N21 AT Command Manual

Issue 1.2

Date 2018-11-28

Neoway Product Documentation

Notice

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Sales@neoway.com

Support@neoway.com

Website: http://www.neoway.com

Contents

About This Document

Scope

This document is applicable to N21 series.

Audience

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

Change History

Issue	Date	Change	Changed By
1.0	2018-05	Initial draft	Tao Wenhong
1.1	2018-08	• Added PSM&eDRX commands • Added +CPWROFF • Added +CSCLK • Added +NVSETPM	Tao Wenhong
1.2	2018-10	• Added +CEREG, +CPIN, +CCLK, +IPR • Added +NETSTATE, +TUESTATS, +CESTATUS • Added +SETSCMODE • Added +IPADDR, +CSCON, PSMEVENT • Added +RRCRLSREQ • Added +NCDP, +NMSTATUS • Added +NEONBIOTCFG, +LEDMODE • Added MQTT commands	Tao Wenhong

Conventions

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

Related Documents

Neoway_N21_Datasheet

Neoway_N21_Product_Specifications

Neoway_N21_Hardware_User_Guide

Neoway_N21_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, enter **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 phoneboos is available.

N21 does not detect baudrate automatically if **at** is sent.

1 General Commands

1.1 Querying Module Information: ATI

Description	To query the module information, including manufacturer, model, and version
Format	ATI<CR>
Parameter	<manufacturer>: Module manufacturer <module_model>: Module model <soft_version>: Software version
Return Value	<CR><LF><manufacturer> <CR><LF><module_model> <CR><LF><soft_version> <CR><LF>OK<CR><LF>
Example	ATI NEOWAY Manufacturer N21 Module model V001 Version OK
Remarks	N/A

1.2 Querying Software Version: +CGMR

Description	To query the software version
Format	AT+CGMR<CR>
Parameter	<version>: Software version information
Return Value	<CR><LF>+CGMR: <version> <CR><LF>OK<CR><LF>
Example	AT+CGMR

	+CGMR: N21_RDD0CM_BZ_V001 OK
Remarks	N/A

1.3 Querying IMEI: +CGSN

Description	To query the International Mobile Equipment Identity (IMEI) of the module
Format	AT+CGSN<CR>
Parameter	N/A
Return Value	<CR><LF>+CGSN: <IMEI> <CR><LF>OK<CR><LF>
Example	AT+CGSN +CGSN: 355910044336974 OK
Remarks	The IMEI is a character string of 15 digits.

1.4 Querying the IMSI: +CIMI

Description	To query the international mobile subscriber identification (IMSI)
Format	AT+CIMI<CR>
Parameter	N/A
Return Value	<CR><LF>+CIMI: <IMSI> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>
Example	AT+CIMI +CIMI: 460020188385503 Obtain the IMSI number.

	OK	
	AT+CIMI	Query the IMSI.
	ERROR	No SIM card is installed.
Remarks	IMSI is a character string of 15 digits and starts with 3 digits of MCC and 2 digits of MNC. It is used to authenticate the SIM card.	

1.5 Obtaining the ICCID of the SIM Card: +CCID

Description	To obtain the integrated circuit card identifier (ICCID) of the SIM card	
Format	AT+CCID<CR>	
Parameter	<ICCID>: SIM card ID	
Return Value	<CR><LF>+CCID: <ICCID> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>	
Example	AT+CCID +CCID: 89860002190810001367 OK	Read command
	AT+CCID ERROR	Read command The SIM card is not inserted.
Remarks	The ICCID number is a character string of 20 digits.	

2 UE Control and Status Report

2.1 Querying the Network Registration Status: +CREG

Description	To query the network registration status of the module
Format	• AT+CREG=[<n>]<CR> • AT+CREG?<CR> • AT+CREG=?<CR>
Parameter	**<n>**: Specified whether to enable network registration unsolicited result codes. 0: Disable network registration unsolicited result codes (default setting). 1: Enable network registration unsolicited result codes `+CREG: <stat>`. 2: Enable network registration and location information (Cell ID, Local ID) unsolicited result code `+CREG: <stat>[, [<lac>],[<ci>],[<AcT>]]` **<stat>**: network status 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 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

Return Value	<CR><LF>+CREG: <n>,<stat>[,<lac>,<ci>[,<Act>]] <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF>	
Example	AT+CREG=1 OK	Enable network registration unsolicited codes.
	AT+CREG? +CREG: 0,1 OK	Query the network registration status of the module.
	AT+CREG=? +CREG: (0-2) OK	Query the value range of the network registration status parameter.
Remarks	N/A	

2.2 Querying EPS Network Registration Status: +CEREG

Description	To query the EPS network registration status of the module
Format	• AT+CEREG=[<n>]<CR> • AT+CEREG?<CR> • AT+CEREG=?<CR>
Parameter	**<n>**: Specified whether to enable network registration unsolicited result codes. 0: Disable network registration unsolicited result codes (default setting). 1: Enable network registration unsolicited result codes `+CREG: <stat>`. 2: Enable network registration and location information (Cell ID, Local ID) unsolicited result code `+CREG: <stat>[,[<lac>],[<ci>],[<AcT>]]` 3: Enable network registration unsolicited information cause_type and reject_cause 4: Enable network registration unsolicited information Active-Time and Periodic-TAU 5: Enable network registration unsolicited information cause_type, reject_cause, Active-Time, and Periodic-TAU **<stat>**: network status 0: Not registered, the module is not currently searching for an operator to register

1: Registered to the home network

2: Not registered, but the module is currently trying to attach or searching for an operator to register

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 HSUPA

7: E-UTRAN

<cause_type>:

0: <reject_cause> contains EMM cause

1: <reject_cause> contains UE cause

<reject_cause>: reject cause. See 3GPP TS 24.301 Annex A.

<Active-Time>:

In GERAN/UTRAN network, set Active Time value (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 2 second ×1=2 seconds

<Periodic-TAU>: 8 bit unibyte

In GERAN/UTRAN network, set RAU circle (T3412)

Bit8-Bit6: unit

000 – 10 minutes

001 – 1 hours

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 1 hour ×2=2 hours	
Return Value	<CR><LF>OK<CR><LF> <CR><LF>+CEREG: <n>,<stat>[,[<tac>],[<ci>],[<AcT>],[cause_type],[reject_cause],[<Active-Time>],[<Periodic-TAU>]] <CR><LF>OK<CR><LF> <CR><LF>+CEREG: (list of supported <n>s) <CR><LF>OK<CR><LF>	
Example	AT+CEREG? +CEREG: 0,1 OK	If the value of <n> is set to 1, the current EPS network registration status is queried.
	AT+CEREG=1 OK	Enable network registration unsolicited codes.
	AT+CEREG=? +CEREG: (0-5) OK	Query the value range of the network registration status parameter.
Remarks	N/A	

2.3 Enabling & Disabling the Terminal Display: ATE1/ATE0

Description	To enable or disable the terminal display function of the AT commands
Format	• ATE1<CR> • ATE0<CR>
Parameter	N/A
Return Value	See the Example

Example	ATE1 OK AT OK	Turn on module AT command echo function Send AT, serial tools show "AT" and "OK".
	ATE0 OK OK	Turn off the module AT command echo function Send AT, serial tools only show "OK"
Remark	• Settings by this command are not saved after the module is powered off. • The terminal display function is enabled by default. • If the command is sent after dialing up to connect the network, terminal display is disabled automatically. • ATE is equal to ATE1.	

2.4 Setting the Code Result Suppression Mode: ATQ

Description	To set the mode whether to suppress the code result	
Format	ATQ[<value>]<CR>	
Parameter	**<value>**: 0, 1 0: Output the code result (default) 1: Suppress the code result	
Return Value	See the Example.	
Example	ATQ1 AT+CSQ +CSQ: 31, 99	Set to code result suppress mode. (The module does not return OK after this command is executed successfully.) After the mode is set, the return value for the AT+CSQ command does not contain the code result OK.
	ATQ0 OK AT OK	Set to the code result output mode. After the mode is set, the return value for the AT command contains the code result OK.
Remarks	• 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 ATQ1.

2.5 Setting the Response Format of the Device: ATV

Description	To set the response format of the device	
Format	ATV[<value>]<CR>	
Parameter	**<value>**: 0, 1 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).	
Return Value	See the Example.	
Example	ATV1 OK AT+CSQ +CSQ: 31, 99 OK	Set the response format to output with all headers, footers, and detailed response text.
	ATV00 AT+CSQ +CSQ: 31, 99 0	Set the response format to output with only some header, footer, and digit text. The module returns 0 after the format is set successfully.
Remarks	• ATV is equal to ATV1. • After **ATV0** is executed, the return value for a command in correct format is 0 (default setting is OK) which follows the command; 4 for command in incorrect format (default setting is ERROR). • Settings by this command are not be saved after the module is powered down.	

2.6 Saving Parameter Settings: AT&W

Description	To save parameter settings

Format	AT&W<CR>	
Parameter	N/A	
Return Value	See the Example	
Example	AT+CEREG? +CEREG: 0,0 OK	Query the current parameter value. The value is 0.
	AT+CEREG=1 OK AT&W OK	Set commands that support parameter saving. Save parameter settings and restart the module.
	AT+CEREG? +CEREG: 1,0 OK	Query the current parameter value. The value is 1.
	AT&W0 OK	Save parameter settings. This command has the same function as AT&W.
Remarks	• The following commands support parameter saving: ATE, +CMEE, ATV, ATQ, +CSCS, +COPS, CEREG, IPR, etc. • **AT&W0** is equal to **AT&W**. To restore to the default settings, execute **AT&F** or **ATZ**.	

2.7 Resetting the Module to Factory Settings: AT&F

Description	To reset the module to the factory settings	
Format	AT&F[<value>]<CR>	
Parameter	**<value>** 0: Reset the module to factory settings.	
Return Value	See the Example.	
Example	AT&F0 OK	Reset the module to factory settings.

