

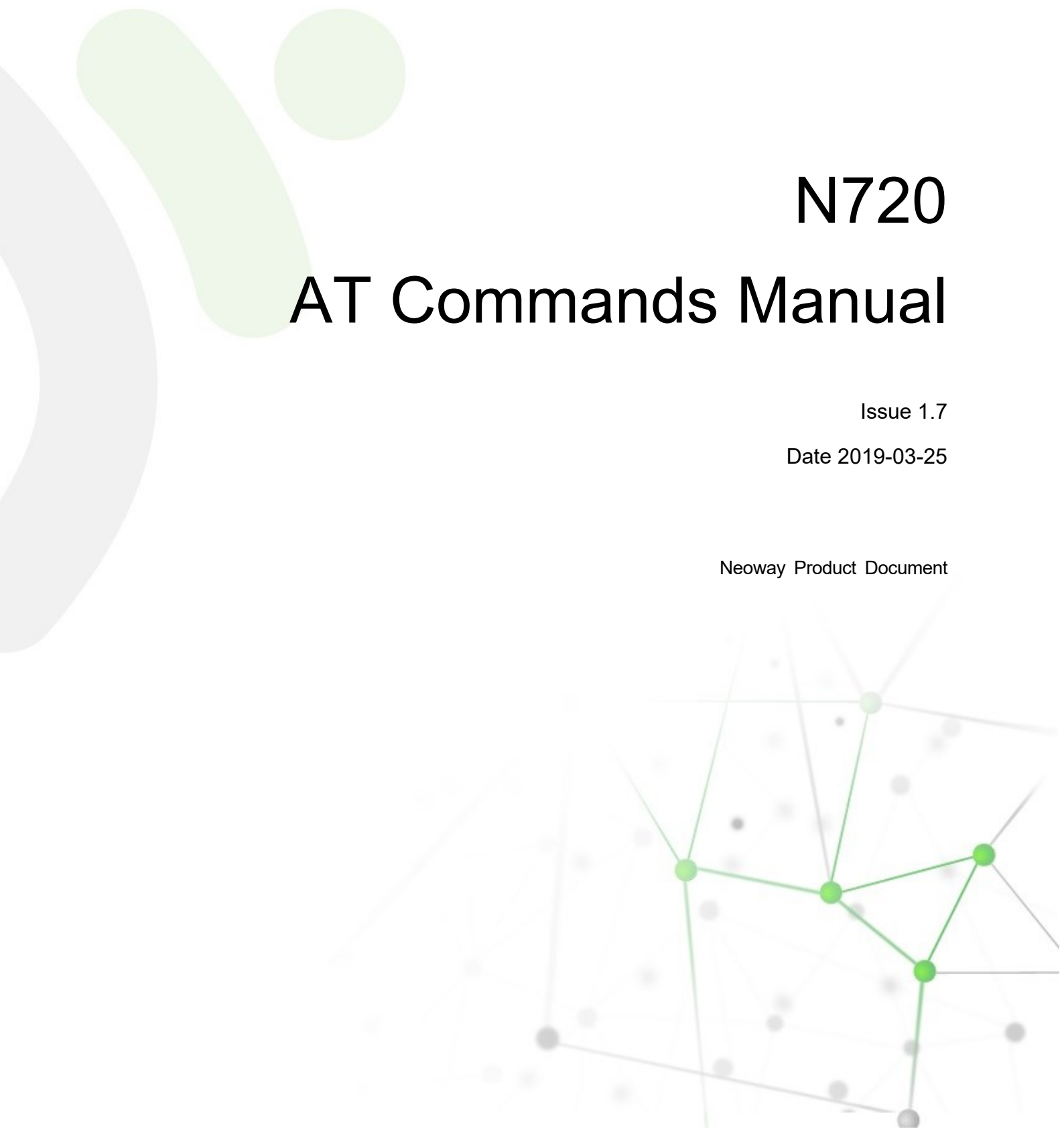
N720

AT Commands Manual

Issue 1.7

Date 2019-03-25

Neoway Product Document



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Notice

This document provides guide for users to use N720.

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

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

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About This Document

Scope

This document is applicable to N720 series.

Audience

This document is intended for [system engineers \(SEs\)](#), [development engineers](#), and [test engineers](#).

Change History

Issue	Date	Change	Changed By
1.0	2016-09	Initial draft	Lei Deyu
1.1	2017-02	- Modified the boot instructions - Added \$MYGPSPWR, \$MYGPSPOS, \$MYADCTEMP, ^SYSINFO, +GMM, +ENPWRSAVE, +NETSHAREACT, +NETSHAREMODE, ATE	Lei Deyu
1.2	2017-03	Added TCP/UDP, HTTP, HTTPS, and FTP commands	Zhang Liaofei
1.3	2017-05	Added TTS, Wi-Fi, and other commands	Zhang Liaofei
1.4	2017-07	- Added APN command and transparent commands - Modified return value of some commands	Zhang Liaofei
1.5	2018-02	- Added AT\$QCRMCall, AT+SIMCOUNTCTL, AT+SIMCOUNTREAD, +VTS, +DTMFDETECT - Modified the following commands: AT\$MYSYSINFO, ATD/AT+CDV, CLIP, CEREg, +NETDMSG, and +NETMSG - Added CDMA1X and LTE to +NETDMSG and +NETMSG	Zhang Liaofei
1.6	2018-07	Modified the following commands: Parameter description of AT+HTTppara	Lei Deyu

- Format and description of AT+HTTPACTION
- Format and example of +HTTPRECV
- Remarks of AT+CLIP
- Remarks of AT+TTSCFG
- Example and Remarks of AT+FSWF
- Example and Remarks of AT+FSRF
- Example and Remarks of AT+FSDf
- Example and Remarks of AT+FSLIST
- Example and Remarks of AT+FSFS
- Example and Remarks of AT+FSLS
- Example and Remarks of AT+FSFAT

Added the following commands:

- AT+RECVMODE, AT+TCPREAD, AT+UDPREAD, AT+TCPREADS, AT+HTTPSCFG, AT+REMAUDIO, AT+NEOFOTA, AT+READADC, AT+SIMHOTSWAP, AT+MYDATAONLY, AT+BANDLOCK
- XTRA commands
- AGPS commands
- Audio recording commands
- SIM card commands
- MQTT commands
- AWS MQTT commands

1.7	2019-02	• Added WIFI STA commands	
		• Added Bluetooth commands	
		• Added AT+DNSSERVER	
		• Added AT+CUSD	
		• Added HTTP, HTTPS commands	Lei Deyu
		• Added AT+SSLTCPCFGA	Liu Hui
		• Added AT+SSLTCPREAD	Yin Jianjun
		• Added AT+PDPKEEPALIVE	Wang
		• Added AT+PDPSTATUS	ShengJin
		• Added AT+SIMCROSS	Hu PengLi
		• Added AT+SIMCARDCONFIG	Jin Huo
		• Added AT+GSN	
		• Added extensive parameters for AT+CMUT	
		• Added AT+MYCELLINFO	
		• Added AT+NCUSTSWITCH	

- Added AT+NSLEEPCFG
- Added AT\$MYGPSCFG
- Added AT+NABNDLOCK
- Added AT+NFREQLOCK
- Added AT+NPCILOCK
- Added support band list
- Modified the format of AT+TCPREAD
- Modified the format of AT+UDPREAD
- Modified Return value and Remarks of AT+IPSTATUS
- Modified Remarks of AT\$MYSYSINFO
- Modified Remarks of AT\$MYNETINFO
- Modified Remarks of AT^SYSCONFIG
- Modified Format of AT+MQTTWILLMSG
- Modified Description of AT+SIGNAL
- Modified Parameter of AT++WIFIBAND
- Modified AT+RCVMODE, AT+TCPSSEND, AT+UDPSSEND
- Modified AT+FTPPUT
- Modified Example of AT+CPMS
- Modified Example of AT+CNMI
- Modified Example of AT+NETSEL
- Modified Example of AT+NETDMSG
- Modified AT+WIFISWITCH
- Modified Return Value of AT+CREG
- Modified Return Value of AT+CEREG
- Modified Parameter of AT+CFUN
- Modified Parameter and Example of AT+CLCK
- Modified Description and Parameter of AT++CGDCONT
- Modified Parameter of AT+XGAUTH
- Modified Example of AT+TCPSETUP
- Modified Example of AT+UDPSETUP
- Modified Example of +UDPCLOSE
- Modified Example of +CLIP
- Modified Return Value of +WIFIDHCP
- Deleted AT+NETSHAREMODE

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_N720_Datasheet

Neoway_N720_Product_Specifications

Neoway_N720_AT_Command_Mannual

Neoway_N720_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 on. The UART responds with **OK** if AT is initialized and outputs **+PBREADY** after the phonebook is available.

1 General Commands

1.1 Querying the Manufacturer Information: +ATI

Description	To query the manufacturer information, including manufacturer, model, and version	
Format	ATI<CR>	
Parameter	<manufacturer>: Module manufacturer <module_version>: Module model <soft_version>: Software version	
Return Value	<CR><LF><manufacturer> <CR><LF><module_version> <CR><LF><soft_version> <CR><LF>OK<CR><LF>	
Example	ATI NEOWAY N720 V003 OK	Manufacturer Module model Version
Remarks	N/A	

1.2 Querying Software Version: +GMR

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

	+GMR: N720_D0B0CM_BZ_V003 OK
Remarks	N/A

1.3 Querying Signal Quality: +CSQ

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

1.4 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 unsolicited result codes for network registration. 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>: Two-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: UTRAN w/HSPA+
Return Value	<CR><LF>+CREG: <n>,<stat>[,<lac>,<ci>[,<Act>]] <CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF> <CR><LF>+CREG: <stat>[,<lac>,<ci>[,<Act>]]<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	

1.5 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 +CEREG: <stat>. 2: Enable network registration and location information (Cell ID, Local ID) unsolicited result code +CEREG: <stat>[, [<lac>], [<ci>], [<AcT>]] 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 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 <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	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CEREG: <stat>[,<tac>][,<ci>][,<AcT>][,[,<Active-Time>][,<Periodic-TAU>]]] <CR><LF>OK<CR><LF>	
	<CR><LF>+CEREG: <stat>[,<tac>][,<ci>][,<AcT>][,[,<Active-Time>][,<Periodic-TAU>]]] <CR><LF>	
	<CR><LF>+CEREG: (list of supported <n>s) <CR><LF>OK<CR><LF>	
Example	AT+CEREG? +CEREG: 0,1 OK	Query the network registration status of the module.
	AT+CEREG=1 OK	Enable network registration unsolicited codes.
	AT+CEREG=? +CEREG: (0-2,4) OK	Query the value range of the network registration status parameter.
Remarks	N/A	

1.6 Selecting and Registering a Network: +COPS

Description	To select and register a 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	See the Example	
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,"CHINAMOBILE",7 OK	China Mobile
	AT+COPS? +COPS: 0,2,"46000",7	If it is set to digital mode, get the number 46000

	OK	
	AT+COPS?	
	+COPS: 0,0,"CHINAUNICOM",7	China Unicom
	OK	
	AT+COPS?	
	+COPS: 0,2,"46001",7	If it is set to digital mode, then get the number 46001.
	OK	
	AT+COPS?	
	+COPS: 0,0,"CHINA TELECOM",9	China Telecom
	OK	
	AT+COPS?	
	+COPS: 0,2,46011,9	If it is set to digital mode, then get the number 46001.
	OK	
	AT+COPS=2	
	OK	Deregister the network.
Remark	N/A	

1.7 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>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CIMI	
	+CIMI: 460020188385503	Obtain the IMSI number.
	OK	
	AT+CIMI	Query the IMSI.
Remarks	ERROR	No SIM card is installed.
	IMSI is a character string of 15 digits and starts with 3-bits of MCC and 2-bits of MNC. It is used to authenticate the SIM card.	

1.8 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: 355897043139120 OK
Remarks	On a 3GPP2 network, the return code is an 8-digit ESN.

1.9 Querying IMEI: +GSN

Description	To query the International Mobile Equipment Identity (IMEI) of the module
Format	AT+GSN<CR>
Parameter	N/A
Return Value	<CR><LF>+GSN: <IMEI> <CR><LF>OK<CR><LF>
Example	AT+GSN +CGSN: 355897043139120 OK
Remarks	The IMEI number is a string of 15 digits.

1.10 Obtaining ICCID of 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>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CCID	
	+CCID: 89860002190810001367	Read command
	OK	
	AT+CCID	Read command
	ERROR	The SIM card is not inserted.
Remarks	The ICCID number is a string of 20 digits.	

1.11 Querying the Module Model: +CGMM

Description	To query the module model	
Format	AT+CGMM<CR>	
Parameter	<model>: Module model	
Return Value	<CR><LF>+CGMM: <model>	
	<CR><LF>OK<CR><LF>	
Example	AT+CGMM	
	+CGMM: N720	Query the product model.
	OK	
Remarks	N/A	

1.12 Querying the Module Model: +GMM

Description	To query the module model	
Format	AT+GMM<CR>	
Parameter	N/A	
Return Value	<CR><LF>+CGMM: <model>	
	<CR><LF>OK<CR><LF>	

Example	AT+GMM	
	+GMM: N720	Query the product model.
	OK	
Remarks	N/A	

1.13 Setting Baud Rate: +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, 9600, 19200, 38400, 57600, 115200.	
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=115200 OK	Set the baud rate to 115200 bps.
	AT+IPR? +IPR: 115200 OK	Query the current baud rate. .
	AT+IPR=? +IPR: 0, 9600,19200,38400,57600,115200 OK	Query the available baud rate range.
	AT+IPR=100 ERROR	Set the baud rate to 100. The value is not allowed
	- The default baud rate is 0, indicating automatic baud rate detection. - The settings are not saved after the module is powered off.	

1.14 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 module before setting it to <fun> power level 1: reset the module 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>		
	<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	The settings are not be saved after the module is powered off.		

1.15 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 <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-transmission, 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. Not supported	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+CMUX=0 OK	Basic option. Other parameters are left out.
	AT+CMUX=2 ERROR	The parameter value exceeds available range
	AT+CMUX=0,0,,512,254,5,255 OK	Basic option.
	AT+CMUX=1,0,,512,254,5,255 ERROR	Advanced option. Not supported
	AT+CMUX=? +CMUX: (0),(0),(1-6),(16-1509),(1-255),(0-100),(2-255),(1-255),(1-7)	Query the available range of parameters.

	OK	
	AT+CMUX?	Incorrect command syntax.
	ERROR	
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 for AT command sending and receiving. <T2> must be greater than <T1>. - To enable multiplexing function, send AT+CMUX=0.	

1.16 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. This information is optional because it can be displayed only when the network supports it.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CCLK: <time> <CR><LF> OK<CR><LF>	
Example	AT+CCLK="08/07/01,14:54:01"	Set the real-time clock of the module.
	OK	
	AT+CCLK?	
	+CCLK: "08/07/01,14:54:10"	Query the setting of the real-time clock.
	OK	
	AT+CCLK=14/07/02,10:48:50	Incorrect command syntax.
	ERROR	
Remarks	- The settings are not saved after the module is powered off. - The default clock is GMT+0.	

1.17 Entering PIN Code: +CPIN

Description	To query the PIN status and enter PIN code	
Format	• AT+CPIN=<pin>[,<newpin>]<CR> • AT+CPIN?<CR> • AT+CPIN=<pin><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.	
Example	AT+CPIN? +CPIN:READY OK	Query whether PIN code is required. No password is required.
	AT+CPIN? +CPIN: SIM PIN OK AT+CPIN="1234" OK	Query whether PIN code is required. Required Input correct PIN code.
	PBREADY	Unlock
	AT+CPIN? +CPIN: SIM PUK OK AT+CPIN="12345678","4321" OK	PUK code is required if PIN code is input incorrectly for three times Input PUK code, and new PIN code.
	PBREADY	Unlock
Remarks	• To enter PIN code, lock current SIM card (running AT+CLCK="SC",1,"1234") and then restart the module. • If PIN code is input incorrectly for three times, PUK is required to unlock.	

1.18 Locking/Unloding Module: +CLCK

Description	To lock, unlock or interrogate module
Format	• AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]<CR> • AT+CLCK=?<CR>
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 home country "SC": SIM card "AO": All outgoing calls "OX": All outgoing international calls except to the home country "AB": All barring services "AG": All outgoing barring services "AC": All incoming barring services "FD": SIM fixed dialing memory feature "PS": PH-SIM (lock Phone to 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, 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	
Return Value	When <mode>=2 and command successful: <CR><LF>+CLCK: <status>[,<class1>[<CR><LF>+CLCK: <status>,<class2>...]]] <CR><LF>OK<CR><LF>	
Example	AT+CLCK="SC",2 +CLCK: 0 OK	
	AT+CLCK=? +CLCK: ("AB","AC","AG","AI","AO","IR","OI","OX", "SC","FD","PN","PU","PP","PC","PF") OK	Query the network information related to the module.
	AT+CLCK="SC",1,"1234" OK	Lock the current SIM card. "1234" is the PIN code of current SIM card.
	AT+CLCK="SC",0,"1234" OK	Unlock the current SIM card. "1234" is the PIN code of current SIM card.
	AT+CLCK="SC",1,"2222" ERROR	The PIN code is incorrect.
Remarks	The settings of this command take effect after the module is restarted.	

1.19 Modifying Password: +CPWD

Description	To modify the password of the lock function of the module
Format	- AT+CPWD=<fac>,<oldpwd>,<newpwd><CR> - AT+CPWD=?<CR>
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 "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.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CPWD: list of supported (<fac>,<pwdlength>)s <CR><LF>OK<CR><LF>	
	<CR><LF> ERROR<CR><LF>	
Example	AT+CPWD=? +CPWD: ("AB",4),("AC",4),("AG",4),("AI",4),("AO",4), ("IR",4),("OI",4),("OX",4),("SC",8),("P2",8) OK	Query the service range of the PIN password allowed by the module.
	AT+CPWD="SC","1234","0000" OK	Modify the PIN code of the current SIM card. "1234" is the old PIN code and "0000" is the new PIN code.
	AT+CPWD=SC,1234,0000 ERROR	Incorrect command syntax. A pair of quotation marks (") is required for each parameter.
Remarks	To modify the PIN code, lock the SIM card (running AT+CLCK="SC",1,"1234").	

1.20 Defining PDP Context: +CGDCONT

Description	To set the packet data protocol (PDP) format	
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. Minimum value = 1. <PDP_type>: (Packet Data Protocol type) a string parameter. IP: Internet Protocol (IETF STD 5) PPP: Point to Point Protocol (IETF STD 51) IPv6: Internet Protocol version 6 <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 SDCP 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>	
Return Value	See the Example.	
Example	AT+CGDCONT=1,"IP","CMNET"	Set PDP type to IP and APN to CMNET.
	OK	
	AT+CGDCONT? +CGDCONT: 1,"IP","CMNET","0.0.0.0",0,0,0,0 OK	Query current PDP format.
	AT+CGDCONT=? +CGDCONT: (1-24),"IP",,,(0-2),(0-4),(0-1),(0-1) +CGDCONT: (1-24),"PPP",,,(0-2),(0-4),(0-1),(0-1)	Query the available value range of PDP format.

	+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
Remarks	N/A

1.21 PDP Authentication: +XGAUTH

Description	PDP authentication		
Format	- AT+XGAUTH=<cid>,<auth>,<name>,<pwd><CR> - AT+XGAUTH=?		
Parameter	<cid> : PDP context identifier <auth> : authentication may be: 0: NONE 1: PAP (default) 2: CHAP 3: PAP or CHAP <name> : user name <pwd> : password		
Return Value	See the Example.		
Example	AT+XGAUTH=1,1,"gsm","1234" OK	Set the first PDP authentication.	
	AT+XGAUTH=? +XGAUTH: (1),(0-3),32,32 OK	Query the available value range of parameters.	
Remarks	- Before sending this command, send AT+CGDCONT. - To use internal protocol stack, add this command to the process. <cid> is same as that in +CGDCONT.		

1.22 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 GPRS 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. • The settings are be saved after the module is powered off.	

1.23 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	Turn on module AT command echo function
	OK	
	AT	Send AT, serial tools show "AT" and "OK".
	OK	
	ATE0	Turn off the module AT command echo function
	OK	
	OK	Send AT, serial tools only show "OK"
Remark	• The 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.	

1.24 GPRS Dialing Command: ATD*99#

Description	To initialize a GPRS connection using external protocol stacks
Format	ATD*99#<CR>
Parameter	N/A
Return Value	<CR><LF>CONNECT<CR><LF>
Example	ATD*99# CONNECT
Remarks	• This command is applicable only to external protocol stacks.

- Ensure that the module has registered the network and set APN before dialing any number.

1.25 Enabling or Disabling Sleep Mode: +ENPWRSAVE

Description	To enable or disable sleep mode	
Format	• AT+ENPWRSAVE=<n><CR> • AT+ENPWRSAVE?<CR>	
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)	
Return Value	See the Example.	
Example	AT+ENPWRSAVE=1 OK	Disable the sleep mode.
	AT+ENPWRSAVE? +ENPWRSAVE: 1 OK	Query current sleep mode status.
Remarks	• The settings by this command are not saved after the module is powered off. • Sleep mode is triggered by inputting low level at DTR by default. • After this command is sent and low (or high) level is input at DTR, the module can enter sleep mode unless circuit of each part inside the module allows.	

1.26 Setting Blinking Status Signal Indicator: +SIGNAL

Description	To set the different blinking status of the signal indicator	
Format	• AT+SIGNAL=<value><CR> • AT+SIGNAL?<CR> • AT+SIGNAL=?<CR>	
Parameter	<value>: Integers, ranging from 0 to 10 0: Blink once every second in normal situation. Being off or on if any abnormality occurs.	

	1: Blink once every second after the module is connected to the GPRS network. Being off in any other situations. 2: Flash and blink. Flash every 250 ms for the GPRS data service and blink every second in other normal situations. 3: Be on after the GPRS network is connected and blink every second in other situations. 4: Be on after the GPRS network is connected and being off in other situations. 5: Be off if the SIM card cannot be detected after the module is started, blink every second if the SIM card is detected, and be on after the GPRS network is connected. 6: Four indicator states: • If no SIM card is installed or the SIM card does not register network, the indicator blinks every one second and is on for 0.1 second. • If the SIM card registered network, the indicator blinks every three second and is on for 0.1 second. • If the GPRS network is connected, the indicator blinks every 250 ms and is on for 0.1 second. • The indicator is always on during a call. 7: four indicator states • Off: No SIM card, not registered • On: registered network • On for 0.2 second and off for 1.8 second: Obtained the IP address • On for 1.8 second and off for 0.2 second: Connected to the server 8: Be off all the time 9: Be on all the time 10: custom on/off interval <low_interval>: 10 to 65535 ms <high_interval>: 10 to 65535 ms	
Return Value	<CR><LF>+SIGNAL: <value> <CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF>	
Example	AT+SIGNAL?	
	+SIGNAL: 2 OK	The current signal indicator status is 2.
	AT+SIGNAL=3 OK	Set current signal indicator status to 3.
	AT+SIGNAL=11	The parameter is set to an incorrect value.

	ERROR	
	AT+SIGNAL=? +SIGNAL: (0-7) OK	The available value of the signal indicator status ranges from 0 to 7.
Remarks	- The default status setting is 7. - If the status is set to 0 to 6, the indicator will be always on when a call or SIM message in incoming in sleep mode. - The settings by this command are saved after the module is powered off. Setting of 8, 9, or 10 are not saved	

1.27 Sending USSD Data: +CUSD

Description	To send Unstructured Supplementary Service Data (USSD)	
Format	- AT+CUSD=[<n>[,<str>[,<dcs>]]]<CR> - AT+CUSD?<CR> - AT+CUSD=?<CR>	
Parameter	<n>: to specify whether to display return codes 0: Do not display return codes 1: Display return codes 2: Cancel the request (not available for read command) <str>: USSD string. If this parameter is not set, the module does not access network. <dcs>: 3GPP TS 23.038 [25] Cell Broadcast Data Coding Scheme in integer format (default 0) <m>: 0: no further user action required 1: further user action required 2: USSD terminated by network 3: other local client has responded 4: operation not supported 5: network response times out	
Return Value	<CR><LF>OK<CR><LF> +CUSD: <m>[,<str>,<dcs>]	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CUSD=1,"*100#",15	The operator supports this

	data service.
OK	
+CUSD: 2, "04110430043B0430043D0441003A003300350031002C0035003104400020", 72	
AT+CUSD=?	
+CUSD: (0-2)	Query the value range of parameters.
OK	
Remarks	N/A

1.28 Setting Report Timer: +NSLEEPCFG

Description	To set a timer of reporting incoming signals to wake up	
Format	- AT+NSLEEPCFG=<mode>,<time><CR> - AT+NSLEEPCFG?<CR>	
Parameter	<mode>: 1: timer controlling the delay of reporting incoming signals 2~99: reserved <time>: timer range, 0 to 65535 ms. 0 by default	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+NSLEEPCFG: <mode>,<time>	
	<CR><LF>OK<CR><LF>	
Example	AT+NSLEEPCFG=1,1000 OK	Set the timer to 1000ms. If any data is incoming in sleep mode, it is reported 1 second after the level changes at ring pin.
	AT+NSLEEPCFG? +NSLEEPCFG:1,1000 OK	Query the setting of the timer.
	AT+NSLEEPCFG=1,0	Switch off the timer

	OK
Remarks	This command is valid for non-transparent TCP and SMS messages

2 SMS Commands

2.1 Selecting SMS Services: +CSMS

Description	To select an SMS service among SMS-MO, SMS-MT, and SMS-CB	
Format	• AT+CSMS=<service><CR> • AT+CSMS?<CR> • AT+CSMS=?<CR>	
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	
Return Value	<CR><LF>+CSMS: <mt>,<mo>,<bm>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>+CSMS: <service>,<mt>,<mo>,<bm>	
	<CR><LF>OK<CR><LF>	
Example	<CR><LF>+CSMS: (list of supported <service>s)	
	<CR><LF>OK<CR><LF>	
	AT+CSMS=1 +CSMS: 1, 1, 1 OK	Set SMS service to 1.
	AT+CSMS? +CSMS: 1, 1, 1, 1 OK	Query the current parameter value.
Example	AT+CSMS=? +CSMS: (0-1) OK	Query the value range of SMS service.

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

2.2 Setting Preferred SMS Storage: +CPMS

Description	To set preferred SMS storage	
Format	- AT+CPMS=<mem1><CR> - AT+CPMS?<CR> - AT+CPMS=?<CR>	
Parameter	<mem1>: String type, for example, "SM", "ME", "MT" <used>: Used quantity <total>: Total capacity of the storage <mem1>: "SM": SIM only "ME": ME only	
Return Value	<CR><LF>+CPMS: <used1>, <total1>, <used2>, <total2>, <used3>, <total3> <CR><LF>OK<CR><LF>	
	<CR><LF>+CPMS: <mem1>, <used1>, <total1>, <mem2>, <used2>, <total2>, <mem3>, <used3>, <total3> <CR><LF>OK<CR><LF>	
	<CR><LF>+CPMS: (list of supported <mem1>s), (list of supported <mem2>s), (list of supported <mem3>s) <CR><LF>OK<CR><LF>	
Example	AT+CPMS="SM" +CPMS: 50, 50, 50, 50, 50, 50 OK	Set the SMS storage to "SM", that is, store SMS messages in SIM card.
	AT+CPMS? +CPMS: "SM", 50, 50, "SM", 50, 50, "SM", 50, 50 OK	Query the capacity of current SMS storage.
	AT+CPMS=? +CPMS: ("SM","ME","MT"),("SM","ME","MT"),("SM","ME","MT") OK	Query the available storages.

Remarks	• The settings by this command are saved after the module is powered off. • The default storage is SM.
----------------	--

2.3 Setting SMS Inputting Mode: +CMGF

Description	To set the SMS inputting mode	
Format	• AT+CMGF[=<mode>]<CR> • AT+CMGF?<CR> • AT+CMGF=?<CR>	
Parameter	<mode>: 0: PDU mode 1: Text mode	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CMGF: <mode>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>+CMGF: (list of supported <mode>s) <CR><LF>OK<CR><LF>	
Example	AT+CMGF=1 OK	Set the SMS to text mode.
	AT+CMGF? +CMGF: 1 OK	Query the current mode of SMS message input.
	AT+CMGF=? +CMGF: (0-1) OK	Query the value range of SMS mode setting.
Remarks	N/A	

2.4 Setting the TE Character Set: +CSCS

Description	To set the format of the TE character set	
Format	• AT+CSCS[=<chset>]<CR> • AT+CSCS?<CR> • AT+CSCS=?<CR>	
Parameter	< chset >: • "GSM": Default GSM alphabet (GSM03.38.6.2.1) • "HEX": string consisting of 0x00 to 0xFF in hexadecimal format. E.g. 032FE6 is 3 8-bit characters, which are respectively 3, 47, and 230. (not supported) • "IRA": International reference alphabet (ITU-T T.50) • "8859-1": ISO 8859 Latin 1 character set (not supported) • "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.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CSCS: <chset>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>+CSCS: (list of supported <chset>s) <CR><LF>OK<CR><LF>	
Example	AT+CSCS="IRA" OK	Set IRA character set.
	AT+CSCS? +CSCS: "IRA" OK	Query the format of current character set.
	AT+CSCS=? +CSCS: ("IRA","GSM","UCS2") OK	Query the character set formats that the module supports. The list of the character set formats is returned.
Remarks	The default value is IRA.	

2.5 Setting SMS Indication Mode: +CNMI

Description	To set the mode how the module informs users of new SMS messages received from the network
Format	- AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]<CR> - AT+CNMI?<CR> - AT+CNMI=?<CR>
Parameter	<mode>: Set the instruction mode after receiving SMS messages. 0: SMS instruction codes can be saved in the buffer of the module. If the TA is full, the old codes can be saved in other place or replaced with new codes. 1: When the module is online, it will discard saved SMS instruction codes and reject new codes. In other situations, the codes are displayed on the end device. 2: When the module is online, the SMS instruction codes are saved in the buffer of the module. After the connection is released, the SMS instruction codes are output through UART. In other situations, codes are directly displayed on the end device. 3: when the module is online, SMS indicator code and other data are transmitted together and the code will be displayed on the device. <mt>: Set the format of the new SMS instruction codes. The default value is 0. 0: SMS instruction codes will not be sent to the end device (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 1. 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 1. 0: No status report of SMS message sending 1: The format of the SMS sending status report is +CDS :<fo>,<mr>,[<ra>],[<tora>],<scts>, <dt>,<st>(text mode). 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.	
Return Value	See the Example.	
Example	AT+CNMI=1,1,0,0,0 OK	Set the SMS message indication mode.
	AT+CNMI=? +CNMI: (0-2),(0-3),(0,2),(0-2),(0,1) OK	Query the value ranges of the paramters.
	AT+CNMI? +CNMI: 1, 1, 0, 0, 0 OK	Query the current setting of the parameters.
Remarks	- The default settings of this command are 0, 0, 0, 0, 1. - The recommended setting is +CNMI: 2,1,0,0,0 (new messages are stored on SIM card rather than displayed directly) or +CNMI: 2,2,0,0,0 (new messages are displayed rather than stored on SIM card). - SMS message types: - Class 0: Displayed not stored - Class 1: Stored in ME - Class 2: Stored in SIM - Class 3: Sent to TE	

2.6 Reading SMS Messages: +CMGR

Description	To read SMS messages stored in current memory (use the AT+CPMS command to specify the current memory)
Format	AT+CMGR=<index><CR>
Parameter	<index> : location value <index> from preferred message storage <mem1> to the TE
Return Value	Text mode (+CMGF=1) - The command is executed successfully and the command is SMS-DELIVER: +CMGR: <stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>]<CR><LF><data> - The command is executed successfully and the command is SMS-SUBMIT: +CMGR: <stat>,<da>,[<alpha>],<toda>,<fo>,<pid>,<dc>,[<vp>],<sca>,<tosca>,<length>]<CR><LF><data> - The command is executed successfully and the command belongs to SMS-STATUS-REPORT: +CMGR: <stat>,<fo>,<mr>,[<ra>],<tora>,<scts>,<dt>,<st> - The command is executed successfully and the command is SMS-COMMAND: +CMGR: <stat>,<fo>,<ct>,[<pid>],[<mn>],[<da>],[<toda>],<length>]<CR><LF><cdata>] - The command is executed successfully and the command supports CBM storage: +CMGR: <stat>,<sn>,<mid>,<dc>,<page>,<pages>]<CR><LF><data> Stat: "REC UNREAD" Received unread "REC READ" Received read "STO UNSENT" Stored unsent "STO SENT" Stored sent PDU mode (+ CMGF=0) and the command is executed successfully: +CMGR: <stat>,[<alpha>],<length>]<CR><LF><pdu> Stat: 0 Received unread 1 Received read 2 Stored unsent 3 Stored sent

	Alpha: number of characters to represent Length: number of octets of the given TP-level data unit (octets that do not contain the service center address) pdu: PDU data	
Example	AT+CMGR=1 +CMGR: "REC READ","66421",,"11/09/13,16:37:59+32" 050003140401E27778592EA7E7EBE9373C3C279BCF68F59AA DC78FED62779BA596D7EBAEB5B91EBD16A5D46C35F98406 A744E311A95C32594DA75688B50EADACA6D689150EADF1B2 BC5E579AD575E5B5582D5EABD5624C36A3D56C375C0E1693 CD6835DB0D9783A15C91D2E06BDAA558AC1F60C52B937CA DCD2B747AA9021BDEC627E8E9441BD42655DEF446 OK	Read the message indexed as 1.
	AT+CMGF=0 OK AT+CSCS="UCS2" OK +CMTI: "SM",39 AT+CMGR=39 +CMGR: 0,,23 0891683110501905F0240BA18177377949F50000413062312503 230468341A0D OK	Set to PDU mode. Incoming SMS Read SMS.
	AT+CMGF=1 OK AT+CSCS="GSM" OK +CMTI: "SM",40 AT+CMGR=40 +CMGR:"REC UNREAD","18777397945",,"14/03/26, 13:57:58+32" hello world OK	Set to text mode Incoming SMS. Read SMS.
Remarks	If the received message is unread, its status in the storage changes to received read after executing this command.	

