



Shanghai HezhouCat.1Module (Solomon)8910Platform Series)ATCommand ManualV1.1.4

Applicable modules:Air720/Air724series

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Modification history

Version	Modified time	Modifications	author	Version Requirements	Remark
V1.0.0	2023.3.15	Version 1	Shen Yuanyuan		Version number can be passed PassATIQery
V1.0.2	June 1, 2023	Modify the default value of SLEDS	Shen Yuanyuan		
		Modify the AT+MCONFIG command parameter description	Shen Yuanyuan		
V1.0.3	July 26, 2023	Add AT+HTTPPARA URL to set length limit description	Shen Yuanyuan		
V1.0.4	August 8, 2023	Add toAT+CIPSTATUS=<n>Instruction Description	Shen Yuanyuan		
V1.0.6	2023.9.19	Delete traffic query command:AT^DATAINFOInstruction	Shen Yuanyuan		Not supported
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V1.0.8	October 26, 2023	Adding AT+MCONFIG command HostNameFlag parameter description	Shen Yuanyuan	> =V401880	
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V1.1.1	2024.3.11	ReviseAT+CIPSRIP=1ExampleURThe report contains an error; it includes an extra plus sign and a space.	Shen Yuanyuan		
V1.1.2	2024.4.30	Modify the return value of CGCONTRDP	Shen Yuanyuan		
V1.1.3	2024.5.22	GPSChange the unit of ground speed to nautical miles per hour	Shen Yuanyuan		
V1.1.4	2025.1.17	Correcting typos	Shen Yuanyuan		

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1ATCommand Overview

1.1Document Purpose

This manual provides a detailed introduction to Cosmos.Luat LTEThe module provides support.ATCommand set.

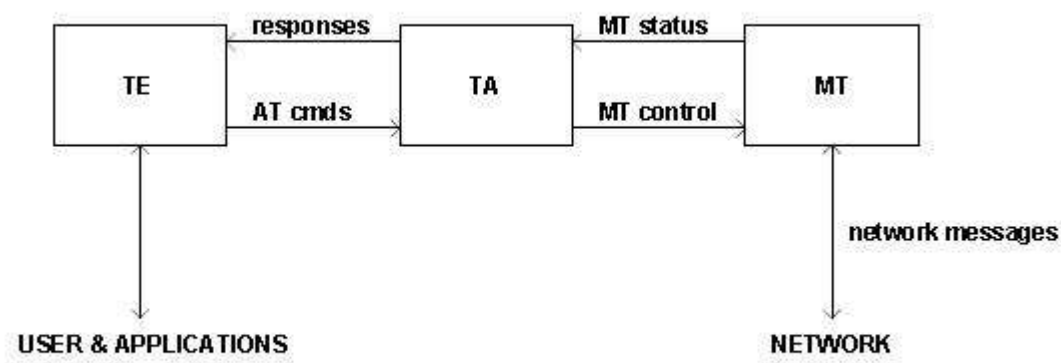
1.2Conventions and abbreviations

In this manual, modules may be referred to by the following terms:

- 1)ME (Mobile devices, which may include mobile terminals (MTTerminal adapter (TA) 2)MS (Mobile station), which includes mobile devices (ME) and user identification module (SIM) 3)TA (Terminal adapter)
- 4)DCE ((Data communication equipment) or fax machineDCE ((Fax modem, fax board)

In the application, the controller sends data via serial port.ATCommand to controlGSMModule. The controller at the other end of the serial cable can be referred to by the following terms:

- 1)TE (Terminal equipment) or
- 2)DTE (Data terminal equipment, or simply put, an embedded application



Other abbreviations:

AT	ATtention; this two-character abbreviation is always used to start a command line to be sent from TE to TA
BCD	Binary Coded Decimal
DCE	Data Circuit terminating Equipment
DTE	Data Terminal Equipment
IMEI	International Mobile Station Equipment Identity
ICCID	Integrate circuit card identity
IRA	International Reference Alphabet (ITU-T T.50)
ME	Mobile Equipment

MT	Mobile Termination
SIM	Subscriber Identity Module
TA	Terminal Adapter, eg a GSM data card (equal to DCE)
TE	Terminal Equipment, eg a computer (equal to DTE)
URC	Unsolicited Reslut Code
NTP	Network Time Protocol
NITZ	Network Identity and Time Zone
MO	Mobile Originated

1.3 ATCommand Syntax

All command lines in this manual must begin with "AT" or "at" as the beginning, with a newline character (<CR>). The response usually follows the command and follows the format "<carriage return><newline><response content><carriage return><newline>" (<CR><LF><Response content><CR><LF>). Throughout the entire manual, only the <response content> is introduced from beginning to end, while <carriage return> and <newline> are intentionally omitted.

Hezhou wireless module provides AT. The command contains the following: GSM07.05, GSM07.07 and ITU-T Recommendation V.25ter. The command.

all AT commands can be categorized into three types based on their syntax: "basic", "...". The parameter class and the extended class are described below:

1.3.1 Basic Classes AT Order

This type AT. The command has "AT<x><n>" or "AT&<x><n>". The format, where "<x>" is a command; "<n>" it can be one or more parameters. For example: ATE<n>". This command is used for DCE on/off echo function, i.e. DCE will be based on "<n>". The value determines whether to echo the received characters to the output. DTE "<n>". These are optional parameters. If no value is assigned, the module will use the default value.

1.3.2 SParameter class AT Order

This type AT. The command format is "AT<n>=<m>", among which "<n>" yes S register index; "<m>" it is the value assigned. m>". These are optional parameters. If no value is assigned, the module will use the default value.

1.3.3 Extended Class AT Order

Generally speaking, extended commands can be categorized into the following types based on their functionality:

Command type	grammar	illustrate
Test command	AT+<X>=?	This command is used to query parameters set by configuration commands or internal programs, as well as their value ranges.
Query command	AT+<X>?	This command is used to return the current value of the parameter.
Setting commands	AT+<X>=<...>	This command is used to set user-defined parameter values.
Execute command	AT+<X>	This command is used to read the received data. GSM Invariable parameters controlled by the module's internal program

Extended class command syntax:

In the command line TA. In the returned results, parameters within <> are required, and parameters within [] are optional. In each command, required and optional parameters must be arranged in the prescribed order, and each parameter must be separated by a comma. String parameters are generally enclosed in double quotes.

In actual use, <> and [] do not need to be entered.

Enter multiple lines on one lineATCommand syntax:

SeveralATCommands can be entered in the same command line. This eliminates the need to type "" at the beginning of each command.AT"or"at"Only needs to be opened in the command line

Header input "AT"or"at"That's it. Please note: a semicolon should be added after the command for the extended class as a delimiter, and the commands for the base class and...SParameter commands are not

Use a semicolon.

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	ATE0&W+CREG=2;&W	Set echo to off and save, then set network registration status.URCThe reporting mode is2 And save
←	OK	Setup successful
→	AT+CFUN=1;+CIMI;+VER	
←	AirM2M_Air724UG_V401874_LTE_AT 460012336904515 OK	

1.4 ATMaximum command response time

The following table listsATRegardless of whether it's a configuration command, query command, or test command, the maximum response time is as shown in the table. (The table does not list...)ATRegardless of whether it's a test command, query command, or configuration command, the maximum response time is...9Second.

ATOrder	Maximum response time (in seconds)
COPS	300
BGLTEPLMN	300
CGACT	108
CGATT	108
CGDATA	180
CUSD	108
CFUN	45
CMGS	90
CMGW	90
CPBW	72
CPIN	180
CSTT	60
CIICR	90
CIPSHUT	90

Special Note: Unless otherwise specified, each command applies to all universes.4GModule!

2Basic commands

2.1Search for manufacturer name:AT+CGMI

Syntax rules:

Command type	grammar	return
Execute command	AT+CGMI	<manufacturer> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<manufacturer>	ManufacturersID		The value is defined by the module manufacturer.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGMI	The manufacturer of the query moduleID
←	+ CGMI: "AirM2M" OK	Return query results

2.2Query module model:AT+CGMM

Syntax rules:

Command type	grammar	return
Execute command	AT+CGMM	<model> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<model>	Module model		Depends on the manufacturer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGMM	Query module model
←	+ CGMM: "Air724UG" OK	Return query results

2.3Query module version information:AT+CGMR

Syntax rules:

Command type	grammar	return
Execute command	AT+CGMR	Revision: <revision>

		OK
Test command	AT+CGMR=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<revision>	Software version identifier		Defined by the manufacturer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGMR	Query software version identifier
←	+ CGMR: "AirM2M_Air724UG_V401874_LTE_AT" OK	Return query results

2.4QueryIMEINumber:AT+CGSN

Syntax rules:

Command type	grammar	return
Execute command	AT+CGSN	<IMEI> OK
Test command	AT+CGSN=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<IMEI>	Product serial number, also known as International Mobile Equipment Identity.IMEI (International Mobile Equipment Identification)	-	15Composition of digits

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGSN	Search for productsIMEI
←	359759002514931 OK	Return query results

2.5QuerySIMCardICCIDNumber:AT+CCID(/ICCID)

Syntax rules:

Command type	grammar	return
Execute command	AT+CCID	<iccid> OK
	AT+ICCID	+ ICCID:<iccid> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<ICCID>	productICCIDNumber (Integrated circuit card identity, Integrated circuit card identification code)		Generally by20Composition of digits

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CCID	QuerySIMCardICCIDNumber
←	89860117831003134201 OK	Return query results
→	AT+ICCID	QuerySIMCardICCIDNumber
←	+ ICCID: 89860117831003134201 OK	Return query results

2.6QueryIMSI:AT+CIMI

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CIMI	<IMSI> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<IMSI>	International Mobile Subscriber Identity (IMSI) International Mobile Subscriber Identity)		Depend on15Composition of digits

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CIMI	QueryIMSiNumber
←	460001841426414 OK	Return query results

2.7Inquire about product information:ATI

Syntax rules:

Command type	grammar	return
Execute command	ATI	<module info> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<module info>	Module-related information (manufacturer, version)	-	Defined by the manufacturer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	ATI	Query module information
←	AirM2M_Air724UG_V401874_LTE_AT OK	Return query results

2.8Query moduleFIRMWAREVersion:AT+VER

Syntax rules:

Command type	grammar	return
Execute command	AT+VER	<firmware ver> OK
Precautions	Return results andATConsistent	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
< firmware ver>	Internal software version of the module	-	Defined by the manufacturer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+VER	Query module information
←	AirM2M_Air724UG_V670_LTE_AT OK	Return query results

2.9Check the platform hardware version:AT HVER

Syntax rules:

Command type	grammar	return
Execute command	AT HVER	^HVER:<hardversion> OK

For example:

Command (→) /	Example	Explanation and clarification
---------------	---------	-------------------------------

Return (←)		
→	AT+HVER	Query module platform hardware information
←	+HVER: RDA8910 OK	Return query results

2.10 Query various information: AT+I

Syntax rules:

Command type	grammar	return
Setting commands	AT+I	Manufacturer:<manufacturer> Model: <model> Revision: <revision> ATVer: <atver> HWVer: <hwver> Buildtime: <Buildtime> IMEI: <imei> ICCID:<iccid> IMSI:<imsi> OK

Parameter definition:

parameter	Definition	Value	explain
<manufacturer>	+CGMCommand return		
<model>	+CGMMCommand return		
<revision>	+CGMRCommand return		
<atver>	ATVersion		
<hwver>	Hardware version		
<Buildtime>	firmware compilation time		
<imei>	Same +CGSNcommand return value		
<iccid>	Same +ICCIDcommand return value		
<imsi>	International Mobile Subscriber Identity (IMSI) International Mobile Subscriber Identity)		Depend on15Composition of digits

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+I	
←	Manufacturer: AirM2M Model: Air724UG Revision: AirM2M_Air724UG_V670_LTE_AT ATVer: 193 HWVer: A10 Buildtime: Jun 13 2020 17:55:20 IMEI: 866714043071637	

	ICCID: 898600650915F6049889 IMSI: 460001651547739	
	OK	

2.11 Repeat the previous command: A/

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	A/	response: Repeat the previous command; this command line does not need to end with a terminator.
Precautions	This command requires an Enter key to function correctly.	