	AT&F OK	Reset the module to factory settings.
Remarks	• If the module is set to the code result suppression mode (ATQ1), reset it to factory settings by executing this command. • This command is similar to the ATZ command in function.	

2.8 Activating Multiplexing Mode: +CMUX

Description	To activate multiplexing mode
Format	• AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]<CR> • AT+CMUX=?<CR>
Parameters	**<mode>**: The mode of MUX that is enabled, integer type 0: Basic option (default value) 1: Advanced option (not supported) **<subnet>**: Subset of frame format, integer type 0: UIH frames used only (default value) 1: UI frames used only (not supported currently) **<port_speed>**: UART port rate, integer type 1: 9600bit/s 2: 19200bit/s 3: 38400bit/s 4: 57600bit/s 5: 115200bit/s (default) 6: 230400bit/s (not supported) **<N1>**: Maximum frame size. Integer type, ranging from 1 to 1509. The default value is 31. For Advanced option, the default value is 64. **<T1>**: Acknowledgement timer in unite of ten milliseconds, integer type, ranging from 1 to 255, where 10 is default (equal to 100 ms). **<N2>**: Maximum number of re-transmissions, integer type, ranging from 0 to 5. The default value is 3. **<T2>**: response timer for the multiplexer control channel in units of ten milliseconds, integer type. Ranging from 2 to 255. The default value is 30 (300 ms). **<T3>**: Wake up response timer in seconds, integer type. Not supported

	<k>: window size, integer type. Ranging from 1 to 7. The default value is 2. Not supported	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+CMUX? +CMUX: 0,0,5,127,10,3,30,10,2 OK	Basic option. Other parameters are left out.
	AT+CMUX=? +CMUX: (0,1),(0),(1-6),(1-2048),(1-255),(0-100),(2-255),(1-255),(1-7) OK	Query the available range of parameters.
	AT+CMUX=7 ERROR	The parameter value exceeds available range
	AT+CMUX=0,0, 115200,512,254,5,255 OK	Activate multiplexing mode
Remarks	• The multiplexing protocol allows two or more virtual ports to be created on a physical port. Generally, two virtual ports are created: one is used for dialing network and one is used to send and receive AT command. • <T2> must be greater than <T1>.	

2.9 Setting Module Functionality: +CFUN

Description	To select the level of functionality of the module by setting **<fun>**
Format	• AT+CFUN=[<fun>[,<rst>]]<CR> • AT+CFUN?<CR> • AT+CFUN=?<CR>
Parameter	**<fun>**: power saving function mode 0: turn off radio and SIM power 1: Full functionality (default) 4: Turn off the TX and RX circuits (Flight mode) **<rst>**: Specifies whether to restart the module 0: do not reset the MT before setting it to <fun> power level 1: reset the MT before setting it to <fun> power level

Return Value	<CR><LF>+CFUN: (list of supported <fun>s),(list of supported <rst>s) <CR><LF>OK<CR><LF> or <CR><LF>+CME ERROR: <err><CR><LF> or <CR><LF>ERROR<CR><LF>	
Example	AT+CFUN=1 OK	Set full functionality.
	AT+CFUN? +CFUN: 1 OK	Query current function level. Full functionality
	AT+CFUN=? +CFUN: (0-1,4),(0-1) OK	Query available parameter value ranges.
Remarks	Settings by this command are not be saved after the module is powered down.	

2.10 Clock: +CCLK

Description	To set and query the real-time clock	
Format	• AT+CCLK=<time><CR> • AT+CCLK?<CR>	
Parameter	**<time>**: Character string in format of "YY/MM/DD,hh:mm:ss[+TZ]". TZ: Two digits, indicating the time lag between the local time and the GMT time.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CCLK: <time> <CR><LF> OK<CR><LF>	
Example	AT+CCLK="18/07/01,14:54:01+32" OK	Set the real-time clock of the module.
	AT+CCLK? +CCLK: "18/07/01,14:54:10+32" OK	Query the setting of the real-time clock.

	AT+CCLK=14/07/02,10:48:50 ERROR	Incorrect command syntax.
Remarks	• Settings by this command are not be saved after the module is powered down. • The default clock is GMT+0.	

2.11 Setting the Baud Rate of the Module: +IPR

Description	To set the baud rate of the module	
Format	• AT+IPR=<baud rate><CR> • AT+IPR?<CR> • AT+IPR=?<CR>	
Parameter	**<baud rate>**: The value can be 0, 2400, 4800, 9600, 14400, 19200, 28800, 33600, 38400, 57600	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+IPR: <baud rate> <CR><LF>OK<CR><LF>	
	<CR><LF>+IPR: (list of supported <baud rate>s) <CR><LF>OK<CR><LF>	
Example	AT+IPR=57600 OK	Set the baud rate to 57600 bps.
	AT+IPR? +IPR: 57600 OK	Query the current baud rate.
	AT+IPR=? +IPR: (0,2400,4800,9600,14400,19200,28800,33600, 38400,57600) OK	Query the available baud rate range.
	AT+IPR=100 ERROR	Set the baud rate to 100. The value is not allowed
Remarks	• The default baud rate is 0, indicating automatic baud rate detection. • Settings by this command are not saved after the module is powered down.	

2.12 Entering PIN Code: +CPIN

Description	To query the PIN status and enter PIN code	
Format	• AT+CPIN=<pin>[,<newpin>]<CR> • AT+CPIN?<CR>	
Parameter	**<pin>**, **<newpin>**: string type value	
Return Value	<CR><LF>+CPIN: <code> <CR><LF>OK<CR><LF> **<code>**: READY: No password SIM PIN: Enter PIN code. SIM PUK: Enter PUK code. SIM PIN2: Enter PIN2 code. SIM PUK2: Enter PUK2 code. Or <CR><LF>ERROR<CR><LF>	
Example	AT+CPIN? +CPIN: READY OK	Query whether PIN code is required.
	AT+CPIN="0000" ERROR	Incorrect pin code
	AT+CPIN="1234" OK	Input correct PIN code.
	AT+CPIN? ERROR	No SIM card is inserted.
Remarks	• To enter PIN code, lock current SIM card and then restart the module. • If PIN code is input incorrectly for three times, PUK is required to unlock.	

3 Network Service

3.1 Querying Signal Quality: +CSQ

<table>
<tr><td>Description</td><td>To check the receiving signal strength indication (RSSI)</td></tr>
<tr><td>Format</td><td>AT+CSQ<CR></td></tr>
<tr><td>Parameter</td><td>N/A</td></tr>
<tr><td>Return Value</td><td><CR><LF>+CSQ: < signal >, <ber>
<CR><LF>OK<CR><LF>
< signal>
The following table shows the relationship between the signal and the RSSI.
<table>
<tr><th></th><th>signal</th><th>RSSI</th></tr>
<tr><td>0</td><td><4 or 99</td><td><-107 dBm or unknown</td></tr>
<tr><td>1</td><td><10</td><td><-93dBm</td></tr>
<tr><td>2</td><td><16</td><td><-81 dBm</td></tr>
<tr><td>3</td><td><22</td><td><-69 dBm</td></tr>
<tr><td>4</td><td><28</td><td><-57 dBm</td></tr>
<tr><td>5</td><td>>=28</td><td>>=-57 dBm</td></tr>
</table>
<ber>
<table>
<tr><td>0...7</td><td>Refer to the value of RXQUAL in the table of GSM 05.08 8.2.4.</td></tr>
<tr><td>99</td><td>Not known or not detectable</td></tr>
</table></td></tr>
<tr><td>Example</td><td>AT+CSQ
+CSQ: 19,2
OK</td></tr>
<tr><td></td><td>AT+CSQ=?
+CSQ: (0-31,99),(0-7,99)
OK</td></tr>
<tr><td>Remarks</td><td>N/A</td></tr>
</table>

3.2 Selecting and Registering a GSM Network: +COPS

Description	To select and register a GSM network
Format	• AT+COPS=[<mode>[,<format>[,<oper>>[,<AcT>]]]]<CR> • AT+COPS?<CR> • AT+COPS=?<CR>
Parameter	**<mode>**: To set automatic network selection or manual 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>**: It is given in <format>. This field may be in 16-character long alphanumeric format, 8-characters short alphanumeric format, or 5-character numeric format (MCC/MNC). **<AcT>**: indicates the radio access technology and its value can be 0, 1, and 2. 0: GSM 1: GSM compact 2: UTRAN 3: GSM w/EGPRS 4: UTRAN w/HSDPA 5: UTRAN w/HSUPA 6: UTRAN w/HSDPA and HSUPA 7: E-UTRAN 9: CDMA
Return Value	<CR><LF>OK<CR><LF> or <CR><LF>+COPS: <mode>,<format>,<oper>,<AcT> <CR><LF>OK<CR><LF>
Example	AT+COPS=0,0 OK Automatic network selection is enabled. Long alphanumeric mode.

	AT+COPS=0,2 OK	Set to digital mode
	AT+COPS? +COPS: 0,0,"CHINA MOBILE" OK	China Mobile
	AT+COPS? +COPS: 0,2,"46000" OK	If it is set to digital mode, get the number 46000
	AT+COPS? +COPS: 0,0,"CHINA UNICOM" OK	China Unicom
	AT+COPS? +COPS: 0,2,"46011" OK	If it is set to digital mode, then get the number 46001.
	AT+COPS=? +COPS: (2,"China Unicom","CU-GSM","46001",0), (3,"China Mobile","CMCC","46000",0),, (0-3),(0-2) OK	Query the value ranges of parameters.
	AT+COPS=2 OK	Deregister the network.
Remark	• **<AcT>** is displayed only during the query of the current network selection parameters if the device supports UMTS. • **<AcT>** indicates the access technology of the manual attach procedure if GSM/UMTS is set dual mode and select network manually. • Ignore the parameter <AcT> if automatic network selection is enabled.	

