000: LTE B26
0x8000000: LTE B28
The following values are returned if **<net_type>** is set to CAT M1:
0x1: LTE B1
0x2: LTE B2
0x4: LTE B3
0x8: LTE B4
0x10: LTE B5
0x80: LTE B8
0x800: LTE B12
0x1000: LTE B13
0x20000: LTE B18
0x40000: LTE B19
0x80000: LTE B20
0x2000000: LTE B26
0x8000000: LTE B28
0x4000000000: LTE B39

Example

```
AT+NETSTATE?
+NETSTATE: 1,0x80                    The current registered network is CAT NB1 and the frequency
                                     band is band8.

OK
```

5.4 AT+CELLINFO – Querying Cell Information

To query the information of the cell that the module is registered with

Format

Type	Command	Response
Query	AT+CELLINFO?<CR>	<CR><LF>+CELLINFO:<mcc>,<mnc>,<cell_id>,<rat> <CR><LF><CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<mcc>	Mobile country code
<mnc>	Mobile network code
<cell_id>	Cell ID
<rate>	Network mode of the cell 0: no network 1: CAT NB1 2: CAT M1 3: GSM

Example

```
AT+CELLINFO?                                Query the information of current cell.
+CELLINFO: 460,00,184646930,1
OK
```

5.5 AT+NETINFO – Querying Network Information

To query the information of the network that the module is registered with

Format

Type	Command	Response
Execute	AT+NETINFO<CR>	<CR><LF>+NETINFO:<rsrp>,<rsrq>,<rssi>,<snr>,<band> <CR><LF><CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<rsrp>	Reference Signal Receiving Power
<rsrq>	Reference Signal Receiving Quality

<rssi>	Received Signal Strength Indication
<snr>	Signal Noise Ratio
<band>	Frequency band registered with NB-IoT/CatM: 1-85: LTE Band 1-85 GSM 43: GSM 850 44: GSM 900 Extend 45: GSM 900 Primary 47: GSM 1800 48: GSM 1900

Example

```
AT+NETINFO                                  Query the information of the network that the module
+NETINFO: -96,-7,-89,8.8,8                  is registered with.

OK
AT+NETINFO                                  Query the information of the network that the module
+NETINFO: ,,-74,,44                         is registered with
                                            The module is registered with a GSM network. RSRP,
OK                                          RSRQ, and SNR are not supported.
```

5.6 AT+NETCFG – Setting Network Mode

To set the network mode the module searches

The settings by this command are not be saved after the module is powered down.

Format

Type	Command	Response
Execute	AT+NETCFG=<class>,<value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NETCFG?<CR>	<CR><LF>+NETCFG:<class>,<value> <CR><LF>+NETCFG: "timeout",<timeout><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<class>	Setting item
<netmode>	The network mode to be locked. 0: AUTO 1: GSMONLY 2: NB-IoT ONLY 3: CATM ONLY 4: CATM or NB-IoT
<timeout>	The module switches to the AUTO mode automatically when unregistering to the networks. Its Maximum timeout is 600s.

Example

```
AT+NETCFG="netmode",1                          Set the network to GSM.
OK
AT+NETCFG?
+NETCFG: "netmode",1                           Query the current network mode and the timeout
+NETCFG: "timeout",180                         value.

OK
```

5.7 AT+NVSETBAND – Setting Frequency Band

To set the number of frequency bands and band value

The settings by this command are saved after the module is powered down.

Format

Type	Command	Response
Execute	AT+NVSETBAND=<band_num>,<band_value>,…<CR>	<CR><LF>OK<CR><LF> Or <LF>ERROR<CR><LF>
Query	AT+NVSETBAND?<CR>	<CR><LF><band_num> band in total:<band_value1>,⋯<band_valueN><CR><LF>

		<CR><LF>OK<CR><LF>
Test	AT+NVSETBAND=?<CR>	<CR><LF>+NVSETBAND: <band_num>,(list of supported <band_value>)<CR><LF> <CR><LF>OK <CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<band_num> Allowed band quantity, ranging 1 to 20. 0 indicates all the bands are enabled.

<band_value> Allowed frequency bands (1, 2, 3, 4, 5, 8, 12, 13, 14, 18, 19, 20, 25, 26, 27, 28, 31, 66, 71, 85)

Example

```
AT+NVSETBAND=3,3,5,8
OK
AT+NVSETBAND=0
OK
AT+NVSETBAND?
3 band in total:3,5,8
OK
```

Set the number of frequency bands to 3 and the bands are respectively 3, 5, and 8.

Enable all the frequency bands.

Query the number of frequency bands and band values.

6 EPS Commands

6.1 AT+CGDCONT – Defining PDP Context

To set the packet data protocol (PDP) format of the GPRS network

Only one APN can be set.

Format

Type	Command	Response
Set	AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]<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: (value range of <cid>),<PDP_type>,,,(value range of <d_comp>),(value range of <h_comp>),(value range of <pd1>),…(,value range of <pdN>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<cid>	(PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition. Minimum value = 1.
<PDP_type>	(Packet Data Protocol type) a string parameter. IP: Internet Protocol (IETF STD 5)
<APN>	Access Point Name. A string parameter which is a logical name that is used to select the GGSN or the external packet data network.

<PDP_address>	A string parameter that identifies the terminal 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, the subscription value will be requested.
<d_comp>	Numeric parameter that controls PDP data compression. Used only for SNDCP. 0 - off (default if value is omitted)
<h_comp>	Numeric parameter that controls PDP header compression. 0 - off (default if value is omitted)
<pd1>, … <pdN>	Zero to N string parameters whose meanings are specific to the <PDP_type>

Example

```
AT+CGDCONT=1,"IP","CMIOT"                                   Set PDP type to IP and APN to
OK                                                          CMNET.
AT+CGDCONT=1,IP,CMIOT
                                                            Format error
ERROR
AT+CGDCONT?                                                 Query current PDP format.
+CGDCONT: 1,"IP","CMIOT","0.0.0.0",0,0
OK
AT+CGDCONT=?                                                Query the available value
+CGDCONT: (1-24),"IP",,,(0-2),(0-4),(0-1),(0-1)             range of PDP format.
+CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV6",,,(0-2),(0-4),(0-1),(0-1)
+CGDCONT: (1-24),"IPV4V6",,,(0-2),(0-4),(0-1),(0-1)
OK
```

6.2 AT+XIIC – Setting Up a PPP Link

To set up a PPP link

Ensure that the module is registered with a network and the APN is configured before using the **AT+XIIC=1** command to set up PPP link.

Use **AT+CEREG?** to check whether the module is registered with a network or not. If **+CEREG: 0,1** or **+CEREG: 0,5** is returned, the module did not register to the network.

Send **AT+CGDCONT** to set APN.

Format

Type	Command	Response
Set	AT+XIIC=<n><CR>	<CR><LF>OK<CR><LF>

		or <CR><LF>ERROR<CR><LF>
Query	AT+XIIC?<CR>	<CR><LF>+XIIC: <act>,<ip><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

n	0: disconnect the PPP link 1: set up the PPP link.
<ip>	IP address

Example

```
AT+XIIC=1                                   Set up a PPP link.
OK
AT+XIIC?                                    The PPP link is set up successfully.
+XIIC: 1,10.107.216.162                     There are four spaces before 1.

OK
AT+XIIC?                                    Query the PPP link status.
+XIIC: 0,0.0.0.0                            The PPP link is not activated successfully.
                                            There are four spaces before 0.
OK

AT+XIIC=1
OK
                                            The PPP link is disconnected.
NET DISCONNECTION
```

6.3 AT+CGATT – Attaching and Detaching to PS

To attach or detach the module to packet domain (PS) service

By default, the module can automatically perform GPRS attach.

Ensure that the GPRS attach is set before the PPP link is set up. It is recommended to add the **AT+CGATT?** command to the process to query the GPRS status. If the module returns **1**, set up PPP link directly; otherwise, set GPRS attach manually by executing the command **AT+CGATT=1**.

Format

Type	Command	Response
Set	AT+CGATT=<state><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+CGATT?<CR>	<CR><LF>+CGATT: <state><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CGATT=?<CR>	<CR><LF>+CREG: (list of <state> value supported) <CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 30s.

Parameter

<state> 0: indicates detach
1: indicates attach

Example

```
AT+CGATT=1
OK                                          GPRS attach is set successfully.
AT+CGATT=0
OK                                          GPRS detach is set successfully.
AT+CGATT=0                                  ERROR is returned because no SIM card is
ERROR                                       installed.
AT+CGATT?                                   Query the GPRS status.
+CGATT: 0

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

OK
```


7 TCP/UDP Client Commands

7.1 AT+RECVMODE – Setting Receive Mode

To set the receive mode of TCP and UDP data

Do not send this command during communication because it clears the buffer.

This command also works for UDP data.

The settings are not saved after the module is powered down.

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: (value range of <n>),(value range of <mode>) <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Receive mode 0: buffer the TCP or UDP data received and the MCU sends command to read the data 1: print the TCP or UDP data received to UART directly (default)
<mode>	Specifies whether to report in hexadecimal format 0: report in ASCII format (default) 1: report in hexadecimal format

Example

```
AT+RECVMODE=0                                    Set data receive mode.
OK
```

7.2 AT+TCPKEEPALIVE – Setting Keepalive Heartbeat

To set TCP keepalive heartbeat

Send this command before setting up a TCP connection. And it is valid for all connections. The settings by this command are not saved after the module is powered down.

Note that this function consumes data traffic.

Format

Type	Command	Response
Set	AT+TCPKEEPALIVE=<mode>,<time>[,<interval>]]<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+TCPKEEPALIVE?<CR>	<CR><LF>+TCPKEEPALIVE: <mode>,<time>,<interval><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+TCPKEEPALIVE=?<CR>	<CR><LF>+TCPKEEPALIVE: (list of supported <mode>s), (list of supported <time>s), (list of supported <interval>s)<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<onoff>	Heartbeat switch 0: disable (default) 1: enable
<time>	Heartbeat interval at which the module sends data packets to the server, ranging from 30 to 7200. Unit: second The default value is 120. The recommended value ranges from 30 t0 300.

<interval> Retransmission interval at which the module sends heartbeat data packet again if it does not receive the response from the server, ranging from 1 to 1800, unit: second. The default value is 75. The recommended value ranges from 40 to 100.

Example

```
AT+TCPKEEPALIVE=1                                          Enable heartbeat.
OK
AT+TCPKEEPALIVE=1,120,75                                   Enable heartbeat and set the
OK                                                         intervals.
AT+TCPKEEPALIVE=0                                          Disable heartbeat.
OK
AT+TCPKEEPALIVE?                                           Query heartbeat setting.
+TCPKEEPALIVE: 1,120,75

OK
AT+TCPKEEPALIVE=?                                          Query the value ranges.
+TCPKEEPALIVE: (0-1),(30-7200),(1-1800)

OK
```

7.3 AT+TCPSETUP – Setting Up TCP Connection

To set up a TCP Connection

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

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Socket ID, ranging from 0 to 5
<ip>	Destination IP address, in xx.xx.xx.xx or domain name format
<port>	Destination port ID in decimal ASCII code
<result>	Result code OK FAIL LINK ALREADY OPENED

Example

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

                                          Successful

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

+TCPSETUP:0,OK                            Successful
+TCPCLOSE:0,Link Closed                   The socket is closed.
AT+TCPSETUP=1,192.168.20.6,7000           Fails to set up a connection to 192.168.20.6,7000 on
OK                                        socket 1. The server is not started, the IP address is
                                          incorrect, or the SIM card is out of credit.
+TCPSETUP: 1,FAIL
AT+TCPSETUP=0,neowayjsr.oicp.net,60010    A TCP/UDP connection has been set up on socket 0.
OK

+TCPSETUP: 0,LINK ALREADY OPENED
AT+TCPSETUP=5,192.168.20.6,7000           Parameters are set incorrectly.
+TCPSETUP:ERROR
AT+TCPSETUP=0.58.60.184.213.10012         Parameters are set incorrectly.
+TCPSETUP:ERROR
AT+TCPSET=0,58.60.184.213,10012           The AT command is not complete.
ERROR
```

7.4 AT+TCPSEND – Sending TCP Data

To send TCP data

The module will return > after this command is sent. Send TCP data 50 ms to 100 ms later.

Ensure that a TCP connection is set up before sending TCP data. The **AT+IPSTATUS** command is recommended to check the buffer size before sending data.

Backslash is used for data link escape. For how to send quotation marks or backlash in character string, see the example.

Format

Type	Command	Response
Execute	AT+TCPSEND=<n>,<length><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Unsolicited report	+TCPSEND: <n>[,<length>],<result>	

Timeout

The command times out if the module does not respond in 300 ms.

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, ranging from 1 to 4096, unit: byte
<mode>	SUCCESS FAIL OPERATION EXPIRED

Example

```
AT+TCPSEND=0,1                                  1-byte data is successfully sent through
>                                               socket 0.