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CIMI	QueryIMSI
←	460001841426414 OK	returnIMSI
→	A/	Repeat the previous command, that is AT+CIMI
←	460001841426414 OK	returnIMSI

2.12 WriteSN Command No. 1: AT+WISN

AT+WISN It is used to write user information.sn (serial number) To the module.

Syntax rules:

Command type	grammar	return
Setting commands	AT+WISN=<user_sn>	OK
		+ CME ERROR: <err>
Query command	AT+WISN?	<user_sn>
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<user_sn>	special SN	-	User-defined, longest 64Bit

For example:

Command (→) /	Example	Explanation and clarification
---------------	---------	-------------------------------

Return (←)		
→	AT+WISN="1234567890"	Write a customerSNNumber
←	OK	
→	AT+WISN?	Customer InquirySNNumber
←	1234567890 OK	

2.13 Restart module:AT+RESET

Restart the module.

Syntax rules:

Command type	grammar	return
Execute command	AT+RESET	OK

2.14 Reboot the module and restore factory settings:AT+RSTSET

Restart the module and restore factory settings.

Syntax rules:

Command type	grammar	return
Execute command	AT+RSTSET	OK

3Configuration commands

3.1chooseTECharacter set:AT+CSCS

Configure command notificationsDCE,DTEThe required character set must be used to ensure...DCEandDTEAccurately convert strings between agreed character sets. Syntax rules:

Command type	grammar	return
Setting commands	AT+CSCS=<chset>	OK
Query command	AT+CSCS?	+ CSCS: <chset>
		OK
Test command	AT+CSCS=?	+ CSCS: (<chset>(List of possible values)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<chset>	character set	"GSM"	GSM 7default character (3GPP TS 23.038)
		"IRA"	International Reference Symbols (ITU-T T.50)
		PCCP936	
		"HEX"	
		"UCS2"	16Bit-Generalized Multibyte Encoded Character Set

For example:

Command (→) / Return Back(←)	Example	Explanation and clarification
→	AT+CSCS?	
←	+ CSCS: IRA OK	
→	AT+CSCS=?	Query character set range
←	+ CSCS: ("GSM","HEX","PCCP936","UCS2") OK	CAT1Module return

3.2Save the user's current configuration:AT&W

Most of the content in this documentATCommands, if you want the parameters to remain unchanged after a module restart, all need to be passed through...AT&WSave. This command saves some user settings.ATCommand parameters saved toNVIn this case, the relevant configurations will automatically load and take effect after a reboot. Syntax rules:

Command type	grammar	Return and Explanation
--------------	---------	------------------------

Execute command	AT&W	OK
-----------------	------	----

3.3Set command echo mode:ATE

Execute command settingsTAIN command mode, is it possible to echo from...TEThe received characters.

Syntax rules:

Command type	grammar	return
Execute command	ATE<value>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	Echo	0	Echo mode off
		<u>1</u>	Echo mode on

3.4Restore all parameters to factory settings:AT&F

Execute the command to restore all parameters to factory settings.

Syntax rules:

Command type	grammar	return
Execute command	AT&F	OK

3.5Set result code suppression mode:ATQ

This command is used to setTAWwhether toTESend the result code. This setting will not affect the content of the response.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	ATQ<n>	OK
Parameter storage mode	The parameters of the command can be set throughAT&WCommand saved toNVMIn the middle, restarting will not lose data.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Should the result code be displayed?	<u>0</u>	TowardsTESend result code
		1	The result code is suppressed and not sent.

For example:

Command (→) / Back(←)	return	Example	Explanation and clarification
→		ATQ1	Set to not return result code
←			It did not appear at this time.OKThis result code
→		AT+CREG?	

←	+ CREG: 0,1	It did not appear at this time.OKThis result code
---	-------------	---

3.6set upTAThe format of the response content:ATV

This command is used to set the transmission format (numeric or alphabetic) for the result code and return result, and to set the header and footer content, which are sent together with the result code and return result.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	ATV<value>	When <value>=0Return: 0or4
		When <value>=1Return: OKorERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	Result code display mode	0	After successful setup, enterATThe return information after the command is as follows: Information returned: <text><CR><LF> Result code returned (numeric): <numeric code><CR>
		1	After successful setup, enterATThe return information after the command is as follows: Information returned: <CR><LF><text><CR><LF> Result code returned (long character type): <CR><LF><verbose code><CR><LF>

Some commonly usedcodeThe definition is as follows:

<numeric code> (ATV0)	<verbose code>(ATV1)	illustrate
0	OK	Correct confirmation of command execution
1	CONNECT	The connection has been established;DCESwitch from command mode to online data mode
2	RING	DCEA call from the network has been detected.
3	NO CARRIER	Connection interrupted or connection attempt failed.
4	ERROR	The command cannot be recognized, exceeds the maximum length of the command line, has an invalid parameter value, or there is another problem with the command process.
6	NO DIALTONE	Unable to detect dial tone
7	BUSY	Busy tone detected (line occupied)
8	NO ANSWER	If the "@" dialing modification is used, then it will be followed by5Remote ringing with a 1-second silence time was not set in the timer (S7The timeout was detected. (No response was received.)
9	PROCEEDING	OneATThe command is being processed.
Manufacturer's Special Needs	CONNECT <text>	andCONNECTThe same, but texts containing manufacturer-specific requirements can be formulated. DTERate, line speed, error control, data compression, or other status.

For example:

Command (→) / Back(←)	return Example	Explanation and clarification
→	ATV0	Set the result code display mode to0After successful setup, enterATThe return information after the command is as follows: Information returned: <text><CR><LF>

		Result code returned (numeric): <numeric code><CR>
←	0	0expressOK
← (URC)	AT+CSCS?	
← (URC)	+ CSCS: IRA	
	0	

3.7set upCONNECTResult code format and monitoring call process:ATX

This command is used to setTAWhether to perform dial tone and busy tone detection, and to...TESend a specific result code.

Syntax rules:

Command type	grammar	return
Execute command	ATX<value>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	CONNECTresult Code and call process model Style setting	0	The given connection is returned immediately upon entering online data status.CONNECTResult code, dial tone, and busy tone detection are all disabled.
		1	The given connection is returned immediately upon entering online data status.CONNECT<text>Result code, dial tone, and busy tone detection are all disabled.
		2	The given connection is returned immediately upon entering online data status.CONNECT<text>Result code, dial tone detection enabled, busy tone detection disabled.
		3	The given connection is returned immediately upon entering online data status.CONNECT<text>Result code, dial tone detection disabled, busy tone detection enabled.
		4	The given connection is returned immediately upon entering online data status.CONNECT<text>Result code, dial tone, and busy tone detection are all enabled.

3.8Set the number of rings before automatic answer:ATS0

Configuration commands can be used to enable or disable...DCEAutomatically answer incoming calls. If <n>Set to a non-zero value when an incoming call indicates (RING)After reaching the specified number of times,DCEAutomatic response.

Syntax rules:

Command type	grammar	return
Setting commands	ATS0=<n>	OK
Query command	ATS0?	<n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Automatic response mode	<u>0</u>	Disable automatic answering (default)
		1~255	Automatic answering will be enabled after the specified number of rings.

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	ATS0=3	Set it to respond to incoming callsMTAutomatically answers after three rings
←	OK	
← (URC)	RING RING RING OK	There is an incoming call, when the display shows3individualRINGAfter three rings, the call will be answered automatically.

3.9FOTAOver-the-air upgrade:AT+UPGRADE

FOTA(Firmware Over The AirThis is the function for over-the-air firmware updates. The process is as follows: 1Compare the version number with the server firmware version;
2If the server firmware version number is high, the firmware download process will begin. 3Once the firmware download is complete, the module will automatically restart and flash the new version.
4The module automatically restarted again and ran the new firmware.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+UPGRADE=<tag>,<value> [,<savetoNV>]	OK	Settingstag>value
	AT+UPGRADE=<tag>	+ UPGRADE:<tag>,<value> OK	Querytag>value
Query command	AT+UPGRADE?	+ UPGRADE: <state> OK	<state>=0Time return
		+ UPGRADE: <state>, <percent> OK	<state>=1Time return
		+ UPGRADE: <state>, [<error code>, <http response>, <fota error cause>] OK	<state>=2Time return
Execute command	AT+UPGRADE	OK	Manually trigger upgrade

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<tag>		"KEY"	use"KEYTo configure the serverProductKEY
		"AUTO"	use"AUTOConfigure whether to automatically upgrade.

		"PERIOD"	use"PERIODSet the automatic update query cycle, in seconds. When the set cycle expires, the module queries the server for the version. When the server's module version number is greater than its own, it will initiate an automatic upgrade. class.
		"URL"	use"URLSet up your own upgrade serverURLaddress
<savetoNV>	Save parameters? arriveNV	0	Save, default value
		1	Do not save
<value>	<tag>The value of , Differenttag>have Different values		String type, <tag> = "KEY"At that time, this value is set to the cosmos. iotA server productProductKeyYou can do so under this product.OTA upgrade
		0	<tag>="AUTO"The value at time is an integer. 0Turn off automaticFOTA(The module no longer communicates with the server) 1Turn on automaticFOTA (The module periodically queries the server) Note: The default value is...1This means it will automatically upgrade to "on"!
		1	
		60~2 32(4294967296)	<tag>="PERIOD"The value for time is an integer, in seconds. The default value is...86400,Right nowtwenty fourHour
		"http://xxxx.bin"	<tag> = "URL"The value at time is a string.
<state>		0	Not executedFOTA
		1	Downloading firmware from server
		2	Firmware download results
<percent>	Upgrade percentage	1~100	When the module is in <state>=1In this state, the percentage of firmware downloaded.
<error code>		- 1000	InvalidURL
		- 1001	Network error
		- 1002	Server connection error
		- 1003	Invalid firmware
		- 1004	httpResponse error
		- 1005	Storage firmware error
		- 1006	Other errors
<http response>	httpError code		Please refer to the following for detailed value options: https://baike.baidu.com/item/HTTP%E7%8A%B6%E6%8
<fota error cause>	FOTAError reason	3	Invalid device. Device not found.
		17	No permission
		25	Invalid projects
		26	Invalid firmware
		27	It's already the latest version. It passed the previous checks, but the version number is... Is it the latest version, or is the upgrade switch not turned on, or is it not specified?meiwait

For example:

Command (→) / Return (←)	Example	Explanation and clarification
Upgrade using the private server provided by HeZhou:		
	1Upload the new firmware version to the server.	

Through the union of the universeERPAfter purchasing the module,ERPAn upgrade server management account will be automatically assigned. The login address is: http://iot.openluat.com/ The username is the buyer's mobile phone number, and the default password is:888888 After logging in, please click on the corresponding module model. Here, we'll use...**Air72XUXStandard Module**For example:



Clicking on "Products" -> "Equipment List" will show you the modules you have purchased.IMEIList, AutoFOTAfirmware upgrades can be performed on these devices.