3.3 Querying Network State: +NETSTATE

Description	To query the current network registration state

Format	AT+NETSTATE?<CR>
Parameter	<CR><LF>+NETSTATE: <net_type>,<net_band> <CR><LF>OK<CR><LF>
Return Value	**net_type**: registered network mode 0: CAT NB1 1: CAT M1 **<net_band>**: registered network band 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
Example	AT+NETSTATE? +NETSTATE: 1,0x80 OK The current registered network is NB-IoT and band is band8.
Remarks	N/A

3.4 Querying Network Status: + TUESTATS

Description	To query network status
Format	AT+TUESTATS=<type><CR>
Parameter	<type>: RADIO: radio specific information

	CELL: per-cell information for the top 5 cells BLER: block error rate information THP: throughput ALL: all information. The value of <type> output is the correct one for each data type.
Return Value	<type> = RADIO <signal power in centibels> <total power in centibels> <current TX power level in centibels > <total TX time since last reboot in millisecond> <total RX time since last reboot in millisecond> <last SIB1 cell ID> <last ECL value> < last snr value> < last earfcn value> < last pci value> <rsrq in centibels> <type> = CELL <earfcn> absolute radio-frequency channel number <physical cell id> physical id of the cell <primary cell> 1 indicates the current serving cell <rsrp> reference signal received power <rsrq> reference signal received quality <rssi> received signal strength indicator <snr> signal to noise ratio <type> = BLER <rlc_ul_bler> RLC layer block error rate (uplink). Integer % <rlc_dl_bler> RLC layer block error rate (downlink). Integer % <mac_ul_bler> physical layer block error rate (uplink). Integer % <mac_dl_bler> physical layer block error rate (downlink). Integer % <total bytes transmitted> <total bytes received> <transport blocks sent> <transport blocks received> <transport blocks retransmitted>

	<total ack/nack messages received> <type> = THP <rlc_ul> RLC layer throughput (uplink). Integer bps <rlc_dl> RLC layer throughput (downlink). Integer bps <mac_ul> physical layer throughput (uplink). Integer bps <mac_dl> physical layer throughput (downlink). Integer bps
Example	AT+TUESTATS="RADIO" TUESTATS:RADIO,Signal power,13 TUESTATS:RADIO,Total power,45 TUESTATS:RADIO,Tx power,-1 TUESTATS:RADIO,TX time,288 TUESTATS:RADIO,RX time,44 TUESTATS:RADIO,Cell ID,197756455 TUESTATS:RADIO,ECL,0 TUESTATS:RADIO,SNR,9 TUESTATS:RADIO,EARFCN,1640 TUESTATS:RADIO,PCI,245 TUESTATS:RADIO,RSRQ,255 OK AT+TUESTATS="CELL" TUESTATS:CELL,1640,245,1,43,255,-76,6 TUESTATS:CELL,1640,68,0,34,34,255,127 TUESTATS:CELL,1640,67,0,31,32,255,127 OK AT+TUESTATS="BLER" TUESTATS:BLER,RLC UL BLER,0 TUESTATS:BLER,RLC DL BLER,0 TUESTATS:BLER,MAC UL BLER,0 TUESTATS:BLER,MAC DL BLER,0 TUESTATS:BLER,Total TX bytes,77 TUESTATS:BLER,Total RX bytes,77 TUESTATS:BLER,Total TX blocks,1 TUESTATS:BLER,Total RX blocks,1

	TUESTATS:BLER,Total RTX blocks,0 TUESTATS:BLER,Total ACK/NACK RX,0 OK AT+TUESTATS="THP" TUESTATS:THP,RLC UL,600 TUESTATS:THP,RLC DL,844 TUESTATS:THP,MAC UL,2156 TUESTATS:THP,MAC DL,2464 OK
Remarks	Queried throughput is valid only when transmitting and receiving data.

3.5 Querying CE Status: +CESTATUS

Description	To query CE status
Format	AT+CESTATUS<CR>
Parameter	N/A
Return Value	<CR><LF>+CESTATUS: <status> <CR><LF>OK<CR><LF> <status>: 0: No CE 1: CE level 0 2: CE level 1 3: CE level 2 4: CE level 3
Example	AT+CESTATUS +CESTATUS: 1 OK
	AT+CSQ=? +CSQ: (0-31,99),(0-7,99) Query the value range of CSQ. OK
Remarks	N/A

3.6 Setting SC Mode: +SETSCMODE

Description	To set scrambling code mode of the module it must be the same as that on the base station so that the module can register with network.
Format	• AT+SETSCMODE=<mode><CR> • AT+SETSCMODE?<CR>
Parameter	<mode>: 0: Old SC 1: New SC
Return Value	<CR><LF>OK<CR><LF> Or <CR><LF>+SETSCMODE: <mode> <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Example	AT+SETSCMODE=1 OK Use new SC. AT+SETSCMODE? +SETSCMODE: 1 Query SC mode. OK
Remarks	• Use new SC by default. • Settings by this command are saved after the module is powered down.

4 EGPRS Commands

4.1 Setting PDP Format: CGDCONT

Description	To set the packet data protocol (PDP) format of the GPRS
Format	• AT+CGDCONT=[<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp> [,<pd1> [,…[,pdN]]]]]]]]<CR> • AT+CGDCONT?<CR> • AT+CGDCONT=?<CR>
Parameter	<cid>: (PDP Context Identifier) a numeric parameter that specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command. <PDP_type>: (Packet Data Protocol type) a string parameter. IP Internet Protocol (IETF STD 5) <APN>: (Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value is requested. <PDP_address>: a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value maybe provided by the TE during the PDP startup procedure or, failing that, a dynamic address is requested. The read form of the command continues to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command. <d_comp>: a numeric parameter that controls PDP data compression (applicable for SNDCP only) 0: off (default if value is omitted) <h_comp>: a numeric parameter that controls PDP header compression 0: off (default if value is omitted) <pd1>, … <pdN>: zero to N string parameters whose meanings are specific to the <PDP_type>
Return Value	See the Example.
Example	AT+CGDCONT=1,"IP","CMIOT" Set APN. OK

	AT+CGDCONT=1,IP, CMIOT ERROR	A pair of quotation marks are required for each parameter
	AT+CGDCONT? +CGDCONT: 1,"IP","CMIOT","0.0.0.0",0,0 OK	Query the current parameter value.
	AT+CGDCONT=? +CGDCONT: (1),"IP",,,(0),(0) OK	Query the value range of parameters.
Remarks	Only one APN can be set.	

4.2 Setting Up a PPP Link: +XIIC

Description	To set up a PPP link	
Format	• AT+XIIC=<n><CR> • AT+XIIC?<CR>	
Parameter	n: 0: Deactivate the PPP link 1: Activate the PPP link.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+XIIC: 1, <ip> <CR><LF>OK<CR><LF> <ip>: IP address	
Example	AT+XIIC=1 OK	The module is required to set up a PPP link.
	AT+XIIC? +XIIC: 1, 10.107.216.162 OK	The PPP link is set up successfully and the IP address is 10.107.216.162. There are four spaces before 1.
	AT+XIIC? +XIIC: 0, 0.0.0.0 OK	The PPP link is not set up successfully. There are four spaces before 0.
Remarks	• Use AT+CGDCONT to set APN before setting up a PPP link. • Ensure that the module registers the network before using the **AT+XIIC=1**	

	command to set up PPP link. Use **AT+GREG?** to check whether the module registers the network or not. If **+CREG: 0,1** or **+CREG: 0,5** is returned, the module did not register to the network.

4.3 Setting GPRS Attach and Detach: +CGATT

Description	To set GPRS attach and detach	
Format	• AT+CGATT=<state><CR> • AT+CGATT?<CR> • AT+CGATT=?<CR>	
Parameter	<state>: 0, 1 0: indicates detach 1: indicates attach	
Return Value	See the Example.	
Example	AT+CGATT=1 OK	GPRS attach is set successfully.
	AT+CGATT=0 OK	GPRS detach is set successfully.
	AT+CGATT=0 GPRS DISCONNECTION OK	Send this command after setting a PPP connection.
	AT+CGATT=0 ERROR	**ERROR** is returned because no SIM card is installed.
	AT+CGATT? +CGATT: 0 OK	Query the GPRS status.
	AT+CGATT=? +CGATT:(0,1) OK	Query the valid parameter values for the command.
Remarks	• By default, the module can automatically perform PS attach.	

	• Ensure that the GPRS attach is set before the PPP connection 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 connection directly; otherwise, set GPRS attach manually by executing the command **AT+CGATT=1**.

4.1 Reporting IP Address: +IPADDR

Description	To report IP address allocated by network after PPP is activated
Format	+IPADDR: <ip><CR>
Parameter	N/A
Return Value	<ip>: IP address
Example	+IPADDR: 10.100.45.2
Remarks	This function is disabled by default. **AT+NEONBIOTCFG** is used to enable or disable it.

4.2 Reporting RRC Status: +CSCON

Description	To report current RRC status
Format	+CSCON: <status><CR>
Parameter	N/A
Return Value	<status>: 0: IDLE 1: CONNECTED
Example	+CSCON: 1
Remarks	This function is disabled by default. **AT+NEONBIOTCFG** is used to enable or disable it.

4.3 Reporting PSM Status: +PSMEVENT

Description	To report current PSM status
Format	+PSMEVENT: <status><CR>
Parameter	N/A
Return Value	<status>: PSM status ENTER PSM PSM WAKEUP
Example	+PSMEVENT: ENTER PSM
Remarks	This function is disabled by default. **AT+NEONBIOTCFG** is used to enable or disable it.

4.4 Releasing RRC Connection: +RRCRLSREQ

Description	To release RRC connection Module state changes from CONNECTED to IDLE.
Format	AT+RRCRLSREQ<CR>
Parameter	N/A
Return Value	See the Example
Example	AT+RRCRLSREQ OK
Remarks	N/A

5 TCP Client Commands

5.1 Setting Receive Mode: +RECVMODE

Description	To set the receive mode of TCP and UDP data
Format	• AT+RECVMODE=<n><CR> • AT+RECVMODE?<CR> • AT+RECVMODE=?<CR>
Parameter	**<n>**: receive mode 0: buffer the TCP or UDP data received and MCU sends command to read the data 1: print the TCP or UDP data received to UART directly (default) <mode>: whether to report in hexadecimal format 0: report in ASCII format (default) 1: report in hexadecimal format
Return Value	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> Or <CR><LF>+RECVMODE: (0-1) <CR><LF>OK<CR><LF> Or <CR><LF>+RECVMODE: <n>[,<mode>] <CR><LF>OK<CR><LF>
Example	AT+RECVMODE=0 Set data receiving mode. OK
Remarks	• Do not send this command during communication because it clears the buffer. • This command also works for UDP data.