OK

+TCPSEND: 0,1,SUCCESS
AT+TCPSEND=0,1024                               Send 1024-byte data.
>

OK

+TCPSEND: 0,1024,FAIL
AT+TCPSEND=0,10                                 and > is returned, no more data is entered
>                                               in 60 seconds. Then the expiration
                                                information is displayed.
ERROR

+TCPSEND: 0,OPERATION EXPIRED
AT+TCPSEND=0,1                                  One-byte data fails to be sent on socket 0
ERROR                                           because the link is not established.
AT+TCPSEND=0,4097                               4097-byte data fails to be sent on socket 0
ERROR                                           because data length exceeds the limit.
```


7.5 AT+TCPRECV – Unsolicited TCP Data Output

Unsolicited TCP data output.

When the module receives TCP data from the network, the UART prints the data automatically.

Format

Type	Command	Response
Unsolicited report	+TCPRECV:<n>,<length>,<data><CR>	

Timeout

N/A

Parameter

<n>	Socket ID, ranging from 0 to 5
<length>	Length of the data received
<data>	Data received Identify the end based on **<length>**.

Example

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

7.6 AT+TCPREAD – Reading TCP Data

To read TCP data from the buffer

Format

Type	Command	Response
Set	AT+TCPREAD=<n>,<length><CR>	<CR><LF>+TCPREAD: <n>,<length>,<data> <CR><LF>OK<CR><LF> **Or**

	<CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Socket ID, ranging from 0 to 5
<length>	Maximum length of data allowed to read, ranging from 1 to 2048, byte
<data>	Data that is read

Example

```
+TCPRECV: 0,10                                  Socket 0 receives data.
                                                Read data.
AT+TCPREAD=0,100                                The data read is 1234567890.
+TCPREAD: 0,10,1234567890
OK
```

7.7 AT+TCPCLOSE – Closing TCP Connection

To close a TCP connection

Formats

Type	Command	Response
Execute	AT+TCPCLOSE=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Unsolicited report	+TCPCLOSE:<n>,<result>	

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Socket ID, ranging from 0 to 5
<result>	OK
	FAIL
	Link Closed

Example

```
AT+TCPCLOSE=1                          Close the TCP connection.
OK                                     The TCP connection on socket 1 is closed successfully.

+TCPCLOSE: 1,OK
AT+TCPCLOSE=5                          Socket number error
ERROR
AT+TCPCLOSE=1                          Close the TCP connection.
OK

+TCPCLOSE: 1,FAIL                      Fail to close the TCP connection on socket 1.

                                       The TCP connection is closed.
+TCPCLOSE: 0,Link Closed                The server sends command to close TCP connection or the
                                       network encounters abnormality or weak signals.
```

7.8 AT+UDPSETUP – Setting Up UDP Connection

To set up a UDP connection

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

Format

Type	Command	Response
Execute	AT+UDPSETUP=<n>,<ip>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Unsolicited report	+UDPCLOSE:<n>,<result>	

Timeout

The command times out if the module does not respond in 60s.

Parameter

<n>	Socket ID, ranging from 0 to 5
<ip>	Destination IP address, in xx.xx.xx.xx format or domain name format (www.*XXXX*.com)
<port>	Destination port ID in decimal ASCII code
<result>	OK
	FAIL
	LINK ALREADY OPENED

Example

```
AT+UDPSETUP=1,220.199.66.56,7000                    The connection to 220.199.66.560.7000
OK                                                  is successfully set up on socket 1.

+UDPSETUP:1,OK
AT+UDPSETUP=0,neowayjsr.oicp.net,60010              Set up a connection to
OK                                                  neowayjsr.oicp.net,60010 on socket 0

+UDPSETUP: 0,OK                                     Successful
AT+UDPSETUP=0,58.60.184.213,11008                   A TCP/UDP connection is already set up
OK                                                  on socket 0.

+UDPSETUP: 0, LINK ALREADY OPENED
AT+UDPSETUP=1,192.168.20.6,7000                     Fail to set up the connection to
OK                                                  192.168.20.6,7000 on socket 1.

+UDPSETUP: 1,FAIL
AT+UDPSETUP=5,192.168.20.6,6800                     Socket ID is set incorrectly.
ERROR
AT+UDPSETUP=0.58.60.184.213.10012                   Punctuation mark is used incorrectly.
ERROR
AT+UDPSET=0,58.60.184.213,10012                     The AT command is not complete.
ERROR
```

7.9 AT+UDPSEND – Sending UDP Data

To send UDP data

The module will return > after this command is sent. Send UDP data 50 ms to 100 ms later.

Ensure that the UDP connection is set up before sending UDP data. Send AT+IPSTATUS to query the buffer size before sending UDP data.

Format

Type	Command	Response
Execute	AT+UDPSEND=<n>,<length>[[,<content>]	<CR><LF>OK<CR><LF>

	[,mode]]<CR>	**Or** <CR><LF>ERROR<CR><LF>
Unsolicited report	+UDPSEND: <n>,<length>,<result>	

Timeout

The command times out if the module does not respond in 300 ms.

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, ranging from 1 to 4096, unit, byte
<result>	SUCCESS FAIL OPERATION EXPIRED

Example

```
AT+UDPSEND=0,2                                  Send 2-byte data on socket 0.
>                                               Then send the characters 50 ms to 100 ms
                                                after the module returns >.
OK                                              The data is sent successfully.

+UDPSEND: 0,2,SUCCESS

                                                Send 4097-byte data through socket 0.
AT+UDPSEND=0,4097                               4097-byte data fails to be sent on socket 0
ERROR                                           because data length exceeds the limit.
AT+UDPSEND=0,10                                 After the data sending command is input
>                                               and > is returned, no more data is entered
                                                in 30 seconds. Then the expiration
ERROR                                           information is displayed.

+UDPSEND: 0,OPERATION EXPIRED
```

7.10 AT+UDPRECV – Unsolicited UDP Data Ouput

Unsolicited UDP data output.

When the module receives UDP data from the network, the UART prints the data automatically.

Format

Type	Command	Response
Unsolicited report	+UDPRECV: <n>,<length>[,<data>]<CR>	

Timeout

N/A

Parameter

<n>	Socket ID, ranging from 0 to 5
<length>	Length of the data received
<data>	Data received Identify the end based on **<length>**.

Example

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

7.11 AT+UDPREAD – Reading UDP Data

To read UDP data

Format

Type	Command	Response
Execute	AT+UDPREAD=<n>,<length><CR>	<CR><LF>+UDPREAD:<n>,<length>,<data><CR><LF> <CR><LF>OK<CR><LF> **Or** <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Socket ID, ranging from 0 to 5
<length>	Maximum length of data allowed to read
<data>	Data that is read, 1 to 2048 bytes

Example

```
+UDPRECV: 0                                          Socket 0 receives data.
                                                     Read data.
AT+UDPREAD=0,100                                     The data read is 1234567890.
+UDPREAD: 0,10,1234567890

OK
```

7.12 AT+UDPCLOSE – Closing UDP Connection

To close the UDP connection

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	socket ID, ranging from 0 to 5
<result>	OK FAIL

Example

```
AT+UDPCLOSE=1                                   The UDP link on socket 1 is closed
OK                                              successfully.

+UDPCLOSE:1,OK
AT+UDPCLOSE=6                                   Socket number error
+UDPCLOSE:ERROR
```

7.13 AT+IPSTATUS－Querying TCP/UDP Socket Status

To query the TCP/UDP socket status

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	Socket ID, ranging from 0 to 5
<status>	Socket status, CONNECT or DISCONNECT, or CONNECTING or DISCONNECTING
<type>	Socket type, 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 has been set up on socket 0 and
+IPSTATUS: 0,CONNECT,TCP,4096                   the buffer size is 4096 bytes.

OK
AT+IPSTATUS=1                                   A UDP connection has been set up on socket 1.
```



```
+IPSTATUS: 1,CONNECT,UDP,4096

OK
AT+IPSTATUS=0                                   No TCP or UDP connection is set up on socket 1.
+IPSTATUS: 0,DISCONNECT

OK
```

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

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

Format

Type	Command	Response
Execute	AT+TCPACK=<n><CR>	<CR><LF>+TCPACK: <n>,<data_sent>,<acked_recv><CR><LF> Or <CR><LF>ERROR<CR><LF> Or No connection is set up on the socket. <CR><LF>+TCPACK: <n>,DISCONNECT<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

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. The unit is byte
<acked_recv>	Size of data acknowledged by the receiver, unsigned 64-bit integer in decimal ASCII. The unit is byte

Example

```
AT+TCPACK=0                                  20-byte data has been transmitted from socket 0 and
+TCPACK: 0,20,20                             the receiver acknowledged 20-byte data.
AT+TCPACK=1                                  No connection is set up on socket 1.
+TCPACK: 1,DISCONNECT
AT+TCPACK=6                                  The socket ID in the command is incorrect.
ERROR
```

8 Transparent TCP/UDP Commands

8.1 AT+TCPTRANS – Setting Up Transparent TCP Connection

To set up a transparent TCP connection

TCP data can be transparently transmitted after the transparent TCP connection is set up successfully and **+TCPTRANS:OK** is returned. At most 4096-byte data can be sent or received in transparent mode.

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 command mode and ATO to switch it to data mode.

Format

Type	Command	Response
Execute	AT+TCPTRANS=<ip>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<ip> destination IP address, in xx.xx.xx.xx format or domain name format (www.*XXXXXX*.com)
<port> destination port ID in decimal ASCII code

Example

```
AT+TCPTRANS=220.199.66.56,6800                    A transparent TCP connection is set up
OK                                                successfully.
```



```
+TCPTRANS:OK
AT+TCPTRANS=neowayjsr.oicp.net,60010                    A transparent TCP connection is set up
OK                                                      successfully by using domain name.

+TCPTRANS:OK
AT+TCPTRANS=220.199.66.56,6800                          Fails to set up a transparent TCP
OK                                                      connection.

+TCPTRANS:FAIL
AT+TCPTRANS=220.199.66.56,6800                          A transparent (TCP, UDP, TCP server)
ERROR                                                   connection has been set up.
```

8.2 AT+UDPTRANS – Setting Up Transparent UDP Connection

To set up a transparent UDP link

UDP data can be transparently transmitted after the transparent UDP connection is set up successfully and **+UDPTRANS:OK** is returned. At most 4096-byte data can be sent or received in transparent mode.

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.

Format

Type	Command	Response
Execute	AT+UDPTRANS=<ip>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<ip> destination IP address, in xx.xx.xx.xx format or in domain name format (www.*XXXXX*.com).

<port> destination port ID in decimal ASCII code

Example

```
AT+UDPTRANS=220.199.66.56,6800                    A transparent UDP connection is set up
OK                                                successfully.

+UDPTRANS:OK
AT+UDPTRANS=neowayjsr.oicp.net,60010              A transparent UDP connection is set up
OK                                                by using domain name successfully.

+UDPTRANS:OK
AT+UDPTRANS=220.199.66.56,                        The command format is incorrect.
+UDPTRANS:ERROR
AT+UDPTRANS=220.199.66.56,6800                    Fails to set up a transparent UDP link.
OK

+UDPTRANS:FAIL
AT+UDPTRANS=220.199.66.56,6800                    A transparent (TCP, UDP, TCP server)
ERROR                                             connection has been set up.
```

8.3 AT+IPSTATUS –Querying TCP/UDP Socket Status

To query the TCP/UDP socket status

For UDP socket, this command can query only whether the module sets up a connection through an AT command.