当前项目		Air72XUX标准模块		搜索IMEI	搜索			操作
IMEI	设备名称	设备版本	固件名称	升级状态	Debug状态	最近上线	创建时间	
B61551056130107				升级	关	2017-01-01 00:00:00		查看 删除
B61551056130107	861551056130107	1.0.0	LUAT_IOT_SERVER_UPDATE_LuatOS-Air_RDA8910_TTS_NOVOLT_FLOAT	升级	关	2023-03-03 16:15:46		查看 删除
B66714049416182	866714049416182	0.0.0	AirM2M_720U_LTE_AT	升级	关	2022-11-17 10:58:49		查看 删除

Click to enter**Product -> Firmware List -> Create Firmware -> Upload File**Upload the firmware to be updated.binFor firmware upgradesbinThe

document was published on the HeZhou official website.ATThe command is included in the firmware package.

To unite the universeAirM2M_720U_V401874_LTE_ATTaking the test firmware as an example, the upgrade package contains four files after decompression, including...binThe file needs to be uploaded to the server.

8910 > banben > AirM2M_720U_V401874_LTE_AT				
名称	修改日期	类型	大小	
AirM2M_720U_V401874_LTE_AT.dfota.bin	2022/11/21 14:51	BIN 文件	5,122 KB	
AirM2M_720U_V401874_LTE_AT.pac	2022/11/21 14:51	PAC 文件	6,470 KB	
package_info.txt	2022/11/21 14:51	文本文档	1 KB	
Release_Notes_AirM2M_720U_LTE_AT.xls	2022/11/21 14:51	XLS 工作表	25 KB	

After uploading the file, select one of the two options shown in the image below:**yes**

创建固件

提醒: 不同功能的固件应当选用不同的固件名来区分, 以免出现版本混乱。误操作、误升级。

选择文件

点击选择文件

文件名

AirM2M_720U_V401874_LTE_AT.dfota.bin

固件名

AirM2M_720U_LTE_AT

版本号

0.0.0

允许升级

☒

全项目升级

☐

备注

关闭

确定

After completing the above settings, the module can perform automatic over-the-air firmware upgrades.FOTA The default query server interval is...twenty four Hours. Note: Users can also...AT+UPGRADE="AUTO",0Turn off automatic updates. If the customer wants to upgrade automatically again, there are two methods:

- 1)enterAT+UPGRADEManually trigger upgrade
- 2)enterAT+UPGRADE="AUTO",1Re-enable automatic updates

2You can view it on the server side.FOTAUpgrade status

After clicking Firmware Upgrade -> Upgrade Statistics, you can see the number of successful upgrades for each version.

升级统计		查看IoT / 固件升级 / 升级统计				
当前项目	Air72XU标准模块	搜索固件名	搜索			
固件名	备注	新版本号	允许升级	升级全部设备	设备数量 ①	操作
LUAT_IOT_SERVER_UPDATE_LuatOS-Air_RDA8910_TTS_NOVOLTE_FLOAT		1.0.1	是	否	0	导出设备

3Module performance throughout the upgrade process

Firmware download has begun. The system will automatically report the following:

+ UPGRADEIND: <percent>

percent: 0-100

After the firmware download is complete, the system will automatically reboot and begin flashing the firmware. During the flashing process, it will proactively report:

+ UPGRADEDL: <percent>

percent: 0-100

After successful burning, the system will automatically restart and proactively report that the software has been updated.

+ UPGRADEVER: <new version>

(new version: New firmware version number, for example: "AirM2M_720U_V401874_LTE_AT ")

+ UPGRADEVER: <upload state>

(upload state: Has the status of the new firmware update been successfully reported?1Report successfully submitted.0(Report failed)

Note: Download firmware (print+)UPGRADEIND: <percent>After the module automatically restarts, the new firmware will be burned (printed). + UPGRADDL: <percent>, and then report the upgrade status after restarting (print +UPGRADEVER: <new version>The entire process is completed automatically by the module, and users are prohibited from restarting the module or powering it off during this process!

Upgrade using the user's own server:

Users have placed it on their own servers.binFile, then enter:

AT+UPGRADE="URL","http://xxx.bin"

OK

Similarly, the default is automatic upgrade, and the interval is also...twenty fourHours. The module downloads firmware from the server, which is done using...HTTPprotocol.

3.10Set the command line terminator:ATS3

The configuration command can be set for...ATCommand line terminator, this character can be...TAIdentification.

Syntax rules:

Command type	grammar	return
Setting commands	ATS3=<n>	OK
Query command	ATS3?	<n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Command line terminatorASCIIvalue	<u>13</u>	Default value:13,correspondASCIIThe character is <CR>((Enter character) Note: Only this value is supported.

3.11Configure command-line editing characters:ATS5

This command is set to delete the character that was previously displayed on the command line.

Syntax rules:

Command type	grammar	return
Setting commands	ATS5=<n>	OK
Query command	ATS5?	<n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Command line editorASCIIvalue	<u>8</u>	Default value:8(correspondASCIICharacter <BS>Backwards symbol)

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	ATS5?	Query the current command line edit characters
←	008 OK	The current command line editing character isBackspaceBackwards symbol

3.12set upCDCFunctional Modes:AT&C

This command sets109(DCDThe relationship between circuit status and signal detection on the remote receiving line.

Syntax rules:

Command type	grammar	return
Execute command	AT&C<value>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	DCDCircuit status	0	DCDThe line is alwaysON
		<u>1</u>	DCDThe line is only active when the data carrier is present.ON

3.13set upDTRFunctional Modes:AT&D

This command sets the data mode.circuit 108/2 (DTR)fromONBecomeOFFIn the state,TAThe response status.

Syntax rules:

Command type	grammar	return
Execute command	AT&D<value>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	DTRCircuit status	0	TAneglectDTRstate
		<u>1</u>	DTRDepend onONtoOFF:TAWhile maintaining the current data call, switch to command mode.
		2	DTRDepend onONtoOFF:TARelease data call and switch to command mode. DTR= OFFWhen the time is set, the automatic response is off.

3.14Real-time clock:AT+CCLK

Syntax rules:

Command type	grammar	return
Setting commands	AT+CCLK=<time>	OK
Query command	AT+CCLK?	+ CCLK: <time>
		OK
Test command	AT+CCLK=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<time>	time	-	String type (strings must be enclosed in quotation marks); format similar to "yy/MM/dd,hh:mm:ss±zz"The last two characters indicate the year, month, day, hour, minute, second, and time zone (in local time and...).GMTThe difference between time periods is used to represent the difference between time periods.1/4Represented in hour format; range -47...+48)

For example:

Command (→) /	Example	Explanation and clarification
---------------	---------	-------------------------------

Return (←)		
→	AT+CCLK?	Query current time
←	+ CCLK: "18/08/01,12:12:58+00"	The returned query results
	OK	
→	AT+CCLK="18/08/07,13:28:29+32"	Set the current time to the correct time. You can set the time zone using the "+" sign.
←	OK	
→	AT+CCLK?	Query the current time again
←	+ CCLK: "18/08/07,13:28:31+32"	The returned query results
	OK	

3.15set upUSBmodel:AT+SETUSB

This command can be setUSBUsage patterns of the mouth.

Syntax rules:

Command type	grammar	return
Setting commands	AT+SETUSB=<mode>[,<vid>,<pid>]	OK
Query command	AT+SETUSB?	mode: <mode> Vid: <vid> Pid: <pid> OK
Test command	AT+SETUSB=?	OK
Precautions	This command can automatically save the settings when the computer is turned off.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	USBThe usage pattern sets the required parameters for commands. parameter	1	RNDIS+AT+PPP+DIAGMode, default value
		2	ECM+ AT+PPP+DIAGmodel
		3	reserve
<vid>	Vendor IDSet optional parameters for the command.		Air72XUXThe default value for the series is0x1782
<pid>	Product IDSet optional parameters for the command.		Air72XUXThe default value for the series is0x4e00

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+SETUSB=2	Set toECMNetwork card
←	OK	
→	AT+SETUSB?	
←	mode: 2 vid: 0x1782 pid: 0x4e00	

	OK	
--	----	--

3.16 Device error: AT+CME

This command enables or disables the use of result codes. CME ERROR: <err>As and MEIndicators related to function errors. Syntax rules:

Command type	grammar	return
Setting commands	AT+CME=[<n>]	OK
Query command	AT+CME?	+ CME :<n> OK
Test command	AT+CME=?	+ CME:<n>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Result code reporting mode	<u>0</u>	Disable result code+CME ERROR: <err>,useERROR
		1	Enable result code+CME ERROR: <err>and using numeric <err>Value
		2	Enable result code+CME ERROR: <err>and using a verbose approacherr>Value

3.17 Error code description: +CME ERROR:<err>

Numeric typeerr> Value	verbose styleerr>Value	explain
Common errors		
0	phone failure	mobile phone malfunction
1	No connection to phone	Not connected to phone
2	phone-adaptor link reserved	Reserved mobile adapter link
3	Operation not allowed	Operation not allowed
4	Operation not supported	Operation not supported
5	PH-SIM PIN required	needPH-SIMCardPIN
6	PH-FSIM PIN required	needPH-FSIMofPIN
7	PH-FSIM PUK required	needPH-FSIMofPUK
10	SIM not inserted	No insertionSIMCard
11	SIM PIN required	needSIMCardPIN
12	SIM PUK required	needSIMCardPUK
13	SIM failure	SIMCard malfunction
14	SIM busy	SIMCard Encounter Busy
15	SIM wrong	SIMmistake
16	incorrect password	Invalid password

17	SIM PIN2 required	needSIMCardPIN2
18	SIM PUK2 required	needSIMCardPUK2
20	memory full	Storage full
twenty one	invalid index	Invalid index
twenty two	Not found	No findings
twenty three	memory failure	Storage failure
twenty four	text string too long	The text string is too long.
25	invalid characters in text string	Invalid characters in the text string
26	dial string too long	Dialing string too long
27	invalid characters in dial string	Invalid characters in the dial string
30	No network service	No network service
31	network timeout	Network timeout
32	network not allowed - emergency calls only	Network not allowed - only applicable to emergency calls
40	network personalization PIN required	Network personalization is neededPIN
41	network personalization PUK required	Network personalization is neededPUK
42	network subset personalization PIN required	Personalization of network subsets is requiredPIN
43	network subset personalization PUK required	Personalization of network subsets is requiredPUK
44	service provider personalization PIN required	Personalized service provider requiredPIN
45	service provider personalization PUK required	Personalized service provider requiredPUK
46	corporate personalization PIN required	Company customization requiredPIN
47	corporate personalization PUK required	Company customization requiredPUK
48	Hidden key required	You need to enter a hidden password.
49	EXE_NOT_SURPORT	
50	EXE_FAIL	(Applicable to)cat1(Module)
50	Invalid Param	Invalid parameters (applicable to)cat4(Module)
51	NO MEMORY	Insufficient memory (applicable to)cat1(Module)
52	OPTION NOT SURPORT	Option not supported (applicable to)cat1(Module)
53	Parameters are invalid	Invalid parameters (applicable to)cat1(Module)
54	EXT_REG_NOT_EXIT	(Applicable to)cat1(Module)
55	EXT_SMS_NOT_EXIT	(Applicable to)cat1(Module)
56	EXT_PBK_NOT_EXIT	(Applicable to)cat1(Module)
57	EXT_FFS_NOT_EXIT	(Applicable to)cat1(Module)
58	INVALID_COMMAND_LINE	(Applicable to)cat1(Module)
59	ITF_DIFFERENT	(Applicable to)cat1(Module)
60	BURN_FLASH_FAIL	(Applicable to)cat1(Module)
61	TFLASH NOT EXIST	TFCard not found (applicable to)cat1(Module)
62	FILE NOT EXIST	The file does not exist (applicable to)cat1(Module)
63	FILE TOO LARGE	The file is too large (applicable to)cat1(Module)
96	INVALID DATE OR TIME	Invalid date or time (applicable to)cat1(Module)
97	DIR CREATE FAIL	Folder creation failed (applicable to)cat1(Module)
98	DIR NOT EXIST	The folder does not exist (applicable to)cat1(Module)
99	NOT IMPLEMENTED	Non-executable (applicable to)cat1(Module)
100	unknown	unknown
103	Illegal MS	illegalMS