2.7 SMS Message List: +CMGL

Description	To read SMS messages of one type from the current memory specified by the +CPMS command
Format	- AT+CMGL[=<stat>]<CR> - AT+CMGL=?<CR>
Parameter	<state>: 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
Return Value	Text mode (+CMGF=1) - Command is executed successfully and is SMS-SUBMITs and/or SMS-DELIVERs: +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>[...]] - Command is executed successfully and SMS-STATUS-REPORTs: +CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [<CR><LF>+CMGL: <index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> [...]] - Command successful and SMS-COMMANDs: +CMGL: <index>,<stat>,<fo>,<ct> [<CR><LF>+CMGL: index>,<stat>,<fo>,<ct>[...]] - Command successful and CBM storage: +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) Command is executed successfully: +CMGL: <index>,<stat>,<[alpha]>,<length><CR><LF><pdu>[<CR><LF> +CMGL: <index>,<stat>,<[alpha]>,<length><CR><LF><pdu>[...]]	
Example	AT+CMGL="ALL" +CMGL: 1,"REC READ","66421","", "2011/09/13 16:37:59+32" 050003140401E27778592EA7E7EBE9373C3C279BCF68F59AADC78FED6277 9BA596D7EBAEB5B91EBD16A5D46C35F98406A744E311A95C32594DA75688 B50EADACA6D689150EADF1B2BC5E579AD575E5B5582D5EABD5624C36A3 D56C375C0E1693CD6835DB0D9783A15C91D2E06BDAA558AC1F60C52B937 CADCD2B747AA9021BDEC627E8E9441BD42655DEF446 +CMGL: 14,"STO SENT","66045","", 050003010401E27778592EA7E7EBE9373C3C279BCF68F59AADC78FED6277 9BA596D7EBAEB5B91EBD16A5D46C35F98406A744E311A95C32594DA75688 B50EADACA6D689150EADF1B2BC5E579AD575E5B5582D5EABD5624C36A3 D56C375C0E1693CD6835DB0D9783A15C91D2E06BDAA558AC1F60C52B937 CADCD2B747AA9021BDEC627E8E9441BD42655DEF446 +CMGL: 44,"REC UNREAD","8615719556937","", "2011/09/30 03:00:55+32" 5E7F4E1C79FB52A863D0919260A8003A4E2D536B7528623700310035003700 3100390035003500360039003300377ED960A86765753500326B21002C67005 40E4E006B21572800320039002F00300039002000320030003A00340038002C 60A853EF6309901A8BDD952E621690099879952E76F463A556DE62E8 OK.	
	AT+CMGL=? +CMGL: ("REC UNREAD", "REC READ", "STO UNSENT", "STO SENT", "ALL") OK	Query in text format (AT+CMGF=1).
	AT+CMGL=? +CMGL: (0-4) OK	Query in PDU format (AT+CMGF=0).
	AT+CMGL=ALL ERROR	A pair of quotation marks (") is required for the parameter.
	AT+CMGF=1 OK AT+CMGL=4 ERROR	The parameter should be set to 0.

	AT+CMGF=0 OK AT+CMGL="ALL" ERROR	The parameter should be set to 1 .
Remarks	N/A	

2.8 Sending SMS Messages: +CMGS

Description	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	- 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)	
Parameter	<da> : The destination number to which the SMS message is sent in text mode <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	
Return Value	- if text mode (+CMGF=1) and sending successful: <CR><LF>+CMGS: <mr>[,<scts>] <CR><LF>OK<CR><LF> - if PDU mode (+CMGF=0) and sending successful: <CR><LF>+CMGS: <mr>[,<ackpdu>] <CR><LF>OK<CR><LF> <scts> : service center time stamp <ackpdu> : 3GPP 23.040 RP-User-Data element of RP-ACK PDU	
Example	AT+CMGS="66358"<CR> > This is the text → +CMGS: 171 OK	Text mode(+CMGF=1) → is the symbol after pressing Ctrl+Z .

	AT+CMGS="15889758493"<CR> > This is the text → ERROR	AT+CMGF=1 might not be executed.
	AT+CMGS=33<CR> > 0891683108705505F001000B815118784271F2000 8146DF157335E025B9D5B89533A59276D6A80545 EFA → +CMGS: 119 OK	PDU mode (+CMGF=0)
Remarks	N/A	

2.9 Writing SMS Messages: +CMGW

Description	To write an SMS message into the memory The location information <index> will be returned after the message is saved correctly.	
Format	- 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)	
Parameter	<da> : The destination number to which the SMS message is sent in text mode <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	
Return Value	<CR><LF>+CMGW:<index> <CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF>	
Example	AT+CMGW="091137880" <CR> >"This is the text"<Ctrl+Z> +CMGW: 15 OK	Text mode (+CMGF=1)

	AT+CMGW=091137880 ERROR	A pair of quotation marks (") is required for the number in text mode.
	AT+CMGW=31<CR> >0891683108705505F001000B813124248536F3000 81200400026002A535A53D153A653C1532052C7<Ct rl+Z> +CMGW: 1 OK	PDU mode (+CMGF=0)
Remarks	If PDU messages is sent through a UART commissioning tool, press the Enter button or enter <CR> in hexadecimal format.	

2.10 Sending Messages from Storage: +CMSS

Description	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	AT+CMSS=<index>[,<da>[,<toda>]]<CR>	
Parameter	<index> : Message location <da> : the destination number of the SMS messages <toda> : type of address	
Return Value	- if text mode (+CMGF=1) and sending successful: <CR><LF>+CMSS: <mr>[,<scts>] <CR><LF>OK<CR><LF> - if PDU mode (+CMGF=0) and sending successful: <CR><LF>+CMSS: <mr>[,<ackpdu>] <CR><LF>OK<CR><LF> <mr> : message reference number <scts> : service center time stamp <ackpdu> : 3GPP 23.040 RP-User-Data element of RP-ACK PDU	
Example	AT+CMSS=2 +CMSS: <mr> OK	Send the SMS messages stored in memory 2.

	AT+CMSS=2 ERROR	No SMS message is stored in memory 2 or the SMS message number in memory 2 is incorrect.
Remarks	N/A	

2.11 Deleting SMS Messages: +CMGD

Description	To delete SMS messages from the current memory.	
Format	- AT+CMGD=<index>[,<delflag>]<CR> - AT+CMGD=?<CR>	
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.	
Return Value	<CR><LF>OK<CR><LF> <CR><LF>+CMGD: (list of supported <index>s, list of supported <delflag>s) <CR><LF>OK<CR><LF>	
Example	AT+CMGD=0,3 OK	Delete all read, sent, and unsent SMS messages. Delete successfully
	AT+CMGD=? +CMGD:(0-50),(0-4) OK	Query the value ranges of parameters.
	AT+CMGD=5 ERROR	The 5 th message does not exist.
Remarks	If we set <delflag> , ignore the parameter <index> .	

2.12 Setting SMS Center Number: +CSCA

Description	To set the SMS center number	
Format	- AT+CSCA=<sca>[,<tosca>]<CR> - AT+CSCA?<CR>	
Parameter	<sca> : SMS center number <tosca> : The format of the SMS center number. 129 indicates national number; 145 indicates international number.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CSCA:<sca>, <tosca> <CR><LF>OK<CR><LF>	
Example	AT+CSCA="8613800755500",145 OK	Set an international SMSC number.
	AT+CSCA=8613800755500,145 OK	A pair of quotation marks (") are not mandatory for SMSC number.
	AT+CSCA? +CSCA: "+8613800755500",145 OK	Query the SMSC number.
Remarks	This command is not supported on a CDMA network.	

2.13 Setting Text Mode Parameters: +CSMP

Description	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	• AT+CSMP=[<fo>[,<vp>[,<pid>[,<dc>]]]]<CR> • AT+CSMP?<CR>					
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>: <table><tr><th>Value</th><th>Validity Period</th></tr><tr><td></td><td></td></tr></table>		Value	Validity Period		
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)	
	<dc> : Encoding plan for integer-type cell broadcast data (default value: 0)	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+CSMP: <fo>,<vp>,<pid>,<dc>	
	<CR><LF>OK<CR><LF>	
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?	
	+CSMP: 17,167,0,0	Query the current settings of the text mode.
	OK	
Remarks	The default setting is,,0,0.	

2.14 Displaying the Parameters of the Text Mode: +CSDH

Description	To set whether the detailed header information is displayed in the result code in text mode	
Format	• AT+CSDH=[<show>]<CR> • AT+CSDH?<CR> • AT+CSDH=?<CR>	
Parameter	<show>: 0: not display (default value) 1: display	
Return Value	See the Example.	
Example	AT+CSDH=0	Set the header information to not display
	OK	
	AT+CMGR=0	Read the 0 th

	+CMGR:"RECREAD","13510895077",,"15/07/23,20:58:28 +32" abc OK	message.
	AT+CSDH=1 OK AT+CMGR=0 +CMGR:"RECREAD","13510895077",,"15/07/23,20:58:28 +32",161,36,0,0,"+8613010888500",145,3 abc OK	Set the detailed header information to display. Read the 0 th message.
	AT+CSDH? +CSDH: 0 OK	Query the current parameter setting of the command.
	AT+CSDH=? +CSDH: (0-1) OK	Query the value range of parameter in the command.
Remarks	This command is valid in text mode, which can be set by AT+CMGF=1 .	

2.15 Save Settings: +CSAS

Description	To save current settings	
Format	- AT+CSAS[=<profile>]<CR> - AT+CSAS=?<CR>	
Parameter	<profile>: 0: Save settings (or omit the parameter)	
Return Value	See the Example.	
Example	AT+CSAS OK	Save settings
	AT+CSAS=0 OK	Save settings
	AT+CSAS=1	

	ERROR	
	AT+CSAS=? +CSAS: 0 OK	Query the valid parameter values for the command.
Remarks	Only the parameter settings of AT+CSCA , AT+CSMP , and AT+CSCB can be saved by executing this command.	

3 TCP/UDP Client Commands

3.1 Setting Network APN: +NETAPN

Description	To set the network APN	
Format	- AT+NETAPN="APN","USERNAME","PASSWORD"<CR> - AT+NETAPN?<CR>	
Parameter	APN : GPRS network access point USERNAME : GPRS user name PASSWORD : GPRS password	
Return Value	OK	
Example	AT+NETAPN="CMNET","","" OK	Set GPRS APN to CMNET and leave user account and password blank.
	AT+NETAPN=CMNET,, ERROR	A pair of quotation marks is required for each parameter.
	AT+NETAPN? +NETAPN:"","","" OK	Query the current settings of APN parameter.
Remarks	N/A	

3.2 Setting Up a PPP Link: +XIIC

Description	To set up a PPP link	
Format	- AT+XIIC=<n><CR> - AT+XIIC?<CR>	
Parameter	n : 0: Disconnect 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	- Send AT+CGDCONT to set APN before executing this command. - 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.	

3.3 Setting Up TCP Connection: +TCPSETUP

Description	To set up a TCP Connection	
Format	AT+TCPSETUP=<n>,<ip>,<port><CR>	
Parameter	<n>: Socket number, 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	
Return Value	See the Example.	
Example	AT+TCPSETUP=0,220.199.66.56,6800 OK	The link to 220.199.66.56,6800 is successfully set up on socket 0.
	+TCPSETUP: 0,OK	

	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.	

3.4 Sending TCP Data: +TCPSEND

Description	To send TCP data
	The module will return > after this command is sent. Send TCP data 50 ms to 100 ms later.
Format	AT+TCPSEND=<n>,<length>[,<content>][,<mode>]<CR>
Parameter	<n>: Socket number, ranging from 0 to 5. A TCP connection is established on the socket.
	<length>: The length of the data to be sent, ranging from 1 to 4096, unit: byte.
	1 to 2018 for HEX data sent in buffer mode 1 to 4096 for ASCII data sent in buffer mode

	1 to 512 for data sent in command mode (HEX and ASCII)
	<content> : data sent in command mode with a length ranging from 0 to 1024, supports data link escape
	<mode> : data format
	0: ASCII, supports data link escape (default)
	1: HEX
Return Value	AT+TCPSEND=<n>,<length>[,<content>][,<mode>]<CR>
	Buffer mode
	<CR><LF>><content>
	<CR><LF>OK<CR><LF>
	Command mode
Return Value	<CR><LF>OK<CR><LF>
	Error code
	• <CR><LF>+TCPSEND: ERROR<CR><LF> • <CR><LF>+TCPSEND: <n>, OPERATION EXPIRED<CR><LF> • <CR><LF>+TCPSEND: SOCKET ID OPEN FAILED<CR><LF> • <CR><LF>+TCPSEND: DATA LENGTH ERROR<CR><LF> • <CR><LF>ERROR<CR><LF>
Example	AT+TCPSEND=0,1
	>
	OK
	+TCPSEND:0,1
	1-byte data is successfully sent through socket 0.
Example	AT+TCPSEND=0,1024,,1
	>
	OK
	+TCPSEND:0,1024
	Send 1024-byte HEX data in buffer mode.
Example	AT+TCPSEND=0,27,"3~!@#\$%^&*()_+;32",32
	>
	OK
	+TCPSEND: 0,27
	Command mode
Example	AT+TCPSEND=0,3,"313233",1
	>
	OK
	+TCPSEND: 0,3
	Command mode, HEX format

	+TCPSEND: 0,3	
	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.
Remarks	• Ensure that the 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. • The settings are not saved. • To send data containing more than 15 commas, use buffer mode.	

3.5 Setting Receive Mode: +RCVMODE

Description	To set the receive mode of TCP and UDP data
Format	• AT+RCVMODE=<n><CR> • AT+RCVMODE?<CR> • AT+RCVMODE=?<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>

	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+RCVMODE: (0-1), (0-1)	
	<CR><LF>OK<CR><LF>	
	<CR><LF>+RCVMODE: <n>[,<mode>] <CR><LF>OK<CR><LF>	
Example	AT+RCVMODE=0 OK	Set data receiving mode.
	AT+RCVMODE=1,1 OK	HEX report in command mode
	AT+RCVMODE=? +RCVMODE: (0-1),(0-1) OK	Query value ranges of parameters in this command
Remarks	- Do not send this command during communication because it clears the buffer. - This command also works for UDP data. - The setting are not saved after the module is powered off.	

3.6 Unsolicited TCP Data Output: +TCPRECV

Description	Unsolicited TCP data output. When the module receives TCP data from the network, the UART prints the data automatically.	
Format	+TCPRECV:<n>,<length>,<data><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5 <length>: Length of the data received <data>: Data received Add 0x0d 0x0a to the end of the data. Identify the end based on <length>.	
Return Value	See the Example.	
Example	+TCPRECV:0,10,1234567890	10-byte data is successfully received on socket 0. The data is 1234567890.
Remarks	N/A	

3.7 Reading TCP Data: +TCPREAD

Description	To read TCP data	
Format	AT+TCPREAD=<n>,<length><CR>	
Parameter	<n>: socket number, ranging from 0 to 5 <length>: maximum length of data allowed to read, ranging from 1 to 2048	
Return Value	See the Example	
Example	+TCPRECV: 0,10 AT+TCPREAD=0,100 +TCPREAD: 0,10,1234567890 OK	Socket 0 receives data. Read data. The data read is 1234567890.
Remark	Execute +RECVMODE to select data receive mode.	

3.8 Closing TCP Connection: +TCPCLOSE

Description	To close a TCP connection	
Format	AT+TCPCLOSE=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5	
Return Value	See the Example.	
Example	AT+TCPCLOSE=1 +TCPCLOSE: 1,OK	Close the TCP connection. The TCP connection on socket 1 is closed successfully.
	AT+TCPCLOSE=2 +TCPCLOSE: ERROR	Socket number error
	+TCPCLOSE: 0,Link Closed	The TCP connection is closed. The server sends TCP connection closing command or the network encounters abnormality or weak signals.
Remarks	N/A	

3.9 Setting Up UDP Connection: +UDPSETUP

Description	To set up a UDP connection	
Format	AT+UDPSETUP=<n>,<ip>,<port><CR>	
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	
Return Value	See the Example.	
Example	AT+UDPSETUP=1,220.199.66.56,7000 OK +UDPSETUP: 1,OK	The connection 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,ERROR1	A TCP/UDP connection is already set up on socket 0.
	AT+UDPSETUP=1,192.168.20.6,7000 OK +UDPSETUP: 1,FAIL	Fails to set up the connection to 192.168.20.6,7000 on socket 1 because socket 1 is unavailable.
	AT+UDPSETUP=6,192.168.20.6,6800 +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 ERROR	The AT command is not complete.
Remarks	Use the AT+XIIC=1 command to set up a PPP link before executing this command.	

3.10 Sending UDP Data: +UDPSEND

Description	To send UDP data The module will return > after this command is sent. Send UDP data 50 ms to 100 ms later.	
Format	AT+UDPSEND=<n>,<length>[[,<content>]][,<mode>]<CR>	
Parameter	<n>: Socket number, ranging from 0 to 5. A UDP connection is established on the socket. <length>: Length of the data to be sent, unit: byte. 1 to 2018 for HEX data sent in buffer mode 1 to 4096 for ASCII data sent in buffer mode 1 to 512 for data sent in command mode (HEX and ASCII) <content>: data sent in command mode with a length ranging from 0 to 1024, supports data link escape <mode>: data format 0: ASCII, supports data link escape (default) 1: HEX	
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 connection has not been set up, the module returns +UDPSEND: RROR. - After entering the command, input the data 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,,1 > OK +UDPSEND: 0,1024	Send 1024-byte HEX data in buffer mode. Data is sent successfully.
	AT+UDPSEND=0,27,"!@#\$%^&*()_+;332\","32\"" OK	Command mode

	+UDPSSEND: 0,27	
	AT+UDPSSEND=0,3,"313233",1 OK	Command mode, HEX format
	+UDPSSEND: 0,3	
	AT+UDPSSEND=0,4097 +UDPSSEND: DATA LENGTH ERROR	4097-byte data fails to be sent on socket 0 because data length exceeds the limit.
	AT+UDPSSEND=0,10 > +UDPSSEND: 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.
Remarks	• Ensure that the UDP link is set up before sending UDP data. • To decrease the packet loss rate, do not send more than 1472 each time. • Backslash is used for data link escape. For how to send quotation marks or backlash in character string, see the example. • The settings are not saved. • To send data containing more than 15 commas, use buffer mode.	

3.11 Unsolicited UDP Data Output: +UDPRECV

Description	Unsolicited UDP data output. When the module receives UDP data from the network, the UART prints the data automatically.	
Format	+UDPRECV: <n>,<length>,<data><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5 <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	+UDPRECV: 0,10,1234567890	10-byte data is successfully received on socket 0. The data is 1234567890.
Remarks	N/A	

3.12 Reading UDP Data: +UDPREAD

Description	To read UDP data	
Format	AT+UDPREAD=<n>,<length><CR>	
Parameter	<n>: socket number, ranging from 0 to 5 <length>: maximum length of data allowed to read	
Return Value	See the Example	
Example	+UDPRECV: 0 AT+UDPREAD=0,100 +UDPREAD: 0,10,1234567890 OK	Socket 0 receives data. Read data. The data read is 1234567890.
Remark	N/A	

3.13 Closing UDP Connection: +UDPCLOSE

Description	To close the UDP connection	
Format	AT+UDPCLOSE=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5	
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=6 +UDPCLOSE: ERROR	Socket number error
Remarks	N/A	

3.14 Querying TCP/UDP Socket Status: +IPSTATUS

Description	To query the TCP/UDP socket status
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Format	AT+IPSTATUS=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5	
Return Value	+IPSTATUS: <n>,<CONNECT or DISCONNECT or CONNECTING or DISCONNECTING>[,<TCP or UDP>, <send-buffer-size>] <CONNECT or DISCONNECT>: Socket status, value: CONNECT or DISCONNECT, or CONNECTING or DISCONNECTING <TCP or UDP>: 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	A TCP connection has been set up on socket 0 and the buffer size is 4096 bytes.
	AT+IPSTATUS=0 +IPSTATUS: 0,CONNECT,UDP,0	A UDP connection has been set up on socket 0.
	AT+IPSTATUS=1 +IPSTATUS: 1,DISCONNECT	No TCP or UDP connection is set up on socket 1.
	AT+IPSTATU ERROR	The AT command is not complete.
	AT+IPSTATUS=6 ERROR	The socket number in the command is incorrect.
Remarks	<send-buffer-size> is not supported on UDP connection	

3.15 Querying Status of Data Sent by TCP Socket: +TCPACK

Description	To query the size of data successfully sent by the TCP socket and the size of the data successfully received	
Format	AT+TCPACK=<n><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5	
Return Value	+TCPACK: <n>,<data_sent>,<acked_recv> <data_sent>: Data successfully sent through this socket <acked_recv>: Data acknowledged by the receiver	

	+TCPACK:<n>,< DISCONNECT > No connection is set up on this socket. +TCPACK:NO TCP LINK A UDP connection is already set up on this socket.	
Example	AT+TCPACK=0 + TCPACK: 0,20,20	20-byte data has been transmitted from socket 0 and the receiver acknowledged 20-byte data.
	AT+TCPACK=0 + TCPACK: 0,128,120	128-byte data has been transmitted from socket 0 and the receiver acknowledged 120-byte data.
	AT+TCPACK=1 + TCPACK: 1,DISCONNECT	No connection is set up on socket 1.
	AT+TCPACK=2 +TCPACK: NO TCP LINK	A UDP connection is set up on socket 2.
	AT+TCPACK=6 ERROR	The socket number in the command is incorrect.
Remarks	The values of <data_sent> and <acked_recv> are unsigned 64-bit integers in decimal ASCII. The unit is byte.	

3.16 Setting DNS Server: DNSSERVER

Description	To set primary and secondary DNS servers	
Format	• AT+DNSSERVER? <CR> • AT+DNSSERVER=<n>,<dns-ip><CR>	
Parameter	<n> : DNS server number, ranging from 1 to 2 <dns-ip> : IP address of DNS server	
Return Value	See the Example.	
Example	AT+DNSSERVER? +DNSSERVER:dns1:114.114.114.114;dns2:0.0.0.0	Query DNS server.
	AT+DNSSERVER=1,114.114.114.114 +DNSSERVER:OK	Set DNS server.
Remarks	In general, you do not have to set DNS server, which will be issued by base station during PPP negotiation.	

3.17 Setting PDP Keepalive Heartbeat: +PDPKEEPALIVE

Description	To set PDP keepalive heartbeat	
Format	- AT+PDPKEEPALIVE?<CR> - AT+PDPKEEPALIVE=<onoff>,<interval><CR>	
Parameter	<onoff> : heartbeat switch 0: disable (default) 1: enable <interval> : heartbeat interval, ranging from 1 to 65535. Unit: second	
Return Value	See the Example	
Example	AT+PDPKEEPALIVE? +PDPKEEPALIVE: 1,5 OK	Query heartbeat setting.
	AT+PDPKEEPALIVE=1,60 OK	Enable heartbeat and set the interval to 60 seconds.
Remarks	Activate PDP before sending this command.	

3.18 Querying PDP Status: +PDPSTATUS

Description	To query the status of PDP	
Format	AT+PDPSTATUS<CR>	
Parameter	NA	
Return Value	See the Example	
Example	AT+PDPSTATUS +PDPSTATUS: CONNECT	PDP connected
	AT+PDPSTATUS +PDPSTATUS: DISCONNECT	PDP disconnected
	AT+PDPSTATUS +PDPSTATUS: PSEUDO_CONNECT	PDP activated, but in pseudo_connect state
Remarks	N/A	

4 TCP Server AT Commands

4.1 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	Listening port ID: 6800
	+TCPLISTEN: 0,OK	The server starts to listen.
	AT+TCPLISTEN=6800	
	+TCPLISTEN: bind error	Fails to bind
	AT+TCPLISTEN=6800	
	Listening...	Transparent listening has been set.
	AT+TCPLISTEN?	
Example	+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.
Example	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	Only the SIM cards with fixed IP addresses can be used as servers.	

4.2 Closing Listening Socket: +CLOSELISTEN

Description	To close the listening socket 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 socket or network abnormalities occur.
	AT+CLOSELISTEN +CLOSELISTEN: 0,local link closed	The connections to the client are closed.
	AT+CLOSELISTEN +CLOSELISTEN: Transparent local link closed	Transparent mode
Remarks	N/A	

4.3 Closing Remote Socket: +CLOSECLIENT

Description	To close remote sockets	
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 remote sockets are closed successfully.
	AT+CLOSECLIENT=1 +CLOSECLIENT: 1,remote link closed	Close socket 1.
	AT+CLOSECLIENT=1 ERROR	No client connected to socket 1.
	AT+CLOSECLIENT +CLOSECLIENT: All remote link closed	All clients are closed.

Remarks	N/A
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4.4 Unsolicited TCP Data Output: +TCPRECV(S)

Description	Unsolicited TCP data output. When the module receives TCP data from the client, the UART prints the data automatically.	
Format	+TCPRECV(S): <n>,<length>,<data><CR>	
Parameter	<n>: Socket ID, ranging from 0 to 5 <length>: Length of the data received <data>: Data received Add 0x0d 0x0a to the end of the data. 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.
Remarks	Additional (s) makes this command different from the receive mode of the client mode in format.	

4.5 Reading TCP Data: +TCPREADS

Description	To read TCP data	
Format	+TCPREAD(S): <n>,<length><CR>	
Parameter	<n>: socket number, ranging from 0 to 5 <length>: maximum length of data allowed to read, ranging from 1 to 2048	
Return Value	See the Example	
Example	+TCPRECV(S): 1 AT+TCPREADS=1,100 +TCPREADS: 1,10,1234567890 OK	Socket 0 receives data. Read data. The data read is 1234567890.
Remark	N/A	

4.6 Sending Data to Client: +TCPSENDS

Description	To send data to the client	
Format	AT+TCPSENDS=<socket>[,<length>]<CR>	
Parameter	<socket> : 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 > +TCPSENDS: Buffer not enough,439	536-byte data is sent on socket 0. Fails to transmit the data because internal buffer is insufficient.
	AT+TCPSENDS=0 > OK +TCPSENDS: 0,21	Send 21-byte data on socket 0. (e.g.: 012345678901234567890).
	AT+TCPSENDS=0,10 +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.	

4.7 Querying Client Connection Status: +CLIENTSTATUS

Description	To query the connection status of the client
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Format	AT+CLIENTSTATUS=<socket><CR>	
Parameter	<socket>: The value of AcceptSocket , that is, the socket of the module. See the description of the AT+TCPLISTEN command.	
Return Value	+CLIENTSTATUS: <socket>,<CONNECT or DISCONNECT>,<TCP or INVALID>,<send-buffer-size> < CONNECT or DISCONNECT >: Socket status, value: CONNECT or DISCONNECT < TCP or INVALID >: Socket type, value: TCP or INVALID < send-buffer-size >: The size of the available send buffer on the module, in decimal ASCII mode, unit: byte	
Example	AT+CLIENTSTATUS=0 +CLIENTSTATUS: 0,CONNECT,TCP,61440	A TCP connection to client has been set up to the socket 0 and the buffer size is 61440 bytes.
	AT+CLIENTSTATUS=4 +CLIENTSTATUS: 4,DISCONNECT	No connection is set up on socket 4.
	AT+CLIENTSTATUS=1 +CLIENTSTATUS: 1,CONNECT,INVALID	The connection does not exist.
Remarks	If the socket is invalid, it may be the listen socket of TCP/UDP client or server.	

4.8 Querying Status of Data Sent by TCP Server: +TCPACK

Description	To query the size of data successfully sent by the TCP server and the size of the data successfully received	
Format	AT+TCPACKS=<socket><CR>	
Parameter	< socket >: Socket ID, ranging from 0 to 5	
Return Value	+TCPACKS: <socket>,<data_sent>,<acked_recv> < data_sent >: Data successfully sent through this socket < acked_recv >: Data acknowledged by the client +TCPACK: <socket>,<DISCONNECT> No connection is set up on this socket.	
Example	AT+TCPACK=0	The module sends 20-byte data to client through socket 0 and the client acknowledges 20-byte

	+ TCPACK: 0,20,20	data.
	AT+TCPACK=0 + TCPACK: 0,128,120	The module sends 128-byte data to client through socket 0 and the receiver acknowledges 120-byte data.
	AT+TCPACK=1 + TCPACK: 1,DISCONNECT	No connection to the client is set up on socket 1.
Remarks	The values of <data_sent> and <acked_rcv> are unsigned 64-bit integers in decimal ASCII. The unit is byte.	

5 Transparent TCP/UDP Commands

5.1 Setting Up Transparent TCP Connection: +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 connection is set up successfully.
	AT+TCPTRANS=neowayjsr.oicp.net,60010 OK +TCPTRANS:OK	A transparent TCP connection is set up successfully by using domain name.
	AT+TCPTRANS=220.199.66.56, +TCPTRANS:ERROR	The command is in wrong format.
	AT+TCPTRANS=220.199.66.56,6800 OK +TCPTRANS:FAIL	Fails to set up a transparent TCP connection.
	AT+TCPTRANS=220.199.66.56,6800 ERROR	A transparent (TCP, UDP, TCP server) connection has been set up.
Remarks	- 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. - The module will disconnect 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 connection is set up successfully and **+TCPTRANS:OK** is returned.

5.2 Setting Up Transparent UDP Connection: +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 connection is set up successfully.
	AT+UDPTRANS=neowayjsr.oicp.net,60010 OK +UDPTRANS:OK	A transparent UDP connection 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	Fails to set up a transparent UDP link.
	AT+UDPTRANS=220.199.66.56,6800 ERROR	A transparent (TCP, UDP, TCP server) connection has been set up.
Remarks	• 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.
- The module will disconnect the transparent connection 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 connection is set up successfully and **+UDPTRANS:OK** is returned.