Format

Type	Command	Response	
Execute	AT+IPSTATUS<CR>	<CR><LF>+IPSTATUS: <STATUS>[,<TYPE>,<send-buffer-size>]<CR><LF><CR><LF>OK<CR><LF>	

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<status>	Socket status, CONNECT or DISCONNECT
<type>	Socket type, TCP or UDP
<send-buffer-size>	The size of the available send buffer on the module, unit: byte

Example

```
AT+IPSTATUS                                    A transparent TCP connection is set up. The
+IPSTATUS: CONNECT,TCP,4096                    available buffer is 61440 bytes.

OK
AT+IPSTATUS                                    A transparent UDP connection is set up. The
+IPSTATUS: CONNECT,UDP,4096                    available buffer is 61440 bytes.

OK
AT+IPSTATUS                                    No transparent connection has been set up.
+IPSTATUS: DISCONNECT

OK
```

8.4 AT+TRANSCLOSE – Closing Transparent Socket

To close the transparent socket

Format

Type	Command	Response
Execute	AT+TRANSCLOSE<CR>	<CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

N/A

Example

```
AT+TRANSCLOSE                                  A transparent TCP socket is closed
OK                                             successfully.
```

9 FTP Commands

9.1 AT+FTPLOGIN –Logging in to the FTP Server

To log in to the FTP server

- The FTP functions cannot be used together with the internal protocol stack TCP/UDP function.
- Data can be read or written on the FTP server only after login.

Format

Type	Command	Response
Execute	AT+FTPLOGIN=<ip>,<port>,<user>,<pwd><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+FTPLOGIN: ERROR<CR><LF>
Unsolicited report	+FTPLOGIN:<result>	

Timeout

The command times out if the module does not respond in 60 s.

Parameter

<ip>	FTP server address
<port>	Port ID of the FTP server, 21
<user>	The user name to log in to the FTP server. The length of the user name cannot exceed 100 ASCII codes and the user name cannot contain comma (,).
<pwd>	The password for the user account to log in to the FTP server. The length of the password cannot exceed 100 bytes in ASCII code and the password cannot contain comma (,).
<result>	• **Error**: The format of the AT command is incorrect • **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 logged in to the FTP server successfully.
- **530 Not logged in:** The user failed 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                                                  user1 logs in to the server 219.134.179.52
                                                    through port 21 successfully.
+FTPLOGIN: User logged in
AT+FTPLOGIN=58.60.184.213,21,neowayftp,neowayftp
OK

                                                    Fail to log in to the FTP server.
+FTP: Server Ctrl Link Disconnect

+FTPLOGIN: Error
```

9.2 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>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

N/A

Example

```
AT+FTPLOGOUT
OK                                          Log out from the FTP server

+FTPLOGOUT: User logged out
AT+FTPLOGOUT                                Log out of the FTP server because the FTP server is
ERROR                                       offline.
```

9.3 AT+FTPSIZE – Obtaining File Size on FTP Server

To obtain the size of a file on the FTP server

Format

Type	Command	Response
Execute	AT+FTPSIZE=<filename><CR>	<CR><LF>+FTPSIZE: <size><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

If the module fails to activate PDP context or the file does not exist, ERROR is returned directly.

Timeout

The command times out if the module does not respond in 60s.

Parameter

<filename>	file name The file directory is under the FTP root directory.
<size>	File length, byte

Example

```
AT+FTPSIZE=test.txt
+FTPSIZE: 1024                              Obtain the size of test.txt in the FTP root
                                            directory.
OK
```

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[,length]]<CR>	<CR><LF>+FTPGET: <length>[,<content>]<CR><LF><CR><LF>OK<CR><LF> Or <CR><LF>+FTPGET: OK.total length is <n><CR><LF>
Unsolicited report	+FTPSTATE: <result>	

Timeout

The command times out if the module does not respond in 30 s.

Parameter

<dir&filename>	Path and name of the file to be read. The file directory is under the FTP root directory.
<type>	File transfer 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.
<length>	Length of file downloaded from the start point, ranging from 1 to 8192
<length>	Length of content obtained, byte
<content>	Content obtained
<result>	Server Data Link Disconnect

Example

```
AT+FTPGET=pre_ftp1.txt,1,1                Obtain the information in test.txt.
+FTPGET: 10,0123456789
```



```
+FTPGET: OK.total length is 10

+FTP: Server Data Link Disconnect      The connection is closed.
AT+FTPGET=pre_ftp1.txt,1,1,2          Read all data after the first byte.
+FTPGET: 8,23456789

+FTPGET: OK.total length is 8

+FTP: Server Data Link Disconnect
AT+FTPGET=pre_ftp1.txt,1,1,2,4        Read 4-byte data after the first byte.
+FTPGET: 4,2345

+FTPGET: OK.total length is 4

+FTP: Server Data Link Disconnect
AT+FTPGET=pre_ftp1.txt,1,2
+FTPGET: 63,-rw-r--r-- 1 ftp ftp      Obtain the length of the test.txt file.
10 Jul 18 11:45 pre_ftp1.txt

+FTPGET: OK.total length is 63

+FTP: Server Data Link Disconnect
```

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>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<filename>	The name of the file to be uploaded, the file directory under the FTP root directory
<type>	File transfer mode 1: ASCII 2: Binary

<mode>	Operation mode 1: STOR mode. Create a file on the FTP server and write the data to the file. If the file exists, the original file is overwritten. 2: APPE mode. Create a file on the FTP server and write the data to the file. If the file exists, the data is attached to the end of the file. 3: DELE mode. Delete a file.
<size>	Data length. The data length cannot exceed 8192

Example

```
AT+FTPPUT=test.txt,1,1,10                Upload the text.txt file, which is 10 bytes. The file is
>OK                                      transferred in ASCII and the operated in STORE.
AT+FTPPUT=test.txt,1,2,10                Upload the text.txt file, which is 10 bytes. The file is
>OK                                      transferred in ASCII and the operated in APPE.
AT+FTPPUT=test.txt,1,3,0
OK                                       Delete the test.txt file.
AT+FTPPUT=test.txt,1,2,10
>ERROR                                   Data sending times out.
```

9.6 AT+FTPSTATUS – Querying FTP Link Status

To query the FTP link status

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<status	0: The FTP link has not been set up. 1: The FTP link has been set up.
<ip>	The IP address of the FTP server
<port>	The port of the FTP server

Example

```
AT+FTPSTATUS                              Query the FTP link status.
+FTPSTATUS: 1,119.139.221.66,21           The module is successfully connected to the FTP
                                          server. The IP address of the FTP server is
OK                                        119.139.221.66 and the port is 21.
AT+FTPSTATUS
+FTPSTATUS: 0
                                          Not logged in

OK
```

10 Remote Upgrade Via FTP

10.1 AT+FTPGETFURC – Switching the Unsolicited Report of Download Start for FTP Upgrade

To enable or disable the unsolicited report of download start for DTP upgrade

If the unsolicited report is enabled, the module reports +FTPGETF: DOWNLOAD START after executing the FTP upgrade.

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<download_start>	Switch of unsolicited report of download start 0: disable (default) 1: enable

Example

```
AT+FTPGETFURC=1                                  Enable the unsolicited report of download start
OK
AT+FTPGETFURC?
+FTPGETFURC: 1                                   Query the switch status.
OK
AT+FTPGETFURC=?
+FTPGETFURC: (0-1)                               Query the value range of the parameter.
OK
```

10.2 AT+FTPGETF – FTP Upgrade

To upgrade the module remotely through FTP

Before the upgrade, you need to prepare the upgrade package and save it on the FTP server. After the package is downloaded successfully, the module powers down and up and then executes the upgrade automatically.

Format

Type	Command	Response
Execute	AT+FTPGETF=<ip>,<port>,<mode>,<filename>,<user>[,<pwd>]<CR>	<CR><LF>OK<CR><LF> < CR><LF>+FTPGETF: <process><CR><LF> After the module is restarted, it returns FOTA START FOTA SUCCESS FOTA FAIL num
Query	AT+FTPGETF?<CR>	<CR><LF>+FTPGETFURC: <n> <CR><LF>OK<CR><LF> Or <CR><LF>+FTPGETF: 1 ,<total_size>,<length><CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<ip> IP address or domain name of the FTP server

<port>	Server port, 21 in general
<mode>	0: module upgrade 1: other upgrade
<filename>	Name of the upgrade file on the FTP server
<user>	Users name used to log in to the FTP server. The length of the user name cannot exceed 100 ASCII codes and the user name cannot contain a comma (,).
<pwd>	Password used to log in to the FTP server. The length of the password cannot exceed 100 ASCII codes and the password cannot contain a comma (,).
<process>	LOGIN OK DOWNLOAD START: displayed only after the unsolicited report is enabled FILE END: the file is downloaded successfully ERROR EPSV: the server should support IPv6 since an IPv6 network is used. 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 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
<n>	Module status 0: idle 1: downloading 2: download ends
<total_size>	Total size of the upgrade package in bytes
<length>	Bytes downloaded

Example

```
AT+FTPGETF=58.60.184.213,11979,0,N51_E2F368_BZ_V001A.pkt,hzh,hzh   Execute upgrade.

AT+FTPGETF?                                                       Downloading
+FTPGETF: 1,23653645,156320                                       The package is 23653645 bytes
OK                                                                and 156320 bytes are
                                                                  downloaded already
AT+FTPGETF?
+FTPGETF: 2                                                       Download ends.
OK

+FTPGETF: FILE END                                                File download ends

FOTA START                                                        Started to upgrade

FOTA SUCCESSS                                                     Upgraded successfully
```

10.3 AT+FTPFREAD – Reading Other Upgrade Files from the FTP Server

To read other upgrade files from the FTP server

Format

Type	Command	Response
Execute	AT+FTPFREAD=<mode>,<offset>,<length><CR>	<CR><LF>+FTPFREAD: <length>,<contents><CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<mode>	Transfer mode 0: buffer mode
<offset>	File reading offset 0 indicates no offset
<length>	Length of data to be read, unit: byte. The maximum length is 8192 bytes.
<contents>	Content reported

Example

```
AT+FTPFREAD=0,0,10
+FTPFREAD: 10,1234567890                    Buffer mode to read 10 bytes
OK
AT+FTPFREAD=0,1000,10                       Buffer mode to read 10 bytes from the 1001st
+FTPFREAD: 10,0123456789                    byte
OK
```

11 HTTP Commands

11.1 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>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<para>	HTTP parameters, supporting the following two parameters: url: Destination path port: Destination port ID (no default value) keepalive: set long-time connection para_value=0 default para_value=1 long-time connection recvmode: receive mode para_value=0 default mode, only one +HTTPRECV: header is included in one HTTP response para_value=1 data is displayed in format of +HTTPRECV: <length>,<data>
<para_value>	Value of **<para>**. The value of url contains at most 2048 bytes and url supports domain name translation.

Example

```
AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx        Set the Neoway homepage as the URL. The
OK                                                      URL supports domain name translation.
AT+HTTPPARA=url,121.15.200.97/Service1.asmx/GetNote     Set URL.
OK
AT+HTTPPARA=url,                                        The AT command is not complete.
```



```
ERROR
AT+HTTPPARA=port,80                                    Set the destination port ID to 80.
OK
AT+HTTPPARA=port,8080                                  Set the destination port ID to 8080.
OK
```

11.2 AT+HTTPSETUP – Setting Up HTTP Connection

To set up an HTTP connection

The connection is set up successfully only after setting the destination address and port ID correctly. Ensure that a network connection has been set up successfully before setting an HTTP connection.

Format

Type	Command	Response
Execute	AT+HTTPSETUP<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 60s.

Parameter

N/A

Example