106	Illegal ME	illegalME
107	GPRS services not allowed	Not allowedGPRSbusiness
111	PLMN not allowed	Not allowedPLMN
112	Location area not allowed	Disallowed location area
113	Roaming not allowed in this location area	Roaming is not allowed in this location area.
132	Service option not supported	Business selection is not supported.
133	requested service option not subscribed	Business selection request not described
134	service option temporarily out of order	Service selection: No connection available at the moment
148	unspecified GPRS error	GPRSError not specified
149	PDP authentication failure	PDPAuthentication failed
150	invalid mobile class	Invalid movement category
151	AT command timeout	ATCommand timeout
181	UNSUPPORTED QCI VALUE	Not supportedCQI
214	SS_UNKNOWN_SUBSCRIBER	
222	SS_ILLEGAL_SUBSCRIBER	
223	SS_BRERSERV_NOT_PROV	
224	SS_TELESERV_NOT_PROV	
225	SS_ILLEGAL_EQUIPMENT	
226	SS_CALL_BARRED	
229	SS_ILLEGAL_OPERATION	
230	SS_ERROR_STATUS	
231	SS_NOT_AVAILABLE	
232	SS_SUBS_VIOLATION	
233	SS_INCOMPATIBILITY	
234	SS_FACILITY_NOT_SUPPORTED	
240	SS_ABSENT_SUBSCRIBER	
247	SS_SYSTEM_FAILURE	
248	SS_DATA_MISSING	
249	SS_UNEXPECTED_DATA_VALUE	
250	SS_PWD_REGISTRATION_FAILURE	
251	SS_NEGATIVE_PWD_CHECK	
256	SS_NUMOF_PWD_ATTEMPT_VIOL	
264	SIM VERIFY FAIL	(Applicable to)cat1(Module)
265	SIM UNBLOCK FAIL	(Applicable to)cat1(Module)
266	SIM CONDITION NO FULLFILLED	(Applicable to)cat1(Module)
267	SS_POSITION_METHOD_FAILURE	(Applicable to)cat4(Module)
267	SIM UNBLOCK FAIL NO LEFT	(Applicable to)cat1(Module)
268	SIM VERIFY FAIL NO LEFT	(Applicable to)cat1(Module)
269	SIM INVALID PARAMETER	(Applicable to)cat1(Module)
270	SIM UNKNOW COMMAND	(Applicable to)cat1(Module)
271	SIM WRONG CLASS	(Applicable to)cat1(Module)
272	SIM TECHNICAL PROBLEM	(Applicable to)cat1(Module)
273	SIM CHV NEED UNBLOCK	(Applicable to)cat1(Module)
274	SIM NOEF SELECTED	(Applicable to)cat1(Module)

275	SIM FILE UNMATCH COMMAND	(Applicable to)cat1(Module)
276	SIM CONTRADICTION CHV	(Applicable to)cat1(Module)
277	SIM CONTRADICTION INVALIDATION	(Applicable to)cat1(Module)
278	SIM MAXVALUE REACHED	(Applicable to)cat1(Module)
279	SIM PATTERN NOT FOUND	(Applicable to)cat1(Module)
280	SIM FILEID NOT FOUND	(Applicable to)cat1(Module)
281	SIM STK BUSY	(Applicable to)cat1(Module)
282	SIM UNKNOW	(Applicable to)cat1(Module)
283	SIM PROFILE ERROR	(Applicable to)cat1(Module)
284	SS_UNKNOWN_ALPHABET	
285	SS_USSD_BUSY	
323		Cat1Module
339	SS_MAXMPTY_CALLS_EXCEEDED	
340	SS_RESOURCES_NOT_AVAILABLE	
501	WIFI labtool return error	
502	BT labtool return error	
503	FM labtool return error	
504	MRD file already exists	
505	MRD file with same version already exists	
506	MRD file with newer version already exists	
507	MRD authorization failure	
508	(U)SIM PUK blocked	
509	Vendor not supported	
510	NVM path not exist	
511	NVM file comcfg error	
535	PROTOCOL stack busy	
600	BTSAP card not accessible	
601	BTSAP card powered off	
602	BTSAP card removed	
603	BTSAP card powered on	
604	BTSAP data not available	
605	BTSAP not supported	
606	Non-Production mode	
753	missing required cmd parameter	CRSMMissing parameters
754	Invalid SIM command	CRSMInvalid command
755	Invalid file id	CRSMInvalid document
756	Missing required P1/2/3 parameter	CRSMLackPparameter
757	Invalid P1/2/3 parameter	CRSMInvalidPparameter
758	Missing required command data	CRSMMissing command data
759	invalid characters in command data	CRSMInvalid characters in the command line
765	Invalid input value	Invalid input value
766	Unsupported mode	Unsupported modes
767	Operation failed	Operation failed
768	Mux is already running.	Multiplexing is already in operation.

769	Unable to get control	Unable to gain control
770	SIM network reject	SIMNetwork denial
771	Call setup in progress	Call being established
772	SIM powered down	SIMClosed
773	SIM file not present	SIMThe file is not found.
774	RAC refresh net time failure	
791	Param count not enough	
792	Param count beyond	
793	Param value range beyond	
794	Param type not match	
795	Param format invalid	
796	Get a null param	
797	CFUN state is 0 or 4	
810	No Error	
811	Unrecognized Command	
812	Return Value Error	
813	Syntax Error	
814	Unspecified Error	
815	Data Transfer Already	
816	Action Already	
817	Not At Cmd	
818	Multi Cmd too long	
819	Abort Cops	
820	No Call Disc	
821	BT SAP Undefined	
822	BT SAP Not Accessible	
823	BT SAP Card Removed	
824	AT Not Allowed By Customer	
890	GPS_NOT_RUNNING	
891	GPS_IS_RUNNING	
892	GPS_IS_FIXING	
893	GPS_IS_SLEEPING	
894	GPS_NOT_SLEEPING	
900	DIAED_REJECT	
901	PDP_NO_ACTIVE	
902	PDP_ACTIVE	
910	TCP_CONNECTION_REJECT	
911	TCP_CONNECT_OVERTIME	
912	SOCKET_CONNECTION_EXIST	
913	SOCKET_CONNECTION_NOT_EXIST	
914	BUFFER_OVER_SIZE	
915	SENDING_OVERTIME	
916	DNS_EXIST	
917	DNS_PARSE_OVERTIME	

918	DNS_PARSE_ERROR	
980	INPUT_VALUE_ERROR	
981	OTHER_ERROR	
982	ERROR	
983	NOT_ALLOWED	
1000	UPGRADE_INVALID_URL	
1001	UPGRADE_NET_ERROR	
1002	UPGRADE_SERVER_CONNECT_ERROR	
1003	UPGRADE_INVALID_FILE	
1004	UPGRADE_SERVER_RESPONSE_ERROR	
1005	UPGRADE_WRITE_FLASH_ERROR	
1006	UPGRADE_ERROR	
65535	Other Error	

4Equipment control commands

4.1Mobile phone activity status:AT+CPAS

Syntax rules:

Command type	grammar	return
Execute command	AT+CPAS	+ CPAS: <pas> OK
Test command	AT+CPAS=?	+ CPAS: (<pas>{List of possible values}) OK
Precautions	The command is used to query the phone's activity status.pas>of	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<pas>	state	0	MEReady
		1	MEUnavailable
		2	unknown,MENot ready
		3	Ringing
		4	Call in progress
		5	sleep
		6	call in active

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CPAS=?	Querypas>Range of values
←	+ CPAS: (0,1,2,3,4,5,6) OK	
→	ATD138*****;	The module calls a mobile phone number
←	OK	
→	AT+CPAS	When the other party's phone rings but the call is not answered, the module performs a query.
←	+ CPAS: 3 OK	3Indicates ringing
← (URC)	CONNECT	Answering the call
→	AT+CPAS	After the call is answered, the module checks the status.
←	+ CPAS: 4 OK	4Indicates that the call is in progress.

← (URC)	NO CARRIER	The called party hangs up
→	AT+CPAS	After the called party hangs up, the module checks the status again.
←	+ CPAS: 0 OK	0expressMEReady (idlestate)

4.2Module functional modes:AT+CFUN

Configure the function mode of the command selection module.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CFUN=<fun>[,<rst>]	OK
Query command	AT+CFUN?	+ CFUN: <fun> OK
Test command	AT+CFUN=?	+ CFUN: (<fun>{List of possible values}), (<rst>{List of possible values}) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<fun>	Functional mode	0	Minimum Functionality
		<u>1</u>	All features
		3	Close moduleRFThe receiving function of the circuit
		4	Flight mode. Turn off the module.RFThe circuit's receiving and transmitting functions
		5	makeSIMCard failure
		6	turn off full secondary receiver
<rst>	Do I need to restart?	<u>0</u>	In settingsfun>At the level, do not reset.ME
		1	In settingsfun>At the level, resetME

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CFUN=?	Query the value range of each parameter.
←	+ CFUN: (0,1,3,4,5,6),(0-1) OK	Query results
→	AT+CFUN?	Query the current function mode
←	+ CFUN: 1 OK	Query results
→	AT+CFUN=1,1	It was used to actively restart the module, and after restarting, it entered full-featured mode.
←	OK	

4.3Power off:AT+CPOWD

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPOWD=<n>	<n>=0Emergency shutdown, no response. <n>=1Normal shutdown, return:NORMAL POWER DOWN

4.4enterPINcode:AT+CPIN

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPIN=<pin>[,<newpin>]	OK Note: If neededPINyesSIM PUKorSIM PUK2,Then a second one is needed. pin <new pin>Used to replaceSIMThe original cardpin.
Query command	AT+CPIN?	+ CPIN: <code> OK
Test command	AT+CPIN=?	OK
URC	+ CPIN:<code>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<pin>	password	-	String type
<newpin>	New Password	-	String type
<code>		READY	MENo password required
		SIM PIN	MEAwaiting provisionSIMCardPINcode
		SIM PUK	MEAwaiting provisionSIMCardPUKcode
		SIM PIN2	MEAwaiting provisionSIMCardPIN2code
		SIM PUK2	MEAwaiting provisionSIMCardPUK2code
		SIM REMOVED	SIMCard not detected