5.2 Setting Up TCP Link: +TCPSETUP

Description	To set up a TCP link	
Format	AT+TCPSETUP=<n>,<ip>,<port><CR>	
Parameter	<n>: Socket number, ranging from 0 to 4 <ip>: Destination IP address, in xx.xx.xx.xx or domain name format <port>: Destination port ID in decimal ASCII code	
Return Value	See the Example.	
Example	AT+TCPSETUP=0,220.199.66.56,6800 OK +TCPSETUP: 0,OK	The link to 220.199.66.56,6800 is successfully set up on socket 0.
	AT+TCPSETUP=0,neowayjsr.oicp.net,60010 OK +TCPSETUP: 0,OK	The connection to neowayjsr.oicp.net, 60010 is set up on socket 0 successfully.
	+TCPCLOSE: 0,Link Closed	The link is closed.
	AT+TCPSETUP=1,192.168.20.6,7000 OK +TCPSETUP: 1,FAIL	Fails to set up the connection to 192.168.20.6,7000 on socket 1. The server is probably not started, the IP address is incorrect, or the SIM card is out of credit.
	AT+TCPSETUP=0,neowayjsr.oicp.net,60010 +TCPSETUP: 0, ERROR1	A TCP/UDP link has been set up on socket 0.
	AT+TCPSETUP=5,192.168.20.6,7000 +TCPSETUP: ERROR	Parameters are set incorrectly.
	AT+TCPSETUP=0.58.60.184.213.10012 +TCPSETUP: ERROR	Parameters are set incorrectly.
	AT+TCPSET=0,58.60.184.213,10012 ERROR	The AT command is not complete.
Remarks	Use the **AT+XIIC=1** command to set up a PPP link before running this command.	

5.3 Sending TCP Data: +TCPSEND

Description	To send TCP data The module returns > after this command is sent. Send TCP data 50 ms to 100 ms later.	
Format	AT+TCPSEND=<n>,<length><CR>	
Parameter	<n>: Socket number, ranging from 0 to 4. A TCP link is established on the socket. <length>: The length of the data to be sent, ranging from 1 to 4096, unit: byte.	
Return Value	See the Example.	
Example	AT+TCPSEND=0,1 > OK +TCPSEND:0,1	1-byte data is successfully sent through socket 0.
	AT+TCPSEND=0,1024 > +TCPSEND:ERROR	Network congestion occurs when 1024-byte data is sent. Only some data is sent successfully.
	AT+TCPSEND=0,10 > +TCPSEND: 0,OPERATION EXPIRED	After the data sending command is input and > is returned, no more data is entered in 30 seconds. Then the expiration information is displayed.
	AT+TCPSEND=0,1 +TCPSEND:SOCKET ID OPEN FAILED	One-byte data fails to be sent on socket 0 because the link is not established.
	AT+TCPSEND=0,4097 +TCPSEND:DATA LENGTH ERROR	4097-byte data fails to be sent on socket 0 because data length exceeds the limit.
	AT+TCPSEND=0 > OK +TCPSEND: 0,21	21-byte data is successfully sent through socket 0. The command ends with \r if no data length is contained. The data length should not exceed 4096 bytes.
Remarks	• Ensure that the TCP link is set up before sending TCP data. • The **AT+IPSTATUS** command is recommended to check the buffer size before sending data.	

	• The command supports only char type data if the **AT+DATAFORMAT** command is not used to set the sending format.

5.4 Reading TCP Data: +TCPREAD

Description	To read TCP data	
Format	+TCPREAD: <n>,<length><CR>	
Parameter	**<n>**: socket number, ranging from 0 to 4 **<length>**: maximum length of data allowed to read, ranging from 1 to 2048	
Return Value	See the Example	
Example	+TCPRECV: 0 AT+TCPREAD=0,100 +TCPREAD: 0,10,1234567890 OK	Socket 0 receives data. Read data. The data read is 1234567890.
Remark	N/A	

5.5 Receiving TCP Data: +TCPRECV

Description	To receive TCP data	
Format	+TCPRECV: <n>,<length>,<data><CR>	
Parameter	<n>:Socket number, ranging from 0 to 4 <length>: The length of the data received <data>: The data received Add 0x0d 0x0a to the end of the data. Identify the end based on <length>.	
Return Value	See the Example.	
Example	+TCPRECV: 0,10,1234567890	10-byte data is successfully received on socket 0. The data is 1234567890.
	+TCPRECV: 0,10,31323334353637383930	Socket 0 received 10-byte data.
Remarks	N/A	

5.6 Closing TCP Link: +TCPCLOSE

Description	To close a TCP link	
Format	AT+TCPCLOSE=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 4	
Return Value	See the Example.	
Example	AT+TCPCLOSE=1 +TCPCLOSE: 1,OK	Close the TCP link. The TCP link on socket 1 is closed successfully.
	AT+TCPCLOSE=2 +TCPCLOSE: ERROR	Socket number error
	+TCPCLOSE: 0,Link Closed	The TCP link is closed. The server sends TCP link closing command or the network encounters abnormality or weak signals.
Remarks	N/A	

6 UDP Client Commands

6.1 Setting Up UDP Link: +UDPSETUP

Description	To set up a UDP link	
Format	AT+UDPSETUP=<n>,<ip>,<port><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 4 <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	
Return Value	See the Example.	
Example	AT+UDPSETUP=1,220.199.66.56,7000 OK +UDPSETUP: 1,OK	The link to 220.199.66.560.7000 is successfully set up on socket 1.
	AT+UDPSETUP=0,neowayjsr.oicp.net,60010 OK +UDPSETUP: 0,OK	The connection to neowayjsr.oicp.net,60010 is set up on socket 0 successfully.
	AT+UDPSETUP=0,58.60.184.213,11008 +UDPSETUP: 0,FAIL	A TCP/UDP link has been set up on socket 0.
	AT+UDPSETUP=1,192.168.20.6,7000 OK +UDPSETUP: 0,FAIL	Fails to set up the connection to 192.168.20.6,7000 on socket 1 because socket 0 is unavailable.
	AT+UDPSETUP=5,192.168.20.6,6800 +UDPSETUP:ERROR	Parameters are set incorrectly.
	AT+UDPSETUP=0.58.60.184.213.10012 +UDPSETUP: ERROR	Parameters are set incorrectly.
	AT+UDPSET=0,58.60.184.213,10012	The AT command is not complete.

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

6.2 Sending UDP Data: +UDPSEND

Description	To send UDP data The module returns > after this command is sent. Send UDP data 50 ms to 100 ms later.	
Format	AT+UDPSEND=<n>,<length><CR>	
Parameter	<n>: Socket number, ranging from 0 to 4. A UDP link is established on the socket. <length>: The length of the data to be sent, ranging from 1 to 4096, unit: byte.	
Return Value	• If the AT command is input in correct format, the module returns >. • If the command is input in incorrect format, the module returns **ERROR**. • If the link has not been set up, the module returns **+UDPSEND: ERROR**. • After entering the command, input the data to be sent until the module returns >. • If the UDP data is sent successfully, the module returns **+UDPSEND: <n>,<length>**. **<length>** indicates the length of data already sent.	
Example	AT+UDPSEND=0,2 > OK +UDPSEND: 0,2	Send 2-byte data on socket 0. Then send the characters to be sent 50 ms to 100 ms after the module returns >. The data is sent successfully.
	AT+UDPSEND=0,1024 > +UDPSEND: ERROR	Network congestion occurs when 1024-byte data is sent. Only some data is sent successfully.
	AT+UDPSEND=0,2,ab OK +UDPSEND:0,2	Send 2-byte data through socket 0. Data is sent successfully.
	AT+UDPSEND=0,1025 +UDPSEND: DATA LENGTH ERROR	1025-byte data fails to be sent on socket 0 because data length exceeds the limit.
	AT+UDPSEND=0,10	After the data sending command is

	>\n+UDPSEND: 0,OPERATION EXPIRED	input and > is returned, no more data is entered in 1 minute. Then the expiration information is displayed.
Remarks	• Ensure that the UDP link is set up before sending UDP data. • The **AT+IPSTATUS** command is recommended to check the buffer size before sending data.	

6.3 Receiving UDP Data: +UDPRECV

Description	To receive UDP data	
Format	+UDPRECV: <n>,<length>,<data><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 4 <length>: length of the data received <data>: data received Add 0x0d 0x0a to the end of the data. Identify the end based on <length>.	
Return Value	See the Example.	
Example	+UDPRECV: 0,10,1234567890	10-byte data is successfully received on socket 0. The data is 1234567890.
	+UDPRECV: 0,10,31323334353637383930	10-byte of data is received on socket 0.
Remarks	N/A	

6.4 Reading UDP Data: +UDPREAD

Description	To read UDP data	
Format	+UDPREAD: <n>,<length><CR>	
Parameter	<n>: socket number, ranging from 0 to 4 <length>: maximum length of data allowed to read	
Return Value	See the Example	
Example	+UDPRECV: 0	Socket 0 receives data.