5.3 Querying Status of Data Sent by Transparent TCP Socket: +TCPACK

Description	To query the size of data successfully sent through the transparent TCP connection and the size of the data successfully received	
Format	AT+TCPACK<CR>	
Parameter	N/A	
Return Value	+TCPACK:<data_sent>,<acked_rcv> <data_sent> : Data transparently transmitted through this socket successfully <acked_rcv> : Transparently transmitted data acknowledged by the receiver +TCPACK:<DISCONNECT> No transparent socket in mode has been set up. +TCPACK:NO TCP LINK A transparent UDP link has been set up.	
Example	AT+TCPACK	1024-byte data is successfully sent and
	+TCPACK:1024,1024	received in transparent mode.
	AT+TCPACK	No transparent connection is set up.
	+TCPACK:DISCONNECT	
	AT+TCPACK	A transparent UDP connection is set up.
	+TCPACK:NO TCP LINK	
Remarks	The values of <data_sent> and <acked_rcv> are unsigned 64-bit integers in decimal ASCII. The unit is byte.	

5.4 Querying TCP/UDP Socket Status: +IPSTATUS

Description	To query the TCP/UDP socket status	
Format	AT+IPSTATUS<CR>	
Parameter	N/A	
Return Value	+IPSTATUS:<CONNECT or DISCONNECT>[,<TCP or UDP>, <send-buffer-size> <TRANSPARENT>] <CONNECT or DISCONNECT>: Socket status, value: CONNECT or DISCONNECT <TCP or UDP>: Socket type, value: TCP or UDP <send-buffer-size>: The size of the available send buffer on the module, in decimal ASCII mode, unit: byte	
Example	AT+IPSTATU ERROR	The AT command is not complete.
	AT+IPSTATUS +IPSTATUS:CONNECT,TCP, 61440	A transparent TCP connection is set up. The available buffer is 61440 bytes.
	AT+IPSTATUS +IPSTATUS:CONNECT,UDP, 61440	A transparent UDP connection is set up. The available buffer is 61440 bytes.
	AT+IPSTATUS +IPSTATUS:DISCONNECT	No transparent connection has been set up.
Remarks	This command can be used to query the status of the transparent socket.	

5.5 Closing Transparent Socket: +TRANSCLOSE

Description	To close the transparent socket	
Format	AT+TRANSCLOSE<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+TRANSCLOSE +TRANSCLOSE:0,OK	A transparent TCP socket is closed successfully.
	AT+TRANSCLOSE	No transparent TCP/UDP socket is set

	ERROR	up.
	AT+TRANSCLOSE +TRANSCLOSE:1,OK	A transparent UDP socket is closed successfully.
	+TCPTRANS:Link Closed	The transparent TCP socket is closed.
	+UDPTRANS:Link Closed	The transparent UDP socket is closed.
Remarks	N/A	

6 Transparent TCP Server Commands

6.1 Setting Listening for Transparent TCP: +TCPSRVTRANS

Description	To set transparent listening for the TCP server	
Format	- AT+TCPSRVTRANS=<port><CR> - AT+TCPSRVTRANS?<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+TCPSRVTRANS=6800 +TCPSRVTRANS:OK	Listening port ID: 6800 The transparent listening of the TCP server is started.
	AT+TCPSRVTRANS=6800 +TCPSRVTRANS:bind error	Fails to bind
	AT+TCPSRVTRANS=6800 Transparent Listening...	Transparent listening is set.
	AT+TCPSRVTRANS? + TCPSRVTRANS:listening status	Query the listening status. The server is listened.
	AT+TCPSRVTRANS? +TCPSRVTRANS:not listening	Query the listening status. The server is not listened.
	AT+TCPSRVTRANS=5000 PLEASE BUILD PPP LINK FIRST!	PDP is not activated.
	Connect AcceptSocket=0,ClientAddr=119.123.77.133,ClientPort=8000	
	Receive the connection request from the client. The client has set up socket 0 with the module and 119.123.77.133 is the IP address of the client, 8000 is the port ID of the client.	
Remarks	- A connection must be set up between the server and the client through a socket before the server transparently transmits TCP data. - Use +++ to switch the server to command mode and ATO to switch it to data	

mode.

- Only the SIM cards with fixed IP addresses can be used as servers.
- The server set up in transparent mode can be connected to only one TCP client (transparent mode or non-transparent mode).
- The server will automatically disconnect from the client if a call or message is incoming.

6.2 Querying Socket Status of Client: +CLIENTSTATUS

Description	To query the socket status of the client	
Format	AT+CLIENTSTATUS<CR>	
Parameter	N/A	
Return Value	+CLIENTSTATUS:<CONNECT or DISCONNECT>,<TCP>, <send-buffer-size> <CONNECT or DISCONNECT>: Socket status, value: CONNECT or DISCONNECT <TCP>: Socket type, value: TCP <send-buffer-size>: The size of the available send buffer on the module, in decimal ASCII mode, unit: byte	
Example	AT+CLIENTSTATUS +CLIENTSTATUS:CONNECT,TCP,61440	A transparent TCP connection is set up and the buffer size is 61440 bytes.
	AT+CLIENTSTATUS +CLIENTSTATUS:DISCONNECT,TCP,61440	No transparent TCP connection is set up. The available buffer is 61440.
Remarks	N/A	

7 FTP AT Commands

7.1 Logging in to 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	user1 logs in to the server 219.134.179.52 through port 21 successfully. And the password for user1 is pwd2009.
	+FTPLOGIN: User logged in	
	AT+FTPLOGIN=58.60.184.213,21,neoway,neoway OK	Fails to log in to the FTP server using neoway because the connection times out.
	+FTPLOGIN: Error Connect Server Fail	
	AT+FTPLOGIN=58.60.184.213,21,neowayftp,neow	Fails to log in to the FTP

	ayftp OK +FTP:Server Control Link Disconnect	server.
Remarks	- The FTP functions cannot be used together with the internal protocol stack TCP/UDP function. - Data read and write on the FTP server can be performed only after login.	

7.2 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	

7.3 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 <offset>: Specifies offset of file content. <length>: Length of file downloaded from the start point, ranging from 1 to 8192
Return Value	ERROR: 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 interval 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.
Example	<pre> 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 Obtain information in 10:36 1M.doc the root directory. -rw-rw-rw- 1 user group 10 Jan 15 15:01 test.txt +FTPGET: OK.total length is 446 +FTP: Server Data Link Disconnect </pre> <pre> 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 +FTP: Server Data Link Disconnect </pre> <pre> AT+FTPPUT=test.txt,1,2,10 > </pre> Upload 10-byte data.

	+FTPPUT: OK,10	
	AT+FTPGET=test.txt,1,1	
	+FTPGET: 10,0123456789	
	+FTPGET: OK.total length is 10	Obtain the information in test.txt.
	+FTP: Server Data Link Disconnect	
	AT+FTPGET=test.txt,1,1,2	
	+FTPGET: 8,23456789	
	+FTPGET: OK.total length is 8	Read all data after the first byte.
	+FTP: Server Data Link Disconnect	
	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.
	+FTP: Server Data Link Disconnect	
Remarks	N/A	

7.4 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 will be 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. This parameter is not included in transparent transmission mode.	
Return Value	• 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. (None-transparent) • +FTPPUT: OK,<n>: The file is sent successfully and the file length is n. • +FTPPUT: Delete File OK: The file is deleted successfully. • +FTPPUT: ErrorTimeOut: No data input for long time. (None-transparent) • +FTPPUT: OK,<size>: None-transparent • CONNECT +FTPPUT: OK,<size> (transparent)	
Example	AT+FTPPUT=test.txt,1,1,10 >1234567890 +FTPPUT: OK,10	Upload the test.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 test.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.
	AT+FTPPUT=test.txt,1,1 CONNECT 1234567890 +FTPPUT:OK,10	Transparent mode
	AT+FTPPUT=test.txt,1,2 CONNECT 1234567890 +FTPPUT:OK,10	Transparent mode
	AT+FTPPUT=test.txt,1,3 +FTPPUT:Delete File OK	Transparent mode
Remarks	• Use to exit from transparent transmission mode and end uploading	

- In transparent mode, it is recommended to use buffer mode or APPE mode for large files. Otherwise, the port will be occupied all the time and this affects other commands.

7.5 Querying FTP Socket 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	Query the FTP socket status.
	+FTPSTATUS: 1,119.139.221.66,21	The module is successfully connected to the FTP server.
	AT+FTPSTATUS	
	+FTPSTATUS: 0,0.0.0.0,21	Not logged in
Remarks	N/A	

8 HTTP Commands

8.1 Setting HTTP Parameters: +HTTTPARA

Description	To set HTTP parameters	
Format	AT+HTTTPARA=<para>,<para_value><CR>	
Parameter	<para> : HTTP parameters, supporting the following two parameters: url: Destination path port: Destination port ID (no default value) <para_value> : The value of <para> . The value of url contains at most 512 bytes and url supports domain name translation.	
Return Value	See the Example.	
Example	AT+HTTTPARA =url,www.neoway.com.cn/en/index.aspx OK	Set the Neoway homepage as the URL. The URL supports domain name translation.
	AT+HTTTPARA=url,121.15.200.97/Service1.aspx/GetNote OK	Set URL.
	AT+HTTTPARA=url, ERROR	The AT command is not complete.
	AT+HTTTPARA=port,80 OK	Set the destination port ID to 80.
	AT+HTTTPARA=port,8080 OK	Set the destination port ID to 8080.
Remarks	N/A	

8.2 Setting Up HTTP Connection: +HTTPSETUP

Description	To set up an HTTP connection
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Format	AT+HTTPSETUP<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+HTTPSETUP OK	Set up an HTTP connection Successful
	AT+HTTPSETUP ERROR	Fails to set up an HTTP connection
Remarks	- 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.	

8.3 Executing HTTP Request: +HTTPACTION

Description	To execute an HTTP request
Format	- AT+HTTPACTION=<mode>[,<length>[,<type>]]<CR> - AT+HTTPACTION=<mode>[,<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, 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-urlencoded 1: text 2: json 3: xml 4: html <offset>: specifies the start of file to be downloaded in GET mode <size>: specifies download size for file download in GET mode

Return Value	See the Example.	
Example	AT+HTTPPARA=url,www.neoway.com.cn/en/index.aspx	Set the destination path.
	OK	
	AT+HTTPPARA=port,80	
	OK	The port is 80.
	AT+HTTPSETUP	
	OK	Set up an HTTP connection.
	AT+HTTPACTION=0	
	OK	
	+HTTPRECV: HTTP/1.1 200 OK	GET request
	Cache-Control: private	
	Content-Type: text/html; charset=utf-8	
	Server: Microsoft-IIS/7.5	Receive the response from the HTTP server.
	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*/	
		
	/* neoway homepage*/	
	+HTTPCLOSED: HTTP Link Closed	The server finished the response and disconnected the connection.
	AT+HTTPPARA =url,www.neoway.com.cn/en/index.aspx	Set the destination path.
	OK	
	AT+HTTPPARA=port,80	
	OK	The port is 80.
	AT+HTTPSETUP	Set up an HTTP connection
	OK	HEAD request
	AT+HTTPACTION=1	
	OK	The HTTP server

+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=znt4fqabqsucIz55pvfufn55; 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	responds.
AT+HTTTPARA=url,121.15.200.97/Service1.asmx/GetNote OK AT+HTTTPARA=port,8080 OK AT+HTTPSETUP OK AT+HTTPACTION=2,23 >MAC=NEOWAY&DATA=0123456 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	Set destination path Set the destination port ID as 8080. Set up an HTTP connection POST request. Send 23 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

Content-Length: 98	NEOWAY and 0123456.
<?xml version="1.0" encoding="utf-8"?> <string xmlns="http://wslu.cn/">NEOWAY+0123456 </string> +HTTPCLOSED: HTTP Link Closed	The server disconnected with the module after it finished responding.
AT+HTTTPARA=url,www.neoway.com.cn/en/index.aspx OK AT+HTTTPARA=port,80 OK AT+HTTPSETUP OK AT+HTTPACTION=99,76 >HEAD /en/index.aspx HTTP/1.1 connection: close HOST: www.neoway.com.cn OK	Set destination path The HTTP connection is set up through port 80.
+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	Send 76-byte user-defined packets Receive the response from the HTTP server.
AT+HTTPACTION=0 +HTTPACTION: SOCKET ID OPEN FAILED	The server disconnects with the module after it finishes responding. PPP is not enabled or SOC connection encountered an

		error.
	AT+HTTPACTION=0 +HTTPSETUP: ERROR	Failed to send data.
	AT+HTTPACTION=2,adasd ERROR	Other errors
Remarks	- Comply with the HTTP protocol when defining packets. - Add a carriage return to the end of the packets if the HTTP request is set to custom packet mode.	

8.4 Closing an HTTP Socket: +HTTPCLOSE

Description	To close an HTTP socket	
Format	AT+HTTPCLOSE<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+HTTPCLOSE OK	Close the HTTP socket.
	+HTTPCLOSE: HTTP Link Closed	Unsolicited report after socket is closed successfully.
	AT+HTTPCLOSE OK	OK is returned
Remarks	- After the +HTTPCLOSE command is sent, the HTTP socket is closed and the setting of +HTTTPARA is cleared. - Only OK is returned after running this command if the HTTP socket is not connecting.	

8.5 Unsolicited HTTP Data Output: +HTTPRECV

Description	Unsolicited HTTP data output When the module receives HTTP data from the network, the UART prints the data
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	automatically.
Format	• <CR><LF>HTTPRECV: <data> • <CR><LF>+HTTPRECV: <length>,<data>
Parameter	<length> : Data length <data> : Data received through the HTTP socket
Return Value	See the Example.
Example	<pre>+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</pre> Report the data received from the HTTP connection.
	<pre>+HTTPRECV: 803,HTTP/1.1 206 Partial Content Cache-Control: no-cache Connection: Keep-Alive Content-Length: 10 Content-Range: bytes 0-9/14615 Content-Type: text/html Date: Tue, 10 Jul 2018 00:55:30 GMT Etag: "5b3c3650-3917" Last-Modified: Wed, 04 Jul 2018 02:52:00 GMT P3p: CP=" OTI DSP COR IVA OUR IND COM " Pragma: no-cache Server: BWS/1.1 Set-Cookie: BAIDUID=F18E6894A34321D8CF9AAF28C14FACC9:F</pre> Data format when RECVMODE is set to 1

	G=1; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com Set-Cookie: BIDUPSID=F18E6894A34321D8CF9AAF28C14FACC9; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com Set-Cookie: PSTM=1531184130; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com Vary: Accept-Encoding X-Ua-Compatible: IE=Edge,chrome=1 <!DOCTYPE
Remarks	N/A

8.6 HTTP Socket Closing: +HTTPCLOSED

Description	Unsolicited report of the HTTP socket 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 socket closing
Remarks	N/A

8.7 Configuring SSL Parameters for HTTPS: +HTTPSCFG

Description	To configure SSL parameters for HTTPS
Format	• AT+HTTPSCFG=<type>,<type_name><CR> • AT+HTTPSCFG?<CR> • AT+HTTPSCFG=?<CR>
Parameter	Type: SSL options

	type_name: setting of SSL	
Return Value	<CR><LF>OK<CR><LF>	
	Or	
	<CR><LF>+ HTTPSCFG: <type>,<type_name>	
	Or	
	<CR><LF>+HTTPSCFG:	
	<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey>	
	type: SSL options	
	sslversion: SSL version	
	authmode: authentication mode	
	ciphersuite: Cipher suite	
Example	cacert: CA certificate	
	clientcert: Client certificate	
	clientkey: Client key	
	type_name: setting of SSL	
	sslversion:	
	0: SSL3.0	
	1: TLS1.0	
	2: TLS1.1	
	3: TLS1.2	
	Authmode:	
	0: No authentication	
	1: Manage server authentication	
	2: Manage server and client authentication if requested by the remote server	
	Cacert: string type, CA certificate	
	Clientcert: string type, client certificate	
	Clientkey: string type, client key	
	AT+ HTTPSCFG ="sslversion",0	Set SSL version to ssl3.0.
	OK	
	AT+ HTTPSCFG ="authmode",0	Set no authentication.
	OK	
	AT+ HTTPSCFG?	
	+HTTPSCFG: 0,1,,ca.pem,cc.pem,ck.pem	Query current SSL settings.
	OK	

	AT+ HTTPSCFG =? + HTTPSCFG: <type>,<type_name> OK	Query the value range of parameters.
Remarks	If authmode is set to 0 , you do not have to set cacert , clientcert , or clientkey .	

8.8 Setting HTTPS Parameters: +HTTPSPARA

Description	To set HTTPS parameters	
Format	AT+HTTPSPARA=<para>,<para_value><CR>	
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 512 bytes and url supports domain name translation.	
Return Value	See the Example.	
Example	AT+HTTPSPARA=url,www.alipay.com/index.html OK	Set the alipay homepage as the URL. The URL supports domain name translation.
	AT+HTTPSPARA=url,support.cdmatech.com/index.html OK	Set URL.
	AT+HTTPSPARA=port,443 OK	Set the destination port ID to 443.
Remarks	- Set new HTTPS parameters for new HTTPS requests. - After the +HTTSCLOSE command is sent, the connection is closed and parameter settings will be cleared.	

8.9 Setting up an HTTPS Connection: +HTTPSSETUP

Description	To set up an HTTPS connection
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Format	AT+HTTPSSETUP<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+HTTPSSETUP	Set up an HTTPS connection
	OK	Successful
	AT+HTTPSSETUP	Set up an HTTPS connection
	ERROR	Failed.
Remarks	- 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.	

8.10 Executing HTTPS Request: +HTTPSACTION

Description	To execute an HTTPS request
Format	- AT+HTTPSACTION=<mode>[,<length>[,<type>]]<CR> - AT+HTTPSACTION=<mode>[,<offset>,<size>]<CR>
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-urlencoded 1: text 2: json 3: xml 4: html <offset>: specifies the start of file to be downloaded in GET mode <size>: specifies download size for file download in GET mode
Return Value	See the Example.

Example

AT+HTTPSPARA=url,support.cdmatech.com/login/ OK AT+HTTPSPARA=port,443 OK AT+HTTPSSETUP OK AT+HTTPSACTION=0 OK +HTTPSRECV: HTTP/1.1 200 OK Server: QUALCOMM 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 Content-Length: 7630 Connection: close Set-Cookie: JSESSIONID=8V1dS1CpzIPcyNI2LzJZLQgDxWclpMJzP 3FHZhVhpGb83GVM02sn!1955538012; path=/; HttpOnly /*homepage, html format*/ /*homepage*/ +HTTPCLOSED: HTTPS Link Closed	Set the destination path. Set the destination port. Set up an HTTPS connection. GET request. Receive the request from the HTTPS server. The server responded and then disconnected the connection.
AT+HTTPSPARA=url,support.cdmatech.com/login/ OK AT+HTTPSPARA=port,443 OK AT+HTTPSSETUP OK AT+HTTPSACTION=1 OK +HTTPSRECV: HTTP/1.1 200 OK Server: QUALCOMM X-Powered-By: Servlet/2.5 JSP/2.1 Content-Type: text/html; charset=ISO-8859-1	Set the destination path. Set the destination port. Set up an HTTPS connection. HEAD request The HTTPS server responds.

	Date: Sat, 15 Feb 2014 06:05:39 GMT Content-Length: 0 Connection: close Set-Cookie: JSESSIONID=qyNVS1DSmnjS9cvh72yW1xz1jtjBBRj0yv 0zTmMy2LVyBG7HK02b!1955538012; path=/; HttpOnly +HTTSCLOSED: HTTPS Link Closed	
	AT+HTTPSPARA=url,mybank.icbc.com.cn/icbc/perbank/ index.jsp OK AT+HTTPSPARA=port,443 OK AT+HTTPSSETUP OK AT+HTTPSACTION=99,500 >POST /icbc/perbank/index.jsp HTTP/1.1<CRLF> /* custom header */ Connection: close<CRLF> /* custom header */ Host: mybank.icbc.com.cn<CRLF> /* custom header */ Content-Length: 10<CRLF> /* custom header */ Content-Type: application/x-www-form- urlencoded<CRLF> /* custom header */ <CRLF><CRLF> /*data to be sent*/ +HTTPSRECV: /*homepage, html format*/ /*homepage*/ +HTTSCLOSED: HTTPS Link Closed	Set the destination path. Set the port. Set up an HTTPS connection. Send 69-byte custom packets. The HTTPS server responded. The server closed the link after responding.
Remarks	Comply with the HTTP protocol when defining packets.	

8.11 Closing HTTPS Socket: +HTTSCLOSE

Description	To close an HTTPS socket
Format	AT+HTTSCLOSE<CR>
Parameter	N/A
Return Value	See the example.
Example	<pre>AT+HTTSCLOSE OK</pre> Close the HTTPS socket. <pre>+HTTSCLOSE: HTTPS Link Closed</pre>
Remarks	After the +HTTSCLOSE command is sent, the HTTPS socket is closed and the setting of +HTTSPARA is cleared.

8.12 Unsolicited HTTPS Data Output: +HTTPSRECV

Description	Unsolicited HTTPS data output When the module receives HTTPS data from the client, the UART prints the data automatically.
Format	<CR><LF>+HTTPSRECV: <CR><LF><datas> <CR><LF>+HTTPSRECV: <length>,<datas>
Parameter	<datas>: Data received through the HTTPS connection
Return Value	See the Example.
Example	<pre>+HTTPSRECV: HTTP/1.1 200 OK Cache-Control: private Content-Length: 13842 Content-Type: text/html; charset=utf-8 Server: Microsoft-IIS/7.5 Set-Cookie: ASP.NET_SessionId=pvlaai3fizxg44eyvyqsyenk; path=/; HttpOnly X-AspNet-Version: 2.0.50727 X-Powered-By: ASP.NET</pre> Report the data received from the HTTPS connection.

	X-UA-Compatible: IE=EmulateIE7 Date: Thu, 28 Nov 2013 05:40:24 GMT Connection: close +HTTSCLOSED: HTTPS Link Closed
	+HTTPSRECV: 832,HTTP/1.1 206 Partial Content Server: Tengine/2.1.0 Date: Tue, 10 Jul 2018 01:09:25 GMT Content-Type: text/html; charset=utf-8 Content-Length: 10 Connection: keep-alive x-server-id: 40-5005 request-id: 0bea4b2215311849654971530e6674 Accept-Ranges: bytes set-cookie: ctoken=MBHI38pHhdL6q0ltGFqjkviz; path=/; domain=.alipay.com; secure set-cookie: ALIPAYJSESSIONID=jMi6e4Q2JmIN8HRk68wm53KXisfnB5H 0homeproxy; path=/; domain=.alipay.com x-frame-options: SAMEORIGIN x-xss-protection: 1; mode=block x-content-type-options: nosniff x-download-options: noopen strict-transport-security: max-age=31536000 Content-Range: bytes 0-9/21651 x-readtime: 2 Set-Cookie: ssl_upgrade=0;path=/;secure; Set-Cookie: spanner=aGuTtGMbvBcOy1dCyZ/e4JI97JSiPcR1Xt2T4qEYgj 0=;path=/;secure; Via: spanner-internet-g2-35.em14[206]
Remarks	N/A

Data format
when
RECVMODE is
set to 1

8.13 HTTPS Socket Closing: +HTTPSCLOSE

Description	Unsolicited report of the HTTPS socket closing	
Format	<CR><LF>+HTTPSCLOSE: Link Closed <CR><LF>	
Parameter	N/A	
Return Value	See the Example.	
Example	+HTTPSCLOSED: HTTPS Link Closed	Unsolicited report of the HTTPS socket closing
Remarks	N/A	

8.14 Setting up HTTP Connection: +HTTPOPEN

Description	To set up an HTTP connection	
Format	AT+HTTPOPEN=<id>,<url>,<port>[,<keepalive>[,<recvmode>]]<CR>	
Parameters	<id>: socket ID, ranging from 0 to 4 <url>: destination path <port>: server port. It can be omitted if the url contains a port number. <keepalive>: Long connection 1: Long connection 0: short connection (default) <recvmode>: receive mode 1: print received data directly 0: buffer received data and MCU sends AT+HTTPREAD to read the data (default)	
Return Value	See the Example	
Example	AT+HTTPOPEN=1,58.60.184.213/index.html,12002,1,1 +HTTPOPEN: 1,OK	Set up an HTTP connection. Successful
	AT+HTTPOPEN=1,58.60.184.21/index.html,12002,1,1 +HTTPOPEN: 1,FAIL	Set up an HTTPS connection. Failed
Remarks	Ensure that a network connection has been set up successfully before setting an HTTP connection.	

8.15 HTTP Request: +HTTPREQ

Description	To execute HTTP request	
Format	- AT+HTTPREQ=<id>,<mode>[,<length>[,<type>]]<CR> - AT+HTTPREQ=<id>,<mode>[,<offset>,<size>]<CR>	
Parameters	<id>: socket ID, ranging from 0 to 4 <mode>: HTTPS request mode 0: GET 1: HEAD 2: POST 99: OPEN_MODE. You can customize the packet mode. <length>: the length of POST content or custom packets. You must set it if you set <mode> to POST or OPEN_MODE. <type>: data type of POST request 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html <offset>: Specifies offset of file content in GET mode <size>: Length of file downloaded from the start point in GET mode	
Return Value	See the Example	
Example	AT+HTTPOPEN=1,www.baidu.com/,80,1 +HTTPOPEN: 1,OK	To set up an HTTP connection
	AT+HTTPREQ=1,1 +HTTPREQ: 1,OK	HEAD request
	+HTTPRSP: 1	Receive the response from the HTTP server.
	+HTTPCLS: 1,Link Closed	HTTP socket is closed.
Remarks	- Customized packets must comply with the HTTP protocol. - Add a carriage return to the end of the packets if the HTTP request is set to custom packet mode.	

8.16 Closing HTTP Socket: +HTTPCLS

Description	To close an HTTP socket	
Format	AT+HTTPCLS=<id><CR>	
Parameters	N/A	
Return Value	See the Example	
Example	AT+HTTPCLS=1 +HTTPCLS: 1,OK	Close an HTTP socket.
Remarks	N/A	

8.17 Receiving HTTP Data: HTTPRSP

Description	Unsolicited report of data HTTP socket receives	
Format	<CR><LF>+HTTPRSP: <id><CR><LF> <CR><LF>+HTTPRSP: <id>,<length>,<datas><CR><LF> Data report mode is determined by the setting of <recvmode> in AT+HTTSPEN Report ID only when recvmode is set to 0 and data is read by AT+HTTPREAD Report data received directly when recvmode is set to 1	
Parameters	<id>: socket ID, ranging from 0 to 4 <length>: data length <datas>: data HTTP socket receives	
Return Value	See the Example	
Example	AT+HTTSPEN=1,www.baidu.com/,80,1 +HTTSPEN: 1,OK AT+HTTPREQ=1,1 +HTTPREQ: 1,OK +HTTPRSP: 1	Unsolicited report of data HTTP socket receives
Remarks	N/A	

8.18 Reading HTTP Data: +HTTPREAD

Description	To read HTTP data
Format	AT+HTTPREAD=<id>,<length>,<read_head><CR><LF>
Parameters	<id>: socket ID, ranging from 0 to 4 <length>: data length, ranging from 1 to 4096 <read_head>: specifies whether to read HTTP header 0: skip header 1: read heard (default)
Return Value	See the Example
Example	<pre>AT+HTTPOPEN=1,www.baidu.com/,80,1 +HTTPOPEN: 1,OK AT+HTTPREQ=1,1 +HTTPREQ: 1,OK +HTTPRSP: 1 AT+HTTPREAD=1,4096 +HTTPREAD: 1,176,HTTP/1.1 302 Found Connection: Keep-Alive Content-Length: 17931 Content-Type: text/html Date: Thu, 30 Aug 2018 01:19:30 GMT Etag: "54d9748e-460b" Server: bfe/1.0.8.18 OK</pre>
Remarks	N/A

8.19 HTTP Socket Closed: +HTTPCLS

Description	To close an HTTP socket	
Format	<CR><LF>+HTTPCLS: <id>,Link Closed<CR><LF>	
Parameters	N/A	
Return Value	See the Example	
Example	+HTTPCLS: 1,Link Closed	Unsolicited report that the HTTP socket is closed
Remarks	N/A	

8.20 Configuring HTTPS Parameters:+HTTPSCFGA

Description	To configure SSL parameters for HTTPS	
Format	• AT+HTTPSCFGA=<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey><CR> • AT+HTTPSCFGA?<CR> • AT+HTTPSCFGA=?<CR>	
Parameters	sslversion: SSL protocol version 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 authmode: authentication mode 0: no authentication 1: manage server authentication 2: Manage server and client authentication if requested by the remote server cacert: CA certificate clientcert: client certificate clientkey: client key	
Return Value	See the Example	

Example	AT+HTTPSCFGA=3,1,"ca.pem","","" OK	Set SSL to TLS1.2 Server authentication Set CA certificate to ca.pem Other certificates are left empty
	AT+HTTPSCFGA? +HTTPSCFGA: 0,1,ca.pem,cc.pem,ck.pem OK	Query the current settings of SSL.
Remarks	- Certificates can be set only after imported by AT+CERTADD. - Certificates can be left empty.	

8.21 Setting up HTTPS Connection: +HTTPSOPEN

Description	To set up an HTTP connection	
Format	AT+HTTPSOPEN=<id>,<url>,<port>[,<keepalive>,<recvmode>]]<CR>	
Parameters	<id>: socket ID, ranging from 0 to 4 <url>: destination path <port>: server port. It can be omitted if the url contains a port number. <keepalive>: Long connection 1: Long connection 0: short connection (default) <recvmode>: receive mode 1: print received data directly 0: buffer received data and MCU sends AT+HTTPSREAD to read the data (default)	
Return Value	See the Example	
Example	AT+HTTPSOPEN=1,58.60.184.213/index.html,12002,1,1 +HTTPSOPEN: 1,OK	Set up an HTTPS connection Successful
	AT+HTTPSOPEN=1,58.60.184.21/index.html,12002,1,1 +HTTPSSOPEN: 1,FAIL	Set up an HTTPS connection Failed
Remarks	Ensure that a network connection has been set up successfully before setting an HTTPS connection.	

8.22 HTTPS Request: +HTTPREQ

Description	To execute HTTPS request	
Format	- AT+HTTPSREQ=<id>,<mode>[,<length>[,<type>]]<CR> - AT+HTTPSREQ=<id>,<mode>[,<offset>,<size>]<CR>	
Parameters	<id>: socket ID, ranging from 0 to 4 <mode>: HTTPS request mode 0: GET 1: HEAD 2: POST 99: OPEN_MODE. You can customize the packet mode. <length>: the length of POST content or custom packets. You must set it if you set <mode> to POST or OPEN_MODE. <type>: data type of POST request 0: x-www-form-urlencoded 1: text 2: json 3: xml 4: html <offset>: Specifies offset of file content in GET mode <size>: Length of file downloaded from the start point in GET mode	
Return Value	See the Example	
Example	AT+HTTPSOPEN=1,www.baidu.com/,443,1 +HTTPSOPEN: 1,OK	Set up an HTTPS connection.
	AT+HTTPSREQ=1,1 +HTTPSREQ: 1,OK	HEAD request
	+HTTPSRESP: 1	Receive the response from the HTTPS server.
	+HTTPSCLS: 1,Link Closed	HTTPS socket is closed.
Remarks	- Customized packets must comply with the HTTP protocol. - Add a carriage return to the end of the packets if the HTTP request is set to custom packet mode.	