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPIN?	QueryPINCode lock status
←	+ CPIN: READY OK	expressPINThe key lock is not open.
→	AT+CLK="SC",1,"1234"	StartupPINCode lock,1234yesPINcode,SCIIt means yesSIMCard
←	OK	returnOKThen, restart the module.
←	+ CPIN: SIM PIN	After restarting, the module will automatically report.PINCode status,SIM PINIndicates power-onPIN The code isONThe status (i.e., the input required to power on)PINcode)
→	AT+CPIN="1234"	At this point, you need to enter...PINcode

←	+ CPIN: READY OK	This indicates that the password is correct.PINUnlocking the code lock
→	AT+CLCK="SC",2	Check current startup statusPINIs the code still enabled?
←	+ CLCK: 1 OK	1This indicates that the device is still powered on.PINCode prompt
→	AT+CLCK="SC",0,"1234"	Turn off power-onPINCode prompt
←	OK	returnOKThen restart
←	+ CPIN: READY	After restarting, the module will automatically report.PINCode status,READYIndicates power-onPIN code: OFF

4.5Device locked:AT+CLCK

Execute commands to lock, unlock, and query.MEor network equipmentfac>A password is usually required.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CLCK=<fac>,<mode> [,<password>[,<class>]]	When <mode>≠2, return: OK
		When <mode>=2,return: + CLCK:<status>[,<class1><CR><LF> + CLCK:<status>,<class2>[...]] OK
Test command	AT+CLCK=?	+ CLCK:(<fac>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<fac>	equipment	"CS"	Control surface(Lock control interface)
		PS	Lock the device to one or moreSIMOn the card
		"PF"	Lock the device to the first inserted one.SIMOn the card
		"SC"	SIM/UICC(LockSIMCard)
		"AO"	All outgoing calls are prohibited.
		"OI"	All international exit calls are prohibited.
		"OX"	All international outgoing calls are prohibited, except for those from the country of origin.
		"AI"	All incoming calls are prohibited.
		"IR"	When roaming outside of your home country, all incoming calls are prohibited.
		"NT"	prohibitTAUnsaved number incoming call
		"NM"	prohibitMTUnsaved number incoming call
		"NS"	prohibitSIM/UICCUnsaved number incoming call
		"NA"	Calls from numbers that are not saved in any storage space will be blocked.

		"AB"	All services are prohibited, only whenmode=0efficient
		"AG"	All exit services are prohibited, only whenmode=0efficient
		"AC"	All services are prohibited from joining, only whenmode=0efficient
		"FD"	SIMCard-based fixed dialing
		"PN"	Personalization of the network (please refer to)GSM 02.22)
		"PP"	Service provider personalization (please refer to)GSM 02.22)
		"PU"	Personalization of network subsets (please refer to)GSM 02.22)
		"PC"	Personalization for businesses (please refer to)GSM 02.22)
<mode>	Work mode	0	Unlock
		1	locking
		2	Query status
<status>	Activated state	0	Inactive
		1	activation
<classx>	Business type	1	Voice (telephone service)
		2	Data (all carrying services; when <mode>=2At that time, ifTANot supported16,32,64, 128The value of this parameter only represents a portion of the services carried.
		4	Fax (Fax Service)
		8	Short Message Service
		16	Data circuit synchronization
		32	asynchronous data circuits
		64	Dedicated group access
		128	PADDedicated Access
<password>	password		Character type; andMEUser interface device password, password change command +CPWDThe passwords set are the same

4.6Change password:AT+CPWD

Syntax rules:

Command type	grammar	return
Setting commands	AT+CPWD=<fac>,<oldpwd>,<newpwd>	OK
Test command	AT+CPWD=?	+ CPWD: (<fac>,<pwdlength>)List of values OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<oldpwd>,<newpwd>	Old password, new password	-	Character type; andMEDevice password and password change command used by the user interface + CPWDThe passwords set are the same
<pwdlength>	Password length	-	Integer type, the maximum password length supported by the device.
<fac>	equipment		andAT+CLKSame definition in Chinese

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CLK="SC",1,"1234"	If you want to modify the boot processPINThe code must be enabled by powering on.PINcode lock
←	OK	
→	AT+CPWD="SC","1234","8888"	Modify bootPINThe code is8888
←	OK	Restart the module at this time.
←	+ CPIN: SIM PIN	After restarting, the module will automatically report.PINcode status,SIM PIN Indicates power-onPINcode:ON
→	AT+CPIN="8888"	At this point, you need to enter...PINcode
←	+ CPIN: READY OK	This indicates that the password is correct.PINUnlocking the code lock

4.7Network light blinking interval:AT+SLEDs

Syntax rules:

Command type	grammar	return
Setting commands	AT+SLEDs=<mode>, <timer_on>, <timer_off>	OK
Query command	AT+SLEDs?	+ SLEDs:<mode>, <timer_on>,<timer_off> OK
Test command	AT+SLEDs=?	+ SLEDs: (<mode>(List of possible values), (<timer_on>(List of possible values) (<timer_off>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Set the flash interval under what conditions?	1	Sets the blinking interval of the network light when no network is registered.
		2	Sets the blinking interval of the network light when the network is already registered.
		3	set upPPPNetwork light blinking interval during communication status
<timer_on>	Light on time	0or40~65535	unitms,0For constant extinction
<timer_off>	Time for lights to go out	0or40~65535	unitms,0For Changliang

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+SLEDs=?	Test command
←	+ SLEDs: (1-3),(0,40-65535),(0,40-65535) OK	

→	AT+SLEDs?	Query command
←	+ SLEDs:<1>,<200>,<1800> + SLEDs:<2>,<1800>,<200> + SLEDs:<3>,<64>,<300> OK	This is the default configuration.

4.8 set up TE-TA Baud rate: AT+IPR

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+IPR=<rate>	OK
Query command	AT+IPR?	+ IPR: <rate> OK
Test command	AT+IPR=?	+ IPR: ((List of adaptive baud rate values), (List of fixed baud rate values)) OK
Precautions	<p>1.Default baud rate =0That is, adaptive baud rate.</p> <p>2.The module needs to be powered on.MCUEnter several " thereAT"Or (Note: "aT","At" If the baud rate cannot be trained, the module's baud rate can be trained to match that of the main controller. At this point, initialization information will be reported, indicating that the training was successful.</p> <p>3.After successful training,ATThe command can recognize uppercase, lowercase, or mixed case.</p> <p>4. "AT+IPR=x;&W" You can set a fixed baud rate and save it. After restarting the module, the module will still use this baud rate.xIf the host computer's baud rate is also xAt this point, no input is required; the module will automatically report the startup initialization information. Note:xIt is the baud rate, for example115200</p>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<rate>	baud rate, unit bps	<u>0</u>	Adaptive baud rate (adaptive range varies depending on the module model)
		1200	
		2400	
		4800	
		9600	
		14400	
		19200	
		28800	
		38400	
		57600	
		115200	
		230400	
		460800	
		921600	

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+IPR=?	QueryAIR720SCurrently supported baud rate range
←	+ IPR: (0,9600,14400,19200,28800,33600,38400,57600,115 200), (230400,460800,921600) OK	The adaptive baud rate range is:9600, 14400, 19200,28800,38400,57600, 115200
→	AT+IPR=?	QueryAIR720UCurrently supported baud rate range
	+ IPR: (0,2400,4800,9600,14400,19200,28800,33600,38400, 57600,115200),(230400,460800,921600) OK	The adaptive baud rate range is: 2400, 4800, 9600, 14400, 19200, 28800, 33600, 38400, 57600, 115200

4.9set upTE-TAFrame format:AT+ICF

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+ICF=<format>[,<parity>]	OK
Query command	AT+ICF?	+ ICF: <format>[,<parity>] OK
Test command	AT+ICF=?	+ ICF: (<format>(List of possible values), (<parity>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<format>	Frame format	0	Automatic recognition
		1	8Data bits0Parity bit2Stop bit
		2	8Data bits1Parity bit1Stop bit
		<u>3</u>	8Data bits0Parity bit1Stop bit
		4	7Data bits0Parity bit2Stop bit
		5	7Data bits1Parity bit1Stop bit
		6	7Data bits0Parity bit1Stop bit
			Note:0Parity bit means there is no parity bit, in which case <parity>Ignored
<parity>	Check bit	0	Odd number (Odd)
		1	Even digits (Even)
		2	mark(Mark)
		<u>3</u>	Space (Space)

For example:

Command (→) / Back(←)	return	Example	Explanation and clarification
→		AT+ICF=?	Query parameter value range
←		+ ICF: (1-6),(0-3) OK	
→		AT+ICF=?	Query parameter value range
←		+ ICF: (1-6), (0-1)	Air780E/Air600ESeries module return values

4.10Set the command line newline character:ATS4

The settings command using this instruction allows you to configure the characters used for line breaks in the result code and

information text. Syntax rules:

Command type	grammar	return
Setting commands	ATS4=<n>	OK
Query command	ATS4?	<n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Command line newline characterASCIIvalue	<u>10</u>	Default value:10(correspondASCIICharacter <LF>(newline character) Note: Only this value is supported.

4.11 TE-TALocal traffic control:AT+IFC

Introduction to Flow Control:

For modules andDTEFor reliable communication, flow control is crucial. If, during a data or fax call, the sender's transmission rate exceeds the receiver's reception rate, the receiver should have a way to instruct the sender to pause transmission until it catches up again when the receive buffer is nearly full. This is flow control.

Generally, there are two methods to implement flow control: software flow control and hardware flow control. Hardware flow control is recommended in multiplexing mode. The Hezhou module supports both flow control methods.

Software flow control:

Software flow control sends different characters to pause (XOFFDecimal19)and recovery (XONDecimal17)Data stream. It is suitable for serial communication with only three wires.

He ZhouLTEIf the module uses software flow control, it needs to be done via command:**AT+IFC=1,1**To configure

Because this configuration is not saved, if you want to continue using software flow control after a reboot, you need to...AT&WSave to the user configuration table.

Note: Software flow control is not suitable when the module transmits binary/hexadecimal data, because...TEIt may treat binary data as flow control characters.

Hardware flow control:

Hardware flow controlRTS/CTSThis is achieved through signals. When the receive buffer is almost full, the module...CTSThe signal is set to invalid, and data transmission is paused. When the module's receive buffer can receive more data...CTSThe signal has been reactivated. To implement hardware flow control, ensure your application's serial port includes...RTS/CTSWire.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+IFC=<dce_by_dte>,[<dte_by_dce>]	OK
Query command	AT+IFC?	+ IFC: <dce_by_dte>,<dte_by_dce> OK
Test command	AT+IFC=?	+ IFC: (<dce_by_dte>(list of possible values), <dte_by_dce>(List of possible values) OK
Precautions	This module has no flow control by default. If you require hardware flow control, please enter "AT+IFC=2,2;&W"Restarting the module will keep the changes taking effect.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<dce_by_dte>	TEReceive fromTAdata The flow control method used at that time	<u>0</u>	No flow control
		1	Software flow control
		2	Hardware flow control
<dte_by_dce>	TAReceive fromTEdata The flow control method used at that time	<u>0</u>	No flow control
		1	Software flow control
		2	Hardware flow control

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+IFC=?	Querydce_by_dte>and <dte_by_dce>Range of values
←	+ IFC: (0-2),(0-2) OK	Query results
→	AT+IFC?	Query the current flow control method
←	+ IFC: 2,2 OK	Hardware flow control

4.12Multiplexing:AT+CMUX

Syntax rules:

Command type	grammar	return
Setting commands	AT+CMUX=[<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]]	OK

Query command	AT+CMUX?	+ CMUX:[<mode>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>,<T3>,<k>]]]]]]]]] OK
Test command	AT+CMUX=?	+ CMUX:(<mode>),(<subset>s),(<port_speed>s),(<N1> > s),(<T1>s),(<N2>s),(<T2>s),(<T3>s),(<k>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Multiplexing pass-through mechanism	0	Basic choices
<subset>	How to establish a multiplexer for control channels	0	Use only UIHBao Wen
<port_speed>	Transmission rate, in units ofbits/s	1	9600
		2	19200
		3	38400
		4	57600
		<u>5</u>	115200
		6	230400
		7	460800
<N1>	Maximum message size	1-255	default:127
<T1>	take overtime,by10msas a unit	1-255	default:10 (100 ms)
<N2>	Maximum number of retransmissions	0-100	default:3
<T2>	Response timing of multiplexer control channel instrument, with10msas a unit	2-255	default:30
<T3>	Wake-up response timer, in seconds	1-255	default:10
<k>	Window size, suitable for error recovery <small>Advanced operations of the options</small>	1-7	default:2

4.13Turn on and offSIMCard in-situ hardware detection:AT+CSDT

The settings for this command can be enabled.USIM_CDThe function of this pin. WhenAT+CSDT=1When [the pin is active], enable that pin. This is in conjunction with [other actions].SIMThe card's external detection circuit can detect it.