	AT+UDPREAD=0,100 +UDPREAD: 0,10,1234567890 OK	Read data. The data read is 1234567890.
Remark	N/A	

6.5 Closing UDP Link: +UDPCLOSE

Description	To close the UDP link	
Format	AT+UDPCLOSE=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 4	
Return Value	If the value of <n> is illegal, the module returns: **+UDPCLOSE: ERROR**. Otherwise, the module returns **+UDPCLOSE: <n>,OK**.	
Example	AT+UDPCLOSE=1 +UDPCLOSE: 1,OK	The TCP link on socket 1 is closed successfully.
	AT+UDPCLOSE=5 +UDPCLOSE: ERROR	Socket number error
Remarks	N/A	

6.6 Querying TCP/UDP Link Status: +IPSTATUS

Description	To query the TCP/UDP link status
Format	AT+IPSTATUS=<n><CR>
Parameter	**<n>**: Socket ID, ranging from 0 to 5
Return Value	<CR><LF>+IPSTATUS:<n>,<STATUS>[,<TYPE>,<send-buffer-size>] <CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF> <STATUS>: Socket status, value: CONNECT or DISCONNECT <TYPE>: Link type, value: TCP or UDP <send-buffer-size>: The size of the available send buffer on the module, in decimal

	ASCII mode, unit: byte	
Example	AT+IPSTATUS=0 +IPSTATUS: 0,CONNECT,TCP,4096 OK	Query TCP link status
	AT+IPSTATUS=1 +IPSTATUS: 1,CONNECT,UDP,4096 OK	Query UDP link status.
	AT+IPSTATUS=0 +IPSTATUS: 0,DISCONNECT OK	No TCP or UDP link is set up on socket 1.
Remarks	N/A	

7 Transparent TCP/UDP Commands

7.1 Setting Up Transparent TCP Link: +TCPTRANS

Description	To set up transparent TCP link	
Format	AT+TCPTRANS=<ip>,<port><CR>	
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	
Return Value	See the Example.	
Example	AT+TCPTRANS=220.199.66.56,6800 OK + TCPTRANS:OK	A transparent TCP link is set up successfully.
	AT+TCPTRANS=neowayjsr.oicp.net,60010 OK +TCPTRANS:OK	A transparent TCP link is set up by using domain name successfully.
	AT+TCPTRANS=220.199.66.56, +TCPTRANS:ERROR	The command is in wrong format.
	AT+TCPTRANS=220.199.66.56,6800 OK +TCPTRANS:FAIL	Failed to set up a transparent TCP link.
	AT+TCPTRANS=220.199.66.56,6800 ERROR	**ERROR** is returned after the command is executed because a transparent (TCP, UDP, TCP server) link has been set up.
Remarks	• The UART does not display the data transmitted to the server after the transparent TCP link is set up successfully. • Use +++ to switch the module to the command mode and ATO to switch it to the data mode.	

	• The module disconnects the transparent link if a call or message is incoming. • At most 4096-byte data can be sent or received in transparent mode. • TCP data can be transparently transmitted after the transparent TCP link is set up successfully and **+TCPTRANS:OK** is returned.

7.2 Setting Up Transparent UDP Link: +UDPTRANS

Description	To set up a transparent UDP link	
Format	AT+UDPTRANS=<ip>,<port><CR>	
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	
Return Value	See the Example.	
Example	AT+UDPTRANS =220.199.66.56,6800 OK +UDPTRANS:OK	A transparent UDP link is set up successfully.
	AT+UDPTRANS=neowayjsr.oicp.net,60010 OK +UDPTRANS:OK	A transparent UDP link is set up by using domain name successfully.
	AT+UDPTRANS=220.199.66.56, +UDPTRANS:ERROR	The command format is incorrect.
	AT+UDPTRANS=220.199.66.56,6800 OK +UDPTRANS:FAIL	Failed to set up a transparent UDP link.
	AT+UDPTRANS=220.199.66.56,6800 ERROR	**ERROR** is returned after the command is executed because a transparent (TCP, UDP, TCP server) link has been set up.
Remarks	• The UART does not display the data transmitted to the server after the transparent UDP link is set up successfully.	

	• Use +++ to switch the module to the command mode and ATO to switch it to the data mode. • The module disconnects the transparent link if a call or message is incoming. • At most 4096-byte data can be sent or received in transparent mode. • UDP data can be transparently transmitted after the transparent UDP link is set up successfully and **+UDPTRANS:OK** is returned.

7.3 Closing Transparent Link: +TRANSCLOSE

Description	To close the transparent link	
Format	AT+TRANSCLOSE<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+TRANSCLOSE +TRANSCLOSE: 0,OK	A transparent TCP link is closed successfully.
	AT+TRANSCLOSE ERROR	No transparent TCP/UDP link is set up.
	AT+TRANSCLOSE +TRANSCLOSE: 1,OK	A transparent UDP link is closed successfully.
	+TCPTRANS: Link Closed	The transparent TCP link is closed by the server or because of network abnormality.
	+UDPTRANS: Link Closed	The transparent UDP link is closed by the server or because of network abnormality.
Remarks	N/A	

8 TCP Server Commands

8.1 Setting TCP Listening for the Server: +TCPLISTEN

Description	To set the TCP listening function of the server	
Format	• AT+TCPLISTEN=<port><CR> • AT+TCPLISTEN?<CR>	
Parameter	<Port>: Port ID <Socket>: Socket ID	
Return Value	See the Example.	
Example	AT+TCPLISTEN=6800 +TCPLISTEN: 0,OK	Listening port ID: 6800 The listening function of the server is started.
	AT+TCPLISTEN=6800 +TCPLISTEN: bind error	Fails to bind
	AT+TCPLISTEN=6800 Listening...	Transparent listening has been set.
	AT+TCPLISTEN? +TCPLISTEN: listening status	Query the listening status. Here the server is in the listening status.
	AT+TCPLISTEN? +TCPLISTEN: not listening	Query the listening status. Here the server is not in the listening status.
	Connect AcceptSocket=1,ClientAddr=119.123.77.133,ClientPort=8000	Receive the connection request from the client. **AcceptSocket** indicates the socket ID on the module, and **119.123.77.133** is the IP address of the client.
Remarks	• Activate the PPP before using this command. • Only the SIM cards with fixed IP addresses can be used as servers. • This function might not work because carriers' networks do not support.	

8.2 Closing the Listening Connection: +CLOSELISTEN

Description	To close the listening connection and close all connections	
Format	AT+CLOSELISTEN<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	+CLOSELISTEN: 0,local link closed	The host closes the link or network abnormalities occur.
	AT+CLOSELISTEN +CLOSELISTEN: 0,local link closed	The local link is closed if there is any connection to the client.
Remarks	This function might not work because carriers' networks do not support.	

8.3 Closing Connections with the Client: +CLOSECLIENT

Description	To close all connections with the client	
Format	AT+CLOSECLIENT[=<socket>]<CR>	
Parameter	<Socket>: Socket ID	
Return Value	<CR><LF>+CLOSECLIENT: <socket>,remote link closed<CR><LF>	
Example	AT+CLOSECLIENT +CLOSECLIENT: 1,remote link closed +CLOSECLIENT: 2,remote link closed	There is no parameter in this command. All connections with the client are closed successfully.
	AT+CLOSECLIENT=1 +CLOSECLIENT: 1,remote link closed	There is a parameter in this command. Close the connection on socket 1 with the client.
	AT+CLOSECLIENT=1 ERROR	No client on socket 1.
	AT+CLOSECLIENT +CLOSECLIENT: All remote link closed	All clients are closed.
Remarks	This function might not work because carriers' networks do not support.	

8.4 Receiving Data from the Client: +TCPRECV(S)

Description	To receive data from the client	
Format	+TCPRECV(S): <n>,<length>,<data><CR>	
Parameter	< n>: Socket ID, ranging from 0 to 4 <length>: The length of the data received <data>: The data received Add **0x0d 0x0a** to the end of the data. We can identify the end based on <**length**>.	
Return Value	See the Example.	
Example	+TCPRECV(S): 1,10,1234567899	Socket 1 receives 10-byte data in char format from the client.
	+TCPRECV(S): 0,10,30313233343536373839	Socket 0 receives 10-byte data in hexadecimal ASCII format.
Remarks	• Additional **(s)** makes this command different from the receive mode of the client mode in format. • This function might not work because carriers' networks do not support.	

8.5 Sending Data to the Client: +TCPSENDS

Description	To send data to the client	
Format	AT+TCPSENDS=<socket>[,<length>]<CR>	
Parameter	<socket>: The value of **AcceptSocket**, that is, the socket of the module. See the description of the **AT+TCPLISTEN** command. <length>: The length of the data to be sent, value ranges from **1** to **4096**, unit: byte.	
Return Value	See the Example.	
Example	AT+TCPSENDS=0,10 > OK +TCPSENDS: 0,10	10-byte data is successfully sent through socket 0.
	AT+TCPSENDS=0,536 >	536-byte data is sent on socket 0. Fails to transmit the data because internal

	+TCPSENDS: Buffer not enough,439	buffer is insufficient.
	AT+TCPSENDS=0 > OK +TCPSENDS: 0,21	Send 21-byte data on socket 0. (e.g.: 012345678901234567890).
	AT+TCPSENDS=0,1024 > +TCPSENDS: ERROR	Send TCP data. Congestion.
	AT+TCPSENDS=0,10 +TCPSENDS: 0 is not link AT+TCPSENDS=0 +TCPSENDS: 0 is not link	No connection is set up on socket 0.
	AT+TCPSENDS=0,5 > +TCPSENDS: 0,OPERATION EXPIRED	No data is input within 30 seconds after > is displayed
Remarks	Ensure that the TCP connection has been set up before sending TCP data.	

9 FTP AT Commands

9.1 Logging in to the FTP Server: +FTPLOGIN

Description	To log in to the FTP server	
Format	AT+FTPLOGIN=<ip>,<port>,<user>,<pwd><CR>	
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 bytes in ASCII code 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 (,).	
Return Value	• **+FTPLOGIN: Error**: The format of the AT command is incorrect • **+FTPLOGIN: Have Logged In**: The user has logged in to the FTP server. • **+FTPLOGIN: AT Busy**: Last FTP AT command has not been executed completely. • **+FTPLOGIN: User logged in**: The user logged in to the FTP server successfully. • **+FTPLOGIN: 530 Not logged in:** The user failed to log in to the FTP server because the user account or password is incorrect. • **+FTPLOGIN: 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 +FTPLOGIN: User logged in	user1 logs in to the server 219.134.179.52 through port 21 successfully. And the password for user1 is pwd2009.
	AT+FTPLOGIN=58.60.184.213,21,neoway,neoway OK +Connection timed out - Auto closed link to server!	Fails to log in to the FTP server using neoway because the connection times out.