```
AT+HTTPSETUP                                   Set up an HTTP connection
OK                                             Successful
AT+HTTPSETUP                                   Set up an HTTP connection
ERROR                                          DNS translation fails
```

11.3 AT+HTTPACTION – Executing HTTP Request

To execute an HTTP request

Comply with the HTTP protocol when defining packets.

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

Timeout

The command times out if the module does not respond in 60s.

Parameter

<mode>	HTTP request mode, available value can be 0, 1, 2, 99 0: GET 1: HEAD 2: POST 99: OPEN_MODE, custom packet mode
<length>	POST content length or custom packet length; mandatory when <mode> is set to POST or OPEN_MODE, 2048 at most.
<type>	data type of POST request 0: x-www-form-url encoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode
<size>	Size of file to be downloaded in GET mode
<post_content>	Content sent through HTTPPOST

Example

```
AT+HTTPPARA=url,www.neoway.com.cn/en/index.aspx                    Set the destination path.
OK
AT+HTTPSETUP                                                       Set up an HTTP connection.
OK
AT+HTTPACTION=0
```



```
OK
                                                                    GET request
+HTTPRECV:
HTTP/1.1 200 OK                                                     Receive the response
Cache-Control: private                                              from the 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: Wed, 02 Mar 2016 06:52:35 GMT
Connection: close
Content-Length: 13842

/*neoway homepage, html format, 13842 bytes*/                       The server finishes the
……..                                                               response and
/* neoway homepage*/                                               disconnects the
+HTTPCLOSED: HTTP Link Closed                                       connection.
AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx                     Set the destination
OK                                                                  path.
AT+HTTPSETUP                                                        Set up an HTTP
OK                                                                  connection
AT+HTTPACTION=1                                                     HEAD request
OK

+HTTPRECV:                                                          The HTTP server
HTTP/1.1 200 OK                                                     responds.
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 destination path
OK
AT+HTTPPARA=port,8080                                               Set the destination
OK                                                                  port ID as 8080.
AT+HTTPSETUP                                                        Set up an HTTP
OK                                                                  connection
AT+HTTPACTION=2,23
```

>MAC=NEOWAY&DATA=0123456	POST request.
OK	Send 23 bytes; enter the contents to be 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>	Receive the response from the HTTP server. The server replies an XML file containing the uploaded content NEOWAY and 0123456.
+HTTPCLOSED: HTTP Link Closed	The server disconnected with the module after it finished responding.
AT+HTTPPARA=url,www.neoway.com.cn/en/index.aspx	Set destination path
OK	
AT+HTTPSETUP	The HTTP connection is set up through port 80.
OK	
AT+HTTPACTION=99,76 >HEAD /en/index.aspx HTTP/1.1 connection: close HOST: www.neoway.com.cn OK	Send 76-byte user-defined packets
+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	Receive the response from the HTTP server. The server disconnects with the module after it finishes responding.

11.4 AT+HTTPCLOSE – Closing an HTTP Socket

To close an HTTP socket

After the +HTTPCLOSE command is sent, the HTTP socket is closed and the setting of +HTTPPARA is cleared.

Format

Type	Command	Response
Execute	AT+HTTPCLOSE<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Unsolicited report	+HTTPCLOSE: HTTP Link Closed	

Timeout

The command times out if the module does not respond in 300ms.

Parameter

N/A

Example

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

                                      Unsolicited report after socket is closed
+HTTPCLOSE: HTTP Link Closed           successfully.
```

11.5 +HTTPRECV – Unsolicited HTTP Data Output

Unsolicited HTTP data output

When the module receives HTTP data from the network, the UART prints the data automatically.

Format

Type	Command	Response
Unsolicited report	<CR><LF>HTTPRECV: <CR><LF><datas>	

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<data> Data received through the HTTP socket

Example

```
+HTTPRECV:                                                          Report the data received
HTTP/1.1 200 OK                                                    from the HTTP connection.
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
+HTTPRECV: 288,HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Set-Cookie: JSESSIONID=5D4CC622732E3C52BBC3EE681CD123BD; Path=/;
HttpOnly
Content-Type: text/html;charset=UTF-8
Content-Length: 52
Date: Mon, 16 Mar 2020 09:52:23 GMT                                Report the data received
Connection: close                                                  from the HTTP connection.

<html>
<body>
<h2>Hello World!</h2>
</body>
```

```
</html>



+HTTPCLOSED: HTTP Link Closed
```

11.6 +HTTPCLOSED – HTTP Socket Closed

Unsolicited report of the HTTP socket closing

Format

Type	Command	Response
Unsolicited report	<CR><LF>+HTTPCLOSE: Link Closed<CR><LF>	

Timeout

N/A

Parameter

N/A

Example

```
+HTTPCLOSED: HTTP Link Closed              Unsolicited report of the HTTP socket closing
```


12 HTTPS Commands

12.1 AT+HTTPSPARA – Setting HTTPS Parameters

To set HTTPS parameters

Set new HTTPS parameters for new HTTPS requests. After the **+HTTPSCLOSE** command is sent, the connection is closed and parameter settings will be cleared.

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<para>	HTTPS parameters, supporting the following two parameters: url: destination path port: destination port ID
<para_value>	The value of <para>. The value of url contains at most 128 bytes and url supports domain name translation. A pair of quotation marks is required for url.

Example

```
AT+HTTPSPARA=url,www.alipay.com/index.html                          Set the Alipay homepage as
OK                                                                  the URL. The URL supports
                                                                    domain name translation.
AT+HTTPSPARA=url,"132.188.73.13/prodreg/beginRegistration.action"   Set URL.
OK
AT+HTTPSPARA=port,443                                               Set the destination port ID
OK                                                                  to 443.
```

12.2 AT+HTTPSSETUP – Setting up an HTTPS Connection

To set up an HTTPS connection

The connection is set up successfully only after setting the destination address and port ID correctly.

Ensure that PPP dialing is successful before an HTTPS connection is set up.

Format

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

Timeout

The command times out if the module does not respond in 60s.

Parameter

N/A

Example

```
AT+HTTPSSETUP                                   Set up an HTTPS connection
OK                                              Successful

+HTTPSSETUP: OK
AT+HTTPSSETUP                                   Set up an HTTPS connection
ERROR                                           Failed.
AT+HTTPSSETUP                                   Set up an HTTPS connection
OK

+HTTPSSETUP: ERROR                              Failed.
```

12.3 AT+HTTPSACTION – Executing HTTPS Request

To execute an HTTPS request

Comply with the HTTPS protocol when defining packets.

Different status codes might be returned. For example, the server returns **405 Method Not Allowed** if the request methods is not supported.

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> Or <CR><LF>><post_content><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<mode>	HTTPS request mode, available value can be 0, 1, 2, 99 0: GET 1: HEAD 2: POST 99: OPEN_MODE, custom packet mode
<length>	POST content length, ranging from 1 to 2048; or custom packet length when **<mode>** is set to **POST** or **OPEN_MODE**
<type>	data type of POST request 0: x-www-form-url encoded 1: text 2: json 3: xml 4: html
<offset>	Offset in GET mode
<size>	Size of file to be downloaded in GET mode
<post_content>	Content sent through HTTPPOST

Example

```
AT+HTTPSPARA=url,support.cdmatech.com/login/                    Set the
OK                                                              destination path.
AT+HTTPSSETUP
OK                                                              Set up an HTTPS
                                                                connection.

HTTPS SETUP OK
AT+HTTPSACTION=0                                                GET request.
OK

                                                                Receive the
+HTTPSSEND: SUCCESS                                             request from the
                                                                HTTPS server.

+HTTPSRECV:
HTTP/1.1 200 OK
Server: spanner/1.0.6
X-Powered-By: Servlet/2.5 JSP/2.1
Content-Type: text/html; charset=ISO-8859-1
Date: Sat, 15 Feb 2014 05:58:54 GMT                             The server
Content-Length: 7630                                            responded and then
Connection: close                                               disconnected the
Set-Cookie:                                                     connection.
JSESSIONID=8V1dS1CpzlPcyNl2LzJZLQgDxWclpMJzP3FHZhVhpGb83GVM02sn!1955538012;
path=/; HttpOnly
/*homepage, html format*/
……..
/*homepage*/
+HTTPSCLOSED: HTTPS Link Closed
AT+HTTPSPARA=url,support.cdmatech.com/login/                    Set the
OK                                                              destination path.
AT+HTTPSSETUP                                                   Set up an HTTPS
OK                                                              connection.

HTTPS SETUP OK
AT+HTTPSACTION=1                                                HEAD request
OK

                                                                The HTTPS server
+HTTPSRECV:                                                     responds.
HTTP/1.1 200 OK
Server: spanner/1.0.6
X-Powered-By: Servlet/2.5 JSP/2.1
Content-Type: text/html; charset=ISO-8859-1
Date: Sat, 15 Feb 2014 06:05:39 GMT
Content-Length: 0
Connection: close
Set-Cookie:
JSESSIONID=qyNVS1DSmnjS9cvh72yW1xz1jtjBBRj0yv0zTmMy2LVyBG7HK02b!1955538012;
path=/; HttpOnly

+HTTPSCLOSED: HTTPS Link Closed
```

```
AT+HTTPSPARA=url,www.alipay.com/index.html                                  Set the
OK                                                                          destination path.
AT+HTTPSSETUP                                                               Set up an HTTPS
OK                                                                          connection.

HTTPS SETUP OK
AT+HTTPSACTION=99,69                                                        Send 69-byte
>HEAD /index.html HTTP/1.1                                                 custom packets.
HOST:www.alipay.com
connection: close                                                           The HTTPS server
                                                                            responded.
OK

+HTTPSSEND: SUCCESS

+HTTPSRECV:
HTTP/1.1 200 OK
Server: spanner/1.0.6
Date: Sat, 02 Aug 2014 06:06:21 GMT
Content-Type: text/html; charset=gbk
Content-Length: 56059
Connection: close
Last-Modified: Fri, 01 Aug 2014 07:45:49 GMT
Strict-Transport-Security: max-age=31536000
Accept-Ranges: bytes
Set-Cookie: spanner=LBKsxiiZAaTeM3wRYcCaUtMjpheSwnH+;path=/;secure;         The server closed
                                                                            the link after
+HTTPSCLOSED: HTTPS Link Closed                                             responding.
```

12.4 AT+HTTPSCLOSE – Closing HTTPS Socket

To close an HTTPS socket

After the **+HTTPSCLOSE** command is sent, the HTTPS socket is closed and the setting of **+HTTPSPARA** is reserved.

Format

Type	Command	Response
Execute	AT+HTTPSCLOSE<CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Unsolicited report	+HTTPSCLOSE: HTTPS Link Closed	

Timeout

The command times out if the module does not respond in 300ms.

Parameter

N/A

Example

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

+HTTPSCLOSE: HTTPS Link Closed
```

12.5 +HTTPSSEND – Unsolicited Report of HTTPS Sending Result

Unsolicited report of the HTTPS data sending result

Format

Type	Command
Unsolicited report	+HTTPSSEND: <state>

Timeout

N/A

Parameter

<state>	SUCCESS FAIL

Example

```
+HTTPSSEND: SUCCESS                        HTTPS data is sent successfully.
```

```
+HTTPSSEND: FAIL                          The module fails to send HTTPS data.
```

12.6 +HTTPSRECV – Unsolicited Report of HTTPS Data Received

Unsolicited report of HTTPS data received

Format

Type	Command
Unsolicited report	<CR><LF>+HTTPSRECV: <CR><LF><datas>

Timeout

N/A

Parameter

<datas> Data that the HTTP socket receives

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;  Unsolicited report of data that the HTTPS socket
path=/; HttpOnly                             receives
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

+HTTPSCLOSED: HTTPS Link Closed
```

12.7 +HTTPSCLOSED – HTTPS Socket Closed

Unsolicited report of the HTTPS socket closing

Format

Type	Command	Response
Unsolicited report	<CR><LF>+HTTPSCLOSED: HTTPS Link Closed <CR><LF>	

Timeout

N/A

Parameter

N/A

Example

```
+HTTPSCLOSED: HTTPS Link Closed                Unsolicited report of the HTTPS socket closing
```

13 GNSS Commands

13.1 AT+GNSSPWR – GNSS Switch

To enable/disable GPS service

GPS service occupies too many resources of the module. It is recommended to turn off the GPS service if you do not need the service.