SIM The card is in place, meaning either the card is inserted or the card has been removed.

Note:USIM_CDfeetUSIMFor the in-place detection pin, please refer to the hardware manual of the relevant model for its specific definition.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CSDT=<mode>,<[<level>]	OK
Query command	AT+CSDT?	+ CSDT:<mode>,<[<level>] OK
Test command	AT+CSDT=?	+ CSDT: (<mode>{List of possible values}) OK

Precautions	<p>When detectedSIMWhen the card is in place, there will immediately be aURCReport: +CPIN: READY When detectedSIMWhen the card is not in place, there will be an immediate...URCReport: +CPIN: SIM REMOVED If you need to save the settings after shutting down, please enter...AT+CSDT=<mode>;&W</p> <p>The following commands are only applicable to Hezhou.4G CAT1Module (Air720U/Air724U(Series) (Version >=V401857)</p> <p>AT+CSDT=1:The system is triggered on the rising edge by default; the signal is low when no card is inserted and high when a card is inserted.</p> <p>AT+CSDT=1,0:It can be configured to trigger on the falling edge; high when no card is inserted, low when a card is inserted. AT+CSDT=1,1:It can be configured to be triggered on the rising edge; the level is low when no card is inserted and high when a card is inserted.</p>
-------------	--

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	SIMIn-situ detection enabled	<u>0</u>	closureSIMCard in place detection
		1	OpenSIMCard in place detection

4.14Detecting a slotSIMIs the card in place?AT*SIMDETEC

Note: This command applies to the following module types: Air720/Air720G/Air720H/Air720D/Air720S/Air72XCX.

The configuration command is used to detect a specific slot.SIMIs the card in place?

The test command is used to display the currently supported cards.SIM Slot.

Syntax rules:

Command type	grammar	return	
Setting commands	AT*SIMDETEC=<simslot>	* SIMDETEC: <state>	Air720Return of series modules
		OK	
		* SIMDETEC: <simslot>,<state>	Air720sReturn of series modules
		OK	
Test command	AT*SIMDETEC=?	* SIMDETEC: (1,2)	
		OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<simslot>	WhichsimCard slot	<u>1</u>	hostsimCard
		2	sparesimCard (not currently supported)
<state>	SIMCard status	NOS	SIMCard does not exist
		SIM	SIMCard inserted

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT*SIMDETEC=1	
←	* SIMDETEC: NOS OK	SIMCard not in place

4.15controlSimCard status proactively reported:AT CARDMODE

Configure whether command control is allowed.SIMCard statusURCReport toCARDMODE:<sim_state>.

When settingURCReporting switchn>=1andSIM/USIMWhen the card's state changes,CARDMODE:<sim_state>thisURCIt will be reported.

Query command readSIM/USIMThe card's current state.

Syntax rules:

Command type	grammar	return
Setting commands	AT ĈCARDMODE=<n>	OK
Query command	AT ĈCARDMODE?	ĈCARDMODE:<sim_state>[,<n>] OK
Test command	AT ĈCARDMODE=?	ĈCARDMODE: (list of supported <n>s) OK
URC	ĈCARDMODE:<sim_state>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	URCReporting switch	0	Reporting is not allowed.ARDMODE:<sim_state>
		<u>1</u>	Allowed to report ĈCARDMODE:<sim_state>
<sim_state>	SIMCard status	0	Unknown state
		1	EffectiveSIM CARD
		2	EffectiveUSIM CARD
		255	Not detectedSIM/USIMCard, orpinThe code was not unlocked.

4.16GetSimtype:AT*EUICC

LearnSIM Card type.

Syntax rules:

Command type	grammar	return
Query command	AT*EUICC?	* EUICC: <n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	SIM card type	0	SIM
		1	USIM

4.17 In data transmission mode, specify the time to wait before entering sleep mode: AT*RTIME

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT*RTIME=<wait_time>	OK
Query command	AT*RTIME?	* RTIME: <wait_time> OK
Precautions	Under normal signal conditions, wait_time The shorter the value, the lower the power consumption. It is recommended to set it to [value]. If the actual usage environment has poor signal and data transmission and reception are frequently delayed due to retransmission, then this value needs to be increased.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<wait_time>	In data transmission mode, how long should you wait before entering sleep mode? state.	0~20	Unit: seconds 0 This indicates that the window is closed. The default value is 0.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT*RTIME=2	Set the wait time to 2 seconds.
←	OK	

4.18 pass UART Settings for sleep/wake cycle: AT+CSCLK

The prerequisite for putting the module to sleep via serial port is: no connection. USB □.

Grammar rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CSCLK=<n>	OK
Query command	AT+CSCLK?	+ CSCLK: <n> OK
Test command	AT+CSCLK=?	+ CSCLK: (list of supported <n>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Sleep settings	<u>0</u>	The module's sleep function is disabled. The module cannot enter sleep mode. Default value.

1	2	<p>Sleep mode1. By moduleAP_WAKEUP_MODULEThe feet control whether or not you fall asleep.</p> <p>whenAP_WAKEUP_MODULERaise (default is high, because there is an internal pull-up), setAT+CSCLK=1No other interrupts occurred.GPIO(Incoming calls, text messages, etc.) The module will automatically enter sleep mode.1In this mode, the module can still receive calls and text messages from the network.</p> <p>When the module is in sleep mode1The module can be woken up using the following methods.</p> <ul style="list-style-type: none"> - The module received an external interrupt signal; - The module receives a voice or data call; - The module received a short message (SMS); - Serial port receivedATOrder; - pull downAP_WAKEUP_MODULEpins approximately50ms <p>Note: The module will display a message after receiving a voice call, data call, or SMS message.URCReport</p>
		<p>Sleep mode2.</p> <p>set upAT+CSCLK=2Afterwards, the module will continuously monitor the serial port data. If there is no data input on the module's serial port and no other interrupts are generated (GPIO(Incoming calls, text messages, data calls, etc.) Default5The module will automatically enter sleep mode in seconds.2(Note:</p> <p>Sleep mode2In this case,AP_WAKEUP_MODULEThe voltage level has no effect on the module's sleep/wake function; this is related to the hibernation mode.1The main differenceIn this mode, the module can still receive calls and text messages from the network.</p> <p>When the module is in sleep mode2The module can be woken up using the following methods.</p> <ul style="list-style-type: none"> - The module received an external interrupt signal; - The module receives a voice or data call; - The module received a short message (SMS); - Serial port receivedATOrder.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
Sleep and wake-up application examples1		
→	AT+CSCLK=2	<p>Set to sleep mode2In this sleep mode, the module will enter sleep mode when all of the following conditions are met simultaneously.</p> <ul style="list-style-type: none"> - Module inATNo input - NoURCReporting (including no incoming calls, no text messages, no data received from the server, etc.) - noneGPIOInterruption
←	OK	
→	AT+WAKETIM?	Query the time to fall asleep
←	+ WAKETIM:5 OK	The query results are5Seconds.5Seconds areCSCLKSet the default time to enter sleep after sleep.
→	AT+WAKETIM=8	<p>If you need to change the sleep time, you can do so through...WAKETIMto set, for example, change to8(No settings are usually required)</p> <p>Note:WAKETIMDo not set it to this point.0This will cause sleep to fail.</p>
←	OK	
		<p>There are several ways to wake up a module:</p> <p>1)How many serial port inputs?ATCommands (one command is often not enough to wake up the user; you need to enter several).</p>

		2) any URC Reporting (including incoming calls, text messages, and data received from the server). 3) GPIO Interruption
→	AT+CSCLK=0	
←	OK	0 Set to disallow module sleep
Sleep and wake-up application examples ²		
→	AT+CSCLK=1	Set to sleep mode 1. In this sleep mode, the module will enter sleep mode when all of the following conditions are met simultaneously. <ul style="list-style-type: none"> - Module in AT No input - No URC Reporting (including no incoming calls, no text messages, no data received from the server, etc.) - Module AP_WAKEUP_MODULE For high (AP_WAKEUP_MODULE High, which allows the module to sleep; AP_WAKEUP_MODULE Low (wake-up module) None GPIO - Interruption
←	OK	
→	AT+WAKETIM?	Query the time to fall asleep
←	+ WAKETIM:5 OK	The query results are 5 seconds. 5 seconds are CSCLK Set the default time to enter sleep after sleep.
→	AT+WAKETIM=8	If you need to change the sleep time, you can do so through... WAKETIM To set, for example, change to 8 (No settings are usually required) Note: WAKETIM Do not set it to this point. 0 This will cause sleep to fail.
←	OK	
		There are several ways to wake up a module: <ul style="list-style-type: none"> - How many serial port inputs? AT Commands (one or two) AT That's fine. - any URC Reporting (including incoming calls, text messages, and data received from the server). GPIO - Interruption - AP_WAKEUP_MODULE Wake (AP_WAKEUP_MODULE Low, awake; AP_WAKEUP_MODULE High (allows sleep)
→	AT+CSCLK=0	
←	OK	0 Set to disallow module sleep

4.19 Set sleep wait time: AT+WAKETIM

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+WAKETIM=<wait_time>	OK
Query command	AT+WAKETIM?	+ WAKETIM:<wait_time> OK
Precautions	- Please use WAKETIM To set the module's sleep time using the command, please use... CSCLK Set to sleep.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<wait_time>	exists! DLE In the state (no) AT, No text messages, no calls and AP_WAKEUP_MODULE (In cases of high blood pressure) How long should one wait to fall asleep?	0~100	Unit: seconds 0 It indicates not sleeping. The default value is 5.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+WAKETIM=8	Set sleep time to 8 seconds
←	OK	

4.20 set up RI Indicator function: AT+CFGRI

Configure command settings RI (in the universe) Air72X Corresponding modules in the series WAKEUP_OUT (foot) received URC Will there be a low pulse indication when reporting? If the indication function is enabled (<status>=1) Then the corresponding URC When they arrive, RIA will be generated 120ms Low pulse (default setting).