	+FTPLOGIN: Error	
	AT+FTPLOGIN=58.60.184.210,21,neowayftp,neowayftp OK +CME ERROR: OTHER ERROR +FTPLOGIN: Error	IP was set incorrectly.
	AT+FTPLOGIN=58.60.184.213,21,neowayftp,neowayftp OK +FTP: Server Control Link Disconnect +FTPLOGIN: Error	Fail to log in to the FTP server.
Remarks	• 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.	

9.2 Logging Out from the FTP Server: +FTPLOGOUT

Description	To log out from the FTP server	
Format	AT+FTPLOGOUT<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+FTPLOGOUT +FTPLOGOUT: User logged out OK	Log out from the FTP server
	AT+FTPLOGOUT +CME ERROR: INVALID SOCKET ID ERROR	Log out of the FTP server because the FTP server is offline.
Remarks	N/A	

9.3 Obtaining File Size on FTP Server: +FTPSIZE

Description	To obtain the size of a file on the FTP server
Format	AT+FTPSIZE=<filename><CR>
Parameter	<filename>: file name
Return Value	• **+FTPSIZE: Error**: The format of the AT command is incorrect • **+FTPSIZE: Error Not Login**: The user has not logged in to the FTP server. • **+FTPSIZE: AT Busy**: Last FTP AT command has not been executed completely. • **+FTPSIZE: GPRS DISCONNECTION**: The user logged in to the FTP server before a PPP link is set up. • **+FTPSIZE: <size>**: File length has been obtained successfully.
Example	AT+FTPSIZE=test.txt + FTPSSIZE: 1024 Obtain the size of test.txt in the FTP root directory.
Remark	N/A

9.4 Downloading Data from the FTP Server: +FTPGET

Description	To download data from the FTP server
Format	AT+FTPGET=<dir&filename>,<type>,<Content or Info>[,offset[,length]] <CR>
Parameter	<dir&filename>: Path and name of the file to be read (Note: The file directory 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 3: Obtain the file length <offset>: Specifies offset of file content. <length>: Length of file downloaded from the start point, ranging from 1 to 8192
Return Value	• **+FTPGET: ERROR<n>**: The format of the AT command is incorrect

	• **+FTPGET: Error Not Login**: The user has not logged in to the FTP server. • **+FTPGET: Error!TimeOut**: Some failure is caused by download timeout (timeout period is 30 seconds) and the module does not receive data from the FTP server within 30 seconds. • **+FTPGET: <length>,<data>**: **<length>** indicates the data length; **<data>** indicates the data content. • **+FTPGET: OK.total length is <n>**: The module reads data successfully and the data length is **n**. • **+FTPGET: OK.file length is <m>**: The file length is obtained successfully. <m> indicates the file length obtained.
Example	AT+FTPGET=,1,2 +FTPGET: 446,drw-rw-rw- 1 user group 0 Apr 14 15:55 . drw-rw-rw- 1 user group 0 Apr 14 15:55 .. -rw-rw-rw- 1 user group 1238528 Jan 14 10:36 1M.doc -rw-rw-rw- 1 user group 10 Jan 15 15:01 test.txt +FTPGET: OK.total length is 446 Obtain information in the root directory.
	AT+FTPGET=test.txt,1,2 +FTPGET: 65,-rw-rw-rw- 1 user group 10 Jan 15 15:01 test.txt +FTPGET: OK.total length is 65 Obtain the information about test.txt.
	AT+FTPPUT=test.txt,1,2,10 > +FTPPUT: OK,10 Upload 10-byte data.
	AT+FTPGET=test.txt,1,1 +FTPGET: 10,0123456789 +FTPGET: OK.total length is 10 Obtain the information in test.txt.
	AT+FTPGET=test.txt,1,1,2 +FTPGET: 8,23456789 +FTPGET: OK.total length is 8 Read all data after the first byte.

	AT+FTPGET=test.txt,1,1,2,4 +FTPGET: 4,2345 +FTPGET: OK.total length is 4	Read 4-byte data after the first byte.
	AT+FTPGET=test.txt,1,3 +FTPGET: OK.file length is 10	Obtain the length of the test.txt file.
Remarks	N/A	

9.5 Uploading Data to the FTP Server: +FTPPUT

Description	To upload data to the FTP server
Format	AT+FTPPUT=<filename>,<type>,<mode>,<size><CR>
Parameter	<filename>: The name of the file to be uploaded <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.
Return Value	• **+FTPPUT: ERROR**: The format of the AT command is incorrect. • **+FTPPUT: Error Not Login**: The user has not logged in to the FTP server. • **+FTPPUT: AT Busy**: Last FTP AT command has not been executed completely. • **+FTPPUT: SIZE Error**: The value of **<length>** is greater than 8192. • **+FTPPUT: OK,<n>**: The file is sent successfully and the file length is **n**. • **+FTPPUT: Delete File OK**: The file is deleted successfully. • **+FTPPUT: Error TimeOut**: No data input for long time.
Example	AT+FTPPUT=test.txt,1,1,10 >1234567890 +FTPPUT: OK,10 Upload the text.txt file, which is 10 bytes. The file is transferred in ASCII and the operated in STORE.

	AT+FTPPUT=test.txt,1,2,10 >1234567890 +FTPPUT: OK,10	Upload the text.txt file, which is 10 bytes. The file is transferred in ASCII and the operated in APPE.
	AT+FTPPUT=test.txt,1,3,0 +FTPPUT: Delete File OK	Delete the test.txt file.
Remarks	N/A	

9.6 Querying FTP Link Status: +FTPSTATUS

Description	To query the FTP link status	
Format	AT+FTPSTATUS<CR>	
Parameter	N/A	
Return Value	+FTPSTATUS: <status>,<ip>, <port> <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 +FTPSTATUS: 1,119.139.221.66,21	Query the FTP link status. The module is successfully connected to the FTP server. The IP address of the FTP server is 119.139.221.66 and the port is 21.
	AT+FTPSTATUS +FTPSTATUS: 0	Not logged in
Remarks	N/A	

10 HTTP Commands

10.1 Setting HTTP Parameters: +HTTPPARA

Description	To set HTTP parameters	
Format	AT+HTTPPARA=<para>,<para_value><CR>	
Parameter	<para>: HTTP 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.	
Return Value	See the Example.	
Example	AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx OK	Set the Neoway homepage as the URL. The URL supports domain name translation.
	AT+HTTPPARA=url,121.15.200.97/Service1.asmx/GetNote OK	Set URL.
	AT+HTTPPARA=url, ERROR	The AT command is not complete.
	AT+HTTPPARA=port,80 OK	Set the destination port ID to 80.
	AT+HTTPPARA=port,8080 OK	Set the destination port ID to 8080.
Remarks	N/A	

10.2 Setting Up HTTP Link: +HTTPSETUP

Description	To set up an HTTP link	
Format	AT+HTTPSETUP<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+HTTPSETUP OK	Set up an HTTP link Successful
	AT+HTTPSETUP ERROR	Set up an HTTP link failed
Remarks	The link is set up successfully only after the destination address and port ID are set correctly.	

10.3 HTTP Request: +HTTPACTION

Description	To execute an HTTP request
Format	AT+HTTPACTION=<mode>[,<length>[,<type>[,<offset>,<size>]]]]<CR>
Parameter	<mode>: HTTP request mode, available value can be 0, 1, 2, 99 0: GET 1: HEAD 2: POST 99: OPEN_MODE, user-defined packet mode <length>: The length of the POST content or user-defined packet length, maximum value 2048 This parameter must be set if <mode> is set to POST or OPEN_MODE. <type>: POST request data type 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html <offset>: offset in GET mode

	<size>: size of file to be downloaded in GET mode
Return Value	See the Example.
Example	AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx OK AT+HTTPSETUP OK AT+HTTPACTION=0 OK +HTTPRECV: HTTP/1.1 200 OK Cache-Control:private Content-Type:text/html; charset=utf-8 Server:Microsoft-IIS/7.5 Set-Cookie:ASP.NET_SessionId=rh3fjg554ufzb145aevgzz45; path=/; HttpOnly X-AspNet-Version: 2.0.50727 X-Powered-By:ASP.NET X-UA-Compatible:IE=EmulateIE7 Date:Thu, 28 Nov 2013 03:06:57 GMT Connection:close Content-Length: 13842 /*neoway homepage, html Format, 13842 bytes*/ …….. /* neoway homepage*/ +HTTPCLOSED:HTTP Link Closed Set the destination path. The default port is 80. Set up an HTTP link. GET request Receive the response from the HTTP server. The server finishes the response and disconnects the link.
	AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx OK AT+HTTPSETUP OK AT+HTTPACTION=1 OK +HTTPRECV: HTTP/1.1 200 OK Set the destination path. The default port is 80. Set up an HTTP link HEAD request The HTTP server 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 OK AT+HTTPPARA=port,8080 OK AT+HTTPSETUP OK AT+HTTPACTION=2,25 > MAC=NEOWAY&DATA=012345678 OK +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"?>	Set URL Set the destination port ID as 8080. Set up an HTTP link POST request. Send 25 bytes; enter the contents to be uploaded after > is displayed. Receive the response from the HTTP server. The server replies an XML file containing the uploaded content NEOWAY and 0123456. The server disconnects

	<string xmlns="http://wsliu.cn/">NEOWAY+0123456</string> +HTTPCLOSED: HTTP Link Closed	to the module after finishing responding.
	AT+HTTPPARA=url,www.neoway.com.cn/en/index.aspx OK AT+HTTPSETUP OK AT+HTTPACTION=99,76 >HEAD /en/index.aspx HTTP/1.1 connection: close HOST: www.neoway.com.cn OK +HTTPRECV: HTTP/1.1 200 OK Cache-Control: private Content-Length: 13842 Content-Type: text/html; charset=utf-8 Server: Microsoft-IIS/7.5 Set-Cookie: ASP.NET_SessionId=pvlaai3fizxg44eyvyqsyenk; path=/; HttpOnly X-AspNet-Version: 2.0.50727 X-Powered-By: ASP.NET X-UA-Compatible: IE=EmulateIE7 Date: Thu, 28 Nov 2013 05:40:24 GMT Connection: close +HTTPCLOSED: HTTP Link Closed	Set URL Set the destination port ID as 8080. Request to send 70-byte custom packets. Receive the response from the HTTP server. The server disconnects to the module after finishing responding.
Remarks	Comply with the HTTP protocol when defining packets.	