8.23 Closing HTTPS Socket: +HTTPSCLS

Description	To close an HTTPS socket	
Format	AT+HTTPSCLS=<id><CR>	
Parameters	N/A	
Return Value	See the Example	
Example	AT+HTTPSCLS=1 +HTTPSCLS: 1,OK	Close an HTTPS socket.
Remarks	N/A	

8.24 Receiving HTTPS Data: HTTPSRSP

Description	Unsolicited report of data HTTPS socket receives	
Format	<CR><LF>+HTTPSRSP: <id><CR><LF> <CR><LF>+HTTPSRSP: <id>,<length>,<datas><CR><LF> Data report mode is determined by the setting of <recvmode> in AT+HTTPOPEN Report ID only when recvmode is set to 0 and data is read by AT+HTTPSREAD Report data received directly when recvmode is set to 1	
Parameters	<id>: socket ID, ranging from 0 to 4 <length>: data length <datas>: data HTTP socket receives	
Return Value	See the Example	
Example	AT+HTTPOPEN=1,www.baidu.com/,443,1 +HTTPOPEN: 1,OK AT+HTTPSREQ=1,1 +HTTPSREQ: 1,OK +HTTPSRSP: 1	Unsolicited report of data HTTPS socket receives
Remarks	N/A	

8.25 Reading HTTPS Data: +HTTPSREAD

Description	To read HTTPS data
Format	AT+HTTPSREAD=<id>,<length>,<read_head><CR><LF>
Parameters	<id>: socket ID, ranging from 0 to 4 <length>: data length, ranging from 1 to 4096 <read_head>: specifies whether to read HTTP header 0: skip header 1: read heard (default)
Return Value	See the Example
Example	<pre>AT+HTTPSOPEN=1,www.alypay.com/,443,1 +HTTPSOPEN: 1,OK AT+HTTPSREQ=1,1 +HTTPSREQ: 1,OK +HTTPSRSP: 1 AT+HTTPSREAD=1,4096 +HTTPSREAD: 1,169,HTTP/1.1 403 Forbidden Server: nginx/1.12.1 Date: Thu, 30 Aug 2018 1:17:47 AM GMT Content-Type: text/html; charset=utf8 Content-Length: 169 Connection: keep-alive OK</pre>
Remarks	N/A

8.26 HTTPS Socket Closed: +HTTPSCLS

Description	To close an HTTP socket	
Format	<CR><LF>+HTTPSCLS: <id>,Link Closed<CR><LF>	
Parameters	N/A	
Return Value	See the Example	
Example	+HTTPSCLS: 1,Link Closed	Unsolicited report that the HTTPS socket is closed
Remarks	N/A	

9 Call Control Commands

9.1 Dialing Command: ATD

Description	To initialize a data, fax, or voice link. For a voice link, the dialing string consists of numbers and modifiers and must end with a semicolon.	
Format	• ATD<dial string>[;]<CR> • ATD><n>;<CR> • ATD>"name";<CR>	
Parameter	<dial string> : Phone number <n> : The location of phone number Name : name in current phonebook	
Return Value	OK If the callee hangs up directly: BUSY The callee picks up the phone: CONNECT If the callee hangs up during the call NO CARRIER	
Example	ATD10010; OK	Make a call.
	CONNECT	The callee answers.
	ATD>4; OK CONNECT ATH	Dial up the number listed as 4 in the phonebook.

	OK	
	ATD>"Comneon"; OK	Dial up the number according to the name in the phonebook.
	CONNECT	The callee answers and then ends the call.
	NO CARRIER	
Remarks	There are two types of calls: voice call, data and fax call. Semicolon is required for voice calls and not required for data or fax calls.	

9.2 Dialing Command (EVDO/CDMA): +CDV

Description	To initialize a voice call on a CDMA network	
Format	AT+CDV<dial string>[;]<CR>	
Parameter	<dial string>: phone number	
Return Value	OK	
	If the callee hangs up directly: BUSY	
	If the callee picks up the phone: CONNECT	
	If the callee hangs up during the call: NO CARRIER	
Example	AT+CDV 10010; OK	Dial a number
	NO CARRIER	Hung up
Remarks	This command is used on CDMA networks only.	

9.3 Call Answering: ATA

Description	To answer the call and establish a call connection The return codes containing RING or +CRING indicate an incoming call.	
Format	ATA<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF> If the callee hangs up during a call, the command returns: <CR><LF>BUSY<CR><LF>	
Example	ATA OK	Answer the call (voice).
Remarks	N/A	

9.4 Hanging Up Calls: ATH

Description	To hang up all calls	
Format	ATH<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
Example	ATH OK	End the call connection.
	ATH OK	Refuse the incoming call. Hang up the call.
Remarks	N/A	

9.5 Hanging Up Call (EVDO/CDMA): +CHV

Description	To hang up a voice call on CDMA networks
Format	AT+CHV[value]<CR>

Parameter	[value]: 0: hang up (default) 1 to 255: reserved	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+CHV OK	Hang up a call
	NO CARRIER	
Example	AT+CHV OK	Hang up a call directly
Remarks	This command is used on CDMA networks only.	

9.6 Caller ID: CLIP

Description	To enable or disable caller ID	
Format	- AT+CLIP=<n><CR> - AT+CLIP?<CR> - AT+CLIP=?<CR>	
Parameter	<n>: 0: disable caller ID (default value) 1: enable caller ID	
Return Value	<CR><LF>+CLIP: <n>, <m> <CR><LF>OK<CR><LF> <n>: 0: disable 1: enable <m>: 0: CLIP not provisioned 1: CLIP provisioned 2: unknown (no connection, etc.)	
Example	AT+CLIP=1	Enable the caller ID function.

	OK	
	RING	
	+CLIP: "136*****",161,"",0,"",0	An incoming call from 136*****.
	AT+CLIP? +CLIP: 1, 1 OK	Query the setting of the caller ID.
	AT+CLIP=? +CLIP: (0-1) OK	Query the value range of caller ID function.
Remarks	The caller ID function is enabled by default.	

9.7 Auto-Answer: ATS0

Description	To control the auto-answer mode of the module	
Format	- ATS0=<value><CR> - ATS0?<CR>	
Parameter	<value>: Integers, ranging from 0 to 255. The default value is 000 .	
Return Value	See the Example.	
Example	ATS0=1 OK	Set the auto-answer for one ring.
	ATS0? 001 OK	Query the status of the auto-answer function.
	If ATS0=0 , the auto-answer function is not enabled; otherwise, the module will automatically answer the call after ringing for certain times.	
Remarks		

9.8 Setting the Voice Volume: +CLVL

Description	To set the level of the voice volume, which is valid before a call or during a call
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Format	• AT+CLVL=<level><CR> • AT+CLVL?<CR> • AT+CLVL=?<CR>	
Parameter	<level>: Integers, ranging from 0 to 6. The default value is 3 .	
Return Value	See the Example.	
Example	AT+CLVL=4 OK	Set the level of the voice volume to 4.
	AT+CLVL? +CLVL: 4 OK	Query the level of voice volume of the module.
	AT+CLVL=? +CLVL: (0-6) OK	Query the valid voice volume level for the module.
Remarks	• The setting by this command are not saved after the module is powered off. • This command is used to set the volume level of the current voice output channel, which can be receiver, earphone, or speaker.	

9.9 Mute Control: +CMUT

Description	To set mute control of the voice calls. The setting is valid during a call	
Format	• AT+CMUT=<n>[,<m>]<CR> • AT+CMUT?<CR> • AT+CMUT=?<CR>	
Parameter	<n>: 0: Mute off output (default value) 1: Mute on output <m>: 0: mute off input (default value) 1: mute on input	
Return Value	See the Example.	
Example	AT+CMUT=0,0	Disable the mute mode.

	OK	
	AT+CMUT=1,1	Enable mute control before a call.
	ERROR	
	AT+CMUT?	Query whether the mute mode is enabled.
	+CMUT: 0,0	
	OK	
	AT+CMUT=?	Query the value range of mute mode function.
	+CMUT: (0-1), (0-1)	
	OK	
Remarks	This command is valid only during a call. ERROR will be returned in any other situations.	

9.10 MIC Volume Control: +MICL

Description	To set the level of the MIC volume in a call, which is valid during a call	
Format	• AT+MICL=<level><CR> • AT+MICL?<CR> • AT+MICL=?<CR>	
Parameter	<level> : Integers, ranging from 0 to 6, the default value is 3.	
Return Value	See the Example.	
Example	AT+MICL=3	Set the level of the MIC volume to 3.
	OK	
	AT+MICL?	Query the current level of the MIC volume.
	+MICL: 3	
	OK	
	AT+MICL=?	Query the value range of MIC volume.
	MICL: (0-6)	
	OK	
Remarks	The settings by this command are not saved after the module is powered off.	

9.11 Switching Audio Input Channel: +AUDIN

Description	To switch the audio input channel before and in a call	
Format	• AT+AUDIN=<n><CR> • AT+AUDIN?<CR> • AT+AUDIN=?<CR>	
Parameter	<n>: Interger, ranging from 0 to 1. 0: Set to MIC0 input 1: Set to MIC1 input (default)	
Return Value	See the Example.	
Example	AT+AUDIN=0 OK	Set the audio input channel to MIC0.
	AT+AUDIN? +AUDIN: 0 OK	Query the current audio input channel.
	AT+AUDIN=? +AUDIN: (0-1) OK	Query the range of the command parameter.
Remarks	The settings by this command are not saved after the module is powered off.	

9.12 Switching Audio Output Channel: +AUDOUT

Description	To switch the audio output channel before and in a call	
Format	• AT+AUDOUT=<n><CR> • AT+AUDOUT?<CR> • AT+ AUDOUT =?<CR>	
Parameter	<n>: Integrer, ranging from 1 to 2. 1: Set to loud speaker output (default) 2: Set to earphone output	
Return Value	See the Example.	
Example	AT+AUDOUT=2	Set to earphone output.

	OK	
	AT+AUDOUT?	
	+AUDOUT: 2	Query the current audio output channel
	OK	
	AT+AUDOUT=?	
	+AUDOUT: (1-2)	Query the range of the command parameter.
	OK	
Remarks	The settings by this command are not saved after the module is powered off.	

9.13 Querying Current Calls: +CLCC

Description	To query current calls and their status
Format	AT+CLCC<CR>
Parameter	N/A
Return Value	<CR><LF>[+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,[<number>,<type>,<alpha>]] <CR><LF>[+CLCC: <idx>,<dir>,<stat>,<mode>,<mpty>,[<number>,<type>,<alpha>]] <CR><LF>[...]] <CR><LF>OK<CR><LF> <idx>: Caller ID described in section 4.5.5.1 of 3GPP TS 22.030 [19], integer, this digit can be used in the +CHLD command. <dir>: 0: Mobile originated calls 1: Mobile terminated calls <stat>: Call status 0: active 1: held 2: dialing 3: alerting 4: incoming 5: waiting

	<mode>: Call types 0: voice 1: data 2: fax <mpty>: Multiparty calls 0: Non-multiparty calls 1: Multiparty calls <number>: phone number <type>: Number type, refer to section 10.5.4.7 in TS 24.008 [8] 145 international numbering schemes (contains the character "+") 129 national numbering schemes <alpha>: string type; alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with +CSCS.
Example	AT+CLCC +CLCC: 1,1,4,0,0,"13596722590",129 Incoming call OK
	AT+CLCC +CLCC: 1,0,2,0,0,"13596722590",129 Initiate a call OK
	OK
Remarks	N/A

9.1 Setting Remote Audio Playing: +REMAUDIO

Description	To set remote audio playing
Format	AT+REMAUDIO=<onoff><CR>
Parameters	<onoff>: 0: disable remote audio playing (default) 1: enable remote audio playing After remote audio playing is enabled, TTS and audio played on local can be played to the other party during a call.

Return Value	See the Example	
Example	AT+REMAUDIO=0 OK	Disable remote audio playing.
	AT+REMAUDIO=1 OK	Enable remote audio playing.
	AT+REMAUDIO? +REMAUDIO: 1 OK	Query the setting of the parameter.
Remarks	N/A	

10 TTS Commands

10.1 Setting Voice Broadcast Format: +TTSFMT

Description	To set the encoding format of the content for voice broadcast	
Format	AT+TTSFMT=<format><CR>	
Parameter	<format>: 0: GBK 1: UTF16	
Return Value	See the Example.	
Example	AT+TTSFMT=1 OK	Set the encoding format to UTF16.
	AT+TTSFMT? +TTSFMT: 0 OK	Query the encoding format of the current input content. The format of the current voice broadcast content is GBK.
Remarks	- By default, the encoding format is GBK. - The parameter setting by this command are not saved after the module is powered off. - This command is supported on V003 and later versions.	

10.2 Inputting Broadcast Content Through AT: +TTSPLAY

Description	To input text for voice broadcast through AT commands
Format	AT+TTSPLAY=<n><CR>
Parameter	<n>: The length of the content to be input (0 to 140)
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 +TTSPLAYERROR. - Input the data to be sent till the > is displayed after entering the command. Then

	the module returns OK. If data is not inputted one minute after > is displayed, +TTSPLAY: OPERATION EXPIRED will be displayed. • If the text is broadcast successfully, the module returns +TTSPLAY: OK. • If the text fails to be broadcast, the module returns +TTSPLAY: FAILED. • If the broadcast is interrupted by call or other links, the module returns +TTSPLAY: TERMINATED. • If the length of the data parameter entered is beyond 1 to 140, the module returns TTSPLY: LENGTHERROR.	
Example	AT+TTSPLAY=8 > OK +TTSPLAY:OK	Enter 8-byte TTS broadcast content through AT commands. (TTS broadcast content: A3E1A3E2A3E4A3E5)
Remarks	• The encoding format is GBK (2 bytes). • Broadcast is prior to incoming calls and SMS messages. If an incoming call or SMS message is being broadcast, the broadcast using this command will interrupt the call or message broadcast. The interrupted call will not be broadcast again while the message will be after the broadcast is finished. • Send TTS broadcast content after > is displayed. • The broadcast content must comply the set code format. For example, if AT+TTSFMT=0 is sent, only GBK content can be broadcast; if broadcast contents entered in other formats, no voice outputs for the broadcast. • The voice is output through speaker by default. For details, see +AUDOUT. • This command is applicable to non-CMUX mode. In CMUX mode, use AT+PLAYTTS. • This command is supported on V003 and later versions.	

10.3 Stopping Broadcast: TTSSTOP

Description	To stop voice broadcast
Format	AT+TTSSTOP<CR>
Parameter	N/A
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR<CR><LF>

Example	AT+TTSSTOP	Stop voice broadcast.
	OK	
Remarks	This command is supported on V003 and later versions.	

10.4 Inputting Broadcast Content Through AT: +PLAYTTS

Description	To input text through AT command for voice broadcast	
Format	AT+PLAYTTS<CR>	
Parameter	Length of content to be input (1 to 140)	
Return Value	> is returned if the AT command is input in correct format; otherwise, +TTSPLAY:ERROR is returned. - If > is returned after the command input, input data and end with → . The module returns OK. a. +TTSPLAY: OK is returned after the text is broadcast successfully. b. +TTSPLAY: FAILED is returned after the broadcast fails. c. +TTSPLAY: TERMINATED is returned if the broadcast is terminated by a call.	
Example	AT+PLAYTTS >A3E1A3E2A3E4A3E5 OK +TTSPLAY:OK	Input 8-byte TTS broadcast content (A3E1A3E2A3E4A3E5) and end it with 0x1A.
Remarks	- Encoding format is GBK (2 bytes). - Broadcast is prior to incoming calls and SMS messages. If an incoming call or SMS message is being broadcast, the broadcast using this command will interrupt the call or message broadcast. The interrupted call will not be broadcast again while the message will be after the broadcast is finished. - Send TTS broadcast content after > is displayed and end the content with 0x1A. - The broadcast content must comply with the set code format. For example, if AT+TTSFMT=0 is sent, only GBK content can be broadcast; if broadcast contents entered in other formats, no voice outputs for the broadcast. - The voice is output through speaker by default. For details, see +AUDOUT. - This command can be used in both CMUX mode and common mode. - Do not add any data that do not need to be broadcast (e.g. \r\n) after	

AT+PLAYTTS<CR>.

- **+TTSPLAY: OK** is returned after this command is executed successfully.
- This command is supported on V003 and later versions.

10.5 Configuring Parameters of Voice Broadcast: +TTSCFG

Description	To set the volume, speaking speed, and tone of the voice broadcast	
Format	• AT+TTSCFG=?<CR> • AT+TTSCFG=<volume>,<speed>,<pitch><CR> • AT+TTSCFG?<CR>	
Parameter	<volume>: Broadcast volume, ranging from 0 to 6 <speed>: Broadcast speed, ranging from 0 to 6 <pitch>: Broadcast tone, ranging from 0 to 6	
Return Value	See the Example.	
Example	AT+TTSCFG=1,3,2 OK	Set the volume to 1, speed to 3, and tone to 2.
	AT+TTSCFG? +TTSCFG: 1,3,2 OK	Query the current configurations of the voice broadcast.
	AT+TTSCFG=? +TTSCFG: (0-6),(0-6),(0-6) OK	Query the configuration range of the voice broadcast parameters.
Remarks	• The default value is 3,3,3. • This command is supported on V003 and later versions.	

11 Wi-Fi Functions

11.1 Enabling Wi-Fi: +WIFISWITCH

Description	To enable the Wi-Fi function of the module	
Format	• AT+WIFISWITCH=<mode><CR> • AT+WIFISWITCH? <CR> • AT+WIFISWITCH=?<CR>	
Parameter	<mode> 0: Disable Wi-Fi 1: Enable AP 2: Enable STA 3: Enable AP+STA	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFISWITCH: <mode> <CR><LF>OK<CR><LF>	
	CR><LF>+WIFISWITCH: (0-3) <CR><LF>OK<CR><LF>	
Example	AT+WIFISWITCH=1 OK	The Wi-Fi function is enabled successfully.
	AT+ WIFISWITCH =1 ERROR	Fails to enable the Wi-Fi function.
	AT+WIFISWITCH? +WIFISWITCH: 1 OK	The Wi-Fi function has been enabled.
	AT+WIFISWITCH=? +WIFISWITCH: (0-3) OK	Query the value range of the parameter.
Remarks	To switch to another mode, disable the current mode first.	

11.2 Setting SSID: +WIFISSIDSET

Description	To set SSID	
Format	• AT+WIFISSIDSET=<ssid><CR> • AT+WIFISSIDSET? • AT+WIFISSIDSET=?	
Parameter	<ssid> : SSID character string in ASCII format no longer than 32 bytes.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFISSIDSET: <ssid><CR><LF>	
Example	AT+WIFISSIDSET=Neoway_N720	Set SSID to Neoway_N720.
	OK	
	AT+WIFISSIDSET?	
Remarks	+WIFISSIDSET: Neoway_N720	Query current SSID.
	OK	
	• The default SSID is Neoway_ap. • This command is supported on V003 and later versions.	

11.3 Setting Broadcast: +WIFIBCASTSET

Description	To set broadcast	
Format	• AT+WIFIBCASTSET=<n><CR> • AT+WIFIBCASTSET? • AT+WIFIBCASTSET=?	
Parameter	<n> 0: Disable Wi-Fi broadcast 1: Enable Wi-Fi broadcast	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFIBCASTSET: <n><CR><LF>	

	<CR><LF>+WIFIBCASTSET: (0-1)	
Example	AT+WIFIBCASTSET=1 OK	Enable Wi-Fi broadcast
	AT+WIFIBCASTSET=0 OK	Disable Wi-Fi broadcast
	AT+WIFIBCASTSET? +WIFIBCASTSET: 1 OK	Query Wi-Fi broadcast status
Remarks	This command is supported on V003 and later versions.	

11.4 Setting Authentication Information: +WIFIAUTH

Description	To set authentication method and password	
Format	• AT+WIFIAUTH=<auth>,<encrypt>,<password><CR> • AT+WIFIAUTH? • AT+WIFIAUTH=?	
Parameter	<auth> 0: Open 1: WPA 2: WPA2 3: WPA/WPA2 <encrypt> 0: No authentication 1: TKIP 2: AES 3: TKIP-AES <password>: string character, ranging from 8 to 63 bytes	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFIAUTH: (0-3),(0-3),<password>	
Example	AT+WIFIAUTH=1,1,NeowayN720	Set authentication method and password.

	OK	
	AT+WIFIAUTH=0	Set authentication to open.
	OK	No password is required.
	AT+WIFIAUTH?	Query the authentication type.
	+WIFIAUTH: 1 OK	
Remarks	- The default password is 0123456789. - This command is supported on V003 and later versions.	

11.5 Setting Working Mode and Band: +WIFIBAND

Description	To set working mode and band	
Format	- AT+WIFIBAND=<mode><CR> - AT+WIFIBAND? - AT+WIFIBAND=?	
Parameter	<mode>: Network frequency and mode 1: a/n 2: b 3: b/g 4: b/g/n 5: ac <channel>: Channel 0, 1-13, 149/153/157/161/165 (0 indicates automatic selection)	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+WIFIBAND=1,0	Select 5G frequency band.
	OK	All channels are available.
	AT+WIFIBAND?	The Wi-Fi works on 5G frequency band.
	+WIFIBAND: 1,0 OK	All channels are available.
Remarks	This command is supported on V003 and later versions.	

11.6 Querying Link Status: +WIFILIST

Description	To query current link status	
Format	AT+WIFILIST<CR>	
Parameter	N/A	
Return Value	<CR><LF>+WIFILIST: <n> <CR><LF><mac1>,<ip1> <CR><LF><macn>,<ipn> <CR><LF>OK<CR><LF> <n>: Current link quantity <mac>: Mac address of the client <ip>: IP address of the client	
Example	AT+WIFILIST +WIFILIST: 2 <mac1>,<ip1> <mac2>,<ip2> OK	Query the link status
Remarks	This command is supported on V003 and later versions.	

11.7 Setting DHCP: +WIFIDHCP

Description	To set DHCP IP address range	
Format	- AT+WIFIDHCP=<host_ip>,<start_ip>,<end_ip>,<tth> <CR> - AT+WIFIDHCP? - AT+WIFIDHCP=?	
Parameter	<host_ip>: 192.168.x.a <start_ip>: 192.168.x.b <end_ip>: 192.168.x.c <tth>: valid time, ranging from 1 to 24 hours. 0 means valid forever	
Return Value	<CR><LF>OK<CR><LF>	

	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFIDHCP: <host_ip>,<start_ip>,<end_ip>,<ttl>	
Example	AT+WIFIDHCP="192.168.1.1","192.168.1.100","192.168.1.200",0 <CR> OK	Set DHCP IP address range.
Remarks	This command is supported on V003 and later versions.	

11.8 Setting NAT Mode: +WIFINAT

Description	To set NAT mode	
Format	- AT+WIFINAT=<n><CR> - AT+WIFINAT?<CR> - AT+WIFINAT=?<CR>	
Parameter	<n>: 0: Symmetric 1: Cone	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFINAT: (0-1)	
	<CR><LF>OK<CR><LF>	
Example	AT+WIFINAT=1 OK	Set NAT mode to Cone.
	AT+WIFINAT? +WIFINAT: 1 OK	Current NAT mode is Cone.
Remarks	This command is supported on V003 and later versions.	

11.9 Resetting to Factory Settings: +WIFIRESET

Description	To reset to factory settings	
Format	AT+WIFIRESET<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+WIFIRESET OK	Reset to factory settings
Remarks	This command is supported on V003 and later versions.	

11.10 Querying STA Scanning Result: +WIFISTASCAN

Description	To query the Wi-Fi scanning result in STA mode	
Format	• AT+WIFISTASCAN<CR> • AT+WIFISTASCAN=<Output_format><CR> • AT+WIFISTASCAN?<CR> • AT+WIFISTASCAN=?<CR>	
Parameters	<Output_format>: 0: Output all information scanned 1: Output MAC address 2: Output frequency information 4: Output signal level 8: Output flag 16: Output SSID 17: Output MAC address and SSID The default setting is 0.	
Return Value	<CR><LF>+WIFISTASCAN:<CR><LF> <scan_result> <CR><LF>OK<CR><LF> <CR><LF>TIMEOUT<CR><LF>	

Example	<pre> AT+WIFISTASCAN +WIFISTASCAN: 9c:21:6a:b6:27:d4,2462,-48,[WPA-PSK-CCMP][WPA2- PSK-CCMP][WPS][ESS],Apple dc:a3:33:bc:98:4e,2427,-54,[WPA-PSK-TKIP][WPA2- PSK-CCMP][WPS][ESS],ChinaNet-HJsi b0:48:7a:33:fc:38,2412,-57,[WPA-PSK-CCMP][WPA2- PSK-CCMP][WPS][ESS],IT_OA_TEST ee:d0:9f:65:a2:6d,2437,-61,[WPA2-PSK- CCMP][ESS],link 00:36:76:6e:1d:56,2412,-74,[WPA-PSK-CCMP][WPA2- PSK-CCMP][ESS], 34:96:72:67:c9:0c,2437,-86,[WPA-PSK-CCMP][WPA2- PSK-CCMP][ESS],KOC(2.4G) 20:cf:30:be:c7:34,2447,-87,[WPA-PSK-CCMP][WPA2- PSK- CCMP][ESS],JCG\xe6\x8d\xb7\xe7\xa8\x80\xe6\x99\xba\ \xe8\x83\xbd\xe6\x97\xa0\xe7\xba\xbf\xe8\xb7\xaf\xe7\x9 4\xb1\xe5\x99\xa8 08:10:77:25:c2:60,2437,-71,[ESS],Netcor OK </pre>	Start to scan Wi-Fi hotspots and output all information.
	<pre> AT+WIFISTASCAN=17 +WIFISTASCAN: 9c:21:6a:b6:27:d4,Apple ee:d0:9f:65:a2:6d,link b0:48:7a:33:fc:38,IT_OA_TEST dc:a3:33:bc:98:4e,ChinaNet-HJsi OK </pre>	Start to scan Wi-Fi hotspots and output MAC address and SSID.
Remarks	N/A	

11.11 Setting Allowed Quantity of Wi-Fi Connections: +WIFIMAXSTA

Description	To set the allowed quantity of Wi-Fi connections when the module works as a hotspot
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Format	• AT+WIFIMAXSTA=<num><CR> • AT+WIFIMAXSTA?<CR>
Parameters	<num> : maximum number of allowed Wi-Fi connections, integer, ranging from 1 to 16, 16 by default
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR<CR><LF>
	<CR><LF>+WIFIMAXSTA: <onoff>
	<CR><LF>OK<CR><LF>
Example	AT+WIFIMAXSTA=10 OK
	AT+WIFIMAXSTA? +WIFIMAXSTA:16 OK
Remarks	N/A

11.12 Connecting Hotspot: +WIFICONNECT

Description	To connect a hotspot in STA mode
Format	• AT+WIFICONNECT=<SSID>,<PASSWD><CR> • AT+WIFICONNECT?<CR>
Parameters	<SSID> : Wi-Fi hotspot to connect to, character string, 128 characters at most <PASSWD> : Wi-Fi hotspot password, character string type, ranging from 8 to 255 characters. It can be left empty, indicating that no password is required. <STATUS> : 1: CONNECT SUCCESS 2: WIFI NOT ENABLE 3: AP NOT EXIST 4: ALREADY CONNECTED 5: WRONG PASSWD 6: TIME OUT
Return Value	<CR><LF>OK<CR><LF>

Example	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+WIFICONNECT:<SSID>	
	AT+WIFICONNECT="neoway-ap01","1234567890" OK +WIFICONNSTAT: 1	The module starts to try to connect the Wi-Fi hotspot. Successfully
	AT+WIFICONNECT="neoway-ap01","1234567890" OK +WIFICONNSTAT: 5	Password is incorrect
	AT+WIFICONNECT? +WIFICONNECT: "neoway-ap01" OK	Query the name of the hotspot connected.
Remarks	- This command can be used in STA/AP+STA mode. - The connection is set up successfully only after the module obtains the IP address. - The connection is closed automatically after the module connects to another hotspot.	

11.13 Disconnecting to Wi-Fi Hotspot: +WIFIDISCONN

Description	To disconnect to Wi-Fi hotspot	
Format	AT+WIFIDISCONN<CR>	
Parameters	N/A	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+WIFICONNECT="neoway-ap01","1234567890" OK	Client is disconnecting
	+WIFICONNSTAT: 1	
	AT+WIFIDISCONN	

	OK
Remarks	N/A

11.14 Obtaining Wi-Fi Address: +WIFIGETIP

Description	To obtain Wi-Fi address	
Format	AT+WIFIGETIP<CR>	
Parameters	NA	
Return Value	<CR><LF>+WIFIGETIP: <IP> <CR><LF>OK<CR><LF> <IP>: IP address obtained. 0.0.0.0 is returned if the connection is not set up successfully.	
Example	AT+WIFIGETIP +WIFIGETIP: 192.168.2.145 OK	Obtain IP address in STA mode.
	AT+WIFIGETIP +WIFIGETIP: 0.0.0.0 OK	Failed to obtain the IP address. No connection is set up successfully yet.
Remarks	N/A	

11.15 Setting Static IP Address: +WIFISETIP

Description	To set a static IP address	
Format	- AT+WIFISETIP=<type>,<ip>,<sub_mask>,<gateway>,<dns1>,<dns2><CR> - AT+WIFISETIP=?<CR> - AT+WIFISETIP?<CR>	
Parameters	<type>: Specify how to set 0: Obtain IP address through DHCP 1: Set a static IP address <ip>: static IP address	

	<sub_mask> : subnet mask <gateway> : gateway <dns1> : primary DNS server <dns2> : secondary DNS server	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+WIFISSETIP: <type>,<ip>,<submask>,<gateway>,<dns1>[,<dns2>] <CR><LF>OK<CR><LF>	
Example	AT+WIFISSETIP=0 OK	Set IP address to be obtained through DHCP.
	AT+WIFISSETIP=1,192.168.43.142,255.255.255.0,192.168.43.1,192.168.43.1,8.8.8.8 OK	Set a static IP address.
	AT+WIFISSETIP? +WIFISSETIP: 1,192.168.43.142,255.255.255.0,192.168.43.1,192.168.43.1,8.8.8.8 OK	Query the current parameter settings.
	AT+WIFISSETIP? +WIFISSETIP: 0,192.168.43.142,255.255.255.0,192.168.43.1,192.168.43.1 OK	Obtain IP address through DHCP.
Remarks	- Set after Wi-Fi connection is set up successfully. - Set the static IP address in allowed range. Otherwise, the Wi-Fi connection does not work.	

11.16 Setting Automatic Connection to Wi-Fi Hotspots: +WIFIAUTOCON

Description	To set automatic connection to Wi-Fi hotspots
Format	AT+WIFIAUTOCON=<n><CR>
Parameters	<n> : 0: disable automatic connection

	1: enable automatic connection (default)	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+WIFIAUTOCON=1 OK	Enable automatic connection
	AT+WIFIAUTOCON? +WIFIAUTOCON: 1 OK	Query the current parameter settings.
	AT+WIFIAUTOCON=? +WIFIAUTOCON: (0-1) OK	Query the value range of parameters.
Remarks	- It is recommended to execute this command before enabling Wi-Fi. - The setting by this command is not saved after the module is powered down. - The module automatically connect to the hotspot used last time after Wi-Fi STA is enabled or the hotspot is disconnected abnormally.	

11.17 Querying Wi-Fi Connection Record: +WIFICONLIST

Description	To query Wi-Fi connection record	
Format	AT+WIFICONLIST<CR>	
Parameters	NA	
Return Value	<CR><LF>+WIFICONLIST: <num> <CR><LF>"<ssid>" ... <CR><LF>OK<CR><LF> <num>: number of current records <ssid>: hotspot name saved	
Example	AT+WIFICONLIST +WIFICONLIST: 3 "neoway-ap01" "innos-ap01" "innosCs"	Query Wi-Fi hotspots connected before.

	OK
	AT+WIFICONLIST
	+WIFICONLIST: 0 No connection record
	OK
Remarks	The record list is saved after the module is powered off.