Syntax rules:

Command type	grammar	return
Setting commands	AT+CFGRI=<status> [,<h_time>][,<l_time>][,<count>]	OK
Query command	AT+CFGRI?	+ CFGRI:<status> OK
Precautions	<ul style="list-style-type: none">Regardless of status=yes or still 1 When a text message is received, a default value will be generated. 120ms Low pulse; when a call comes in, it will switch to a low level and will not switch to a high level until the call is connected or disconnected.Only settings AT+CFGRI=1 Afterwards, data services (including) TCP/IP, HTTP, MQTT, FTP When it arrives URC Only by reporting can RI Generate low pulse	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<status>	RI Indicator status	0	RI Indicator function off
		1	RI Indicator function turned on (TCP/IP/FTP/HTTP/MQTT/Other URC)
<h_time>	time to raise	> 0	Unit: milliseconds
<l_time>	Lowering the time	> 0	Unit: milliseconds
<count>	Number of times lowered	> 0	Unit: milliseconds

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CFGRI=0	This is the module's default setting. With this setting, when a text message is received, a [function name] will be generated. 120ms Low pulse; when a call comes in, it will switch to a low level and will not return to a high level until the call is connected or disconnected.
←	OK	
→	AT+CFGRI=1	Under these settings: When you receive a text message, a [function name] will be generated. 120ms Low pulse; when a call comes in, it will switch to a low level and will not return to a high level until the call is connected or disconnected; data services (including) TCP/IP, HTTP, MQTT, FTP When it arrives URC Reporting will produce a 120ms Low pulse.
←	OK	

→	AT+CFGRI=1,200,150,3	Received SMS or data serviceURCAAt that time, it will produce3individual150msThe low pulse, the rise time between low pulses is200msWhen a call comes in, the signal level will switch to low and will only return to high when the call is connected or disconnected.
←	OK	

4.21saveRISettings function:AT+CFGRISAVE

Configure whether to save the value set by the AT+CFGRI command (supported by software versions >= V401870).

Syntax rules:

Command type	grammar	return
Setting commands	AT+CFGRISAVE=<save>	OK
Query command	AT+CFGRISAVE?	+ CFGRISAVE:<save> OK
Precautions	AT+CFGRIAfter setting the corresponding value, you need to execute...AT+CFGRISAVE=1Only then will the corresponding value be maintained.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<save>	Is it critical to save?	0	Do not save
		1	save

4.22SMS specific character triggerRIFunction:AT*CMCRI

Note: This feature is not currently implemented.

AT*CMCRIThe command adds a keyword matching function for SMS messages; it will only trigger if the received SMS message contains the configured specific characters.RI
120ms Low pulse (only <TEXTMode support >).

Syntax rules:

Command type	grammar	return
Setting commands	AT*CMCRI=<status>[,<string>]	OK
Query command	AT*CMCRI?	* CMCRI:<status>,<string> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<status>	RIIndicator status	<u>0</u>	Disable this function
		1	Enable this function
<string>	Specific string		

For example:

Command (→)/ Return (←)	Example	Explanation and clarification
→	AT*CMCRL=1, "testABC"	
←	OK	
→	AT+CMGF=1	
←	OK	
← (URC)	+ CMT: "+8617740879810",,"20/09/23,18:57:11+32" - - - testABC012	I received a text message containing the specified characters.testABC"It should be able to produceRILow pulse; if the received text message does not contain The specified string should not generate...RILow pulse

4.23set upMACaddress:AT+MIFIMAC

Note: This command applies to Hezhou.4G CAT1Module (Air720U/Air724Useries).

MACThe address, also called the physical address or hardware address, is burned into the network card by the network equipment manufacturer during production.Network Interface Cardof EPROM(A type of flash memory chip that can typically be erased and rewritten by a program).It stores the addresses that are actually used to identify the computer sending the data and the host receiving the data when transmitting data.

AT+MIFIMACThe command can be used toMACThe address is used for reading, writing, and deletion. When <mac>WriteMACThe address is48The position (6(bytes). When <status>The return value is1When <status>The return value is0At that time, it means it was not found.status>The return value is0When this happens, it indicates a deletion error.

Syntax rules:

Command type	grammar	return
readMACaddress	AT+MIFIMAC=R	OK
deleteMACaddress	AT+MIFIMAC=D	<status> OK
WriteMACaddress	AT+MIFIMAC=W,<mac>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mac>	MACaddress		
<status>	status codes	1	Deletion successful
		2	Not found
		0	Deletion error

4.24ReadADC:AT+CADC

Syntax rules:

Command type	grammar	return
Setting commands	AT+CADC=<adc_id>,<mode>	OK
Read command	AT+CADC?	+ CADC:<adc_id>,<volt>

		OK
--	--	----

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<adc_id>	ADC idThere are two routes.	0	
		1	
<mode>	ADCUsage Mode	0	Disable
		1	Enable
<volt>	ADCVoltage		Unit: millivolt

4.25ReadVBATVoltage:AT+CBC

Syntax rules:

Command type	grammar	return
Read command	AT+CBC	+ CBC: <bcs>,<bcl>,<volt> OK
Test command	AT+CBC=?	+ CBC: (list of supported <bcs>s),(list of supported <bcl>s),(<voltage>) OK
Setting commands	AT+CBC=<powerOnVol>,<powerOffVol>	OK
Read command	AT+CBC?	+ CBC:<powerOnVol>,<powerOffVol> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<bcs>	Charging status	0	The module is not charging.
		1	The module is charging.
		2	Module charging complete
<bcl>	Battery power	1~100	percentage
<volt>	VBATCurrent voltage		Unit: millivolt
<powerOnVol>	Voltage value detected upon power-on	>=0	Unit: millivolt
<powerOffVol>	Voltage value detected when power is off	>=0	Unit: millivolt

4.26set upVCC_LCDVoltage:AT+LDO

Note: This command is supported by versions >= V401880.

Syntax rules:

Command type	grammar	return
Setting commands	AT+LDO=<ldo>,<level>	+ LDO:<ldo>,<level> OK
Read command	AT+LDO?	+ LDO:<ldo>,<level> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<ldo>	ldoaisle	1	ldoaisle
<level>	voltage level	1~15	level=0Time: CloseLDO level=1hour:LDOOutput1.728V level=2hour:LDOOutput1.839V level=3hour:LDOOutput1.951V level=4hour:LDOOutput2.064V level=5hour:LDOOutput2.175V level=6hour:LDOOutput2.287V level=7hour:LDOOutput2.398V level=8hour:LDOOutput2.514V level=9hour:LDOOutput2.625V level=10hour:LDOOutput2.737V level=11hour:LDOOutput2.849V level=12hour:LDOOutput2.960V level=13hour:LDOOutput3.072V level=14hour:LDOOutput3.183V level=15hour:LDOOutput3.195V

4.27Turn the network light on/off:AT+CNETLIGHT

This command is used to turn the network status indicator light on or off.NET_MODEandNET_STATUSThis command is used to check whether the network status indicator light is turned on.

Air720Each module uses two pin signals to indicate the network status. The pin definitions are described in the table below.

Network indicator pin definitions

pin name	effect
NET_MODE	Indicator module4GNetwork status, corresponding to the universe4GBlue LED on the development board

NET_STATUS	The network operating status of the indicator module corresponds to the coordinate system.4Ggreen light on the development board
-------------------	--

状态	管脚工作状态	网络状态
NET_MODE	高	注册 LTE 网络
	低	其他
NET_STATUS	亮 0.2 秒，灭 1.8 秒	搜网状态
	亮 1.8 秒，灭 0.2 秒	待机
	亮 0.125 秒，灭 0.125 秒	数据传输状态 注意：该状态提示仅限于 PPP 拨号成功或者 AT 指令主动激活 PDP 成功，RNDIS 联网成功

Syntax rules:

Command type	grammar	return
Setting commands	AT+CNETLIGHT=<n>	OK
Read command	AT+CNETLIGHT?	+ CNETLIGHT:<n> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Network status indicator light on/off status	0	closure
		1	Open

4.28 SIM Card switching:AT+SIMCROSS

Air724UG-NAsupportSIM0andSIM1Dual SIM single standby.
Air724UG-MABecause the module already hasSIM1The interface has a built-in patch.SIMCard, thereforeSIM1The interface can no longer be externalized.SIMThe card cannot be used as a card.GPIO.

In +SIMCROSSUnder the default settings (default setting is 0):

Air724UG-MAAfter the module is powered on, it will first query...SIM0Is there an insertion point on the interface?SIMCard, if detectedSIM0On the interfaceSIMThe card will be read.SIM0Use the interface card information to register with the network;
ifSIM0No detection was found on the interface.SIMIf the card is damaged, it will be tested again.SIM1Does the interface have a built-in patch?SIMCard, if detectedSIM1 Built-in patch on the interfaceSIMThe card will then read the built-in patch.SIMUse the card information to register on the network; ifSIM1No built-in interface was detected.SIMIf the card is not inserted, an error message will appear: Not inserted.SIMCard.

Air724UG-NAAfter the module is powered on, it will first query...SIM0Is there an insertion point on the interface?SIMCard, if detectedSIM0On the interfaceSIM The card will be read.SIM0Use the interface card information to register with the network;

ifSIM0No detection was found on the interface.SIM1If the card is damaged, it will be tested again.SIM1Does the interface haveSIMCard, if detectedSIM1On the interfaceSIMThe card will be read.

SIM1Use the interface card information to register with the network; ifSIM1No detection was found on the interface.SIM1If the card is not inserted, an error message will appear: Not inserted.

SIMCard;

SIM0Interface andSIM1If the interface is inserted at the same timeSIMThe card will be used by default.SIM0On the interfaceSIMCard, and can also be used

AT+SIMCROSSThis command is used to switch.

	SIM0	SIM1	默认使用
Air724UG-NA/ Air723UG-NA	插入 SIM 卡 0	插入 SIM 卡 1	SIM0 ¹ AT+SIMCROSS=1可切换到SIM1
	插入 SIM 卡 0	未插入 SIM 卡	SIM0
	未插入 SIM 卡	插入 SIM 卡 1	SIM1
	未插入 SIM 卡	未插入 SIM 卡	报错，未插入 SIM 卡
Air724UG-MA/ Air723UG-MA	插入 SIM 卡 0	有内置贴片 SIM 卡，不可以再外接，否则会出错！	SIM0 ² AT+SIMCROSS=1可切换到内置卡
	未插入 SIM 卡		内部贴片 SIM 卡

Syntax rules:

Command type	grammar	return
Setting commands	AT+SIMCROSS=<id>	OK
Query command	AT+SIMCROSS?	+ SIMCROSS:<id>
		OK
Test command	AT+SIMCROSS=?	+ SIMCROSS:(<id>(range of values)
		OK
Precautions	This command will save the changes upon shutdown, but a restart is required for the changes to take effect.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<id>	SIM No.	0	SIMCard0
		1	SIMCard1Or built-in patch card

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+SIMCROSS?	
←	+ SIMCROSS:0	SIMCard position is 0
	OK	
→	AT+SIMCROSS=1	Switch to built-in patch card orSIMCard1

←	OK	
---	----	--

4.29 SIM Automatic card switching switch:AT*SIMAUTO

Note: This command only applies to the Cosmic Union.Air72XUX/Air72XCXSeries of modules.