It takes time to fix the position after this request is executed successfully. The time period that takes are determined by environmental factors. Pay attention to the antenna matching.

Format

Type	Command	Response
Execute	AT+GNSSPWR=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<n> 0: disable GPS
1: enable GPS

Example

```
AT+GNSSPWR=1                                    Enables GPS service.
OK
AT+GNSSPWR=0                                    Disables GPS service.
OK
```

13.2 AT+GNSSSTATE – GNSS State

To query whether GPS service is enabled.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<status>: GPS status:
gps closed
gps opened

Example

```
AT+GNSSSTATE
+GNSSSTATE: gps closed                    GPS is closed
OK
AT+GNSSSTATE
+GNSSSTATE: gps opened                    GPS is opened
OK
```

13.3 AT+GNSSNMEA – Obtaining NMEA Data

To obtain the NMEA data

It takes time to fix the position for the first time when the GPS service is enabled.

NMEA data obtained by an assistant positioning system start with GNXXX.

Format

Type	Command	Response
Execute	AT+GNSSNMEA=<TYPE>[,<Mode>]<CR>	• 0: NMEA$GPGGA<CR><LF>OK<CR><LF><CR><LF>+GNSSNMEA: $GNGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>*<hh> • 1: NMEA$GPGSA<CR><LF>OK<CR><LF><CR><LF>+GNSSNMEA: $GNGSA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>,<15>,<16>,<17>,*<hh> • 3: NMEA$GPRMC<CR><LF>OK<CR><LF><CR><LF>+GNSSNMEA: $GNRMC,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>*<hh> • 4: NMEA$GPVTG<CR><LF>OK<CR><LF><CR><LF>+GNSSNMEA: $GNVTG,<1>,T,<2>,M,<3>,N,<4>,K,<5>*<hh>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<TYPE>	GPS data type, Integer type 0: NMEA$GPGGA or NMEA$GNGGA 1: NMEA$GPGSA or NMEA$GNGSA 3: NMEA$GPRMC or NMEA$GNRMC 4: NMEA$GPVTG or NMEA$GNVTG 6: output all the GPS data
<Mode>	Output mode 0: output once (default) 1: output periodically 2: disable periodic output
$GNGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>*<hh>	**<1>**: UTC, hh mm ss **<2>**: latitude, dd mm mmmm **<3>**: North & South Hemispheres N: north S: south

	<4>: longitude ddd mm mmmm
	<5>: Western & Eastern Hemispheres
	E: East
	W: West
	<6>: GPS quality indicator
	0: no fix
	1: GPS fix
	2: differential GPS fix
	3: invalid GPS fix
	6: estimating
	<7>: umber of satellites in use
	<8>: Horizontal Dilution of Precision (HDOP)
	<9>: altitude above mean sea level (geoid)
	<10>: unit of altitude
	M: Meter
	<11>: geoidal height
	<12>: unit of geoidal height
	<13>: time since last DGPS update
	<14>: DGPS reference station ID
	<hh>: Checksum
$GNGSA,<1>,<2>,	<1>: fix mode
<3>,<4>,<5>,<6>,	A: automatic
<7>,<8>,<9>,<10>,	M: manual
<11>,<12>,<13>,	**<2>**: fix type
<14>,<15>,<16>,	1: no fix
<17>,*<hh>	2: 2D fix
	3: 3D fix
	<3>: PRN number of satellite used for fix
	<4>: PRN number in second channel
	<5>: PRN number in third channel
	<6>: PRN number in forth channel
	<7>: PRN number in fifth channel
	<8>: PRN number in sixth channel
	<9>: PRN number in seventh channel
	<10>: PRN number in eighth channel
	<11>: PRN number in ninth channel
	<12>: PRN number in tenth channel
	<13>: PRN number in eleventh channel
	<14>: PRN number in twelfth channel
	<15>: position (3D) dilution of precision (PDOP) (0.5 - 99.9)
	<16>: HDOP (0.5 - 99.9)
	<17>: VDOP (0.5 - 99.9)
	<hh>: checksum
$GNRMC,<1>,<2>,	**<1>**: UTC time of position fix, hhmmss
<3>,<4>,<5>,<6>,	**<2>**: status of position fix
<7>,<8>,<9>,<10>,	A: valid

<11>,<12>*<hh>	V: invalid **<3>**: latitude, ddmm.mmmm **<4>**: N or S N: North S: South **<5>**: longitude, dddmm.mmmm **<6>**: E or W E: East W: West **<7>**: Speed over ground in knots, 000.0~999.9 **<8>**: Track made good in degrees, 000.0~359.9, True **<9>**: UTC date, ddmmyy **<10>**: Magnetic variation degrees (Easterly var. subtracts from true course), 000.0~180.0 **<11>**: E or W E: Eastern W: Western **<12>**: GPS quality indicator A: Autonomous D: DGPS E: Estimated N: invalid **<hh>**: Checksum
+GNSSNMEA: $GPVTG,<1>,T, <2>,M,<3>,N, <4>,K,<5>*<hh>	**<1>**: True track made good (degrees) **<2>**: Magnetic track made good **<3>**: Ground speed, knots **<4>**: Ground speed, Kilometers per hour **<5>**: GPS quality indicator A: Autonomous D: DGPS E: Estimated N: Invalid **<hh>**: checksum

Example

```
AT+GNSSNMEA=0
OK
+GNSSNMEA:
$GNGGA,060239.00,2241.170914,N,11359.187225,E,2,16,2.5,116.6,M,,,,*39
AT+GNSSNMEA=1
OK
+GNSSNMEA: $GNGSA,A,2,01,11,16,22,,,,,,,,,2.4,2.2,1.0*32

AT+GNSSNMEA=3
OK
```

Obtain the positioning information.

Obtain the data in PGSA format.

Obtain the data in GPRMC format.


```
+GNSSNMEA:
$GNRMC,074855.00,A,2241.207019,N,11359.188919,E,0.0,78.5,050517,2.3,W,A*16

AT+GNSSNMEA=4                                                    Obtain the data in
OK                                                               GPVTG format.
+GNSSNMEA: $GNVTG,78.5,T,80.8,M,0.0,N,0.0,K,A*29
```

13.4 AT+GNSSSEL – Selecting the Assist Positioning System

To select the assist positioning system.

Turn on the GPS positioning system, and then select the required assist positioning system before using this command.

Format

Type	Command	Response
Execute	AT+GNSSSEL=<n><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<n> 0: BD
1: GLONASS
2: GALILEO

Example

```
AT+GNSSSEL=1                                    Turn on the GLONASS or assist position fix.
OK
AT+GNSSSEL=0                                    Turn on the BDS assist position fix
OK
```

14 Time Synchronization Commands

14.1 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 settings by this command are not saved after the module is powered down.

Format

Type	Command	Response
Set	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> <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: <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> <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> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 60s.

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>	IP address of the time server, in form of xx.xx.xx.xx or domain name The following time servers support time update: time.windows.com, time.nist.gov, etc.
<time>	Timeout period, ranging from 1 to 30, 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 Updating,Please Wait... • 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 2014-03-31, 11:10:26       time.
OK
AT+UPDATETIME=0                                          Query when the time was updated last
+UPDATETIME: Last Update Time 0000-00-00, 00:00:00       time.
OK                                                       The time was not updated.
AT+UPDATETIME=1,210.72.145.44,10                         Set up a PPP link.
+UPDATETIME: No PPP Link
AT+UPDATETIME=1,120.25.108.11,10,"E8",0
OK
                                                         Time out
+UPDATETIME: Time Out
AT+UPDATETIME=1,210.72.145.44,10                         Update the time to that of the server
OK                                                       210.72.145.44.
                                                         Timeout period is 10 seconds.
Time Updating,Please Wait...                             East time zone 8 by default
                                                         No DST
+UPDATETIME: Time Out                                    Time update times out because of network
                                                         congestion.
```



```
AT+UPDATETIME=1,128.138.141.172,10,"E8",0                Update the time to that of the server
OK                                                       128.138.141.172.
                                                         Timeout period is 10 seconds.
Time Updating,Please Wait...                             East time zone 8 by default
                                                         No DST
+UPDATETIME: Update To 2014-03-31,11:32:55               Time is updated successfully.
AT+UPDATETIME=1,time.windows.com,10,"W12",1               Update time to that of time.windows.com.
OK                                                       Timeout period is 10 seconds.
                                                         Select west time zone 12.
Time Updating,Please Wait...                             Select DST.
                                                         Time is updated successfully.
+UPDATETIME: Update To 2014-04-12,15:17:48
AT+UPDATETIME=1,185.255.55.20,10,"E8:15"

OK

Time Updating,Please Wait...

+UPDATETIME: Update To 2019-11-21,13:56:47
AT+UPDATETIME=1,185.255.55.20,10,"E8:30"
OK

Time Updating,Please Wait...

+UPDATETIME: Update To 2019-11-21,14:11:26
AT+UPDATETIME=1,185.255.55.20,10,"E8:45"
OK

Time Updating,Please Wait...

+UPDATETIME: Update To 2019-11-21,14:27:12
AT+UPDATETIME=1,128.138.141.172,10,"W12",1               Time update request sending fails.
OK                                                       The reason probably is bad network
                                                         connection or inability to support time
+UPDATETIME: Send Request Fail                           update.
AT+UPDATETIME=1,time.windows.com,10,"W12",1               The domain name is invalid. The possible
OK                                                       reason is the SIM (USIM) card is out of
                                                         credit.
+UPDATETIME: Domain Name Invalid
AT+UPDATETIME=1,time.windows.com,10,"W12",1               Socket error.
OK                                                       The possible reason might be network
                                                         congestion.
+UPDATETIME: Socket Error
AT+UPDATETIME?                                           Query the IP address of the server to
+UPDATETIME: 128.138.141.172,10,"E8",0                   which the time is updated and the timeout
                                                         period, time zone, and DTS.
OK
AT+UPDATETIME=?                                          Query the value range of parameters.
+UPDATETIME: (0-1),,(1-30),,(0-1)
OK
```

15 GSM Location Command

15.1 AT+CIPGSMLOC – Obtaining the Location of the Module

To obtain the location information of the module.

- The obtained location information is the GPS coordinates.
- The current coordinates of latitude and longitude are valid and precision is reserved (0.0 by default).
- Activate PPP before executing the command.

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> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 60 s.

Parameter

<n>	Request 0: close location request (default) 1: multi-BS positioning request(reserved)
<fail_string>	Request failure CONTACT FAIL LINK FAIL LINK NOT FREE
<result_string>	String including longitude and latitude
<code>	Return code after request is submitted successfully but not longitude or latitude information is returned. 401: No right 400: error occurs during request parsing. 404: legal request, but the queried BS is not included. 408: parsing times out. 500: internal error of server

Example

```
AT+CIPGSMLOC
OK

                                                        BS positioning request is
                                                        executed successfully.
+CIPGSMLOC:{"location":{"lat":34.2062006,"lng":108.836387},  The module reports location
"accuracy":550.0}                                       coordinates.