11.18 Unsolicited Report of Wi-Fi Connection Status: +WIFICONNSTAT

Description	Unsolicited report of Wi-Fi connection status	
Format	<CR><LF>+WIFICONNSTAT: <STATUS><CR><LF>	
Parameters	<STATUS>: 1: CONNECT SUCCESS 2: WIFI NOT ENABLE 3: AP NOT EXIST 4: ALREADY CONNECTED 5: WRONG PASSWD 6: TIME OUT 7: DISCONNECTED	
Return Value	<CR><LF>+WIFICONNSTAT:<STATUS><CR><LF>	
Example	AT+WIFICONNECT="neoway-ap01","1234567890"	Connected to the MQTT server successfully.
	OK	
	+WIFICONNSTAT: 1	
	+WIFICONNSTAT: 7	Disconnected abnormally
Remarks	N/A	

12 SSL TCP Data Service

12.1 Configuring SSL Parameters for TCP: +SSLTCPCFG

Description	To configure SSL parameters for TCP data service
Format	• AT+SSLTCPCFG=<type>,<type_name><CR> • AT+SSLTCPCFG?<CR> • AT+SSLTCPCFG=?<CR>
Parameter	type : SSL parameter options type_name : parameter settings for SSL
Return Value	<CR><LF>OK<CR><LF> Or <CR><LF>+SSLTCPCFG: <type>,<type_name> Or <CR><LF>+SSLTCPCFG: <type_name1>,<type_name2>,<type_name3>... type: SSL parameter options sslversion: SSL protocol version authmode: authorization mode ciphersuite: Cipher suite cacert: CA certificate clientcert: Client certificate clientkey: Client key type_name: Settings for SSL parameter sslversion 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 authmode 0: No authentication 1: Manage server authentication

	2: Manage server and client authentication if requested by the remote server Cacert : string, CA certificate Clientcert : string, client certificate Clientkey : string, client key	
Example	AT+SSLTCPCFG="sslversion",0 OK	Set SSL version to SSL3.0.
	AT+SSLTCPCFG="authmode",0 OK	Set authmode to no authentication.
	AT+SSLTCPCFG? +SSLTCPCFG: 0,1,,ca.pem,cc.pem,ck.pem OK	Query the current SSL settings.
	AT+SSLTCPCFG=? +SSLTCPCFG: <type>,<type_name> OK	Query the value range of the parameters.
Remark	If the authmode is set to 0, you do not have to set other parameters, such as cacert , clientcert , and clientkey .	

12.2 Setting up TCP Connection over SSL: +SSLTCPSETUP

Description	To set up a TCP connection over SSL
Format	- AT+SSLTCPSETUP=<socket_id>,<ip>,<port>,<mode><CR> - AT+SSLTCPSETUP=? - AT+SSLTCPSETUP?
Parameter	Socket_id: socket ID, ranging from 0 to 5, used to identify the connection to the server IP: IP address or domain name of the server Port: server port Mode: transmission mode 0: non-transparent 1: transparent (not supported now)

Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>CONNECT<CR><LF>	
	<CR><LF>+SSLTCPSETUP: (0-5),ip,port,mode	
	<CR><LF>+SSLTCPSETUP: <socket_id>,<ip>,<port>,<mode>	
	<CR><LF>+SSLTCPSETUP: <socket_id>,<ip>,<port>,<mode>...	
Example	AT+SSLTCPSETUP=0,183.239.240.45,4451,0 OK	Set up a non-transparent connection to 183.239.240.45 on socket 0. The port number is 4451.
	+SSLTCPSETUP: 0,OK	
	AT+SSLTCPSETUP=0,183.239.240.45,4451,1 CONNECT	Set up a transparent connection to 183.239.240.45 on socket 0. The port number is 4451.
	AT+SSLTCPSETUP=0, www.alipay.com,443,0 OK	Set up a non-transparent connection to www.alipay.com on socket 0. The port number is 443.
	+SSLTCPSETUP: 0,FAIL	Fails because of timeout.
	AT+SSLTCPSETUP=0, www.alipay.com,443,0 OK	Set up a non-transparent connection to www.alipay.com on socket 0. The port number is 443.
	+SSLTCPSETUP: 0,AUTHFAIL	Fails to authenticate.
	AT+SSLTCPSETUP?	Query the connection status.
	+SSLTCPSETUP: 0,183.239.240.45,4451,0 +SSLTCPSETUP: 1,183.239.240.45,4452,0 OK	A transparent TCP connection has been set up on socket 0 and socket 1.
	AT+SSLTCPSETUP=0,183.239.240.45,4451,0 OK	A connection has been set up on socket 0
	+SSLTCPSETUP: 0,ERROR1	
Remark	Activate PPP and apply one IP address before setting up a TCP connection over SSL.	

12.3 Closing TCP Connection over SSL: +SSLTCPCLOSE

Description	To close a TCP connection over SSL	
Format	- AT+SSLTCPCLOSE=<socket_id> - AT+SSLTCPCLOSE=?	
Parameter	Socket_id : socket ID, ranging from 0 to 5	
Return Value	<CR><LF>+SSLTCPCLOSE: <socket_id>,OK<CR><LF>	
	<CR><LF>+SSLTCPCLOSE: ERROR<CR><LF>	
Example	AT+SSLTCPCLOSE=0	Close the TCP connection on socket 0.
	+SSLTCPCLOSE: 0,OK	
	AT+SSLTCPCLOSE=0	Socket ID is incorrect.
	+SSLTCPCLOSE: ERROR	
	+SSLTCPCLOSE: 0,Link Closed	The connection on socket 0 is closed.
Remark	N/A	

12.4 Sending TCP Data over SSL: +SSLTCPSEND

Description	To send TCP data over SSL	
Format	- AT+SSLTCPSEND=<socket_id>,<data_length> - AT+SSLTCPSEND=?	
Parameter	Socket_id : ranging from 0 to 5, used to identify the connection to the server Data_length : data length, ranging from 1 to 4096	
Return Value	<CR><LF>>	
	<CR><LF>+SSLTCPSEND: <socket_id>,OK<CR><LF>	
	<CR><LF>+SSLTCPSEND: <socket_id>,FAIL<CR><LF>	
Example	AT+SSLTCPSEND=0,0,20	Send 20-byte data to the server over socket 0.
	> +SSLTCPSEND: 0,OK	
	AT+SSLTCPSEND=0,1024	Send 1024-byte data to the server over socket 0.
	>	Failed because buffer is full.

	+SSLTCPSEND: 0,FAIL	
	AT+SSLTCPSEND=0,4097	Send 4097-byte data to the server.
	+SSLTCPSEND: Data length error	Failed because the data length exceeds the threshold.
	AT+SSLTCPSEND=? +SSLTCPSEND: (0-5),(1-4096) OK	Query the value range of the parameters.
Remark	N/A	

12.5 Unsolicited SSLTCP Data Output: +SSLTCPRECV

Description	Unsolicited SSLTCP data output.	
	When the module receives SSLTCP data from the network, the UART prints the data automatically.	
Format	+SSLTCPRECV: <socket_id>,<data_length>,<data><CR><LF>	
Parameter	Socket_id : ranging from 0 to 5, used to identify the connection to the server	
	Data_length : data length, ranging from 1 to 4096	
	Data : data received	
Return Value	N/A	
Example	+SSLTCPRECV: 0,20,1234567890abcdefghjk	Received 20-byte data over socket 0
Remark	N/A	

12.6 Writing SSL Certificate: +CERTADD

Description	To write an SSL certificate to the module	
Format	AT+CERTADD=<file_name>,<length><CR>	
Parameter	File_name : Certificate file name	
	Length : file length	
Return Value	<CR><LF>CONNECT<CR><LF>	

	<CR><LF>+CERTADD: <length>,OK<CR><LF>	
	<CR><LF>+CERTADD: ERROR<CR><LF>	
	<CR><LF>OK<CR><LF>	
Example	AT+CERTADD=ca_cert.pem,1428 CONNECT	Add the alipay.crt certificate of 1428 bytes to the module.
	+CERTADD: 1428,OK	
	AT+CERTADD=clent_cert.pem,1938 CONNECT	Add the alipay.crt certificate of 1938 bytes to the module.
	+CERTADD: 1938,OK	
	AT+CERTADD=client_key.pem,1097 CONNECT	Add the alipay.crt certificate of 1907 bytes to the module.
	+CERTADD: 1097,OK	
Remark	The writing process can be interrupted by +++.	

12.7 Checking SSL Certificate: +CERTCHECK

Description	To check the SSL certificate	
Format	- AT+CERTCHECK=<file_name><CR> - AT+CERTCHECK?<CR>	
Parameter	File_name : Certificate file name	
Return Value	<CR><LF>+CERTCHECK: <file_name>,OK<CR><LF>	
	<CR><LF>+CERTCHECK: ERROR<CR><LF>	
Example	AT+CERTCHECK=ca_cert.pem +CERTCHECK: ca_cert.pem,OK	Check the ca_cert.pem certificate.
	AT+CERTCHECK=clent_cert.pem +CERTCHECK: clent_cert.pem,OK	Check the clent_cert.pem certificate.
	AT+CERTCHECK=client_key.pem +CERTCHECK: ERROR	client_key.pem does not exist.

	AT+CERTCHECK? cacert.pem keycert.pem OK	Check the added file.
Remark	N/A	

12.8 Deleting SSL Certificate: +CERTDEL

Description	To delete an SSL certificate	
Format	- AT+CERTDEL=<file_name><CR> - AT+CERTDEL=<file_name>	
Parameter	File_name : Certificate file name	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CERTDEL=ca_cert.pem OK	Delete ca_cert.pem.
	AT+CERTDEL=client_cert.pem OK	Delete client_cert.pem
	AT+CERTDEL=client_key.pem OK	Delete client_key.pem
	AT+CERTDEL OK	Delete all added files.
Remark	N/A	

12.9 Configuring SSL Parameters for TCP: +SSLTCPCFGA

Description	To configure SSL parameters for TCP data service
-------------	--

Format	- AT+SSLTCPCFGA=<sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey><CR> - AT+SSLTCPCFGA?<CR> - AT+SSLTCPCFGA=?<CR>	
Parameter	sslversion: 0: SSL3.0 1: TLS1.0 2: TLS1.1 3: TLS1.2 authmode: 0: No authentication 1: Manage server authentication 2: Manage server and client authentication if requested by the remote server Cacert: string, CA certificate Clientcert: string, client certificate Clientkey: string, client key	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+SSLTCPCFGA: <sslversion>,<authmode>,<cacert>,<clientcert>,<clientkey> <CR><LF>OK<CR><LF>	
Example	AT+SSLTCPCFGA=3,1,"ca.pem","", "" OK	Set SSL TCP parameters
	AT+SSLTCPCFGA? +SSLTCPCFGA: 0,1,ca.pem,cc.pem,ck.pem OK	Query the current SSL settings.
Remark	- Certificate must be imported before setting. - Certificate can be set empty.	

12.10 Reading SSL TCP Data: +SSLTCPREAD

Description	To read SSL TCP data
--------------------	----------------------

Format	AT+SSLTCPREAD=<id>,<length><CR><LF>
Parameter	<id>: socket ID, ranging from 0 to 5 <length>: data length, ranging from 1 to 4096
Return Value	See the Example
Example	AT+SSLTCPSETUP=0,58.60.184.213,12004,0 OK +SSLTCPSETUP: 0,OK AT+SSLTCPSEND=0,10 > +SSLTCPSEND: 0,OK +SSLTCPRECV: 0 AT+SSLTCPREAD=0,4096 +SSLTCPREAD: 0,10,1111111111 OK
Remark	This command is sent after executing AT+RCVMODE=0 to modify receive mode.

13 MQTT Command

13.1 Configuring TLS Parameters: +MQTTTLS

Description	To configure MQTT TLS parameters	
Format	• AT+MQTTTLS=<type>,<value><CR> • AT+MQTTTLS?<CR> • AT+MQTTTLS=?<CR>	
Parameter	type : parameter type value : parameter value	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+ MQTTTLS: <type>,< value > value : value of type sslmode : 0: not authentication 1: authentication Authmode : 0: verify optional 1: verify required rootca : string, CA certificate clientcert : string, client certificate clientkey : string, client key	
Example	<CR><LF>+ MQTTTLS: < sslmode>,< authmode>,< rootca _name>,< clientcert _name>,< clientkey _name> sslmode : SSL mode authmode : authentication mode rootca : CA certificate clientcert : client certificate clientkey : client key	
	AT+MQTTTLS=authmode,1 OK	Set authentication mode to verify required.

	AT+MQTTTTL? +MQTTTTL: 1,1,ca.pem,cc.pem,ck.pem Query SSL configuration. OK
	AT+MQTTTTL=? +MQTTTTL: <type>,<value> Query value range of parameters. OK
Remarks	Send AT+CERTADD to import certificate.

13.2 Setting User Parameters: +MQTTCONNPARAM

Description	To set ID, user name, and password.	
Format	AT+MQTTCONNPARAM=<"clientId">,<"username">,<"password"><CR>	
Parameter	<"clientId">: Device ID, max. 256 bytes <"username">: User name, max. 512 bytes. <"password">: Password, max. 256 bytes.	
Return Value	<CR><LF>OK<CR><LF>	
Example	+MQTTCONNPARAM="C_201801021127","lixtest/thing01", "0ISoY/eYnISqUeAsbAKKQ/ACmipZwEw9H7Ff0h1kOps="	Parameters are set successfully.
Remarks	The parameters must be marked by quotation marks.	

13.3 Will Settings: +MQTTWILLPARAM

Description	To set will parameters	
Format	AT+MQTTWILLPARAM=<retained>,<qos>,<"topicname">,<message><CR>	
Parameter	<retained>: Retain symbol, digit type, 0 and 1 <qos>: Quality of service, 0 and 1 supported <"topicname">: Will topic, max. 128 bytes. The parameter must be marked by quotation marks. <message>: Will Message, max. 1024 bytes	

Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTWILLPARAM=0,1,"lixytopic",byby OK	The will is set successfully.
Remarks	N/A	

13.4 Setting Long Will Messages: +MQTTWILLMSG

Description	To set long will messages or will messages of non-character string by specifying retained, qos, topic, and message length	
Format	AT+MQTTWILLMSG =<retained>,<qos>,<topic>,<msg_length><CR>	
Parameters	<retained> : Retain flag, digit type, 0 or 1 <qos> : QoS of publish message <topic> : Publish topic <willmsg_length> : Length of will messages, maximum 10240 bytes. After the UART returns >, input message content of the specified length.	
Return Value	<CR><LF>OK<CR><LF> <CR><LF> ERROR<CR><LF>	
Example	AT+MQTTWILLMSG =1,1,"neoway02",10 > OK	Set will message. Successfully
	AT+MQTTWILLMSG=1,1,"neoway02",10 > +MQTTWILLMSG: Timeout!	Set will message. Failed
Remarks	If the message is not input completely within 30 seconds, the UART returns timeout.	

13.5 Connection Command: +MQTTCONN

Description	To connect to the MQTT server.	
Format	AT+MQTTCONN=<host>,<clean>,<keep_alive><CR>	
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	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTCONN=121.43.166.63:1883,0,60	Connect to the MQTT server successfully.
	OK	
Remarks	N/A	

13.6 Subscription: +MQTTSUB

Description	To subscribe a topic	
Format	AT+MQTTSUB=<topicname>,<qos><CR>	
Parameter	<topicname> : Topic to subscribe to, max. 128 bytes	
	<Qos> : Quality of service, 0 and 1 supported	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTSUB="lixystopic",1 OK +MQTTSUB:3,"lixystopic",11,123321HELLO	Subscribe to the topic successfully. The server issues the topic retained last time.
	AT+MQTTSUB=lixystopic,1 OK	Subscribed to the topic successfully.
Remarks	Topicname must be marked by quotation marks.	

13.7 Unsubscription: +MQTTUNSUB

Description	To unsubscribe a topic	
Format	AT+MQTTUNSUB=<"topicname"><CR>	
Parameter	<"topicname"> : Topic to unsubscribe to, max. 128 bytes	

Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTUNSUB="neoway02" OK	Unsubscribe to a topic
Remarks	N/A	

13.8 Publishing Topic: +MQTTPUB

Description	To publish a topic	
Format	AT+MQTTPUB=<retained>,<qos>,<"topicname">,<message><CR>	
Parameter	<Retained>: Retain mark, digit type, 0 and 1 <Qos>: Quality of service, 0 and 1 supported <"topicname">: Topic, max. 128 bytes <Message>: Message, max. 1024 bytes	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+MQTTPUB=1,1,"neoway02", neoway mqtt OK	The topic is published successfully.
	AT+MQTTPUB=1,1,"neoway02", neoway mqtt OK +MQTTSUB:5,"neoway02",11, neoway mqtt	The server does not support QoS=2. After the command times out, the device disconnects to the MQTT server. Developers need to reconnect manually.
Remarks	N/A	

13.9 Publishing Topic: +MQTTPUBS

Description	To publish topic	
Format	AT+MQTTPUBS =<retained>,<topic>,<qos>,<msg_length><CR>	
Parameter	<retained>: retain symbol, digit type, 0 and 1	

	<topic> : topic to be published <qos> : Quality of service, 0 and 1 are supported <msg_length> : the length of message published, max. 10240 bytes	
Return Value	<CR><LF>> <CR><LF>OK<CR><LF>	
Example	AT+MQTTPUBS=1,1,"lixxytopic",10	Topic publishes 10-byte data
	>	Input 10-byte data.
	OK	
	AT+MQTTPUBS=0,1,"lixxytopic",12	
	>	Times out
	+MQTTPUBS: Timeout!	
Remarks	The timer of publish message input is 30 seconds.	

13.10 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.	

13.11 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,"lixityopic",5,12345	Receive messages published by the topic subscribed to.
Remarks	Topicname must be marked by quotation marks.	

13.12 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	Query the MQTT connection status. The device is disconnected to the MQTT server.
Remarks	N/A	

14 AWS MQTT Commands

14.1 Configuring AWS TLS Parameters: +AWSTLSCFG

Description	To configure AWS TLS parameters	
Format	- AT+AWSTLSCFG=<type>,<value><CR> - AT+AWSTLSCFG?<CR> - AT+AWSTLSCFG=?<CR>	
Parameter	<type> : parameter type <value> : parameter value	
Return Value	<CR><LF>OK<CR><LF> <CR><LF>+AWSTLSCFG: <type>,<value > <CR><LF>+AWSTLSCFG: <authmode>,<rootca>,< clientcert _name>,< clientkey _name> <CR><LF>OK<CR><LF> authmode : authentication mode 0: verify optional 1: verify required rootca : CA certificate (character string) clientcert : client certificate (character string) clientkey : client key (character string)	
Example	AT+AWSTLSCFG=authmode,1 OK	Set the authentication mode to verify required.
	AT+AWSTLSCFG? +AWSTLSCFG: 1,ca.pem,cc.pem,ck.pem OK	Query the current configurations of SSL.
	AT+AWSTLSCFG=? +AWSTLSCFG: <type>,<type_name> OK	Query the value range of parameters.
Remarks	Certificates should be imported by sending AT+CERTADD .	

14.2 Setting User Parameters: +AWSAUTHPARAM

Description	To set ID, user name, and password.	
Format	AT+AWSAUTHPARAM=<cliendID>,<username>,<password><CR>	
Parameter	<clientID>: Device ID, max. 256 bytes <username>: User name, max. 512 bytes. <password>: Password, max. 256 bytes.	
Return Value	<CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF>	
Example	AT+AWSauthpARAM=nwy_test OK	The parameters are set successfully.
Remarks	Username and password are not mandatory in version 2.3.0.	

14.3 Setting AWS Connection Parameters: +AWSCONNPARAM

Description	To set AWS connection parameters	
Format	AT+MQTTCONN=<host>,<enable_reconnect><CR>	
Parameter	<host>: server address (url:port) <enable_reconnect>: to specify whether to reconnect after going offline 0: disable 1: enable	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+AWSCONNPARAM=a1epg1vh6w7h1k.iot.us-east-2.amazonaws.com:443,1 OK	Set connection parameters successfully.
Remarks	N/A	

14.4 Connection Command: +AWSCONN

Description	To connect to the MQTT server	
Format	AT+AWSCONN=< keepAlive>,<clean>,<version><CR>	
Parameter	<keepAlive> : time period of keepAlive, mandatory, ranging from 30 to 1200 seconds, 60 seconds by default <clean> : to specify whether to clear the sessions 0: Not clear 1: clear <version> : MQTT version = 4: 3.1.1	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+AWSCONN=60,1,4 OK	Connect to the MQTT server Successfully
Remarks	Only clean =1, version=4 are supported in version 2.3.0.	

14.5 Subscribing to Topic: +AWSSUB

Description	To subscribe to a topic	
Format	AT+AWSSUB=<topicname>,<qos><CR>	
Parameter	<topicname> : topic to subscribe to, max. 128 bytes <qos> : quality of service, 0 and 1 are supported	
Return Value	<CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF>	
Example	AT+AWSSUB=nwy_test/01,1 OK	Subscribe to the topic successfully.
Remarks	N/A	

14.6 Receiving Topic Content: +AWSSUBRECV

Description	To receive the topic message sent by the server	
Format	+AWSSUBRECV: <message_id>,<"topicname">,<message_len>,<message><CR>	
Parameter	<message_id> : Message ID <topicname> : Topic name <message_len> : The length of data received <message> : Data received	
Return Value	See the Example	
Example	+ AWSSUBRECV: 5," nwy_test/01",5,12345 Receive the message of the topic	
Remarks	N/A	

14.7 Publishing Topic: +AWSPUB

Description	To publish topic	
Format	AT+AWSPUB=<retained>,<qos>,<topicname>,<length><CR>	
Parameter	<retained> : retain mark, digit type, 0 or 1 <qos> : Quality of service, 0 and 1 are supported <topicname> : topic name, max. 128 bytes <length> : The length of message to be published, max. 10240 bytes After > is returned, enter messages of the specified length	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+AWSPUB: OK<CR><LF>	
	<CR><LF>+AWSPUB: ERROR<CR><LF>	
Example	AT+AWSPUB =1,1," nwy_test/01",11 > OK	The topic is published successfully.

	AT+AWSPUB =1,1," nwy_test/01",11 > OK +AWSPUB: OK +AWSSUBRECV:5,"nwy_test/01",11,12332ELO	The topic is published successfully and the server issues the topic.
Remarks	N/A	

14.8 Unsubscribing to Topic: +AWSUNSUB

Description	To unsubscribe to a topic	
Format	AT+AWSUNSUB=<topicname><CR>	
Parameter	<topicname>: topic name, max. 128 bytes	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+AWSUNSUB=nwy_test/01 OK	Unsubscribe to the topic successfully.
Remarks	N/A	

14.9 Disconnecting to the AWS MQTT Server: +AWSDISCONN

Description	To disconnect to the AWS MQTT server	
Format	AT+AWSDISCONN<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+AWSDISCONN OK	Disconnect to the AWS MQTT server
Remarks	N/A	

14.10 Querying MQTT Status: +AWSSTATE

Description	To query the status of MQTT connection	
Format	AT+AWSSTATE?<CR>	
Parameter	0 : Disconnected 1 : Connected	
Return Value	See the Example	
Example	AT+AWSSTATE? +AWSSTATE: 1 OKMQTT connected AT+AWSSTATE? +AWSSTATE: 0 OKMQTT disconnected	
Remarks	N/A	

15 GPS Commands

15.1 Switching GPS: \$MYGPSPWR

Description	To switch GPS	
Format	AT\$MYGPSPWR=<n><CR>	
Parameter	<n>: 0: disable GPS service 1: enable GPS service	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT\$MYGPSPWR=1 OK	Enable GPS service
	AT\$MYGPSPWR=0 OK	Disable GPS service
Remarks	- GPS service occupies a lot of resources. If it is not used, disable the service. - After the request is sent successfully, it will take the module some time to enable the GPS service and get GPS position. It depends on the circumstance. Ensure that a matched antenna is used.	

15.2 Querying GPS Status: \$MYGPSSTATE

Description	To query GPS status	
Format	AT\$MYGPSSTATE<CR>	
Parameter	N/A	
Return Value	<CR><LF>\$MYGPSSTATE: gps closed<CR><LF>	
	<CR><LF>\$MYGPSSTATE: gps opened<CR><LF>	

Example	AT\$MYGPSPWR=1	
	OK	Enable GPS
	AT\$MYGPSSTATE	Query GPS status.
	\$MYGPSSTATE: gps opened	
Remarks	N/A	

15.3 Obtaining NMEA Data: \$MYGPSPOS

Description	To obtain NMEA data
Format	AT\$MYGPSPOS=<TYPE>,<Mode><CR>
Parameter	<TYPE>: GPS data type, integer 0: NMEA\$GPGGA 1: NMEA\$GPGSA 2: NMEA\$GPGSV 3: NMEA\$GPRMC 4: NMEA\$GPVTG 5: NMEA\$GPGLL 6: all GPS data <Mode>: output mode 0: output once (default) 1: output periodically 2: disable periodic output
Return Value	0: NMEA\$GPGGA <CR><LF>\$MYGPSPOS: \$GPGGA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>*<hh> <CR><LF>OK<CR><LF> <1>: UTC time of position fix, hh mm ss <2>: latitude of position, dd mm mmmm <3>: North & South Hemispheres N: north S: south <4>: longitude of position, 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: not valid

6: estimated

<7>: Number of satellites in use

<8>: Horizontal Dilution of Precision (HDOP)

<9>: altitude above mean sea level (geoid)

<10>: units 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

1: NMEA\$GPGSA format

<CR><LF>\$MYGPSPOS: \$GPGSA,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>,<13>,<14>,<15>,<16>,<17>,*<hh><CR><LF>OK<CR><LF>

<1>: Mode

A: Automatic

M: Manual

<2>: fix mode

1: invalid fix

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

2: NMEA\$GPGSV format

<CR><LF>\$MYGPSPOS: \$GPGSV, <1>,<2>,<3>,<4>,<5>,<6>,<7>[,<4>,<5>,<6>,<7>...]*<hh><CR><LF>

\$GPGSV, <1>,<2>,<3>,<4>,<5>,<6>,<7>[,<4>,<5>,<6>,<7>...]*<hh><CR><LF>

...

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

<1>: Total number of messages of this type in this cycle

<2>: Message number

<3>: Total number of satellites in view, ranging from 00 to 12.

<4>: SV PRN number, ranging from 01 to 32.

<5>: Evaluation in degrees, ranging from 00 to 90 degree.

<6>: Azimuth, degrees from true north, 000 to 359

<7>: SNR (C/No), 00-99 dB (null when not tracking)

<hh>: checksum

8-11: Information about second SV, same as field 4-7

12-15: Information about third SV, same as field 4-7

16-19: Information about fourth SV, same as field 4-7

The number of \$GPGSV sentences is same as the value of <1>.

3: NMEA\$GPRMC

<CR><LF>\$MYGPSPOS:

\$GPRMC,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>,<10>,<11>,<12>*<hh><CR><LF>OK<CR><LF>

<1>: UTC time of position fix, hhmmss

<2>: status of position fix

A: valid

V: invalid

<3>: latitude of fix, 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: Automatic

D: DGPS

E: Estimated

N: invalid

<hh>: Checksum

4: NMEA\$GPVTG

<CR><LF>\$MYGPSPOS:

\$GPVTG,<1>,T,<2>,M,<3>,N,<4>,K,<5>*<hh><CR><LF>OK<CR><LF>

<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

	5: NMEA\$GPGLL <CR><LF>\$MYGPSPOS: \$GPGLL,<1>,<2>,<3>,<4>,<5>,<6>*<hh><CR><LF>OK<CR><LF> <1>: Latitude, ddmm.mmmmm <2>: N or S N: North S: South <3>: Longitude, dddmm.mmmmm <4>: E or W E: East W: West <5>: UTC time of position fix, hhmmss.sss <6>: Status A: Fix V: No fix <hh>: Checksum	
	AT\$MYGPSPOS=0 \$MYGPSPOS: \$GPGGA,060239.00,2241.170914,N,11359.18722 5,E,2,16,2.5,116.6,M,,,,*39 OK	Obtain the position information.
	AT\$MYGPSPOS=1 \$MYGPSPOS: \$GPGSA,A,2,01,11,16,22,,,,,,,,,2.4,2.2,1.0*32 OK	Obtain GPGSA message.
Example	AT\$MYGPSPOS=2 \$MYGPSPOS: \$GPGSV,5,1,19,01,57,160,50,11,84,151,31,16,09,090,41,22,10,140,49*74 \$GPGSV,5,2,19,04,40,184,,07,57,314,,08,87,050,,10,03,164,*7B \$GPGSV,5,3,19,15,15,270,,19,,,20,,,21,50,071,*78 \$GPGSV,5,4,19,24,13,196,,26,05,309,,28,,,32,,,*7A \$GPGSV,5,5,19,41,,,41,42,,,43,50,,,43*72	Obtain GPGSV message.

	OK
	AT\$MYGPSPOS=3 \$MYGPSPOS: \$GPRMC,074855.00,A,2241.207019,N,11359.188 Obtain GPRMC message. 919,E,0.0,78.5,050517,2.3,W,A*16 OK
	AT\$MYGPSPOS=4 \$MYGPSPOS: \$GPVTG,78.5,T,80.8,M,0.0,N,0.0,K,A*29 Obtain GPVTG message OK
	AT\$MYGPSPOS=5 \$MYGPSPOS: \$GPGLL,2241.207179,N,11359.188345,E,074856. Obtain GPGLL message 00,A*0F OK
Remarks	- The obtained data is GPS coordinates. - It takes time to fix the position for the first time after GPS is enabled. - All data types and query modes are supported on V003 and later versions.

15.4 Enabling an Aid GNSS System: \$MYGNSSSEL

Description	To enabling an aid GNSS system	
Format	AT\$MYGNSSSEL=<n><CR>	
Parameter	<n>: GNSS type 0: BD 1: GLONASS 2: GALILEO 3: BD, GLONASS, GALILEO	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT\$MYGNSSSEL=1	Enable GLONASS for aid positioning
	OK	
	AT\$MYGNSSSEL=0	Enable BD for aid positioning

	OK
Remarks	- Before selecting an aid GNSS system, enable GPS. - Positioning data of the aid GNSS system can be queried by \$MYGNSSMSG. - This command is supported on V003 and later versions.

15.5 Obtaining Positioning Data of Aid GNSS System: \$MYGNSSMSG

Description	To obtain the positioning data of the aid GNSS system	
Format	AT\$MYGNSSMSG<CR>	
Parameter	N/A	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT\$MYGNSSMSG \$GLGSV,3,1,09,,,,,37,70,08,234,20,82,42,033,18,73,28,337,30*5D \$GLGSV,3,2,09,80,47,040,22,79,14,102,39,84,19,196,35,83,73,158,43*68 \$GLGSV,3,3,09,71,08,282,16*5D \$GNGNS,015559.80,2241.185287,N,11359.175639,E,AAA,10,0.8,111.3,-1.0,,*0F \$GNGSA,A,2,73,79,83,84,,,,,,,,,1.1,0.8,0.8,2*3E OK	Obtain the positioning data of the aid GNSS system. GLONASS is enabled as for aid positioning. The navigational messages of GLONASS is returned
	AT\$MYGNSSMSG \$GNGNS,015559.80,2241.185287,N,11359.175639,E,AAA,10,0.8,111.3,-1.0,,*0F \$GNGSA,A,2,201,203,204,206,209,,,,,,,,,1.4,1.1,0.8,4*03 OK	Only BD is enabled for aid positioning.
Remarks	This command is supported on V003 and later versions.	

15.6 Enabling/Disabling XTRA Aid Positioning: +XTRAOPEN

Description	To enable or disable XTRA aid positioning	
Format	AT+XTRAOPEN=<n><CR>	
Parameter	<n>: 0: disable 1: enable	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+XTRAOPEN=1 OK	Enable XTRA aid positioning.
	AT+XTRAOPEN=0 OK	Disable XTRA aid positioning.
Remarks	It is recommended to enable XTRA aid positioning and inject data before enabling GPS function.	

15.7 Writing XTRA Data to Cache: +XTRASEND

Description	To write XTRA data to cache	
Format	AT+XTRASEND=<length>,<timeout><CR>	
Parameter	<length>: data length <timeout>: timeout timer	
Return Value	See the Example	
Example	AT+XTRASEND=60831,10 >	Write XTRA data to cache.
	OK	
Remarks	- It is recommend to set the baudrate to a higher value when using this command. - Enable XTRA before data injection and time injection.	