10.4 Closing HTTP Link: +HTTPCLOSE

Description	To close an HTTP link	
Format	AT+HTTPCLOSE<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+HTTPCLOSE OK	Close the HTTP link.
Remarks	The settings configured by HTTPPARA is cleared after this command is executed.	

10.5 Receiving HTTP Data: +HTTPRECV

Description	To report the data received from the HTTP connection	
Format	<CR><LF>+HTTPRECV: <CR><LF><datas>	
Parameter	<datas>: Data received through the HTTP connection	
Return Value	See the Example.	
Example	+HTTPRECV: HTTP/1.1 200 OK Cache-Control: private Content-Length: 13842 Content-Type: text/html; charset=utf-8 Server: Microsoft-IIS/7.5 Set-Cookie: ASP.NET_SessionId=pvlaai3fizxg44eyvyqsyenk; path=/; HttpOnly 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	Report the data received from the HTTP connection.

Remarks	N/A

10.6 HTTP Link Closing: +HTTPCLOSED

Description	Unsolicited report of the HTTP link closing	
Format	<CR><LF>+HTTPCLOSED: HTTP Link Closed<CR><LF>	
Parameter	N/A	
Return Value	See the Example.	
Example	+HTTPCLOSED: HTTP Link Closed	Unsolicited report of the HTTP link closing
Remarks	N/A	

11 HTTPS Commands

11.1 Setting HTTPS Parameters: +HTTPSPARA

Description	To set HTTPS parameters	
Format	AT+HTTPSPARA=<para>,<para_value><CR>	
Parameter	<para>: HTTPS parameters, including two parameters url: destination path port: destination port number <para_value>: the value of the <para>, 128 bytes at most for url; 443 by default for port	
Return Value	See the Example	
Example	AT+HTTPSPARA=url,mybank.icbc.com.cn/icbc/perbank/index.jsp OK	Set URL to the alipay homepage. The URL supports DNS translation.
	AT+HTTPSPARA=url,132.188.73.13/prodreg/beginRegistration.action OK	Set the destination path to 132.188.73.13.
	AT+HTTPSPARA=port,443 OK	Set the destination port to 443.
Remarks	• To send new HTTPS request, set new HTTPS parameters. • The HTTPS connection is closed if the +HTTPSCLOSE command is executed.	

11.2 Setting Up HTTPS Link: +HTTPSSETUP

Description	To set up an HTTPS connection
Format	AT+HTTPSSETUP<CR>
Parameter	N/A

Return Value	See the Example	
Example	AT+HTTPSSETUP OK	Set up an HTTPS link. Successful
	AT+HTTPSSETUP ERROR	Set up an HTTPS link. Failed
Remarks	The link can be set up successfully only after the destination address and port are set correctly.	

11.3 HTTPS Request: +HTTPSACTION

Description	To execute HTTPS requests	
Format	AT+HTTPSACTION=<mode>[,<length>]<CR>	
Parameter	<mode>: HTTPS request mode 0: GET 1: HEAD 2: POST 99: OPEN_MODE. Customized packet mode. <length>: the length of POST content or custom packets. It is required if <mode>is set to POST or OPEN_MODE. The maximum length is 2048.	
Return Value	See the Example	
Example	AT+HTTPSPARA =url, www.alipay.com/ index.html OK AT+HTTPSSETUP OK AT+HTTPSACTION=0 OK +HTTPSRECV: HTTP/1.1 200 OK Server: spanner/1.0.6 Date: Fri, 01 Aug 2014 03:02:34 GMT Content-Type: text/html; charset=gbk	Set the destination address. The default port is 443. Set up an HTTPS connection. GET request Receive the response from the HTTPS server.

	Content-Length: 56028 Connection: close Last-Modified: Wed, 23 Jul 2014 07:51:38 GMT Strict-Transport-Security: max-age=31536000 Accept-Ranges: bytes Set-Cookie: spanner=Z761rjOVBLsAdq8c3/Rwpd9j7dWQJZjm;path=/;secure; /*alipay homepage, html format, 56028 bytes */ …….. /* alipay homepage*/ +HTTPSCLOSED: HTTPS Link Closed	Unsolicited report that the connection is closed after the server responds to the request.
	AT+HTTPSPARA = url, www.alipay.com/index.html OK AT+HTTPSSETUP OK AT+HTTPSACTION=1 OK +HTTPSRECV: HTTP/1.1 200 OK Server: spanner/1.0.6 Date: Fri, 01 Aug 2014 03:05:41 GMT Content-Type: text/html; charset=gbk Content-Length: 56028 Connection: close Last-Modified: Wed, 23 Jul 2014 07:51:40 GMT Strict-Transport-Security: max-age=31536000 Accept-Ranges: bytes Set-Cookie: spanner=G0TDss3KCl08k1dgppqS1y6qNx1FfX2V;path=/;secure; +HTTPSCLOSED: HTTPS Link Closed	Set the destination address. The default port is 443. Set up an HTTPS connection. HEAD request HTTPS server response
	AT+HTTPSPARA = url, www.alipay.com/index.html OK	Set URL.

	AT+HTTPSSETUP OK AT+HTTPSACTION=99,69 > HEAD /index.html HTTP/1.1 HOST:www.alipay.com connection: close	Use the default port 443 to set up an HTTPS connection. Use custom packet mode to send 69-byte packets.
	OK +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; +HTTPSCLOSED: HTTPS Link Closed	Receive HTTPS server response. The server finishes responding and closes the connection.
Remarks	• Custom packets must comply with the HTTP protocol. • Different status codes might be returned after sending the request.	

11.4 Closing HTTPS Link: +HTTPSCLOSE

Description	To close an HTTPS link
Format	AT+HTTPSCLOSE<CR>
Parameter	N/A
Return Value	See the Example

Example	AT+HTTPSCLOSE OK	Close an HTTPS link.
Remarks	After **+HTTPSCLOSE** is executed, the HTTPS link is closed but the parameters set by **+HTTPSPARA** are reserved.	

11.5 Receiving HTTPS Data: +HTTPSRECV

Description	To report the data received from the HTTP connection	
Format	<CR><LF>+HTTPRECV: <CR><LF><datas>	
Parameter	<datas>: Data received through the HTTPS connection	
Return Value	See the Example.	
Example	+HTTPRECV: HTTP/1.1 200 OK Cache-Control: private Content-Length: 13842 Content-Type: text/html; charset=utf-8 Server: Microsoft-IIS/7.5 Set-Cookie: ASP.NET_SessionId=pvlaai3fizxg44eyvyqsyenk; path=/; HttpOnly 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	Report the data received from the HTTPS connection.
Remarks	N/A	

11.6 HTTPS Link Closed Report: +HTTPSCLOSED

Description	Unsolicited report that an HTTPS link is closed	
Format	<CR><LF>+HTTPSCLOSED: HTTPS Link Closed<CR><LF>	
Parameter	N/A	
Return Value	See the Example	
Example	+HTTPSCLOSED: HTTPS Link Closed	Unsolicited report that the HTTPS link is closed
Remarks	N/A	

12 MQTT Command

12.1 User Parameter Settings: +MQTTCONNPARAM

Description	To set ID, user name, and password.	
Format	• AT+MQTTCONNPARAM=<cliendID>,<username>,<password><CR> • AT+MQTTCONNPARAM？<CR> • AT+MQTTCONNPARAM=?<CR>	
Parameter	<”clientID”>: Device ID, 256 bytes at most <”username”>: User name, 512 bytes at most <”password”>: Password, 256 bytes at most	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTCONNPARAM="23342423b","lixytest/thing01","0lSoY/eYnlSqUeAsbAKKQ/ACmipZwEw9H7Ff0h1kOps=" OK	Parameters are set successfully.
Remarks	The parameters must be marked by quotation marks.	

12.2 Will Settings: +MQTTWILLPARAM

Description	To set will parameters
Format	• AT+MQTTWILLPARAM=<retained>,<qos>,<topicname>,<message><CR> • AT+MQTTWILLPARAM?<CR> • AT+MQTTWILLPARAM=?<CR>
Parameter	<Retained>: Retain mark, digit, 0 or 1 <Qos>: Quality of service, only 0 and 1 are supported <”topicname”>: Will topic, at most 128 bytes <Message>: Will Message, at most 1024 bytes
Return Value	<CR><LF>OK<CR><LF>

Example	AT+MQTTWILLPARAM=0,1,"lixytopic",byby OK	The will is set successfully.
Remarks	Topicname must be marked by quotation marks.	