+CIPGSMLOC: OK

AT+CIPGSMLOC
OK                                                      The module fails to parse the
                                                        domain name of the server.
+CIPGSMLOC: CONTACT FAIL

AT+CIPGSMLOC
OK                                                      The connection to the server
                                                        fails to be set up.
+CIPGSMLOC: LINK FAIL

AT+CIPGSMLOC
OK                                                      The location request is sent
                                                        successfully,
+CIPGSMLOC: 404
                                                        but the queried BS is not
                                                        included.
+CIPGSMLOC: FAIL

AT+CIPGSMLOC=1
OK                                                      Request BS positioning.
AT+CIPGSMLOC=1                                          Last request has not been
+CIPGSMLOC: LINK NOT FREE                               responded.
```


AT+CIPGSMLOC=0 OK +CIPGSMLOC:{"location":{"lat":34.2062006,"lng":108.836387}, "accuracy":550.0} +CIPGSMLOC: OK	Request single BS positioning in standard mode is executed successfully. The module reports its location coordinates.

16 PSM&eDRX Commands

16.1 AT+CPSMS – Setting PSM Mode

To set PSM mode

Format

Type	Command	Response
Execute	AT+CPSMS=[<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CPSMS?<CR>	<CR><LF>+CPSMS: [<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]]<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+CPSMS=?<CR>	<CR><LF>+CPSMS: list of supported [mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]]<CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<mode>	Enable or disable PSM mode

	0: disable PSM mode 1: enable PSM mode
<Requested_Periodic-RAU>	8-bit unibyte Requested periodic RAU cycle on GERAN/UTRAN network (T3312) Bit8-Bit6: unit 000 – 10 minutes 001 – 1 hour 010 – 10 hours 011 – 2 seconds 100 – 30 seconds 101 – 1 minute 110 – 320 hours 111 - T3312 invalid Bit5-Bit1: binary-code time e.g. 00100001 indicates 1 hour
<Requested_GPRS-READY-timer>	8-bit unibyte Requested GPRS READY cycle on GERAN/UTRAN network (T3314) Bit8-Bit6: unit 000 – 2 seconds 001 – 1 minute 010 – 6 minutes 111 - T3314 invalid **Bit5-Bit1**: binary-code time e.g. 00100001 indicates 1 minute
<Requested_Periodic-TAU>	8-bit unibyte Requested periodic-TAU cycle on GERAN/UTRAN network (T3412) Bit8-Bit6: unit 000 – 10 minutes 001 – 1 hour 010 – 10 hours 011 – 2 seconds 100 – 30 seconds 101 – 1 minute 110 – 320 hours 111 - T3412 invalid Bit5-Bit1: binary-code time e.g. 00100001 indicates 1 hour
<Requested_Active-Time>:	8-bit unibyte Requested Active Time on GERAN/UTRAN network Bit8-Bit6: unit 000 – 2 seconds 001 – 1 minute 010 – 6 minutes 111 - T3324 invalid **Bit5-Bit1**: binary-code time e.g. 00100001 indicates 1 minute

- The value of <Requested_Periodic-RAU> must be greater than that of <Requested_GPRS-READY-timer>.
- The settings should be negotiated with the network. For valid values, consult your carriers.

Example

```
AT+CPSMS?
+CPSMS: 0,,,"01100000","00000000"          Query the state of PSM mode.
OK
AT+CPSMS=1
OK                                         Enable PSM mode.
AT+CPSMS=0
OK                                         Disable PSM mode.
AT+CPSMS=1,,,"01100001","00000001"
OK                                         Set PSM parameters.
```

16.2 AT+CEDRXS –Setting eDRX Mode

To set eDRX mode

Format

Type	Command	Response
Execute	AT+CEDRXS=<mode>[,<AcT_type>[,<Requested eDRX value>]]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+CEDRXS?<CR>	<CR><LF>+CEDRXS: <mode>[,<AcT_type>[,<Requested eDRX value>]] <CR><LF>OK<CR><LF>
Test	AT+CEDRXS=?<CR>	<CR><LF>+CEDRXS: list of supported <mode>[,<AcT_type>[,<Requested eDRX value>]] <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<mode> to specify whether to enable eDRX mode
0: disable eDRX mode
1: enable eDRX mode
2: enable eDRX mode and state report
3: reset to default setting *

<AcT_type> NB-IoT networks support 5 only
0: used only for state report
1: EC-GSM-IoT (A/Gb mode)
2: GSM (A/Gb mode)
3: UTRAN (Iu mode)
4: E-UTRAN (WB-S1 mode)
5: E-UTRAN (NB-S1 mode)

<Requested_eDRX_value> Requested eDRX cycle, 4-bit character string

A/Gb mode				
4	3	2	1	GERAN eDRX cycle length duration
0	0	0	0	~1,88 seconds
0	0	0	1	~3,76 seconds
0	0	1	0	~7,53 seconds
0	0	1	1	12,24 seconds
0	1	0	0	24,48 seconds
0	1	0	1	48,96 seconds
0	1	1	0	97,92 seconds
0	1	1	1	195,84 seconds
1	0	0	0	391,68 seconds
1	0	0	1	783,36 seconds
1	0	1	0	1566,72 seconds
1	0	1	1	3133,44 seconds
Iumode				
4	3	2	1	UTRAN eDRX cycle length duration
0	0	0	0	10,24 seconds
0	0	0	1	20,48 seconds
0	0	1	0	40,96 seconds
0	0	1	1	81,92 seconds
0	1	0	0	163,84 seconds
0	1	0	1	327,68 seconds

0	1	1	0	655,36 seconds
0	1	1	1	1310,72 seconds
1	0	0	0	1966,08 seconds
1	0	0	1	2621,44 seconds
WB-S1/NB-S1 mode				
4	3	2	1	E-UTRAN eDRX cycle length duration
0	0	0	0	5,12 seconds (WB-S1)
0	0	0	1	10,24 seconds (WB-S1)
0	0	1	0	20,48 seconds
0	0	1	1	40,96 seconds
0	1	0	0	61,44 seconds (WB-S1)/20,48 seconds (NB-S1)
0	1	0	1	81,92 seconds
0	1	1	0	102,4 seconds (WB-S1)/20,48 seconds (NB-S1)
0	1	1	1	122,88 seconds (WB-S1)/20,48 seconds (NB-S1)
1	0	0	0	143,36 seconds (WB-S1)/20,48 seconds (NB-S1)
1	0	0	1	163,84 seconds
1	0	1	0	327,68 seconds
1	0	1	1	655,36 seconds
1	1	0	0	1310,72 seconds
1	1	0	1	2621,44 seconds
1	1	1	0	5242,88 seconds (NB-S1)/ 2621,44 seconds (WB-S1)
1	1	1	1	10485,76 seconds (NB-S1)/ 2621,44 seconds (WB-S1)

The settings should be negotiated with the network. For valid values, consult your carriers.

Example

```
AT+CEDRXS=1,5,”0001”                    Set eDRX cycle to 10.24s seconds in WB-S1 mode
OK
AT+CEDRXS?
+CEDRXS: 1,5,”0001”                     Query the eDRX settings.
OK
AT+CEDRXS=0                             Disable the eDRX mode.
```

```
OK
```

17 MQTT Command

17.1 AT+MQTTCONNPARAM – Setting User Parameters

To set ID, user name, and password

- Set the MQTT connection parameters before setting up an MQTT connection. The parameters will not take effect if you set them with a connection set up already. The settings are not saved after the module is powered down.
- The query command can be used to query parameter settings only after a connection is set up.

Format

Type	Command	Response
Set	AT+MQTTCONNPARAM=<clientID>, <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:<"clientID">,<"username">,<"password"><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 60s.

Parameter

<clientID> Device ID, max. 128 bytes
<username> User name, max. 512 bytes
<password> Password, max. 256 bytes

Example

```
+MQTTCONNPARAM="C_201801021127","lixytest/thing01","0lSoY/eYnlSqUeAsbAKKQ  Parameters are set
/ACmipZwEw9H7Ff0h1kOps="                                                  successfully.
OK
```

17.2 AT+MQTTWILLPARAM – Will Settings

To set will parameters

- Set the MQTT wills before setting up an MQTT connection. The will settings will not take effect if you set them with a connection set up already. The settings are not saved after the module is powered down.
- The query command can be used to query parameter settings only after a connection is set up.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<retained>	Retain symbol, digit type, 0 and 1
<qos>	Quality of service, 0,1 and 2 supported
<"topicname">	Will topic, max. 128 bytes.
<"message">	Will Message, max. 1024 bytes

Example

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

17.3 AT+MQTTCONN – Connection Command

To connect to the MQTT server.

- It takes the module some time to set up a connection. Do NOT send this command again till the module returns result.
- If the module reports +MQTTDISCONNED: Link Closed after a connection is set up successfully and the module does not disconnect proactively, set up a connection manually again.
- The module embeds a reconnection mechanism. Do not send the connection command again during reconnection if the module does not disconnect or is not disconnected to the server.

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:<"host">,<clean>,<keep_alive><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+MQTTCONN=?<CR>	<CR><LF>+MQTTCONN:<"host">,<clean>,<keep_alive><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 60s.

Parameter

<"host">	Server address (URL:port)
<clean>	whether to clean session, digit type, 0-Not clean (by default) 1-Clean

<Keep_alive> keepAlive time, ranging from 20 to 180, unit: second

Example

```
AT+MQTTCONN=121.43.166.63:1883,0,60                    Connect to the MQTT server successfully.
OK
```

17.4 AT+MQTTSUB – Subscription

To subscribe a topic

- One topic cannot be subscribed repeatedly.
- The module returns result slowly if the network signal is poor.
- If the subscription fails, query the MQTT connection and network status and then send the subscription command again.
- The query command can obtain only the QoS and topic of last subscription and it works only when the module is in a connection.

Format

Type	Command	Response
Execute	AT+MQTTSUB=<topicname>,<qos> <CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+ MQTTSUB?<CR>	<CR><LF>+MQTTSUB:<"topicname">,<qos> <CR><LF> <CR><LF>OK<CR><LF>
Test	AT+ MQTTSUB=?<CR>	<CR><LF>+MQTTSUB:<"topicname">,<qos> <CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 30s.

Parameter

<"topicname"> Topic to subscribe to, max. 128 bytes
<Qos> Quality of service, 0 and 1 supported

Example

```
AT+MQTTSUB="neoway02",1                          Subscribe to the topic successfully.
OK

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

17.5 AT+MQTTUNSUB – Unsubscription

To unsubscribe a topic

- One topic cannot be unsubscribed repeatedly.
- The module returns result slowly if the network signal is poor.
- If the unsubscription fails, query the MQTT connection and network status.
- The module returns Error if you unsubscribe a topic that is not subscribed.

Format

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

Timeout

The command times out if the module does not respond in 30s.

Parameter

<topicname> Topic to unsubscribe to, max. 128 bytes

Example

```
AT+MQTTUNSUB="neoway02"                                  Unsubscribe to a topic
OK
```

17.6 AT+MQTTPUB – Publishing Topic

To publish a topic

Format

Type	Command	Response
Execute	AT+MQTTPUB=<retained>,<qos>,<"topicname">,<"message">[,<format>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+MQTTPUB=?<CR>	<CR><LF>+MQTTPUB:<retained>,<qos>,<"topicname">,<"message"> <CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<retained>	Retain mark, digit type, 0 and 1
<qos>	Quality of service, 0,1 supported
<"topicname">	Topic, max. 128 bytes
<"message">	Message, max. 1024 bytes
<format>	Message format 0: character string 1: HEX character string

Example

```
AT+MQTTPUB=1,1,"neoway02", neowaymqtt                    The topic is published successfully.
OK                                                       The server issues the topic.

+MQTTSUB:5,"neoway02",11, neowaymqtt
```


17.7 AT+MQTTPUBIN – Publishing Long Message

To publish topic

- The module returns result slowly if the network signal is poor.
- Input HEX data after the arrow is displayed.

Format

Type	Command	Response
Execute	AT+MQTTPUBIN=<retained>,<qos>,<"topicname">,<message_len><CR>	<CR><LF>> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Test	AT+MQTTPUBIN=?<CR>	<CR><LF>+MQTTPUBIN:<retained>,<qos>,<"topicname">,<message_len><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if no data is input in 30 seconds after the module returns >.

Parameter

<retained>	Retain symbol, digit type, 0 and 1
<qos>	Quality of service, 0 and 1 are supported
<"topicname”>	Topic to be published
<msg_len>	Length of message published,1 to 512 bytes
<bin_message>	Message, HEX data

Example

```
AT+MQTTPUBIN=1,1,"/650063",2
>
(input HEX data)
OK

+MQTTSUB: 1793,"/650063",2,22
```

17.8 AT+MQTTDISCONN – Disconnecting to the MQTT Server

To disconnect to the MQTT server and release resources

The device disconnects to the MQTT server proactively and releases the MQTT resources.

To publish messages after disconnecting, set up a connection again.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

N/A

Example

```
AT+ MQTTDISCONN                                    Disconnect to the MQTT server.
OK
```

17.9 +MQTTSUB – Receiving Topic Content

To receive the topic content sent by the server.