Description	To inject XTRA cached into GPS
Format	• AT+XTRAINJECTDATA<CR> • AT+XTRAINJECTDATA?<CR>
Parameter	See the Example.
Return Value	+XTRAINJECTDATA:<valid_time>, <production date> <valid_time>: the valid time of XTRA data, 7*24h in general <production date>: production time (UTC time) of XTRA data, unit: ms
Example	AT+XTRAINJECTDATA Inject XTRA data cached into GPS. OK AT+XTRAINJECTDATA? +XTRAINJECTDATA:168,1523494800000 Query the valid time of XTRA data. OK
Remarks	N/A

Description	To inject current time into GPS
Format	AT+XTRAINJECTTIME=<current_time>,<uncertainty_time><CR>
Parameter	<current_time>: current UTC time, unit: ms <uncertainty_time>: uncertainty time, unit: ms
Return Value	N/A
Example	AT+XTRAINJECTTIME=1522831197000,40 Inject current time into GPS. OK
Remarks	N/A

15.10 Setting APN of AGPS: +AGPSOPEN

Description	To set the APN of AGPS	
Format	AT+AGPSOPEN =<pdp_type>,<apnname><CR>	
Parameter	<pdp_type>: 1: IPV4 2: IPV6 3: IPV4V6 <apnname>: APN, length ranging from 1 to 100	
Return Value	See the Example	
Example	AT+AGPSOPEN=1,3GNET OK	Set the APN of AGPS
Remarks	N/A	

15.11 Setting AGPS Server: +SETSERVER

Description	To set the server of AGPS	
Format	AT+SETSERVER =<n>,<url>,<port><CR>	
Parameter	<n>: current network mode 1: 3GPP2 3: 3GPP (only GSM, WCDMA, and LTE are supported) <url>: Server address, IPV4, IPV6, and URL are supported <port>: Server port	
Return Value	See the Example	
Example	AT+SETSERVER=3,supl.qxwz.com,7276 OK	Set the server address of AGPS
Remarks	SETSERVER must be set before GPS is enabled.	

15.12 Clearing GPS Data: +GPSDEL

Description	To clear GPS data	
Format	AT+GPSDEL<CR>	
Parameter	N/A	
Return Value	N/A	
Example	AT+GPSDEL OK	Clear GPS data
Remarks	It is recommended to use this command before enabling GPS or after disabling GPS.	

15.13 Setting GPS: \$MYGPSCFG

Description	To set GPS parameters														
Format	- AT\$MYGPSCFG=<type>,<value><CR> - AT\$MYGPSCFG?<CR>														
Parameters	<type>: Specify how to set 0: set GPS update frequency 1: set NMEA data report 2: set format of NMEA data reported Others: reserved <value>: set based on <type> type=0, update interval, ranging from 100 to 60000 ms type=1, specify whether to report. 0: disable report. 1: enable report (default). type=2, decimal number. The following list masks of different NMEA formats. All enabled by default. <table><tr><td>GP GGA</td><td>0x00000001</td></tr><tr><td>GP RMC</td><td>0x00000002</td></tr><tr><td>GP GSV</td><td>0x00000004</td></tr><tr><td>GP GSA</td><td>0x00000008</td></tr><tr><td>GP VTG</td><td>0x00000010</td></tr><tr><td>GL GSV</td><td>0x00000080</td></tr><tr><td>GN GSA</td><td>0x00000100</td></tr></table>	GP GGA	0x00000001	GP RMC	0x00000002	GP GSV	0x00000004	GP GSA	0x00000008	GP VTG	0x00000010	GL GSV	0x00000080	GN GSA	0x00000100
GP GGA	0x00000001														
GP RMC	0x00000002														
GP GSV	0x00000004														
GP GSA	0x00000008														
GP VTG	0x00000010														
GL GSV	0x00000080														
GN GSA	0x00000100														

	GNGNS 0x00000200	
	GARMC 0x00000400	
	GAGSV 0x00000800	
	GAGSA 0x00001000	
	GAVTG 0x00002000	
	GAGGA 0x00004000	
	PQGSA 0x00008000	
	PQGSV 0x00010000	
	GPGLL 0x00020000	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>\$MYGPSCFG: <type>,<value>	
	<CR><LF>OK<CR><LF>	
Example	AT\$MYGPSCFG=0,1000	Set GPS update frequency to 1 second. NMEA data is reported every one second.
	OK	
	AT\$MYGPSCFG?	
	\$MYGPSCFG: 0,1000	
	\$MYGPSCFG: 1,1	Query parameter settings.
	\$MYGPSCFG: 2,4294967295	
	OK	
	AT\$MYGPSCFG=2,1	Set to report GPGLL data only.
	AT\$MYGPSCFG=1,0	Disable NMEA report.
Remarks	N/A	

16 DTMF Commands

16.1 Sending DTMF Tone: +VTS

Description	To send the DTMF tone	
Format	- AT+VTS=<DTMF>[,<duration>]<CR> - AT+VTS=?<CR>	
Parameter	<DTMF> : A single ASCII character in the set 0-9, #, *, A-D.	
Return Value	See the Example	
Example	AT+VTS=? +VTS: (0-9,*,#,A,B,C,D),(1-255) OK	Query the DTMF signal range of the module.
	AT+VTS=1 OK	Set during a call.
	AT+VTS=1 ERROR	Set not during a call.
Remark	This command is valid during a call.	

16.2 Starting the DTMF Detection: +DTMFDETECT

Description	To start the DTMF detection	
Format	AT+DTMFDETECT=<value><CR>	
Parameter	<value> : Integer, ranging from 0 to 3. 1: Start DTMF detection (only valid in a call) 0: Stop DTMF detection (Pairing with 1)	
Return Value	<CR><LF>+DTMF:DETECT START OK<CR><LF> <CR><LF>+DTMF:DETECT STOP OK<CR><LF> <CR><LF>+DTMF:DETECT ALREADY STARTED<CR><LF>	

	<CR><LF>+DTMF:OPERATION NOT ALLOWED<CR><LF>	
Example	AT+DTMFDETECT=1 +DTMF:DETECT START OK	Set during a call. Start DTMF detection.
	AT+DTMFDETECT=1 +DTMF:DETECT START OK	
	DTMF KEY(Rec): *	Start the DTMF detection during a call.
	DTMF KEY(Rec): #	The module detects *, #, and 8 respectively.
	DTMF KEY(Rec): 8	
	AT+DTMFDETECT=0 +DTMF:DETECT STOP OK	Stop the DTMF detection during a call.
Remark	- After DTMF detection is started, the module will return DTMF KEY(Rec):<key>[,<duration>] if it detects DTMF signals from the other side. - The value of <key> can be 0-9, #, *, and A-D. Please refer to the parameter of AT+VTS.	

17 GSM Location Command

17.1 Obtaining the Location of the Module: +CIPGSMLOC

Description	To obtain the location information of the module
Format	- AT+CIPGSMLOC<CR> - AT+CIPGSMLOC=<n><CR>
Parameter	<n>: request selection 0: Close location request (default) 1: multi-BS positioning request (reserved)
Return Value	<CR><LF>+CIPGSMLOC: <fail_string><CR><LF> <fail_string>: Failure string CONTACT FAIL LINK FAIL LINK NOT FREE <CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: {<result_string>} <CR><LF>+CIPGSMLOC: OK<CR><LF> <result_string>: string including longitude and latitude <CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: <code> <CR><LF>+CIPGSMLOC: FAIL <CR><LF> <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

	<CR><LF>OK<CR><LF> <CR><LF>+CIPGSMLOC: TIMEOUT<CR><LF>	
Example	AT+CIPGSMLOC OK +CIPGSMLOC:{"location":{"lat":22.682403116613813,"lng":113.99042272056249},"accuracy":0.0} +CIPGSMLOC: OK	Single-BS positioning request is executed successfully in State Grid mode. The module reports location coordinates.
	AT+CIPGSMLOC +CIPGSMLOC: CONTACT FAIL	The server domain name fails to be translated.
	AT+CIPGSMLOC +CIPGSMLOC: LINK FAIL	The connection to the server fails to be set up.
	AT+CIPGSMLOC OK +CIPGSMLOC: 404 +CIPGSMLOC: FAIL	The location request is sent successfully, but the queried BS is not included.
	AT+CIPGSMLOC=1 OK AT+CIPGSMLOC=1 +CIPGSMLOC: LINK NOT FREE	Request multi-BS positioning. Last request has not been responded.
	AT+CIPGSMLOC=0 OK	End the request
	AT+CIPGSMLOC=1 OK +CIPGSMLOC:{"location":{"lat":22.689646628671216,"lng":113.98586121790129},"accuracy":0.0} +CIPGSMLOC: OK	Request multi-BS positioning in standard mode is executed successfully. The module reports its location coordinates.
Remarks	- The obtained location information is the GPS coordinates. - If the server does not reply in 10 seconds after the request is submitted successfully, the module returns +CIPGSMLOC: TIMEOUT.	

- The current coordinates of latitude and longitude are valid and precision is reserved (0.0 by default).

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18 ADC Temperature Collection Command

18.1 Querying Environment Temperature: \$MYADCTEMP

Description	To query the environment temperature	
Format	AT\$MYADCTEMP=<mode><CR>	
Return Value	<CR><LF>\$MYADCTEMP: <temp>,<volt> <CR><LF>OK<CR><LF>	
	<CR><LF>\$MYADCTEMP: OVL <CR><LF>OK<CR><LF>	
	<CR><LF>\$MYADCTEMP: OVH <CR><LF>OK<CR><LF>	
Parameter	<mode>: 0: temperature and voltage at ADC port 1: reserved <temp>: Temperature, °C <volt>: Voltage, mV OVL: The temperature exceeds the lower threshold -40 °C OVH: The temperature exceeds the higher threshold 95 °C	
Example	AT\$MYADCTEMP=0 \$MYADCTEMP: 10,350 OK	Get the temperature and voltage at the ADC port.
Remarks	Refer to Neoway temperature sensing scheme.	

19 Time Synchronization Commands

19.1 Updating Time: +UPDATETIME

Description	To update the module time to the network time	
Format	• AT+UPDATETIME=<mode>[,<serv_ip>,<time>[[,<TZ>][,<DST>]]]<CR> • AT+UPDATETIME?<CR> • AT+UPDATETIME=?<CR>	
Parameter	<mode>: 0: Query mode. Query when the time was updated to the network time last time. 1: Setting mode. Synchronize the time to the network time. <serv_ip>: The IP address of the time server, in form of xx.xx.xx.xx or domain name <time>: the timeout period, ranging from 1 to 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)	
Return Value	• No PPP Link • Time Updating,Please Wait... • Time Out • Time Data Is Null • Send Request Fail • Update To yyyy-mm-dd,hh:mm:ss • Last Update Time yyyy-mm-dd,hh:mm:ss • Domain Name Invalid • Socket Error	
Example	AT+UPDATETIME=0 +UPDATETIME: Last Update Time 2014-03-31, 11:10:26	Query when the time was updated last time.

OK	
AT+UPDATETIME=0 +UPDATETIME: Last Update Time 0000-00-00, 00:00:00 OK	Query when the time was updated last time. The time was not updated.
AT+UPDATETIME=1,210.72.145.44,10 +UPDATETIME: No PPP Link	Set up a PPP link.
AT+UPDATETIME=1,210.72.145.44,10 OK Time Updating,Please Wait... +UPDATETIME: Time Out	Update the time to that of the server 210.72.145.44. Timeout period is 10 seconds. East time zone 8 by default No DST Time update times out because of network congestion.
AT+UPDATETIME=1,128.138.141.172,10,"E8",0 OK Time Updating,Please Wait... +UPDATETIME: Update To 2014-03-31,11:32:55	Update the time to that of the server 128.138.141.172. Timeout period is 10 seconds. East time zone 8 by default No DST Time is updated successfully.
AT+UPDATETIME=1,time.windows.com,10,"W12",1 OK Time Updating,Please Wait... +UPDATETIME: Update To 2014-04-12,15:17:48	Update time to that of time.windows.com. Timeout period is 10 seconds. Select west time zone 12. Select DST. Time is updated successfully.
AT+UPDATETIME=1,128.138.141.172,10,"W12",1 OK +UPDATETIME: Send Request Fail	Time update request sending fails. The reason probably is bad network connection or inability to support time

		update.
	AT+UPDATETIME=1,time.windows.com,10,"W12",1 +UPDATETIME: Domain Name Invalid	The domain name is invalid. The possible reason is the SIM (USIM) card is out of credit.
	AT+UPDATETIME=1,time.windows.com,10,"W12",1 OK +UPDATETIME: Socket Error	Socket error. The possible reason might be network congestion.
	AT+UPDATETIME? +UPDATETIME: 128.138.141.172,10,"E8",0 OK	Query the IP address of the server to which the time is updated and the timeout period, time zone, and DTS.
	AT+UPDATETIME=? +UPDATETIME: (0-1),,(1-30),,(0-1) OK	Query the value range of parameters.
Remarks	- The settings by this command are not saved after the module is powered off. - Set up a PPP link (AT+XIIIC=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. - Current the following time servers support time update: time.windows.com, time.nist.gov, etc.	

20 Network Sharing Commands

20.1 Enabling Network Sharing: +NETSHAREACT

Description	To enable network sharing
Format	- AT+NETSHAREACT=<cid>,<action>,<auto>[,<APN>[,<username>[,<passwd>[,<authtype>[,<ip_family>]]]]] - AT+NETSHAREACT? - AT+NETSHAREACT=?
Parameter	<cid>: PDP context, ranging from 1 to 11 <action>: Action 0: stop 1: start <auto>: Specify whether to enable network sharing automatically after the module is powered on. 0: manual 1: auto <APN>: Access Point Name, ranging from 0 to 99 <user_name>: User name, ranging from 0 to 255 <passwd>: password, ranging from 0 to 255 <auth_type>: Authentication type 0: NONE 1: PAP (default) 2: CHAP 3: PAP and CHAP <ip_family>: IP family 4: IPv4 (Default) 6: IPv6 10: IPv4_6
Return Value	+ NETSHAREACT:<stat>,<auto>,<err_code>,<wx_stat>,<PDP_type>,<share_mode> <stat>:

	0: disconnect 1: connect <atuo> : 0: manual 1: auto <err_code> : Not supported <wx_stat> : Not supported <PDP_type> : IPv4 <share_mode> : RNDIS/ECM	
Example	AT+NETSHAREACT=1,1,0,ctnet,card,card,1 OK	Enable network sharing. Disable automatic sharing after power on
	AT+NETSHAREACT=1,1,0,ctnet,card,card,1,6 OK	IPv6 dialup Network sharing is not supported
	AT+NETSHAREACT=? +NETSHAREACT: (0-11),(0-1),(0-1),"apn","user", "passwd",(0-3) OK	Query the parameter ranges.
	AT+NETSHAREACT? +NETSHAREACT: 0,0,,,"IPV4",RNDIS OK	Query the network sharing status.
Remarks	N/A	

20.2 RMNET Dialup: \$QCRMCALL

Description	To enable network sharing through RMNet dialup		
Format	- AT\$QCRMCALL=<Action>,<Instance>[,<IPType>[,<Tech Pref>[,<umts profile number>[,<cdma profile number>[,<APN>]]]]] - AT\$QCRMCALL? - AT\$QCRMCALL=?		
Parameter	<Action> : to specify whether to enable RMNet dialup 0: Stop		

	1: Start <Instance> : 1 - 8 <IP Type> : IP type 1: Ipv4 2: Ipv6 3: Ipv4v6 <Tech Pref> : technology standard 1: 3GPP2 2: 3GPP <umts_profile> : profile number, 1 to 24 <APN> : APN name, maximum of 100 bytes	
Return Value	<CR><LF><ERROR><CR><LF>	
	<CR><LF>< Action >,< Instance >,< IPType >,< Tech Pref >,< profile num>,, <CR><LF>OK<CR><LF>	
	<CR><LF>\$QCRMCall: < Instance >,< IPType ><CR><LF> <CR><LF>OK<CR><LF>	
	<CR><LF>OK<CR><LF>	
	<CR><LF><NO CARRIER ><CR><LF>	
Example	AT\$QCRMCall=1,1,1 \$QCRMCall: 1, V4 OK	Enable the RMNet dialup.
	AT\$QCRMCall=1,1,1 NO CARRIER	Failed to activate or network abnormality.
	AT\$QCRMCall? \$QCRMCall: 1, V4 OK	Query the status of RMNet dialup. The instance number and IP type is returned. RMNet dialup is enabled successfully.
	AT\$QCRMCall? OK	RMNet dialup is not enabled successfully.
	AT\$QCRMCall=1,1,4 ERROR	Parameters are set incorrectly.

	AT\$QCRM_CALL=? \$QCRM_CALL: (0-1),(1,2,3,4,5,6,7,8),(1-3),(1-2),(1-24,100-179),, OK	Query the value ranges of parameters.
Remarks	N/A	

21 Statistics on Data Traffic

21.1 Statistics on Total Data Traffic: +FLOWCALC

Description	To collect the statistics on total data bytes that the module transmits and receives	
Format	AT+FLOWCALC?<CR>	
Parameter	N/A	
Return Value	<CR><LF>+FLOWCALC: <rx_count>,<tx_count>	
	<CR><LF>OK<CR><LF>	
	rx_count : Total data the module received, unit byte tx_count : Total data the module transmitted, unit byte	
Example	<CR><LF>ERROR<CR><LF>	
	AT+FLOWCALC? +FLOWCALC: 1355,1260 OK	Query the total data that the module transmitted and received.
	AT+FLOWCALC? +FLOWCALC: 0,0 OK	Query the total data that the module transmitted and received.
Remarks	- This command supports only statistics on data that the module transmitted and received using external protocols since it was connected to the network last time. - This command is supported on V003 and later versions.	

21.2 Statistics on Transient Traffic: +RATECALC

Description	To collect statistics on transient data bytes that the module transmits and receives within 100ms
Format	AT+RATECALC?<CR>
Parameter	N/A

Return Value	<CR><LF>+RATECALC: <rx_count>,<tx_count>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+RATECALC? +RATECALC: 1355,1260 OK	Query the total data that the module transmitted and received within 100ms.
	AT+RATECALC? +RATECALC: 0,0 OK	Query the total data that the module transmitted and received within 100ms.
Remarks	• This command supports only statistics on data that the module transmitted and received using external protocols • This command is supported on V003 and later versions.	

22 AMR Commands

22.1 Playing AMR Audio Commands: +AMRPLAY

Description	To play AMR audio	
Format	- AT+AMRPLAY=<file_name>,<mode><CR> - AT+AMRPLAY<CR>	
Parameter	<file_name>: File name, at most 50 characters <mode>: Playing mode 0: Play out of a call and automatically stop when a call is on (default) 1: play during a call and the other side can hear the audio played (not supported)	
Return Value	See the Example	
Example	AT+FSWF="test.amr",1,1024,10000 >	Write the test.amr file to user disk. The data content should comply with the AMR file format.
	OK AT+AMRPLAY="test.amr",0 OK	Play the test.amr file.
	+AMRPLAY: Play ok!	The audio is over.
	AT+AMRPLAY="test1.amr",0 +AMRPALY: Play failed! OK	The test1.amr file does not exist, file content format is incorrect, or the files is tried to play during a call.
	AT+AMRPLAY OK	Stop playing.
	AT+AMRPLAY ERROR	ERROR is returned because no audio is played.
Remarks	This command can be used to play only AMR files.	

22.2 Pausing AMR Audio Playing: +AMRPAUSE

Description	To pause the AMR audio playing	
Format	AT+ AMRPAUSE <CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+AMRPAUSE OK	Pause the AMR audio playing after executing the play command
Remarks	N/A	

22.3 Resume AMR Audio Playing: +AMRRESUME

Description	To resume the AMR audio playing	
Format	AT+AMRRESUME<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+AMRPAUSE OK AT+AMRRESUME OK +AMRPLAY: Play ok!	Resume the AMR audio playing after executing the pause command
Remarks	N/A	

23 File System Commands

23.1 Writing Data to File: +FSWF

Description	To write data to a file	
Format	AT+FSWF=<file_name>,<mode>,<size>,<time><CR>	
Parameter	<file_name>: File name, at most 50 characters <mode>: mode 0: If the file already exists, new data is written to the start of the file and then it will overwrites original data. 1: If the file already exists, new data is written to the end of the file. <size>: Data size, ranging from 0 to 16384, unit: byte <time>: timeout period, ranging from 0 to 60000, unit: ms	
Return Value	<CR><LF>+FSWF: Timeout!<CR><LF>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+FSWF="test.txt",1,1024,10000 >	Write 1024-byte data to the test.txt file.
	OK	The command is executed successfully.
	AT+FSWF="test.txt",1,1024,10000 >	Write 1024-byte data to the test.txt file.
	+FSWF: Timeout!	The command times out after 10 seconds.
	AT+FSWF="test.txt",1,1024,60001 ERROR	ERROR is returned because the set value exceeds the parameter range.
	AT+FSWF="/sdcard/test.txt",1,10,60000 >	Write data to the test.txt file in SD card.
	OK	

Remarks	• The data to be written cannot exceed the threshold of the <size> value. • The user file space is 512 KB, that is, the total size of files stored, cannot exceed 512 KB. • If SD card is supported, include /sdcard in file name to operate files in the SD card.
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23.2 Reading Data from File: FSRF

Description	To read data from a file	
Format	AT+FSRF=<file_name>,<mode>,<size>[,<position>]<CR>	
Parameter	<file_name>: File name, at most 50 characters <mode>: mode 0: Read data from the beginning of the file. 1: Read data from the <position> of the file. <size>: data size, not exceed the size of the file, 0 is valid <position>: the position in the file, where data to be read starts, valid when <mode> is set to 1, 0 is invalid	
Return Value	See the Example	
Example	AT+FSRF="test.txt",0,10 +FSRF: 10,start01234 OK	Read 10-byte data from the beginning of the test.txt file.
	AT+FSRF="test.txt",0,0 +FSRF: 0, OK	Read 0-byte data from the beginning of the test.txt file.
	AT+FSRF="test.txt",0,1025 ERROR	ERROR is returned because <size> exceeds the file size.
	AT+FSRF="test.txt",1,20,2 +FSRF: 20,tart0123456789012345 OK	Read 20-byte data from the second byte of the test.txt file. The data is read successfully.
	AT+FSRF="test.txt",1,0,2 +FSRF: 0, OK	Read 0-byte data from the second byte of the test.txt file.

	AT+FSRF="test.txt",1,10,0 ERROR	ERROR is returned because the set value exceeds the parameter range.
	AT+FSRF="/sdcard/test.txt",0,10 +FSRF: 10,start01234 OK	Read data from test.txt in SD card.
Remarks	• The data to be read should not exceed the size of the file. • <size> and <position> is determined by the file size. • If SD card is supported, include /sdcard in file name to operate files in the SD card.	

23.3 Deleting a File: +FSDF

Description	To delete a file	
Format	AT+FSDF=<file_name><CR>	
Parameter	<file_name> : File name, at most 50 characters	
Return Value	See the Example	
Example	AT+FSDF="test.txt" OK	Delete the test.txt file.
	AT+FSDF="123.txt" ERROR	Delete the 123.txt file. ERROR is returned because the file does not exist.
	AT+FSDF="/sdcard/1.txt" OK	Delete 1.txt from SD card
Remarks	If SD card is supported, include /sdcard in file name to operate files in the SD card.	

23.4 Obtaining File List: +FSLIST

Description	To obtain the list of files in the file system
Format	AT+FSLIST?<CR>

Parameter	N/A	
Return Value	N/A	
Example	AT+FSLIST? i.amr,6181 file.txt,6000 OK	File name before comma File size after comma
	AT+FSLIST? OK	No file in the file system
	AT+FSLIST=/sdcard/dir OK	Query file list in /sdcard/dir
Remarks	If SD card is supported, include /sdcard in file name to operate files in the SD card.	

23.5 Obtain the Size of a File: +FSFS

Description	To obtain the size of a file	
Format	AT+FSFS=<file_name><CR>	
Parameter	<file_name>: File name, at most 50 characters	
Return Value	See the Example	
Example	AT+FSFS="test.txt" +FSFS: 1024 OK	Obtain the size of the test.txt file. The size is 1024 bytes.
	AT+FSFS="123.txt" ERROR	Obtain the size of the 123.txt file. ERROR is returned because the file does not exist.
	AT+FSFS=/sdcard/1.txt +FSFS: 10 OK	Obtain the size of the 1.txt file in SD card.
Remarks	If SD card is supported, include /sdcard in file name to operate files in the SD card.	

23.6 Obtaining the Remaining Storage Size of User Disk: FSLs

Description	To obtain the remaining storage size of user disk	
Format	AT+FSLs?<CR>	
Parameter	N/A	
Return Value	See the Example	
Example	AT+FSLs? +FSLs: 48128 OK	Query the remaining storage size of the user disk. The remaining storage size is 48128 bytes.
	AT+FSLs? +FSLs: DiskInfo Not Right!	The disk is not ready.
	AT+FSLs=/sdcard +FSLs: 1535345345 OK	Check the remaining size of SD card
Remarks	- The total size of user disk is 64 Kb. - Every 1- to 512-byte data occupies one data block (512 bytes). For example, the total file size in the disk is 100 bytes, and then the actual remaining size is 65436 (65536 minus 100). But the return value of +FSLs is 65024 (65536 minus 512) bytes. - If SD card is supported, include /sdcard in file name to operate files in the SD card.	

23.7 Formatting User Disk:+FSFAT

Description	To format user disk	
Format	AT+FSFAT<CR>	
Parameter	N/A	
Return Value	See the Example.	
Example	AT+FSFAT OK	Format user disk.

	AT+FSLS? +FSLS: 65536 OK	The remaining size of the user disk is 65536 bytes.
	AT+FSFAT ERROR	ERROR is returned because user disk is not ready.
	AT+FSFAT=/sdcard OK	Format SD card
Remarks	If SD card is supported, include /sdcard in file name to operate files in the SD card.	

24 Audio Recording Commands

24.1 Setting Recording Mode: +RECMODE

Description	To set the buffer mode of record data	
Format	- AT+RECMODE=<mode>[,<file_name>[,<format>]]<CR> - AT+RECMODE?<CR>	
Parameters	<mode>: 0: record local audio (default) 1: record downlink audio of voice 2: record uplink audio of voice 3: record mixed audio of voice <file_name>: saved file name for audio record. The record is in WAV format. Record files are saved from 001.WAV. <format>: record format 0: wav (default) 1: amr	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+RECMODE: <mode>	
	<CR><LF>+RECMODE: (0-3),<file_name>,(0-1)<CR><LF> OK<CR><LF>	
Example	AT+RECMODE=1,voice.wav OK	Set to record downlink audio.
	AT+RECMODE=0,audio.wav OK	Set to record local audio
	AT+RECMODE? +RECMODE:0 OK	Query current setting of record mode.
	AT+RECMODE=? +RECMODE: (0-3),<file_name> OK	Query the value range of parameter.

Remarks	• Execute this command before starting audio record. • Audio record files are saved in the module. • The setting by this command is not saved after the module is powered off.
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24.2 Starting and Stopping Recording Audio: +RECF

Description	To start or stop recording audio	
Format	AT+RECF=<val><CR>	
Parameters	<val>: 1: Start to record audio 0: Stop recording audio	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+RECF=1 OK	Recording
	AT+RECF=0 OK	To stop recording audio
Remarks	• Set record mode before starting to record audios. If the record file name is not set, the files will be saved from 001.WAV. • If a file with the same name exists in the module already, the new record file overwrites the previous one. • The audio record lasts at most 1 minutes. After one minute, the module report +RECP:FINISH to stop recording automatically.	

24.3 Playing Record File: +RECP

Description	To play a record file	
Format	AT+RECP=<sta>,<file_name><CR>	
Parameters	<sta>: audio play switch 0: stop playing 1: start to play	

	<file_name>: audio record file saved in the module	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT+RECP=1,001.wav OK	Play the record file 001.wav.
	AT+RECP=0 OK	Stop playing the audio record.
Remarks	• Audio records can be played when the module is idle or in a call. • Only .wav files can be played by this command. AMR files are played by AT+AMRPLAY. • The module reports +RECP:FINISH after completing playing.	

25 SIM Card Commands

25.1 Enabling Logical Channel of SIM Card: +CCHO

Description	To enable the logical channel of SIM card	
Format	- AT+CCHO=<dfname><CR> - AT+CCHO=?<CR>	
Parameters	<dfname> : AID, a string of 12 to 32 characters (the length must be an event number)	
Return Value	<CR><LF>+ CCHO: < sessionid>	
	<CR><LF>OK <CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+CCHO=a0000000871002ff86ffff89ffffff	
	+CCHO: 1	Enable logical channel.
	OK	
	AT+CCHO=?	
	+CCHO=<dfname>	
	Query the setting.	
	OK	
Remarks	Do not use the default AID.	

25.2 Disabling Logical Channel of SIM Card: +CCHC

Description	To disable the logical channel of the SIM card	
Format	- AT+CCHC=<sessionid><CR> - AT+CCHC=?<CR>	
Parameters	<sessionid> : Session ID returned to +CCHO	

Return Value	<CR><LF>+ CCHC: < sessionid>	
	<CR><LF>OK <CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+CME ERROR: <err><CR><LF>	
Example	AT+CCHC=1	
	OK	Disable logical channel.
	AT+CCHC=?	
	+CCHC=<dfname>	Query the setting.
	OK	
Remarks	N/A	

25.3 Sending APDU Command: +CGLA

Description	To send APDU command through the logical channel of the SIM card	
Format	- AT+CGLA=<sessionid>,<length>,<command><CR> - AT+CGLA=?<CR>	
Parameters	<sessionid> : Session ID returned to +CCHO <length> : Command length <command> : APDU command	
Return Value	<CR><LF>+ CGLA: <sessionid>,<length>,<command>	
	<CR><LF>OK <CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+CGLA: <length>,<response><CR><LF> <CR><LF>+CME ERROR: <err><CR><LF>	
Example	AT+CGLA=1,10,81F2000000	Send APDU command.
	+CGLA: 118,"6237820278218410A0000000871002FF86FFFF89FFFFFFFFFA50C8001718201FF830400004B5C8A01058B032F0607C6099001408301018301819000"	
	OK	
	AT+ CGLA=? +CGLA=<sessionid>,<length>,<command> OK	
		Query the setting.

Remarks	For details about the format of APDU commands, see the 3GPP protocol.
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25.4 Enabling/Disabling SIM Card: +SIMCARDCONFIG

Description	To enable/disable SIM card	
Format	- AT+SIMCARDCONFIG=<n><CR> - AT+SIMCARDCONFIG? <CR>	
Parameters	<n>: 0: Invalid operation or initializing 1: Disable SIM card 2: Enable SIM card	
Return Value	<CR><LF>OK<CR><LF> or <CR><LF>+SIMCARDCONFIG: <n > <CR><LF>OK<CR><LF>	
Example	AT+SIMCARDCONFIG=1	Disable SIM card
	OK	
	AT+SIMCARDCONFIG? +SIMCARDCONFIG: 1	Query the status of the SIM card. The SIM card is disabled.
Remarks	OK	
	- This command is used only after the SIM card is installed successfully. - If no SIM card is inserted, this command is invalid.	

25.5 Switching SIM: AT+SIMCROSS

Description	To switch SIM	
Format	- AT+SIMCROSS=<sim_id>[,<enable_store_setting>]<CR> - AT+SIMCROSS=?<CR> - AT+SIMCROSS?<CR>	
Parameter	sim_id:	

	1 indicates SIM 1 2 indicates SIM 2 <enable_store_setting>: 0: not save setting after powered down 1: save setting after powered down
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>+SIMCROSS: (1-2),(0-1)
	<CR><LF>+SIMCROSS: <sim_id>,< enable_store_setting ><CR><LF>+CME ERROR: <err><CR><LF>
Example	AT+SIMCROSS=1,1 Switch to SIM 1 and enable store setting. OK
	AT+SIMCROSS=? +SIMCROSS: (1-2),(0-1) Query value ranges of the parameters OK
	AT+SIMCROSS? +SIMCROSS: 1,0 Query the current settings. OK
Remarks	• SIM1 is used by default after the module is started for the first time. • If <enable_store_setting> is left empty, the setting is not saved after the module is powered down. • If only one SIM card is to be installed, it is recommended to send this command to query the valid SIM card slot and install the SIM card in to the valid slot. Otherwise, the module cannot register with a network successfully. • Error is returned when switching to the slot without SIM card. • Network mode is set to AUTO when switching SIM card slot. Network mode set last time is not valid. • Only dual-SIM single-standby is supported now.