12.3 Connection Command: +MQTTCONN

Description	To connect to the MQTT server.	
Format	• AT+MQTTCONN=<host>,<clean>,<keep_alive><CR> • AT+MQTTCONN?<CR> • AT+MQTTCONN=?<CR>	
Parameter	<"Host">: Server address (URL:port) <clean>: whether to clean session, digit type, 0-Not clean (default) 1-Clean <Keep_alive>: keepAlive time, ranging from 20 to 180, unit second	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTCONN="121.43.166.63:1883",0,60 OK	Connect to the MQTT server successfully.
Remarks	N/A	

12.4 Subscription: +MQTTSUB

Description	To subscribe a topic
Format	• AT+MQTTSUB=<topicname>,<qos><CR> • AT+MQTTSUB?<CR> • AT+MQTTSUB=?<CR>
Parameter	<topicname>: Topic to subscribe to, 128 bytes at most <Qos>: Quality of service, only 0 and 1 are supported
Return Value	<CR><LF>OK<CR><LF>

Example	AT+MQTTSUB="lixytopic",1 OK +MQTTSUB:3,"lixytopic",11,123321HELLO	Subscribe to the topic successfully. The server issues the message with a retain mark of 1 of this topic.
	AT+MQTTSUB=lixytopic,1 OK	Subscribed to the topic successfully.
Remarks	N/A	

12.5 Unsubscription: +MQTTUNSUB

Description	To unsubscribe a topic	
Format	AT+MQTTUNSUB=<topicname><CR>	
Parameter	<topicname>: Topic to unsubscribe to, 128 bytes at most	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTUNSUB="lixytopic" OK	Unsubscribe to a topic
Remarks	N/A	

12.6 Topic Publish: +MQTTPUB

Description	To publish a topic	
Format	• AT+MQTTPUB=<retained>,<qos>,<topicname>,<message><CR> • AT+MQTTPUB=?<CR>	
Parameter	<Retained>: Retain mark, digit type, 0 and 1 <Qos>: Quality of service, only 0 and 1 are supported <"topicname">: Topic, 128 bytes at most <Message>: Message, 1024 bytes at most	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTPUB=1,1,"lixytopic","123321HELLO"	The topic is published successfully.

	OK	
	AT+MQTTPUB=1,1,"lixytopic",”123321HELLO” OK +MQTTSUB:5,"lixytopic",11,123321HELLO	The topic is published successfully. The server issues the topic.
Remarks	N/A	

12.7 Disconnecting to the MQTT Server: +MQTTDISCONN

Description	To disconnect to the MQTT server and release resources	
Format	AT+MQTTDISCONN<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+ MQTTDISCONN OK	Disconnect to the MQTT server.
Remarks	The device disconnects to the MQTT server proactively and releases the MQTT resources. To publish messages after disconnecting, set up the connection again.	

12.8 Receiving Topic Content: +MQTTSUB

Description	To receive the topic content sent by the server.	
Format	+MQTTSUB=<message_id>,<”topicname”>,<message_len>,<message><CR>	
Parameter	<message_id>: Message ID <”topicname”>: Topic name <message_len>: The length of the data received <message>: Data received	
Return Value	See the Example	
Example	+MQTTSUB:2,"lixytopic",5,12345	Receive messages published by the topic subscribed to.
Remarks	Topicname must be marked by quotation marks.	

12.9 Querying MQTT Connection Status: +MQTTSTATE

Description	To query the status of the MQTT connection.	
Format	AT+MQTTSTATE?<CR>	
Parameter	N/A	
Return Value	See the Example	
Example	AT+MQTTSTATE? +MQTTSTATE:1 OK	The device is connected to the MQTT server.
	AT+MQTTSTATE? +MQTTSTATE:0 OK	The device is disconnected to the MQTT server.
Remarks	N/A	

13 PSM&eDRX Commands

13.1 Setting PSM Mode: +CPSMS

Description	To set PSM mode
Format	• +CPSMS=[<mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]]]<CR> • +CPSMS?<CR> • +CPSMS=?<CR>
Parameter	**<mode>**: enable or disable PSM mode 0: disable PSM mode 1: enable PSM mode 2: disable PSM mode and restore parameters to default settings <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 perodic-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	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CPSMS? +CPSMS:0,,,"01100000","00000000" OK	Query the state of PSM mode.
	AT+CPSMS=1 OK	Enable PSM mode.
	AT+CPSMS=0 OK	Disable PSM mode.

	AT+CPSMS=1,,,"01100001","00000001" OK	Set PSM parameters.
Remarks	• The value of <Requested_Periodic-RAU> must be larger than that of <Requested_GPRS-READY-timer>. • The settings should be negotiated with the network. For valid values, consult your carriers.	

13.2 Setting eDRX Mode: +CEDRXS

Description	To set eDRX mode
Format	• +CEDRXS= <mode>, <AcT_type>, <Requested eDRX value> <CR> • +CEDRXS?<CR> • +CEDRXS=?<CR>
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>: 0: only used 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>**: 4-bit character string Requested eDRX cycle

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
Iu mode				
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)

Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CEDRXS=1,5,"0010" OK	Set eDRX cycle to 10.24s seconds in WB-S1 mode
	AT+CEDRXS? +CEDRXS: 4,"0010" OK	Query the eDRX settings.
	AT+CEDRXS=0 OK	Disable the eDRX mode.
Remarks	• Set UART clock to automatic mode by sending **+CSCLK**. • Set power management mode to low power consumption or ultra-low power consumption by sending **+NVSETPM**. • The settings should be negotiated with the network. For valid values, consult your carriers.	

13.3 Reading eDRX Parameters: +CEDRXRDP

Description	To read eDRX parameters
Format	+CEDRXRDP<CR><LF>
Parameter	N/A

Return Value

<CR><LF>+CEDRXRDP: <AcT_type>,<Requested_eDRX_value>,<NW_provided_eDRX_value>,<Paging_Time_window>

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

<AcT_type>:

0 No eDRX, used to report status only

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 circle (refer to +CEDRXS: Requested_eDRX_value)

<NW_provided_eDRX_value>: eDRX circle provided by network (refer to +CEDRXS: Requested_eDRX_value)

<Paging_Time_window>: paging time window, 4-bit character string

NB-S1 Mode

4	3	2	1	Paging Time Window
0	0	0	0	2,56 seconds
0	0	0	1	5,12 seconds
0	0	1	0	7,68 seconds
0	0	1	1	10,24 seconds
0	1	0	0	12,8 seconds
0	1	0	1	15,36 seconds
0	1	1	0	17,92 seconds
0	1	1	1	20,48 seconds
1	0	0	0	23,04 seconds
1	0	0	1	25,6 seconds
1	0	1	0	28,16 seconds
1	0	1	1	30,72 seconds
1	1	0	0	33,28 seconds
1	1	0	1	35,84 seconds
1	1	1	0	38,4 seconds

	1 1 1 1 40,96seconds	
Example	AT+CEDRXRDP +CEDRXRDP: 5,0000,0010,0011 OK	In NB-S1 mode, the module does not request eDRX circle, the network supports an eDRX circle of 20.48 seconds, and the paging time window is 10.24 seconds.
Remarks	N/A	

14 Other Commands

14.1 Powering Off Module: +CPWROFF

Description	To power off the module	
Format	AT+CPWROFF<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+CPWROFF OK	Power off the module.
Remarks	N/A	

14.2 Setting Clock Mode: +CSCLK

Description	To set clock mode of serial port	
Format	AT+CSCLK=<mode><CR>	
Parameter	mode: 0: Normal mode 1: DTR controls low-frequency clock of serial port High level: enable Low level: disable 2: Auto mode Serial port automatically exits from low-frequency clock when receiving or sending data.	
Return Value	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>	
Example	AT+CSCLK=2	Set clock to auto mode.

	OK
Remarks	• This command is used together with PSM and eDRX commands. • Settings by this command are not saved after the module is powered down.

14.3 Setting PM Mode: +NVSETPM

Description	To set power management mode
Format	AT+NVSETPM=<mode><CR>
Parameter	mode: 0: Normal mode 1: Low power consumption mode (eDRX) 2: Ultra-low power consumption mode (eDRX and PSM)
Return Value	<CR><LF>OK<CR><LF> Or <CR><LF>ERROR<CR><LF>
Example	AT+NVSETPM=1 Set to low power consumption mode OK
Remarks	• This command is used together with PSM and eDRX commands. • Settings by this command are not saved after the module is powered down.

14.4 PING Test: +PING

Description	PING Test
Format	AT+PING=<ip>,<timeout>,<size>,<num><CR>
Parameter	<ip>: IP address <timeout>: Timeout interval <size>: Size of data packet <num>: Ping time numbers
Return Value	<CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

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
Remarks	N/A

14.5 Enabling Extending Functions: +NEONBIOTCFG

Description	To enable or disable extending functions, such as automatic PPP activation, time update, PSM status report, and RRC status report
Format	• AT+NEONBIOTCFG=<auto_ip>,<time_inc>,<psm_inc>,<rrc_inc><CR> • AT+NEONBIOTCFG?<CR>
Parameter	<auto_ip>: Activate PPP automatically and report IP address after registering with network 0: Disable 1: Enable <time_inc>: Report time after registering with network or waking up from PSM 0: Disable 1: Enable <psm_inc>: Report PSM status (PSM ENTER, PSM WAKEUP) 0: Disable 1: Enable <rrc_inc>: Report RRC status 0: Disable 1: Enable

Return Value	<CR><LF>OK<CR><LF> or <CR><LF>+NEONBIOTCFG: <auto_ip>,<time_inc>,<psm_inc>,<rrc_inc> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>
Example	AT+NEONBIOTCFG=1,0,0,0 OK — Enable automatic PPP activation. AT+NEONBIOTCFG=0,1,1,0 OK — Enable time update and PSM report. AT+NEONBIOTCFG? +NEONBIOTCFG: 1,1,1,1 — Query current settings. OK
Remarks	• Send **AT+IPR** to set a fixed baud rate before using this function. • Settings by this command are saved after the module is powered down.

14.6 Setting LED: +LEDMODE

Description	To enable or disable STATUS and NET indicators
Format	• AT+LEDMODE=<mode><CR> • AT+LEDMODE?<CR>
Parameter	<mode>: 0: Disable 1: Enable
Return Value	<CR><LF>OK<CR><LF> or <CR><LF>+LEDMODE: <mode> <CR><LF>OK<CR><LF> or <CR><LF>ERROR<CR><LF>

Example	AT+LEDMODE=1 OK AT+LEDMODE? +LEDMODE: 1 OK	Enable STATUS and NET LED indicators. Query LED settings.
Remarks	• LED indicators are disabled by default. • Settings by this command are saved after the module is powered down.	

15 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