Format

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

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<message_id>	Message ID
<"topicname">	Topic name
<message_len>	The length of the data received
<message>	Data received

Example

```
+MQTTSUB:2,"lixytopic",5,12345          Receive messages published by the topic subscribed to.
```

17.10 +MQTTDISCONNED – Receiving Topic Content

Unsolicited report that the MQTT connection is closed

Format

Type	Command	Response
Unsolicited report	+MQTTDISCONNED: Link Closed<CR>	

Timeout

N/A

Parameter

N/A

Example

```
+MQTTDISCONNED: Link Closed
```

17.11 AT+MQTTSTATE – Querying MQTT Connection Status

To query the status of the MQTT connection

The setting is not saved after the module is powered down. It should be set every time an MQTT connection is set up.

Format

Type	Command	Response
Execute	AT+MQTTSTATE=<mode><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+MQTTSTATE?<CR>	<CR><LF>+MQTTSTATE:<state><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 30s.

Parameter

<mode> Status report mode
0: disable status report (default)
1: enable status report

<state> Reconnection state
0 MQTT disconnected
1 MQTT connected
2 MQTT reconnecting
3 MQTT reconnected
4 MQTT reconnections failed
The state 3 cannot be queried since the status changes very fast.

Example

```
AT+MQTTSTATE?                                   The device is connected to the MQTT
+MQTTSTATE:1                                    server.
OK
```



```
AT+MQTTSTATE=1
OK

+MQTTSTATEURC: 0

                                                    MQTT state report is enabled
+MQTTSTATEURC: 3

+MQTTSTATEURC: 2

+MQTTSTATEURC: 1
```

18 AlibabaCloud MQTT Commands

18.1 AT+IMQTTAUTH – Setting Device Authentication

Device authentication information

Other operations can be performed only after the module is authenticed succussfully and connects to the server.

Format

Type	Command	Response
Execute	AT+IMQTTAUTH=<"product_key">,<"device_name">,<"device_secret"><CR>	<CR><LF>OK<CR><LF> <CR><LF>+IMQTTAUTH: OK<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+IMQTTAUTH: FAIL<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+IMQTTAUTH?<CR>	<CR><LF>+IMQTTAUTH: <"product_key">,<"device_name">,<"device_secret"><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+IMQTTAUTH=?<CR>	<CR><LF>+IMQTTAUTH: <"product_key">,<"device_name">,<"device_secret"><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

< product_key> Product key, 20 bytes at most
<device_name> Device name, 32 bytes at most

< device_secret > Device secret, 64 bytes at most

Example

```
AT+IMQTTAUTH="a1N67lBtniK","n27_test1","EPoA6t6gHtKNh4ZeEhAmhNUwSa34GXB9"
OK                                                                      The device is
                                                                        authenticated
                                                                        successfully.
+IMQTTAUTH: OK
```

18.2 AT+IMQTTPARA – Setting MQTT Parameters

To set the parameters of the device for Ali MQTT communication

Set the MQTT connection parameters before setting up an MQTT connection. The parameters will not take effect if you set them with a connection set up already.

Format

Type	Command	Response
Execute	AT+IMQTTPARA=<"para_tag">,<para_value><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+IMQTTPARA?<CR>	<CR><LF>+IMQTTPARA: <"TIMEOUT">,<timeout_value>,<"CLEAN">,<clean_value><"KEEPALIVE">,<keepalive_value><CR><LF> <CR><LF>OK<CR><LF>
Test	AT+IMQTTPARA=?<CR>	<CR><LF>+IMQTTPARA: <para_tag>,<ParaValue><CR><LF> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<"para_tag"> MQTT parameter tag
"**TIMEOUT**": MQTT timeout interval, unit: second

	"**CLEAN**": to specify whether to clear session **0**: No **1**: Yes "**KEEPALIVE**": heartbeat interval, unit: second
<ParaValue>	MQTT parameter value "TIMEOUT": 2~60 "CLEAN": 0 or 1 "KEEPALIVE": 60~180

Example

```
AT+IMQTTPARA="TIMEOUT",2,"CLEAN",1,"KEEPALIVE",60,"VERSION","3.1.1"                Set timeout
OK
AT+IMQTTPARA="TIMEOUT",2                                                           Obtain parameters
OK
```

18.3 AT+IMQTTCONN – Setting up MQTT Connection

To set up a MQTT connection

- Do not sent this command again before the module returns result.
- Do not send the connection command again during reconnection if the module does not disconnect or is not disconnected to the server.

Format

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

Timeout

The command times out if the module does not respond in 90s.

Parameter

N/A

Example

```
AT+IMQTTCONN
OK                                                    An MQTT connection to Ali server is
                                                      set up successfully.

+IMQTTCONN: OK
```

18.4 AT+IMQTTDISCONN – Disconnecting

To disconnect an MQTT connection

- This command is valid only after a connection is set up successfully.
- All settings are cleared after the MQTT connection is disconnected.

Format

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

Timeout

The command times out if the module does not respond in 30s.

Parameter

N/A

Example

```
AT+IMQTTDISCONN
OK
                                                    Successful
+IMQTTDISCONN: OK


                                                    Disconnected
+IMQTTDISCONN: Disconnected
```

18.5 AT+IMQTTPUB –Publishing Message

To publish a message

Format

Type	Command	Response
Execute	AT+IMQTTPUB=<"topic">,<qos>,<"message">[format]<CR>	<CR><LF>OK<CR><LF> <CR><LF>+IMQTTPUB: OK<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+IMQTTPUB: FAIL<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 60s.

Parameter

<topic >	Topic to be published, 128 bytes at most, e.g. "/abc/device01/update"
<qos>	QoS value, ranging from 0 to 1
<message>	message to be published, 800 bytes at most, e.g. "{"msg":"12"}"
<format >	message format, optional **0**: normal character strings (default) **1**: character string in hexadecimal format. The module converts HEX data into binary data and then sends it out.

Example

```
AT+IMQTTPUB="/a1N67lBtniK/n27_test1/user/1111",1,"{"msg":"12"}"        Send a message.
OK

                                                                       The message is sent
+IMQTTPUB: OK                                                          successfully
AT+IMQTTPUB="/a1N67lBtniK/n27_test1/user/1111",1,"7B5C224C6967687456
6F6C745C223A332E377D",1
OK                                                                     Publish a binary
                                                                       message.
+IMQTTPUB: OK
```

18.6 AT+IMQTTSUB –Subscribing Message

To subscribe a message

The query command obtians the topic and QoS of last subscription.

Format

Type	Command	Response
Execute	AT+IMQTTSUB=<"topic">,<qos><CR>	<CR><LF>OK<CR><LF> <CR><LF>+IMQTTSUB: OK<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+IMQTTSUB: FAIL<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 30s.

Parameter

<topic>	Topic to be subscribed, 128 bytes at most, e.g. "/abc/device01/update"
<qos>	QoS value, ranging from 0 to 1

Example

```
AT+IMQTTSUB="/a1N67lBtniK/n27_test1/user/1111",0
OK                                                    The module subscribes a
                                                      message successfully.
+IMQTTSUB: OK
```

18.7 AT+IMQTTUNSUB –Unsubscribing Message

To unsubscribe a message

Format

Type	Command	Response
Execute	AT+IMQTTUNSUB=<"topic">	<CR><LF>OK<CR><LF> <CR><LF>+IMQTTUNSUB: OK<CR><LF> Or <CR><LF>OK<CR><LF> <CR><LF>+IMQTTUNSUB: FAIL<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 30s.

Parameter

<topic>	Topic to be unsubscribed, 128 bytes at most, e.g. "/abc/device01/update"

Example

```
AT+IMQTTUNSUB="/a1N67lBtniK/n27_test1/user/1111"
OK                                                    The module unsubscribes a
                                                      message successfully.
+IMQTTUNSUB: OK
```

18.8 AT+IMQTTSTATE – Querying MQTT Connection Status

To query the status of the MQTT connection

Format

Type	Command	Response
Execute	AT+ IMQTTSTATE?<CR>	<CR><LF>+IMQTTSTATE: <state><CR><LF> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

< state> MQTT connection state
0: MQTT disconnected
1: MQTT reconnecting
2: MQTT connected

Example

```
AT+IMQTTSTATE?
+IMQTTSTATE: 2
OK
```

The device is connected to the MQTT server.

18.9 +IMQTTRCVPUB – Receiving Publish Message

To receive a publish message

Format

Type	Command

Unsolicited report	<CR><LF>+IMQTTRCVPUB: <packet_id>,<"topic">,<msg_len>,<message>

Timeout

N/A

Parameter

<"topic">	Topic to be published
<packet_id>	Packet ID
<msg_len>	Message length, 1024 bytes at most
<message >	Message received

Example

```
+IMQTTRECVPUB: 24956,"/a1N67lBtniK/n27_test1/user/1111",12,"{"msg":"12"}"
```

19 Other Commands

19.1 AT+CPWROFF – Powering Off Module

To power off the module

Format

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

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

N/A

Example

```
AT+CPWROFF                                    Power off the module.
OK
```

19.2 AT+PING – PING Test

PING Test

Format

Type	Command	Response
Execute	AT+PING=<ip>[,<timeout>,<size>,<num>]<CR>	<CR><LF>OK<CR><LF> Or

	<CR><LF>ERROR<CR><LF>

Timeout

The timeout period is custom and the availble value ranges from 0 to 255 seconds.

Parameter

<ip>	IP address
<timeout>	Timeout interval, 0 to 255 seconds
<size>	Size of data packet, IPv4 (36 to 1500 bytes), IPv6 (56 to 1500 bytes)
<num>	Number of ping tests, 1 to 65535

Example

```
AT+PING=58.60.184.213,255,64,4
OK
Reply from 58.60.184.213: bytes= 64 time = 764(ms), TTL = 255
Reply from 58.60.184.213: bytes= 64 time = 172(ms), TTL = 255
Reply from 58.60.184.213: bytes= 64 time = 206(ms), TTL = 255
Reply from 58.60.184.213: bytes= 64 time = 243(ms), TTL = 255

Ping statistics for 58.60.184.213
Packets: Sent = 4, Received = 4, Lose = 0 <0%>, max_delay = 764 ms, min_delay = 172 ms,
average delay = 346 ms
```

19.3 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 the base station during PPP negotiation.

Format

Type	Command	Response
Execute	AT+DNSSERVER=<n>,<dns-ip><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>

Query	AT+DNSSERVER?<CR>	<CR><LF>+DNSSERVER: <n>,<dns-ip><CR><LF> <CR><LF>OK<CR><LF>	

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<n>	DNS server number, ranging from 1 to 2 1 indicates primary DNS 2 indicates secondary DNS
<dns -ip>	IP address of DNS server

Example

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

OK
```

19.4 AT+SIGNAL－Setting Blinking Status of Signal Indicator

To set the blinking status of signal Indicator

The settings by this command are saved after the module is powered down.

Format

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

Test	AT+SIGNAL=?<CR>	<CR><LF>+SIGNAL: (list of supported <value>s)<CR><LF> <CR><LF>OK<CR><LF>	

Timeout

The command times out if the module does not respond in 300 ms.

Parameter

<value> integer type, ranging from 0 to 7.

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 server. Being off in any other situations.

2: flash and blink. Flash every 250 ms after the module is connected to the server and blink every second in other normal situations.

3: be on after the module is connected to the server and blink every second in other situations.

4: be on after the module is connected to the server and being off in other situations.

5: be off if the SIM card cannot be detected after the module is powered on, blink every second if the SIM card is detected. be on after the module is connected to the server.

6: Three 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 server is connected, the indicator blinks every 250 ms and is on for 0.1 second.

7: Three indicator states:

Off: No SIM card, not registered

On: registered network

On for 0.2 second and off for 1.8 second: Connected to the server.

If the status is set to 0 to 6, the indicator will be always on when a call or SIM message is incoming in sleep mode.

Example

```
AT+SIGNAL?
+SIGNAL: 2                          The current signal indicator status is 2
OK
AT+SIGNAL=3
OK                                  Set current signal indicator status to 3.
AT+SIGNAL=8
ERROR                               The parameter is set to an incorrect value.
AT+SIGNAL=?
+SIGNAL: (0-7)                      The available value of the signal indicator status ranges
OK                                  from 0 to 7
```

19.5 AT+ENPWRSAVE – Enabling or Disabling Sleep Mode

To enable or disable sleep mode

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.

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

Format

Type	Command	Response
Set	AT+ENPWRSAVE=<n><CR>	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Query	AT+ENPWRSAVE?<CR>	<CR><LF>+ENPWRSAVE: <n> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300 ms.

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)

Example

```
AT+ENPWRSAVE=1                                  Enable the sleep mode.
OK
AT+ENPWRSAVE?                                   Query current sleep mode status.
+ENPWRSAVE: 1
OK
```

19.6 AT+NEOFOTA –FOTA Upgrade

To control the remote upgrade of a module

Format

Type	Command	Response
Execute	AT+NEOFOTA=<server>,<port><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+NEOFOTA: <status><CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

< server >	FOTA server address
<port>	FOTA server port
<status>	Upgrade status Password 0: No upgrade package is available 1: Downloaded the upgrade package successfully 2: Failed to download or query the upgrade package 3: Started to upgrade 4: Upgraded successfully 5: Failed to upgrade 6: Started to download 7: Failed to obtain the download address of the upgrade package

Example

```
AT+NEOFOTA=fota.neoway.com/,80                    Trigger FOTA upgrade

OK
+NEOFOTA: 6                                       Started to download the upgrade package

+NEOFOTA: 1                                       The package is downloaded successfully.