26 Bluetooth Commands

26.1 Switching Bluetooth: +NBTINIT

Description	To switch the Bluetooth module	
Format	- AT+NBTINIT=<op><CR> - AT+NBTINIT?<CR>	
Parameters	<op>: 0: disable Bluetooth 1: enable Bluetooth <status>: 0: Bluetooth is not enabled. 1: Bluetooth is enabled.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+NBINIT: <status>	
Example	AT+NBTINIT=1 OK	Enable the Bluetooth
	AT+NBTINIT? +NBINIT: 1 OK	Query the Bluetooth status. Bluetooth is enabled already.
Remarks	N/A	

26.2 Setting Bluetooth Device Name: +NBNAME

Description	To set Bluetooth device name	
Format	- AT+NBNAME=<name><CR> - AT+NBNAME?<CR>	

Parameters	<name>: Bluetooth device name. character string, ranging from 1 to 129 bytes	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>+NBTNAME: <name>	
	<CR><LF>OK<CR><LF>	
Example	<CR><LF>ERROR<CR><LF>	
	AT+NBTNAME="Neoway"	Write Bluetooth device name to Neoway.
	OK	
Example	AT+NBTNAME?	
	+NBTNAME: "Neoway"	Query Bluetooth device name.
	OK	
Remarks	- The setting by this command is saved after the module is powered off. - Do not include quotation marks in the name.	

26.3 Query Bluetooth MAC: +NBTMAC

Description	To query Bluetooth MAC	
Format	AT+NBTMAC?<CR>	
Parameters	NA	
Return Value	<CR><LF>+NBTNAME: <mac_addr>	
Example	<CR><LF>OK<CR><LF>	
	AT+NBTMAC?	
	+NBTMAC: A4:04:50:2D:36:B5	Query the Bluetooth MAC.
Example	OK	
Remarks	Send this command after Bluetooth is enabled.	

26.4 Set BLE Mode: +NBTBLENODE

Description	To set BLE mode
Format	AT+NBTBLENODE=<mode><CR><LF>

Parameters	<mode>: BLE mode	
	0: not working (default)	
	1: Slave mode	
	2: Master mode (not supported)	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+NBTBLEMODE: <mode>	
	<CR><LF>OK<CR><LF>	
Example	AT+NBTBLEMODE=1 OK	Set the module to slave mode.
Remarks	N/A	

26.5 Sending Data through Bluetooth: +NBTWRITE

Description	To send data through Bluetooth	
Format	AT+NBTWRITE=<type>,<length>,<data><CR>	
Parameters	<type>: transmission type	
	0: HEX	
	1: ASCII	
	<length>: Data length. Length after the data converted into hexadecimal format when transmission type is set to HEX.	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+CME ERROR: <err><CR><LF>	
Example	AT+NBTWRITE=0,10,31323334353637383930 OK	Transmit 10-byte data in HEX mode.
	AT+NBTWRITE=1,10,1234567890 OK	Transmit 10-byte data in ASCII mode.
	AT+NBTWRITE=1,10,1234567890 ERROR	Failed to send.

Remarks	N/A
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26.6 Transparent Bluetooth transmission: +NBTTRANS

Description	To transmit data through Bluetooth transparently	
Format	AT+NBTTRANS<CR>	
Parameters	N/A	
Return Value	<CR><LF>CONNECT	
	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
Example	AT+NBTTRANS CONNECT 1234567890 +++ OK	Enter transparent transmission mode and send 1234567890. Send +++ to exit from transparent transmission.
	AT+NBTTRANS ERROR	Bluetooth connection is not set up. Failed to enter transparent mode.
Remarks	N/A	

27 Other AT Commands

27.1 Powering Off the Module: \$MYPOWEROFF

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

27.2 Controlling the Indicator of Socket Status: \$MYSOCKETLED

Description	To control the indicator of socket status	
Format	AT\$MYSOCKETLED=<ONOFF><CR>	
Parameter	<ONOFF>: Indicates the socket status, integer type. 0: The LED status when the socket is not connected. 1: The LED status when the socket is connected.	
Return Value	<CR><LF>OK<CR><LF>	
Example	AT\$MYSOCKETLED=1 OK	
Remarks	This command is used to control the LED indicator when the socket is connected complying with external protocol stack.	

27.3 Obtaining the Version Information of the Module: \$MYGMR

Description	To obtain the version information of the module firmware and hardware
Format	AT\$MYGMR<CR>
Parameter	N/A
Return Value	<CR><LF><module_manufacture> <CR><LF><module_model> <CR><LF><firmware_version> <CR><LF><firmware_release_date> <CR><LF><module_hardware_version> <CR><LF><module_hardware_release_date> <CR><LF>OK<CR><LF> <module_manufacture>: Manufacture code, 4 bytes in ASCII format. <module_model>: Module mode, 8 bytes in ASCII format. <firmware_version>: Firmware version, 4 bytes in ASCII format. <firmware_release_date>: Firmware release date, DDMMYY, 6 bytes in ASCII format. <module_hardware_version>: Hardware version, 4 bytes in ASCII format. <module_hardware_release_date>: Hardware release date
Example	AT\$MYGMR NEO6 N720 V003 100815 V1.0 260815 OK
Remarks	N/A

27.4 Obtaining the CCID of the SIM Card: \$MYCCID

Description	To obtain the circuit card identifier (CCID) of the SIM card	
Format	AT\$MYCCID<CR>	
Parameter	N/A	
Return Value	<CR><LF>\$MYCCID: <SIM_CCID> <CR><LF>OK<CR><LF> <SIM_CCID>: The CCID of the SIM card, character string type.	
Example	AT\$MYCCID \$MYCCID: "89860112965403839541" OK	
	AT\$MYCCID ERROR	Query the CCID of the SIM card. Error is returned because no SIM card is installed.
Remarks	N/A	

27.5 Querying the Type of the Module: \$MYTYPE

Description	To query the type of the module	
Format	AT\$MYTYPE?<CR>	
Parameter	N/A	
Return Value	<CR><LF>\$MYTYPE: <mode>,<network_type>,<extended_feature> <CR><LF>OK<CR><LF> <mode>: Work mode. Extensible bytes are indicated by bit. 1 at bit 0: supporting transparent mode 1 at bit 1: supporting non-transparent mode <network_type>: Network type. Extensible bytes are indicated by bit. 1 at bit 0: GSM network supports GPRS 1 at bit 1: WCDMA network	

	1 at bit 2: TD-SCDMA network 1 at bit 3: CDMA 2000 1 at bit 4: CDMA EVDO 1 at bit 5: LTE 1 at bit 6: PSTN 1 at bit 7: extending one byte <extended_feature> : Extended feature. Extensible bytes are indicated by bit. 1 at bit 0: supporting GPS positioning function 1 at bit 1: supporting BeiDou positioning function 1 at bit 7: extending one byte
Example	AT\$MYTYPE? \$MYTYPE: 03,3F,00 OK
Remarks	N/A

27.6 Querying the Type of the Module: \$MYMODEM (Standards for Canton)

Description	To query the type of the module
Format	AT\$MYMODEM?<CR>
Parameter	N/A
Return Value	<CR><LF>\$MYMODEM: <mode>,<network_type> <CR><LF>OK<CR><LF> <mode> : Work mode. Extensible bytes are indicated by bit. 1 at bit 0: supporting transparent mode 1 at bit 1: supporting non-transparent mode <network_type> : Network type. Extensible bytes are indicated by bit, 16-bit 1 at bit 0: GPRS 1 at bit 1: CDMA network 1 at bit 2: TD-SCDMA network 1 at bit 3: WCDMA 1 at bit 4: CDMA EVDO

	1 at bit 5: TDD-LTE 1 at bit 6: FDD-LTE Bits 8 to 15: Reserved
Example	AT\$MYMODEM? \$MYMODEM: 03,7F00 OK
Remarks	N/A

27.7 Locking BCCH Channel: \$MYBCCH

Description	To lock BCCH channel
Format	- AT\$MYBCCH=<mode>[,<bcch1>],[<bcch2>],[<bcch3>]<CR> - AT\$MYBCCH?<CR> - AT\$MYBCCH=?<CR>
Parameter	<mode>: Integer. The settings of locked channel can be saved after the module is powered off only by running AT\$MYBCCH=1,XX. If the BCCH locked does not exist or its signal is weak, the module cannot register network. 0: Unlock 1: Lock the BCCH cell 2: List IDs of seven BCCH channels that have the strongest signals at current place. <bcch>: channel ID <num>: the number of BCCH channels in the BA list (7 at most) <mcc>: Mobile country code <mnc>: Mobile network code <lac>: Location ID, four-byte characters in hexadecimal format <cell-id>: Cell ID, hexadecimal
Return Value	<CR><LF>OK<CR><LF> <CR><LF>\$MYBCCH: +BA(num): <CR><LF> <CR><LF><bcch1>,<mcc1>,<mnc1>,<lac1>,<cell-id1> <CR><LF><bcch2>,<mcc2>,<mnc2>,<lac2>,<cell-id2> <CR><LF><bcch3>,<mcc3>,<mnc3>,<lac3>,<cell-id3> ... <CR><LF>OK<CR><LF>

	<CR><LF>\$MYBCCH: <bcch1>,<mcc1>,<mnc1>,<lac1>,<cell-id1> <CR><LF>OK<CR><LF>	
	<CR><LF>\$MYBCCH: UNLOCKED <CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>\$MYBCCH: <mode list>,<bcch1>,...<bcch3> <CR><LF>OK<CR><LF>	
Example	AT\$MYBCCH=2 \$MYBCCH: +BA(7): 120, 460, 1, 2543, A85D 734, 460, 1, 2543, AB12 118, 460, 1, 2543, A8AD 115, 460, 1, 2543, A9A7 124, 460, 1, 2543, A85F 731, 460, 1, 2543, B046 123, 460, 1, 2543, A8A5 OK	List IDs of seven BCCH channels that have the strongest signals at current place.
	AT\$MYBCCH=1,120 OK	Lock channel 120.
	AT\$MYBCCH=? \$MYBCCH: (0,1,2), 120, 0, 0 OK	Query the value range of parameters in this command. Channels 120 can be locked.
	AT\$MYBCCH? \$MYBCCH: 734, 460, 1, 2543, AB12 OK	Query channels that are locked currently.
	AT\$MYBCCH=0 OK	Unlock
Remarks	This command is used only for modules that support GSM900/1800.	

27.8 Locking GSM Band: \$MYBAND

Description	To lock the specified GSM band
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Format	• AT\$MYBAND=<band><CR> • AT\$MYBAND?<CR>
Parameter	<band>: Band to be locked. The setting of this parameter will be saved after the module is powered off. 0: Select a band automatically 1: GSM_EGSM_900 2: GSM_DCS_1800
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR: <err><CR><LF>
	<CR><LF>\$MYBAND: <band>
	<CR><LF>OK<CR><LF>
Example	AT\$MYBAND=1
	OK
	AT\$MYBAND?
	\$MYBAND: 1 OK
Remarks	This command is used only for modules that support GSM900/1800.

27.9 Querying Current LAC and CELL_ID: \$MYLACID

Description	To query current LAC and CELL_ID	
Format	AT\$MYLACID<CR>	
Parameter	<LAC>: Location Area Code, hexadecimal <CELL_ID>: CELL_ID, hexadecimal	
Return Value	<CR><LF>ERROR<CR><LF>	
	<CR><LF>\$MYLACID: <LAC>,<CELL_ID>	
	<CR><LF>OK<CR><LF>	
Example	AT\$MYLACID	
	\$MYLACID: 2543,a85d	Query the current location of the user.
	OK	

Remarks	This command is used only for modules that support GSM900/1800.
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27.10 Querying Current Channel, RX Power and TX Power: \$MYCGED

Description	To query current channel, RX power and TX power	
Format	AT\$MYCGED<CR>	
Parameter	<Channel>: channel <Rx power>: RX power, unit dBm <Tx power>: TX power, unit dBm	
Return Value	<CR><LF>ERROR<CR><LF>	
	<CR><LF>\$MYCGED: <Channel>,<Rx power>,<Tx power> <CR><LF>OK<CR><LF>	
Example	AT\$MYCGED \$MYCGED: 48,-75,25 OK	The current channel is 48, RX power is -75 dBm, and TX power is 25dBm.
	AT\$MYCGED \$MYCGED: 48,-44,-1 OK	The current channel is 48, RX power is -44 dBm, and no TX power.
Remarks	This command is used only for modules that support GSM900/1800.	

27.11 Querying or Locking the Network Mode: \$MYSYSINFO

Description	To query or lock the network mode
Format	• AT\$MYSYSINFO=<SysMode><CR> • AT\$MYSYSINFO<CR> • AT\$MYSYSINFO=?<CR>

Parameter	< SysMode >: Network mode 1: AUTO (default) 2: 2G (including GSM, EDGE, CDMA) 3: 3G (including WCDMA, TD-SCDMA, EVDO) 4: 4G (including FDD-LTE, TDD-LTE) 5: 2G + 3G (including GSM, EDGE, CDMA, WCDMA, TD-SCDMA, EVDO) 6: 2G + 4G (including GSM, EDGE, CDMA, FDD-LTE, TDD-LTE) 7: 3G + 4G (including WCDMA, TD-SCDMA, EVDO, FDD-LTE, TDD-LTE)																
Return Value	<CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF> <CR><LF>\$MYSYSINFO: <SysMode>,<mnc> <CR><LF>OK<CR><LF> < SysMode >: network mode 0: No service 2: 2G (including GSM, EDGE, CDMA) 3: 3G (including WCDMA, TD-SCDMA, EVDO) 4: 4G (including FDD-LTE, TDD-LTE) <mnc>: Network carrier code 00: Fail to register 01: China Mobile 02: China Unicom 03: China Telecom 04: Unknown <CR><LF>\$MYSYSINFO: (list of supported <SysMode>s) <CR><LF>OK<CR><LF>																
Example	<table border="0"> <tr> <td>AT\$MYSYSINFO</td><td>The module registered to the 4G network of China Mobile.</td></tr> <tr> <td>\$MYSYSINFO: 4,01</td><td></td></tr> <tr> <td>OK</td><td></td></tr> <tr> <td>AT\$MYSYSINFO=1</td><td>Set network mode to auto.</td></tr> <tr> <td>OK</td><td></td></tr> <tr> <td>AT\$MYSYSINFO=?</td><td>Query the value range of the parameter.</td></tr> <tr> <td>\$MYSYSINFO: 1-7</td><td></td></tr> <tr> <td>OK</td><td></td></tr> </table>	AT\$MYSYSINFO	The module registered to the 4G network of China Mobile.	\$MYSYSINFO: 4,01		OK		AT\$MYSYSINFO=1	Set network mode to auto.	OK		AT\$MYSYSINFO=?	Query the value range of the parameter.	\$MYSYSINFO: 1-7		OK	
AT\$MYSYSINFO	The module registered to the 4G network of China Mobile.																
\$MYSYSINFO: 4,01																	
OK																	
AT\$MYSYSINFO=1	Set network mode to auto.																
OK																	
AT\$MYSYSINFO=?	Query the value range of the parameter.																
\$MYSYSINFO: 1-7																	
OK																	
Remarks	When the network mode is set to any non-AUTO mode, the module will																

automatically check the network status.

- If the module registers a network, it will determine whether the network is the mode set by the command. The module will switch to the set network if the registered network is not the mode set by the command.
- If the module fails to register any network within interval set by \$MYNETAUTO, the module will automatically switch to the AUTO mode.

27.12 Enabling/Disabling Network Mode Report: \$MYSYSINFOURC

Description	To enable/disable the network mode report of the module
Format	• AT\$MYSYSINFOURC=<ONOFF><CR> • AT\$MYSYSINFOURC?<CR>
Parameter	<ONOFF>: integer type 0: Disable network status report (default) 1: Enable network status report
Return Value	<CR><LF>OK<CR><LF> <CR><LF>\$MYSYSINFOURC: <ONOFF> <CR><LF>OK<CR><LF>
Example	AT\$MYSYSINFOURC=1 OK
Remarks	N/A

27.13 Enabling/Disabling Network Mode Report: \$MYURCSYSINFO

Description	To enable/disable the network mode report of the module
Format	• AT\$MYURCSYSINFO=<ONOFF><CR> • AT\$MYURCSYSINFO?<CR>

Parameter	<ONOFF>: integer type 0: Disable network status report (default) 1: Enable network status report
Return Value	<CR><LF>OK<CR><LF> <CR><LF>\$MYURCSYSINFO: <ONOFF> <CR><LF>OK<CR><LF>
Example	AT\$MYURCSYSINFO=1 OK
Remarks	N/A

27.14 Unsolicited Network Mode Report: \$MYURCSYSINFO (Standards for Canton)

Description	Unsolicited network mode report	
Format	<CR><LF>\$MYURCSYSINFO: <SysMode>,<mnc><CR><LF>	
Parameter	< SysMode >: Network mode 0: No service 2: 2G (including GSM, EDGE, CDMA) 3: 3G (including WCDMA, TD-SCDMA, EVDO) 4: 4G (including FDD-LTE, TDD-LTE) <mnc>: Network carrier code 00: Fail to register 01: China Mobile 02: China Unicom 03: China Telecom	
Example	AT\$MYSYSINFOURC=1 OK \$MYURCSYSINFO: 3,01	The module registered the 3G network of China Mobile.
Remarks	N/A	

27.15 Setting Network Mode Choices: \$MYNETINFO (Standards for Canton)

Description	To set network mode choices
Format	• AT\$MYNETINFO=<mode><CR> • AT\$MYNETINFO?<CR> • AT\$MYNETINFO=?<CR>
Parameter	<mode>: Network mode 1: AUTO 2: 2G (including GSM, EDGE, CDMA) 3: 3G (including WCDMA, TD-SCDMA, EVDO) 4: 4G (including FDD-LTE, TDD-LTE) 5: 2G + 3G (including GSM, EDGE, CDMA, WCDMA, TD-SCDMA, EVDO) 6: 2G + 4G (including GSM, EDGE, CDMA, FDD-LTE, TDD-LTE) 7: 3G + 4G (including WCDMA, TD-SCDMA, EVDO, FDD-LTE, TDD-LTE)
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR: <err><CR><LF>
	<CR><LF>\$MYNETINFO: <mode> <CR><LF>OK<CR><LF>
	<CR><LF>\$MYNETINFO: (list of supported <mode>s) <CR><LF>OK<CR><LF>
Example	AT\$MYNETINFO=0
	OK
	AT\$MYNETINFO?
	\$MYNETINFO: 0 OK
Example	AT\$MYNETINFO=?
	\$MYNETINFO: 1-7
	OK
Remarks	When the network mode is set to any non-AUTO mode, the module will automatically check the network status. • If the module registers a network, it will determine whether the network is the mode set by the command. The module will switch to the set network if the registered network is not the mode set by the command.

- If the module fails to register any network within interval set by \$MYNETAUTO, the module will automatically switch to the AUTO mode.

27.16 Enabling/Disabling the TD-SCDMA Mode: +GTUMODE

Description	To enable or disable the TD-SCDMA mode
Format	• AT+GTUMODE=<ONOFF><CR> • AT+GTUMODE?<CR> • AT+GTUMODE=?<CR>
Parameter	<ONOFF>: 0: Disable TD-SCDMA 2: Enable TD-SCDMA
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR<CR><LF>
	<CR><LF>+GTUMODE: <ONOFF> <CR><LF>OK<CR><LF>
	<CR><LF>+GTUMODE: (list of supported <ONOFF>s) <CR><LF>OK<CR><LF>
Example	AT+GTUMODE=0 OK
	AT+GTUMODE? +GTUMODE: 0 OK
	AT+GTUMODE=? +GTUMODE: 0,2 OK
Remarks	N/A

27.17 Enabling/Disabling the Default AUTO Network Modes during Startup: \$MYNETAUTO

Description	To enable/disable the default AUTO network modes during startup
Format	• AT\$MYNETAUTO=<ONOFF>[,<CYCLE>]<CR> • AT\$MYNETAUTO?<CR>
Parameter	<ONOFF>: 0: Disable the default AUTO network modes during startup 1: Enable the default AUTO network modes during startup <CYCLE>: the period that the module restores to auto mode after the network mode is locked and the module failed to register with the network. This value ranges 3 to 1440 minutes, 3 minutes by default.
Return Value	<CR><LF>OK<CR><LF> <CR><LF>ERROR<CR><LF>,<CYCLE > <CR><LF>+GTUMODE: <ONOFF> <CR><LF>OK<CR><LF>
Example	AT\$MYNETAUTO=0 OK AT\$MYNETAUTO? \$MYNETAUTO: 0,3 OK
Remarks	N/A

27.18 Setting System Configurations: ^SYSCONFIG

Description	To set system configurations
Format	• AT^SYSCONFIG=<mode>,<acqorder>,<roam>,<srvdomain><CR> • AT^SYSCONFIG?<CR>
Parameter	<mode>: Network mode 2: Auto selection 13: GSM

14: WCDMA
15: TD-SCDMA
16: No change
17: LTE
18: GSM/TDS-CDMA
19: GSM/LTE
20: TDS-CDMA/LTE
21: GSM/WCDMA
22: TDS-CDMA/WCDMA
23: WCDMA/LTE
24: TDS-CDMA/GSM/LTE
25: TDS-CDMA/WCDMA/LTE
26: TDS-CDMA/WCDMA/GSM
27: WCDMA/GSM/LTE
28: Others (this value cannot be set but can be queried)
<acqorder>: Network access order
0: Auto
1: GSM, TD-SCDMA, LTE
2: TD-SCDMA, GSM, LTE
3: No change
4: GSM, LTE, TD-SCDMA
5: TD-SCDMA, LTE, GSM
6: LTE, TD-SCDMA, GSM
7: LTE, GSM, TD-SCDMA
8: GSM, WCDMA, LTE
9: WCDMA, GSM, LTE
10: GSM, LTE, WCDMA
11: WCDMA, LTE, GSM
12: LTE, WCDMA, GSM
13: LTE, GSM, WCDMA
14: TD-SCDMA, WCDMA, LTE
15: WCDMA, TD-SCDMA, LTE
16: TD, LTE, WCDMA
17: WCDMA, LTE, TD-SCDMA
18: LTE, WCDMA, TD-SCDMA
19: LTE, TD-SCDMA, WCDMA

	20: TD-SCDMA, WCDMA, GSM 21: WCDMA, TD-SCDMA, GSM 22: TD-SCDMA, GSM, WCDMA 23: WCDMA, GSM, TD-SCDMA 24: GSM, WCDMA, TD-SCDMA 25: GSM, TD-SCDMA, WCDMA <roam>: Roam 0: Not support 1: Roam 2: No change <srvdomain>: Domain setting 0: CS_ONLY 1: PS_ONLY 2: CS_PS 3: ANY 4: No change
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR<CR><LF>
	^SYSCONFIG: <mode>,<acqorder>,<roam>,<srvdomain><CR><LF>
	<CR><LF>OK<CR><LF>
Example	AT^SYSCONFIG=13,2,1,2
	OK
	AT^SYSCONFIG?
	^SYSCONFIG: 2,2,0,2
Remarks	OK
	This command is not supported in the CDMA mode.
	When the network mode is set to any non-AUTO mode, the module will automatically check the network status.
	• If the module registers a network, it will determine whether the network is the mode set by the command. The module will switch to the set network if the registered network is not the mode set by the command. • If the module fails to register any network within interval set by \$MYNETAUTO, the module will automatically switch to the AUTO mode.

27.19 Obtaining System Information: ^SYSINFO

Description	To obtain system information
Format	AT^SYSINFO<CR>
Return Value	N/A
Parameter	<CR><LF>^SYSINFO:< srv_status >,< srv_domain >,< roam_status >,< sys_mode >,< sim_state >[,<reserve>],<sys_submode>] <CR><LF> <CR><LF>OK<CR><LF> <srv_status>: 0: No service 1: Limited service 2: Service 3: Service with area limit 4: power saving <srv_domain>: 0: No service 1: CS only 2: PS only 3: PS + CS 4: EPS service <roam_status>: 0: Non-roaming 1: Roaming <sys_mode>: 0: No service 1: AMPS mode 2: CDMA mode 3: GSM mode 4: EVDO mode or TDS mode 5: WCDMA mode 6: GPS mode 7: GSM and WCDMA mode 8: CDMA Hybrid mode 9: LTE mode

	10: GSM, WCDMA, and LTE mode <sim_state>: 0: invalid 1: valid 255: No SIM card or PIN code is required <reserve>: Reserved field <sys_submode>: System sub mode 0: No service 1: GSM mode 2: GPRS mode 3: EDGE mode 4: WCDMA mode 5: HSDPA mode 6: HSUPA mode 7: HSUPA and HSDPA mode 8: TD-SCDMA mode 9: TDD_SUBACT 10: FDD_SUBACT
Example	AT^SYSINFO ^SYSINFO: 2,3,0,4,1 OK
Remarks	N/A

27.20 Selecting Internal or External Protocol Stack: +XISP

Description	To select internal or external protocol stack
Format	- AT+XISP=<n><CR> - AT+XISP?<CR>
Parameter	<n>: 0: Select internal TCP/IP protocol stack (default) 1: Select external protocol stack
Return Value	<CR><LF>OK<CR><LF> <CR><LF>+XISP: <n>

	<CR><LF>OK<CR><LF>	
Example	AT+XISP=0	Specify internal protocol stack.
	OK	
	AT+XISP?	Query which protocol stack is used.
	+XISP: 0	Internal protocol stack is used.
	OK	
Remarks	To use external protocol stack, send AT+XISP=1 to set before using.	

27.21 Querying RSRP, RSRQ, SINR of Cells in a Neighbor of a Serving Cell on LTE Network: +NRSP

Description	To query RSRP, RSRQ, SINR in a neighbor of LTE cell
Format	AT+NRSP<CR>
Parameter	N/A
Return Value	<CR><LF>+NRSP: <rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,...,<sinr> <CR><LF>OK<CR><LF> <rsrpN>: Reference Signal Received Power, the unit is 0.1 dBm. It is valid only on LTE networks. N is the number of cells in a neighbor of the serving cell. The maximum value of N is 8: <rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,..., <rsrpN>,<rsrqN> <rsrqN>: Reference Signal Received Quality, the unit is 0.1 dBm. It is valid only on LTE networks. N is the number of cells in a neighbor of the serving cell: <rsrp1>,<rsrq1>,<rsrp2>,<rsrq2>,..., <rsrpN>,<rsrqN> <sinr>: Signal-to-Interface plus Noise Ratio. The value is 10 times of actual SINR. It is valid only on LTE networks.
Example	AT+NRSP +NRSP: -1093,-115,-1054,-118,-1117,-181,-1109,-172,-1166,-200,-1231,-200,107 OK
Remarks	This command is valid only on LTE networks.

27.22 Controlling Divergent Antenna: \$MYANT AUX

Description	To control the divergent antenna of the 4G module	
Format	- AT\$MYANT AUX=<mode><CR> - AT\$MYANT AUX?<CR>	
Parameter	<mode>: to specify whether to enable the divergent antenna 0: disable the divergent antenna 1: enable the divergent antenna	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>\$MYANT AUX: <mode> <CR><LF>OK<CR><LF>	
Example	AT\$MYANT AUX=0	Disable the divergent antenna of the module.
	OK	
Example	AT\$MYANT AUX?	Query the status of the divergent antenna.
	\$MYANT AUX: 1 OK	
Remarks	This command is supported on V003 and later versions.	

27.23 Querying Network Registration Information: +NETMSG

Description	To query network registration information	
Format	AT+NETMSG<CR>	
Parameter	+NETMSG: <MCC+MNC>, [<LAC>/<SID>/<TAC>], [<CELL_ID>/<NID>], [<BSIC>/<BID>/<Phy_cellid>], <BAND>, <ARFCN>, <RX_dBm>, <TX_dBm>, <net_mode> <CR><LF>OK<CR><LF>	
Return Value	MCC+MNC: MCC: Mobile Country Code, decimal MNC: Mobile Network Code, decimal	
	[<LAC>/<SID>/<TAC>]: Location Area Code, hexadecimal	

SID on CDMA1X networks

TAC on LTE networks

[<CELL_ID>/<NID>]: cell ID, hexadecimal

NID on CDMA1X networks

[<BSIC>/<BID>/<Phy_cellid>]

BSIC on GSM network, decimal

BID on CDMA1X networks, hexadecimal

Phy_cellid on LTE networks, decimal

NULL on other networks

BAND: operating band

CDMA BC0

...

CDMA BC19

GSM 850

GSM 900

GSM 1800

GSM 1900

WCDMA 2100

WCDMA 1900

WCDMA 1800

WCDMA 1700 US

WCDMA 850

WCDMA 800

WCDMA 2600

WCDMA 900

WCDMA 1700 JAPAN

WCDMA 1500

WCDMA 850 JAPAN

LTE BAND 1

...

LTE BAND 43

TDSCDMA BAND A

...

	TDSCDMA BAND F	
	ARFCN : absolute radio-frequency channel number	
	RX dBm : RX power, unit: dBm (199 indicates invalid)	
	TX dBm : TX power, unit: dBm (199 indicates invalid)	
	net_mode : mode of network registered with	
	NONE	
	CDMA1X	
	CDMA1X and HDR	
	CDMA1X and EHRPD	
	CDMA1X and LTE	
	HDR	
	HDR REV0	
	HDR REVA	
	HDR REVB	
	HDR EMPA EHRPD	
	HDR MMPA EHRPD	
	GSM	
	GPRS	
	EDGE	
	WCDMA	
	TDSCDMA	
	HSDPA	
	HSUPA	
	HSDPA and HSUPA	
	HSDPA+	
	HSDPA+ and HSUPA	
	DC HSDPA+	
	DC HSDPA+ and HSUPA	
	64QAM HSDPA+	
	64QAM HSDPA+ and HSUPA	
	DC HSDPA+ and DC HSUPA	
	TDD LTE	
	FDD LTE	
Example	AT+NETMSG +NETMSG: "460+01", 2545, 61C7E15,	Query the details used to register the network.

	164, LTE BAND 3, 1650, -60, 199, "FDD LTE" OK	
	AT+NETMSG +NETMSG: "460+01", 2543, AB13, 34, GSM 1800, 657, -59, 30, "EDGE" OK	Query the details used to register the network.
	AT+NETMSG +NETMSG: "460+01", A547, 1EB68D1, NULL, WCDM 2100, 10713, -58, 199, "HSDPA and HSUPA" OK	Query the details used to register the network.
	AT+NETMSG +NETMSG: "0", 0, 0, 0, 0, 0, 0, 0, "NONE" OK	The module has not been registered with any network or the network encounters abnormalities.
Remarks	• This command works only after the module is registered with a network. • For HDR only, <LAC>, <CELL_ID>, and <BSIC> do not exist. • The value of <TA> is valid only when the module is in a GSM call or transmitting or receiving GPRS data.	

27.24 Setting Network Mode: +NETSEL

Description	To set the mode of network to be registered with
Format	• AT+NETSEL =<mode><CR> • AT+NETSEL?<CR> • AT+NETSEL =?<CR>
Parameter	<mode>: network mode 0: AUTO 1: GSM 2: CDMA 3: EVDO 4: TDS 5: WCDMA 6: TDD-LTE

	7: FDD-LTE
	8: LTE
	9: CDMA/EVDO
	10: CDMA/EVDO/LTE
	11: CDMA/LTE
	12: CDMA/WCDMA/LTE
	13: CDMA/GSM
	14: GSM/LTE
	15: GSM/WCDMA
	16: GWL
	17: TDS/GSM
	18: CDMA/GSM/LTE
	19: EVDO/GSM/LTE
	20: EVDO/LTE
	21: EVDO/WCDMA/LTE
	22: CDMA/EVDO/GSM
	23: CDMA/GSM/WCDMA
	24: TDS/GSM/WCDMA/LTE
	25: TDS/GSM/WCDMA
	26: CDMA/EVDO/GSM/WCDMA
	27: WCDMA/LTE
	28: TDS/LTE
	29: TDS/GSM/LTE
	30: TDS/WCDMA
	31: TDS/WCDMA/LTE
	32: CDMA/EVDO/GSM/TDS/LTE
	33: CDMA/EVDO/GSM/WCDMA/TDS
	34: CDMA/GSM/TDS/WCDMA
	35: CDMA/EVDO/GSM/LTE
	36: CDMA/GSM/WCDMA/LTE
	37: EVDO/TDS/WCDMA
	38: EVDO/TDS/WCDMA/LTE
	39: CDMA/EVDO/GSM/WCDMA/LTE
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>ERROR:<err><CR><LF>

	<CR><LF>+NETSEL: <mode> <CR><LF>OK<CR><LF>
	<CR><LF>+NETSEL (list of supported <mode>s) <CR><LF>OK<CR><LF>
Example	AT+NETSEL =0 OK
	AT+NETSEL? +NETSEL: 0 OK
	AT+NETSEL=? +NETSEL: 0~39 OK
Remarks	- After specifying the mode of the network to be registered with, the module will not search for other networks. - The settings by this command will be saved after the module is powered off.

27.25 Querying Network Registration Information: +NETDMSG

Description	To query the network registration information
Format	AT+NETDMSG<CR>
Parameter	+NETDMSG: <MCC+MNC>, [<LAC>/<TAC>], <CELL_ID>, [<BSIC>/<Phy_cellid>], <net_mode>, <BAND>, <ARFCN>, <RX_dBm>, <TX_dBm>, <SID>, <NID>, <BID>, <RSRP>, <RSRQ>, <SINR> <CR><LF>OK<CR><LF>
Return Value	MCC+MNC : Mobile Country Code + Mobile Network + Code LAC/TAC : Location Area Code/Tracking Area Code, valid for LTE CELL_ID : Cell ID BSIC/Phy_cellid : Base Station Identity Code/Physical Cell ID of LTE networks Net_mode : Network Mode NONE CDMA1X

CDMA1X and HDR
CDMA1X and LTE
CDMA1X and EHRPD
HDR
HDR REV0
HDR REVA
HDR REVB
HDR EMPA EHRPD
HDR MMPA EHRPD
GSM
GPRS
EDGE
WCDMA
TDSCDMA
HSDPA
HSUPA
HSDPA and HSUPA
HSDPA+
HSDPA+ and HSUPA
DC HSDPA+
DC HSDPA+ and HSUPA
64QAM HSDPA+
64QAM HSDPA+ and HSUPA
DC HSDPA+ and DC HSUPA
TDD LTE
FDD LTE
BAND: Network Bands
CDMA BC0
...
CDMA BC19
GSM 850
GSM 900
GSM 1800
GSM 1900
WCDMA 2100
WCDMA 1900

WCDMA 1800
WCDMA 1700 US
WCDMA 850
WCDMA 800
WCDMA 2600
WCDMA 900
WCDMA 1700 JAPAN
WCDMA 1500
WCDMA 850 JAPAN
LTE BAND 1
...

LTE BAND 43
TDSCDMA BAND A
TDSCDMA BAND B
TDSCDMA BAND C
TDSCDMA BAND D
TDSCDMA BAND E
TDSCDMA BAND F

ARFCN: Absolute Radio-Frequency Channel Number

RX_dBm: RX power, 199 indicates invalid

TX_dBm: TX power, 199 indicates invalid

SID: System Identity Number on a CDMA1X network

NID: Network Identity Number on a CDMA1X network

BID: BID on a CDMA1X network

RSRP: Reference Signal Received Power, unit 0.1 dBm, valid on an LTE network

RSRQ: Reference Signal Received Quality, unit 0.1 dB, valid on an LTE network

SINR: [Signal-to-Interference-Plus-Noise Ratio](#), unit 0.1 dB, valid on an LTE network

Example

AT+NETDMSG	Query the network
+NETDMSG: "460+11", 0x7757, 0x77E9B30, 219,	registration information
"CDMA1X and LTE", LTE BAND 3, 1825, -58, 11, 0x0,	on an LTE network.
0x0, 0x0, -848, -83, 159	
OK	
AT+NETDMSG	Query the network
+NETDMSG: "460+11", 0x0, 0x0, 0, "HDR REVA",	registration information
CDMA BC 0, 37, -60, 199, 0x0, 0x0, 0x0, 0, 0, 0	on a non-LTE 3GPP2
OK	network.

	AT+NETDMSG +NETDMSG: "460+00", 0xA57B, 0xAC1474C, 0, "HSDPA", TDSCDMA BAND A, 10080, -69, 199, 0x0, 0x0, 0x0, 0, 0, 0 OK	Query the network registration information on a non-LTE 3GPP network.
	AT+NETDMSG +NETMSG: "0", 0, 0, 0, "NONE", 0, 0, 0, 0, 0, 0, 0, 0, 0, 0 OK	The module has not been registered with any network or the network encountered abnormalities.
Remarks	• This command works only after the module is registered with a network. • For HDR only, <LAC>, <CELL_ID>, and <BSIC> do not exist. • The value of <TA> is valid only when the module is in a GSM call or transmitting or receiving GPRS data. • On a 3GPP network, there will be valid values in the fields of LAC, CELL_ID, and BSIC and the value in the SID, NID, and BID fields is 0. • On a CDMA1X network, there will be valid values in the fields of SID, NID, and BID and the value in the LAC, CELL_ID, and BSIC fields is 0. For HDR only, the values of the SID, NID, and BID fields is 0. • RX power, RSRQ, and SINR are valid only on LTE networks.	

27.26 Enabling/Disabling Statistics on SIM Card Write: +SIMCOUNTCTL

Description	To enable/disable statistics on SIM card write
Format	• AT+SIMCOUNTCTL=<n><CR> • AT+SIMCOUNTCTL=?<CR> • AT+SIMCOUNTCTL?<CR>
Parameter	n: to specify whether to enable statistics on SIM card write 0: disable (default) 1: enable
Return Value	<CR><LF>OK<CR><LF>
	<CR><LF>+SIMCOUNTCTL: <n>
	<CR><LF>+SIMCOUNTCTL: (0-1)

Example	AT+SIMCOUNTCTL=0 OK	Disable the statistics on SIM card write
	AT+SIMCOUNTCTL? +SIMCOUNTCTL: 0 OK	Query the setting of the statistics on SIM card write.
	AT+SIMCOUNTCTL=? +SIMCOUNTCTL: (0-1) OK	Query the value range of the parameter.
Remarks	The setting by this command are not saved after the module is powered off.	

27.27 Reading the Statistics on SIM Card Write: +SIMCOUNTREAD

Description	To read the statistics on SIM card write	
Format	- AT+SIMCOUNTREAD=<n><CR> - AT+SIMCOUNTREAD=?<CR> - AT+SIMCOUNTREAD?<CR>	
Parameter	n: to specify the operation 0: read the current statistics on SIM card write (default) 1: erase the statistics record	
Return Value	<CR><LF>+SIMCOUNTREAD: <count> <count>: times count of SIM card write	
	<CR><LF>+SIMCOUNTREAD: (0-1)	
Example	AT+SIMCOUNTREAD=0 +SIMCOUNTREAD: 13 OK	Read the statistics on SIM card write. The module wrote to the SIM card for 13 times.
	AT+SIMCOUNTREAD +SIMCOUNTREAD: 13 OK	The module wrote to the SIM card for 13 times.
	AT+SIMCOUNTREAD=1 OK AT+SIMCOUNTREAD=0	Erase the statistic record.

	+SIMCOUNTREAD: 0 OK	
	AT+SIMCOUNTREAD? OK	Query the setting.
	AT+SIMCOUNTREAD=? +SIMCOUNTREAD: (0-1) OK	Query the value range of the parameter.
Remarks	Before powering off the module, read the statistics record and save it.	

27.28 FOTA Command: +NEOFOTA

Description	To control the firmware-over-the-air of the module	
Format	• AT+NEOFOTA<CR> • AT+NEOFOTA?<CR>	
Parameter	<CR><LF>ERROR<CR><LF> Or <CR><LF>OK<CR><LF> Or No upgrade package is available <CR><LF>+NEODOWNLOAD:NULL<CR><LF> Or Failed to download or query the upgrade package <CR><LF>+NEODOWNLOAD:FAIL<CR><LF> Or Download the upgrade package successfully <CR><LF>+NEODOWNLOAD:SUCCESS<CR><LF> Or Start to upgrade <CR><LF>+NEOUPDATE:START<CR><LF> Or Upgrade successfully <CR><LF>+NEOUPDATE:SUCCESS<CR><LF> Fail to upgrade <CR><LF>+NEOUPDATE:FAIL<CR><LF> Or No upgrade <CR><LF>+NEOFOTA:NULL<CR><LF>	
Return Value	N/A	
Example	AT+NEOFOTA OK +NEODOWNLOAD:SUCCESS	Enable FOTA. Download upgrade package successfully.

	+NEOUPDATE:START	Start to upgrade
	+NEOUPDATE:SUCCESS	Upgrade successfully
	AT+NEOFOTA? +NEOUPDATE:SUCCESS OK	Query the upgrade status
	AT+NEOFOTA OK	
	+NEODOWNLOAD:NULL	No upgrade package
Remarks	This command is supported on some variants.	

27.29 Reading ADC Value: +READADC

Description	To read the value from pins corresponding to the three ADC channels	
Format	AT+READADC=<channel><CR>	
Parameter	<channel>: Integer, ranging from 1 to 2, which indicates three ADC channels	
Return Value	See the Example	
Example	AT+READADC=1 +READADC:0,53 OK	Read the value from the pin corresponding to ADC 1.
	AT+READADC=2 +READADC:2,3244 OK	Read the value from the pin corresponding to ADC 2.
	AT+READADC=3 ERROR	The parameter value is invalid.
Remarks	Refer to the pin description in hardware user guide.	

27.30 Setting SIM Card Hotswap: +SIMHOTSWAP

Description	To enable hotswap of SIM card	
Format	AT+SIMHOTSWAP=<onoff><CR>	
Parameters	<onoff>: 0: Disable 1: Enable	
Return Value	See the Example	
Example	AT+SIMHOTSWAP=0 OK	Disable hotswap of SIM card.
	AT+SIMHOTSWAP=1 OK	Enable hotwap of SIM card.
	AT+SIMHOTSWAP? +SIMHOTSWAP: 1 OK	Query the hotswap status.
Remarks	- This function must be supported by hardware. - The setting takes effect immediately after the command is executed.	

27.31 Disabling CS Services: +MYDATAONLY

Description	To disable voice call and SMS services	
Format	AT+MYDATAONLY=<onoff><CR>	
Parameter	<onoff>: 0: On 1: OFF	
Return Value	See the Example.	
Example	AT+MYDATAONLY=0 OK	Enable voice call and SMS services
	AT+MYDATAONLY=1 OK	Disable voice call and SMS services

	AT+MYDATAONLY? +MYDATAONLY: 1 OK	Query the status of voice call and SMS services
Remarks	The setting of this command takes effect after the module is restarted.	

27.32 Locking to Band: +BANDLOCK

Description	To lock to a frequency band	
Format	- AT+BANDLOCK=<band_string><CR> - AT+BANDLOCK?<CR><CR> - AT+BANDLOCK=?<CR>	
Parameter	< band_string>: band in string type. The value can be any band that the hardware supports. Issue a query command before locking to a frequency band to check the band supported. < band_string_list>: List of frequency band supported	
Return Value	<CR><LF>+ BANDLOCK: < band_string><CR><LF> OK <CR><LF> or <CR><LF>ERROR<CR><LF> Or <CR><LF>+ BANDLOCK: < band_string_list><CR><LF> OK <CR><LF>	
Example	AT+BANDLOCK=? +BANDLOCK: GSM_900,GSM_1800,WCDMA_2100,WCDMA_900 ,LTE_B1,LTE_B3,LTE_B5,LTE_B38,LTE_B39,LTE_B40,LTE_B41,AUTO OK	Query the frequency bands supported.
	AT+BANDLOCK=LTE_B1 OK	Lock to LTE_B1.
	AT+BANDLOCK? +BANDLOCK: LTE_B1 OK	Query the frequency band locked to.

	AT+BANDLOCK=AUTO OK	Restore to auto frequency band mode.
Remarks	- The network mode will change as a frequency band is locked. E.g. the network mode will change to LTE ONLY after locking to LTE_B1. - The frequency band setting will restore to auto mode if other network mode command is issued. - If no frequency band is locked, NONE will be returned when issuing AT+BANDLOCK? To query frequency band locked. - If the network mode is set to AUTO mode by other command, frequency band locking will expire after the module is restarted. The setting by this command will be saved after the module is powered off if no other command is issued to enable AUTO mode.	

27.33 Obtaining Information of All Cells: +MYCELLINFO

Description	To obtain the information of all cells available for the module
Format	- AT+MYCELLINFO<CR> - AT+MYCELLINFO=<net_mode><CR>
Parameters	<net_mode>: 0: GSM only 1: TDSCDMA only 2: WCDMA only 3: LTE only 4: CDMA only
Return Value	+MYCELLINFO: {[<ScellMode>,<Smcc>,<Smnc>,<Slac>,<ScellId>,<Sarfcn>,<Sp ci>,<SrxLevl>],[<ScellNum>,<NcellIndex>,<NcellMode>,<Nmcc>,<Nmnc>,<Nl ac>,<NcellId>,<Narfcn>,<Npci>,<NrxLevl>]}} NcellNum: the number of neighbor cells NcellIndex: the index of neighbor cells ScellMode/NcellMode: network mode of the cell 0—GSM 1—TDSCDMA 2—WCDMA 3—LTE

	4—CDMA Smcc/Nmcc: Mobile country code For CDMA: sid, system id Smnc/Nmnc: Mobile network code For CDMA: nid, network id Slac/Nlac: Cell location area code For LTE: tac, track area code ScellId/NcellId: Cell ID For CDMA: base_id Sarfcn/Narfcn: absolute radio frequency channel code Spci/Npci: Cell internal description code, For LTE/TDSCDMA: pci, physic cell identify code For CDMA/HDR: pn, pseudo-noise code For GSM: bsic, base station identify code For WCDMA: psc, primary scrambling code SrxLevl/NrxLevl: RX Signal Level GSM: 0 to 31 WCDMA: 0 to 31 LTE: signal strength dB TDSCDMA: signal strength dB	
Example	AT+MYCELLINFO=4 ERROR	ERROR is returned because TDS is not supported.
	AT+MYCELLINFO=5 ERROR	ERROR is returned because the set value is not in valid range (0 - 4).
	AT+MYCELLINFO=0 +MYCELLINFO: {[0,460,00,10351,4043,76,49,31],[6,(0,0,460,0,103 51,4042,80,21,31),(1,0,460,0,0,- 1,591,17,24),(2,0,460,0,0,- 1,74,45,21),(3,0,460,0,0,-1,601,1,21),(4,0,460,0,0,- 1,72,41,19),(5,0,460,0,0,- 1,48,35,18)]},{[0,460,01,9539,43102,115,16,26],[3, (0,0,460,1,9539,43101,120,62,21),(1,0,460,1,0,- 1,113,21,17),(2,0,460,1,0,-1,112,6,17)]} OK	Obtain the information of all GSM cells

AT+MYCELLINFO=2

+MYCELLINFO:

{[2,460,01,42311,32205497,10663,130,22],[2,(0,2,460,1,FFFF,FFFF,10663,263,22),(1,2,460,1,FFFF,FFFF,10663,155,19)]}}

Obtain the information of all WCDMA cells.

OK

AT+MYCELLINFO=3

+MYCELLINFO:

{[3,460,00,10351,205887875,38950,484,-42],[2,(0,3,460,0,FFFF,FFFF,38400,90,-48)]},{[3,460,01,9541,112072509,450,342,-56],[4,(0,3,460,1,FFFF,FFFF,450,343,-68),(1,3,460,1,FFFF,FFFF,450,164,-72),(2,3,460,1,FFFF,FFFF,450,28,-70),(3,3,460,1,FFFF,FFFF,450,37,-69)]},{[3,460,11,30471,125155864,2452,275,-50],[11,(0,3,460,11,FFFF,FFFF,2452,219,-56),(1,3,460,11,FFFF,FFFF,2452,16,-55),(2,3,460,11,FFFF,FFFF,2452,273,-55),(3,3,460,11,FFFF,FFFF,2452,221,-55),(4,3,460,11,FFFF,FFFF,100,0,0),(5,3,460,11,FFFF,FFFF,100,0,0),(6,3,460,11,FFFF,FFFF,100,0,0),(7,3,460,11,FFFF,FFFF,1825,0,0),(8,3,460,11,FFFF,FFFF,1825,0,0),(9,3,460,11,FFFF,FFFF,1825,0,0)]}}

Obtain the information of all LTE cells.

OK

AT+MYCELLINFO

+MYCELLINFO:

{[3,460,00,10351,205887875,38950,484,-41],[0]},{[3,460,01,9541,112072479,1650,344,-52],[2,(0,3,460,1,FFFF,FFFF,1650,164,-67),(1,3,460,1,FFFF,FFFF,1650,162,-66)]},{[3,460,11,30551,218726194,100,239,-43],[4,(0,3,460,11,FFFF,FFFF,100,275,-53),(1,3,460,11,FFFF,FFFF,2452,275,-48),(2,3,460,11,FFFF,FFFF,2452,273,-53)]},{[0,460,00,10351,4043,76,49,31],[6,(0,0,460,0,10351,4042,80,21,31),(1,0,460,0,0,-1,591,17,24),(2,0,460,0,0,-1,74,45,22),(3,0,460,0,0,-1,48,35,19),(4,0,460,0,0,-1,601,1,19),(5,0,460,0,0,-

Obtain the cell information of all network modes.

	<pre>1,72,41,19)}}},{[0,460,01,9539,43102,115,16,27],[5, (0,0,460,1,9539,43101,120,62,22),(1,0,460,1,9539, 43432,119,63,19),(2,0,460,1,9539,43043,113,21,1 8),(3,0,460,1,0,-1,112,6,17),(4,0,460,1,0,- 1,110,25,16)}}},{[2,460,01,42311,32205497,10663,1 30,22],[2,(0,2,460,1,FFFF,FFFF,10663,263,21),(1, 2,460,1,FFFF,FFFF,10663,155,18)}}}</pre> OK
Remarks	- Ensure that a SIM card is installed for the module before using the +MYCELLINFO command. If a SIM card has been inserted, send AT+SIMCARDCONFIG=1 to disable the SIM card and then send +MYCELLINFO after 2 to 4 seconds. After completing cell information query, send AT+SIMCARDCONFIG=2 to enable the SIM card - Parameters in return values S indicates serving and N indicates neighbor The values LAC and CELLID are hexadecimal and FFFFFFFF indicates null. All values of other parameters are integer type and 65535 indicates null - Format of return values Information of all cells is too long and displayed in a format similar to JSON: { [serving cell information] }, { number of neighbor cells, [neighbor cell ID, neighbor cell information] }. - Neighbor cell information According to 3GPP protocols, this command can obtain information of at most 6 neighbor cells on GSM networks. Generally, neighbor cell information does not contain CELLID or LACID. These two parameters might appear because the module will possibly access that neighbor cell so that it obtains the SIB of the neighbor cell and get CELLID and LACID after decoding the SIB. - Command executing duration It takes long time to obtain cell information when this command is executed for the first time. The duration will be shorter within 2 hours after the module is powered up. It takes the following time to search networks of one mode with single PLMN: LTE: 30 seconds GSM: 15 to 20 seconds WCDMA: 10 to 15 seconds TDSCDMA: 15 to 20 seconds

	CDMA: 15 to 20 seconds One network mode allows multiple PLMN. • Command operation caution Do not perform other commands before the module returns any value to this command. Otherwise, the module might encounter network issues. Restart the module if the module encounters any abnormality due to incorrect operations.
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27.34 Switching Custom Functions: +NCUSTSWITCH

Description	To enable or disable custom functions	
Format	• AT+NCUSTSWITCH=<typeX>,<modeX><CR> • AT+NCUSTSWITCH?<CR> • AT+NCUSTSWITCH=?<CR>	
Parameters	Type1: Custom function 1: TCP Nagle's algorithm 3: TCP packet read Mode1: 0: Disable TCP Nagle algorithm 1: Enable TCP Nagle algorithm Mode3: 0: read by packet (default) 1: automatically combine packets TypeX: reserved ModeX: reserved	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+NCUSTSWITCH: <type1>,<mode1>	
	<CR><LF>OK<CR><LF>	
	<CR><LF>+NCUSTSWITCH: (listofsupport<type>s)	
Example	<CR><LF>OK<CR><LF>	
	AT+NCUSTSWITCH=1,0 OK	Disable Nagle algorithm

	AT+NCUSTSWITCH? +NCUSTSWITCH: 1,0 OK	Query the status of TCP Nagle algorithm.
	AT+NCUSTSWITCH=? +NCUSTSWITCH: (1-99) OK	Only type 1 is supported.
Remarks	- The settings by this command are NOT saved after the module is powered down. - Send this command before a TCP socket is set up. - Type supports only 1 and 3 and other values are reserved.	

27.35 Locking Multiple Bands: +NBANDLOCK

Description	To clock one and more frequency bands
Format	- AT+NBANDLOCK=<mode>[,<3GPP_Bands>][,<3GPP2_Bands>]<CR> - AT+NBANDLOCK?<CR> - AT+NBANDLOCK=?<CR>
Parameters	<Mode>: Lock mode 0: Unlock all bands 1: Lock LTE frequency bands 2: Lock TDS frequency bands 3: Lock WCDMA frequency bands 4: Lock GSM/EDGE frequency bands 5: Lock CDMA frequency bands <3GPP_Bands>: frequency bands supported by 3GPP protocol, displayed and input in hexadecimal format <3GPP2_Bands>: frequency bands supported by 3GPP2 protocol, displayed and input in hexadecimal format Each bit indicates a band. 0 indicates disabled and 1 indicates enabled. For details about the match between bit and band, see the Appendix.
Return Value	AT+NBANDLOCK=<mode>[,<3GPP_Bands>][,<3GPP2_Bands>] <CR><LF>OK<CR><LF> <CR><LF>+NBANDLOCK: <mode>,<SupportBandlist>

	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+NBANDLOCK: <err><CR><LF>	
	<CR><LF>+NBANDLOCK: (listofsupport<mode>s),(list of support <3GPP_BAND>s),(list of support <3GPP2_BAND>s) <CR><LF>OK<CR><LF>	
	AT+NBANDLOCK?<CR> <CR><LF>+NBANDLOCK: <mode>,<Bandlist> <CR><LF>+NBANDLOCK: <mode>,<Bandlist> <CR><LF>+NBANDLOCK: <mode>,<Bandlist> <CR><LF>OK<CR><LF>	
Example	AT+NBANDLOCK=1,1 OK	Lock LTE BAND1.
	AT+NBANDLOCK=3,1 OK	Lock WCDMA BAND1.
	AT+NBANDLOCK? +NBANDLOCK: 1,1 +NBANDLOCK: 2,0 +NBANDLOCK: 3,0 OK	Query the status of band locked. LTE band1 is locked. WCDMA BAND1 and GSM bands are not locked.
	AT+NBANDLOCK=? +NBANDLOCK: 1,15 +NBANDLOCK: 2,0 +NBANDLOCK: 3,0 OK	Query frequency band locked. 15 indicates 0x15, converted into 10101 in binary system. LTE band 1, 3, 5 are locked.
Remarks	- After frequency bands are locked through this AT command, the network mode changes. For example, the network mode becomes LTE ONLY if you lock the frequency band to LTE B1. - BANDLOCK and NBANDLOCK is prior to other commands to set network mode. - If other commands are sent to set network mode, the module restores to band unlocked. - If not band is locked, NONE is returned to AT+NBANDLOCK?. - If other command is sent to set the network mode to AUTO, the locking band setting becomes invalid after the module is restarted. The settings by this command are saved after the module is powered down if AUTO mode is not	

enabled by other command.

- For bands supported, see Appendix **Support BandList**

27.36 Locking Frequency: +NFREQLOCK

Description	To lock a combination of frequencies	
Format	• AT+NFREQLOCK=<mode>[,<frequency1>,<frequency2>]<CR> • AT+NFREQLOCK?<CR>	
Parameters	mode: Network mode 0: Unlock all 1: LTE (including FDD\TDD) 2: WCDMA 3: Reserved Frequency: at most two frequencies can be input 0: Unlock frequencies 1~65535: frequency range	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+CME ERROR: <err><CR><LF>	
	AT+NFREQLOCK?<CR>	
	<CR><LF>+NFREQLOCK: <mode>[,<frequency1>,<frequency2>] <CR><LF>+NFREQLOCK: <mode>[,<frequency1>,<frequency2>] ... <CR><LF>OK<CR><LF>	
Example	AT+NFREQLOCK=1,1825	Lock the frequency 1825 of LTE
	OK	network.
	AT+NREQLOCK=2,10633	Lock the frequency 10633 of
	OK	WCDMA network.
	AT+NREQLOCK? +NREQLOCK: 1,1825 +NREQLOCK: 2,10633 OK	Query the status of frequency lock.

	AT+NFREQLOCK=1,0 OK	
	AT+NFREQLOCK? +NFREQLOCK: 1,0 +NFREQLOCK: 2,1650 OK	Unlock frequency of LT network.
	AT+NFREQLOCK=0 OK	
	AT+NFREQLOCK? +NFREQLOCK: 1,0 +NFREQLOCK: 2,0 OK	Unlock all frequencies locked.
	AT+NFREQLOCK=1,1650,1825 OK AT+NFREQLOCK? +NFREQLOCK: 1,1650,1825 +NFREQLOCK: 2,0 OK	Lock frequency range 1650 to 1825 of LTE network.
Remarks	• This command is used to lock frequencies of registered frequency bands. It does not support correction and verification of frequencies input. • LTE network supports Freq1 and Freq2 and WCDMA network supports only Freq1. • Frequency lock for LTE network by this command takes effect immediately and is not saved after the module is powered down. • LTE mode includes FDD and TDD, which are controlled by network access priority. • WCDMA network supports lock of single frequency. The lock and unlock take effect after the modules is restarted. • If NPCILOCK is sent to lock PCI, NFREQLOCK cannot lock frequency successfully because the lock priority of PCI/CELL is higher than FREQ.	

27.37 Locking PCI of LTE Network: +NPCILOCK

Description	To lock PCI of LTE network	
Format	• AT+NPCILOCK=<mode>[,<Earfcn>,< PCI>]<CR> • AT+NPCILOCK?<CR> • AT+NPCILOCK=?<CR>	
Parameters	mode: Network mode 0: Unlock all 1 LTE Earfcn: Frequency of specified PCI PCI: Physical cell ID 0~503: PCI range NONE: Not locked	
Return Value	<CR><LF>OK<CR><LF>	
	<CR><LF>ERROR<CR><LF>	
	<CR><LF>+CME ERROR: LTE BAND INVALID<CR><LF>	
	<CR><LF>+CME ERROR: GW BAND NOT SUPPORT<CR><LF>	
	<CR><LF>+ NPCILOCK: <mode>[,<Earfcn>,< PCI>]	
	<CR><LF>OK<CR><LF>	
Example	<CR><LF>+NPCILOCK: (rangeof<mode>),(range of<PCI>)	
	<CR><LF>OK<CR><LF>	
	AT+NPCILOCK=1,38950,95	Lock the PCI 95 of frequency 38950 on LTE network.
	OK	
	AT+NPCILOCK?	
	+NPCILOCK: 1,38950,95	Query the lock status of PCI on LTE network.
Example	OK	
	AT+ NPCILOCK=0	
	OK	Unlock PCI.
	AT+NPCILOCK?	Query the lock status.
	+NPCILOCK: 0,NONE	Not locked
	OK	
Example	AT+NPCILOCK=?	Query the value ranges of

	+NPCLOCK: (0-1),(1-65535),(0-503,NONE) parameters. OK
Remarks	• This command is used to lock PCI. It does not support correction and verification of PCI input. • The module might encounter crash or failure to access network if the parameters of this command is set incorrectly. • It is recommended to lock network mode to LTE by sending AT\$MYSYSINFO=4 before locking PCI. • Ensure that the module can register with network after it returns OK to this command. Otherwise, the setting is invalid. If the settings take effect, they are saved after the module is powered down.

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

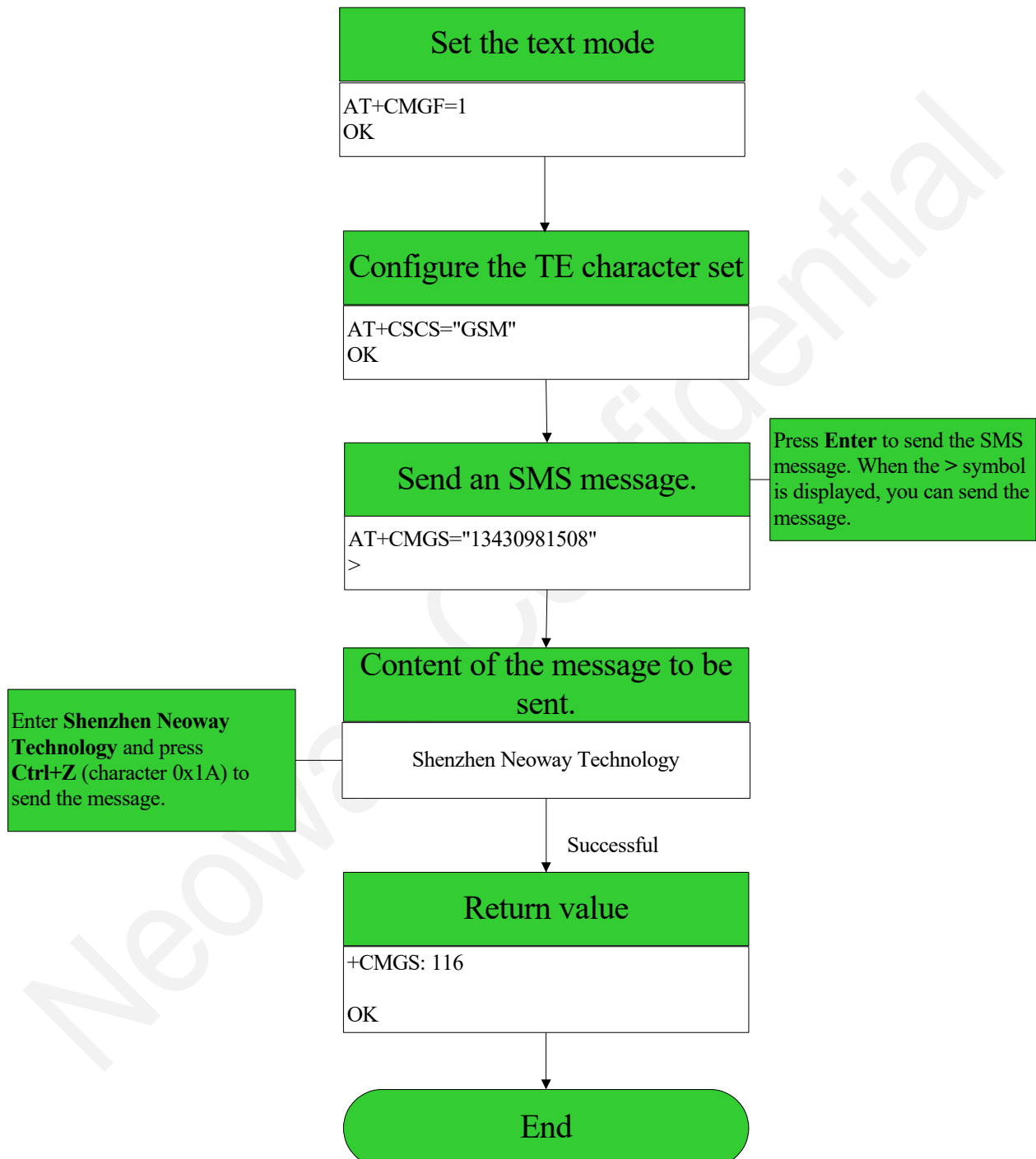
00680065006C006C006F: SMS message content

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