+NEOFOTA: 3                                       Start to upgrade

AT+NEOFOTA=fota.neoway.com/,80

OK
+NEOFOTA: 0                                       No upgrade package is available
```

19.7 AT+NEOFOTAURC – FOTA Status Report

To control the status report during FOTA upgrade

The setting is not saved after the module is powered down. This setting should be configured before upgrade.

Format

Type	Command	Response
Execute	AT+NEOFOTAURC=<result><CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NEOFOTAURC?<CR>	<CR><LF>+NEOFOTAURC: <result> <CR><LF>OK<CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<result> switch of status report
0: disable status report. Only upgrade result is reported.
1: enable status report (Default). All states are reported.

Example

```
AT+NEOFOTAURC=1                          Enable the status report.
OK
AT+NEOFOTAURC=0                          Disable the status report.
OK
```

19.8 AT+NSIMLOCK – Locking SIM

To lock SIM based on PLMN

Format

Type	Command	Response
Execute	AT+NSIMLOCK=<ind>[<plmn>]<CR>	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Query	AT+NSIMLOCK?<CR>	<CR><LF>+NSIMLOCK: 1,<plmn list> <CR><LF>OK<CR><LF> Or <CR><LF>+NSIMLOCK: 0,NULL<CR><LF> <CR><LF>OK<CR><LF>
Test	AT+NSIMLOCK=?<CR>	<CR><LF>+NSIMLOCK: (0-1) OK <CR><LF>

Timeout

The command times out if the module does not respond in 300ms.

Parameter

<ind> lock switch
0: unlock
1: lock
The setting of ind is saved after the module is powered.

<plmn> PLMN that is locked
A SIM card can be locked to at most 10 PLMNs.
+CME ERROR: PLMN MAX is returned after the command times out.

Example

```
AT+NSIMLOCK=1,"46001","46004"
OK                                          Lock the SIM to PLMN46001 and 46004.

AT+NSIMLOCK=?
(0-1)                                       Query the value range of parameter.
OK

AT+NSIMLOCK?
+NSIMLOCK: 1,"46001","46004"                Query the PLMN that the SIM is locked to.
OK

AT+NSIMLOCK=0
OK                                          Unlock SIM.
```

A Reference Process of AT Command Programming

A.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

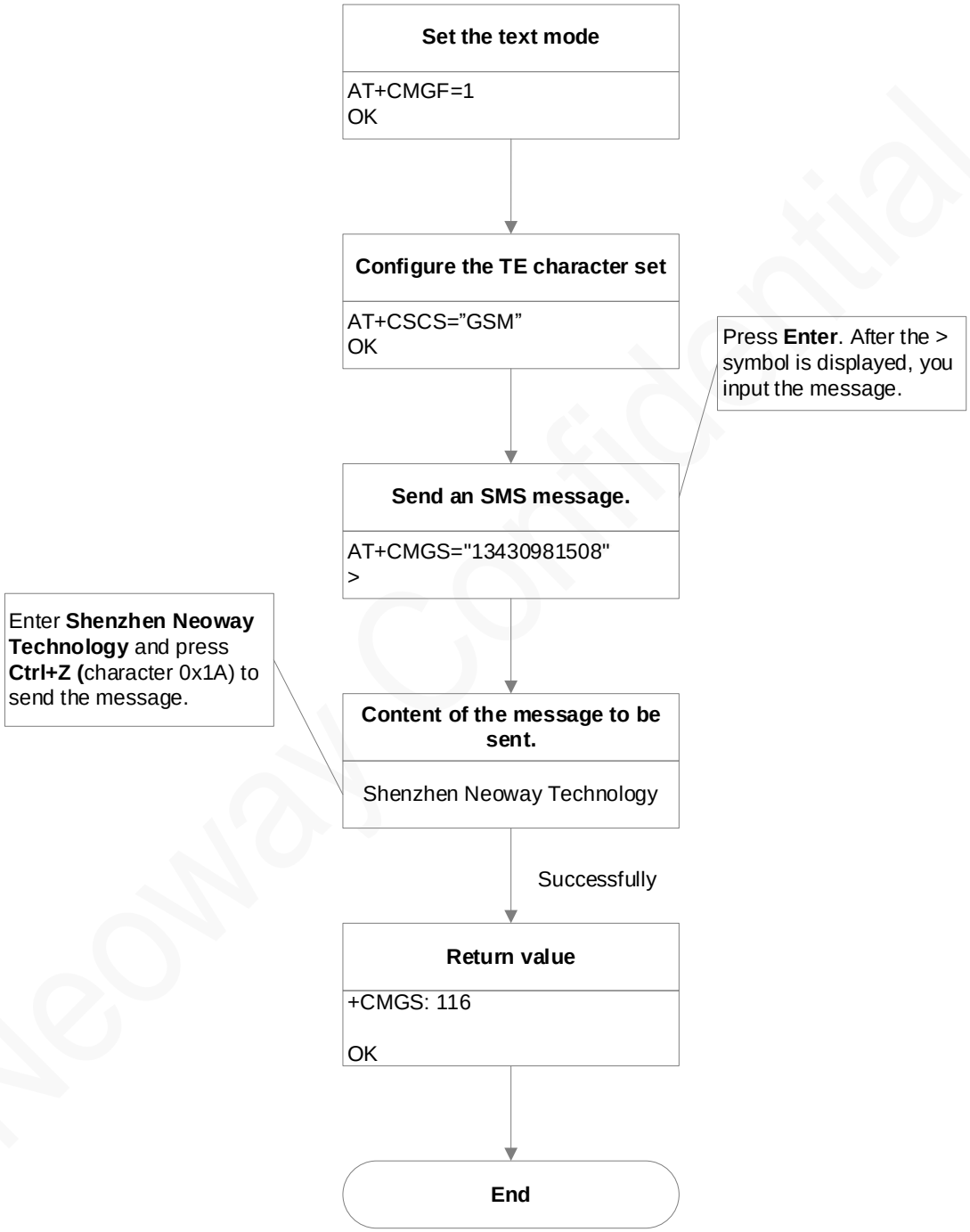
00680065006C006C006F: SMS message content

SMS message content: hello

The SMS message content starts from 0100, so the value of LENGTH in **AT+CMGS=LENGTH** is **23**.

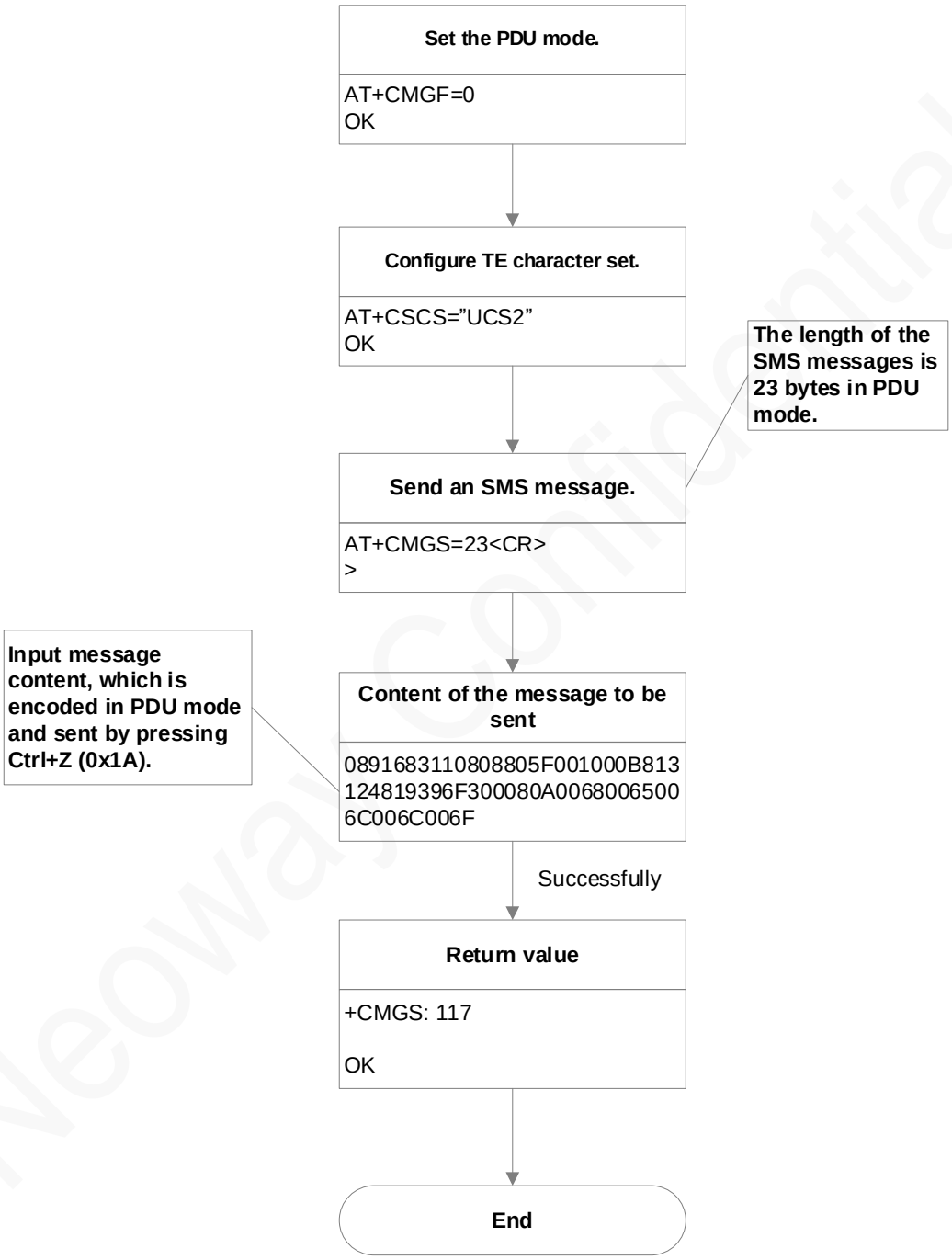
A.2 Flowchart of Sending Text SMS Messages (Through UART)

Figure A-1 Flowchart of sending text format SMS messages



A.3 Flowchart of Sending PDU SMS Messages (Through UART)

Figure A-2 Flowchart of Sending PDU SMS messages



B Error Code

Error Code	Meaning
1	No connection to phone
2	Phone adapter link reserved
3	Operation not allowed
4	Operation not supported
5	PH_SIM PIN required
6	PH_FSIM PIN required
7	7 PH_FSIM PUK required
10	10 SIM not inserted
11	11 SIM PIN required
12	12 SIM PUK required
13	13 SIM failure
14	14 SIM busy
15	15 SIM wrong
16	Incorrect password
17	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
49	Execute not support
50	Execute fail
51	No memory
52	Option not support
53	Param invalid
58	Invalid command line