Syntax rules:

Command type	grammar	return
Setting commands	AT*SIMAUTO=<state>	OK
Query command	AT*SIMAUTO?	* SIMAUTO: <state> OK
Precautions	This command will save the changes upon shutdown, but a restart is required for the changes to take effect.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Automatic switching on/off status	1	Turn on automatic switching
		0	Turn off automatic switching

4.30 RNDIS/ECMFunction switch:AT+RNDISCALL

Syntax rules:

Command type	grammar	return
Setting commands	AT+RNDISCALL=<mode>,<save>	OK
Read command	AT+RNDISCALL?	+ RNDISCALL:<mode> OK
Test command	AT+RNDISCALL=?	+ RNDISCALL:(0-disable;1-enable),(0-not save;1-save) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	0	closureRNDIS/ECMNetwork card
		1	OpenRNDIS/ECMNetwork card
<save>	Should I turn off the computer and save the settings?	0	Do not save
		1	save

4.31 SECURE BOOTEnable switch:AT*SECUREBOOT

Note: This command only applies to the Cosmic Union.4G CAT1Module (Air720U/Air724Useries)

Syntax rules:

Command type	grammar	return
Execute command	AT*SECUREBOOT	OK
Read command	AT*SECUREBOOT?	* SECUREBOOT:<mode> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Enable state	0	Not enabled
		1	Enabled

4.32ReopenUSB:AT+SYSNV=1,"ureboot",1

Syntax rules:

Command type	grammar	return
Execute command	AT+SYSNV=1,"ureboot",1	OK
Query command	AT+SYSNV=0,"ureboot"	+ SYSNV: "ureboot",1 OK

5Network service related commands

5.1Query signal quality:AT+CSQ

Syntax rules:

Command type	grammar	return
Execute command	AT+CSQ	+ CSQ: <rsssi>,<ber> OK
Test command	AT+CSQ=?	+ CSQ: (list of supported <rsssi>s),(list of supported<ber>s) OK

Parameter definition:

parameter	definition	Value	Corresponding received signal strength (dbm)
<rsssi>	Received signal strength indication (received signal strength indication) <rsssi>=(Received signal strengthdbm+113)/2	0	Less than or equal to -115dBm
		1	- 111dBm
		2~30	- 109~-53dBm
		31	Greater than or equal to -51dBm
		99	Unknown or unpredictable
<ber>	Channel bit error rate (BER)bit error rate(This value can only be obtained after the call is established.)	0~7	GSM 05.08 section 8.2.4shownRXQUALvalue
		99	Unknown or unpredictable

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CSQ	Query signal strength and quality
←	+ CSQ: 15.99 OK	Query results
→	ATD131***9873;	dial a mobile number
←	OK	
→	AT+CSQ	Check signal strength when the phone is not connected
←	+ CSQ: 10.99 OK	<ber>=99
← (URC)	CONNECT	Answering a phone call
→	AT+CSQ	Check the signal strength and quality after the connection is established.
←	+ CSQ: 10,6 OK	At this timeber>=6

5.2 Query signal quality (extended): AT+CESQ

The command execution returns the various parameters of the received signal. If the current serving cell is not...GERAN Residential area, rxlev> and < rxqual> Set as 99 If the current serving cell is not UTRA FDD or UTRA TDD Residential area, rscp> Set as 255 If the current serving cell is not UTRA FDD Residential area, ecno> Set as 255 If the current serving cell is not E-UTRA Residential area, rsrq> and < rsrp> Set as 255. Syntax rules:

Command type	grammar	return
Execute command	AT+CESQ	+ CESQ: <rxlev>, <rxqual>, <rscp>, <ecno>, <rsrq>, <rsrp> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<rxlev>	Received signal strength (received signal strength level; 3GPP TS 45.008 subclause 8.1.4) Integer type	0	rssi < -110 dBm
		1	- 110 dBm - rssi < -109 dBm
		2	- 109 dBm - rssi < -108 dBm
	
		61	- 50 dBm - rssi < -49 dBm
		62	- 49 dBm - rssi < -48 dBm
		63	- 48 dBm - rssi
	
		99	Unknown or unpredictable
<rxqual>	Received signal quality (please refer to) 3GPP TS 45.008 subclause 8.2.4 Chinese table RmiddleXQUAL(value); integer type	0	BER < 0.2% Assumed value = 0.14%
		1	0.2 % < BER < 0.4 % Assumed value = 0.28 %
		2	0.4 % < BER < 0.8 % Assumed value = 0.57%
		3	0.8 % < BER < 1.6 % Assumed value = 1.13%
		4	1.6 % < BER < 3.2 % Assumed value = 2.26 %
		5	3.2 % < BER < 6.4 % Assumed value = 4.53 %
		6	6.4 % < BER < 12.8 % Assumed value = 9.05%
		7	12.8 % < BER Assumed value = 18.10 %
		99	Unknown or unpredictable
<rscp>	Received signal code power. Please refer to 3GPP TS 25.133 subclause 9.1.1.3 and 3GPP TS 25.123 subclause 9.1.1.1.3 Integer type	0	rscp < -120 dBm
		1	- 120 dBm - rscp < -119 dBm
		2	-119 dBm - rscp < -118 dBm
	
		94	-27 dBm - rscp < -26 dBm
		95	-26 dBm - rscp < -25 dBm
		96	- 25 dBm - rscp
		255	Unknown or unpredictable
<ecno>	ratio of the received energy per PN chip to the total received power spectral density (see 3GPP TS 25.133) Integer type	0	Ec/Io < -24 dB
		1	- 24 dB - Ec/Io < -23.5 dB
		2	- 23.5 dB - Ec/Io < -23 dB
	

		47	- 1 dB - Ec/Io < -0.5 dB
		48	- 0.5 dB - Ec/Io < 0 dB
		49	0 dB - Ec/Io
		255	Unknown or unpredictable
<rsrq>	reference signal received quality (Please refer to 3GPP TS 36.133 subclause 9.1.7)Integer type	0	rsrq < -19.5 dB
		1	- 19.5 dB - rsrq < -19 dB
		2	- 19 dB - rsrq < -18.5 dB
	
		32	- 4 dB - rsrq < -3.5 dB
		33	- 3.5 dB - rsrq < -3 dB
		34	- 3 dB - rsrq
		255	Unknown or unpredictable
<rsrp>	reference signal received power (Please refer to 3GPP TS 36.133 subclause 9. 1.4)Integer type	0	rsrp < -140 dBm
		1	- 140 dBm - rsrp < -139 dBm
		2	- 139 dBm - rsrp < -138 dBm
	
		95	- 46 dBm - rsrp < -45 dBm
		96	- 45 dBm - rsrp < -44 dBm
		97	- 44 dBm - rsrp
		255	Unknown or unpredictable

5.3 OpenCSQReport proactively: AT+CSQ

Reported URC (CSQ indicators) The following are listed:

+ CSQ:<rss>,<ber>

+ CESQ:<rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>

*** CESQ: <rxlev>,<ber>,<rscp>,<ecno>,<rsrq>,<rsrp>,<sinr>**

Syntax rules:

Command type	grammar	return
Setting commands	AT+CSQ=<n>	OK
Query command	AT+CSQ?	* CSQ:<n> OK
Test command	AT+CSQ=?	* CSQ = (list of supported <n>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>		0	Disable proactive reporting
		1	Enable proactive reporting
<rss>,<ber>	Please see AT+CSQ		
<rxlev>,<rscp>,<ecno>,<rsrq>,<rsrp>	Please see AT+CESQ		

<snr>	Signal-to-noise ratio (SNR) is the ratio of signal to interference plus noise.	
-------	--	--

5.4 Online registration information: AT+CREG

Set command to turn on or off +CREGofURCReport to higher authoritiesURCThe report should include the following:

Settingsn>=1When the network registration status changes, actively report +CREG: <stat>

Settingsn>=2When the network registration status or the registered community changes, it should be proactively reported.CREG: <stat>[,<lac>,<ci>[,<act>]]

The query command returns the current <n>,<stat>The value of, and when <n>=2Timelac>,<ci>The value of .

Syntax rules:

Command type	grammar	return
Setting commands	AT+CREG=[<n>]	OK
Query command	AT+CREG?	<n>=0 (default)or1: + CREG: <n>,<stat> OK <n>=2: + CREG: <n>,<stat>,<lac>,<ci>,<act> OK
Test command	AT+CREG=?	+ CREG: (list of supported <n> values) OK
URC report	+ CREG: <stat>	If <n>=1When the network registration status changes, this should be reported.URC
	+ CREG: <stat>[,<lac>,<ci>[,<act>]]	If <n>=2When the network registration status changes or the location area cell changes

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	URCReport status	<u>0</u>	Disable network registration non-request result code (URC, Unsolicited Result Code)
		1	Enable network registration without request result code +CREG: <stat>
		2	Enable network registration and location information non-request result code + CREG:<stat>[,<lac>,<ci>]
<stat>	Current network registration status	0	Not registered;METhere are currently no new operators to search for for service registration.
		1	Registered, local network
		2	Unregistered, butMESearching for new operators to register services with.
		3	Registration rejected
		4	unknown
		5	Registered, roaming
		6	Register a local network.SMS-only (Only when <AcT>= E-UTRAN(may be)
		7	Register on Roaming.comSMS-only (Only when <AcT>= E-UTRAN(may be)
		8	Attach only emergency bearer service (not supported)

		9	"Registered Location"CSFB not preferredBusiness (only when <AcT>= E-UTRAN(May be)
		10	Register roaming locationCSFB not preferredBusiness (only when <AcT>= E-UTRAN(May be)
		11	Emergency services only
<lac>	Location area	-	16Number in base, string type
<ci>	residential areaid	-	16Number in base, string type
<act>	Access Mode	0	GSM
		1	GSM Compact
		2	UTRAN
		3	GSM w/EGPRS
		4	UTRAN w/HSDPA
		5	UTRAN w/HSUPA
		6	UTRAN w/HSDPA and HSUPA
		7	E-UTRAN
		8	UTRAN HSPA+(CAT1)(module) EC-GSM-IoT (CAT4)(module)

For example:

Order(→)/ return(←)	AT Sequences	explain
→	AT+CREG=?	Query>The range of values
←	+ CREG:(0-2) OK	Query results
→	AT+CREG?	<n>The default is0At this point, check the network registration status.
←	+ CREG: 0,1 OK	The query returned <n>=0,stat>=1(Already registered, and registered on a local network)
← (URC)	+ CREG:0	If you unplug the antenna or walk into an area with no signal, there will be...URCReporting indicates that the network is currently unregistered.
← (URC)	+ CREG:1	Install an antenna or enter an area with a signal; at this time, there will beURCThe report indicates that the network has been re-registered.
→	AT+CREG=2	Settingsn>=2
←	OK	
→	AT+CREG?	Check network registration status
←	+ CREG: 2,1,"1863","0183db22" OK	Found <n>=2,stat>=1,lac>=1863,ci>=0183db22
← (URC)	+ CREG: 1,"1863","01a2c315"	The mobile module will have a [function/function] when the cell number changes.URCReport it up

5.5E-UTRAN EPS Online registration status:AT+CEREG

Set command to turn on or off +CEREG of URC Report to higher authorities. URC The report should include the following:

Settings $n \geq 1$ When E-UTRAN Net EPS When the registration status changes, proactively report it. CEREG: <stat>

Settings $n \geq 2$ When E-UTRAN Net EPS When the registration status or the community where the network is located changes, proactively report it. CEREG: <stat>[,<tac>,<ci>,<act>]

Settings $n \geq 3$ When E-UTRAN Net EPS When the registration status or the community where the network is located changes, report it proactively.

+ CEREG: <stat>[,<tac>,<ci>,<act>[,<cause_type>,<reject_cause>]]

Syntax rules:

Command type	grammar	return
Setting commands	AT+CEREG=<n>	OK
Query command	AT+CEREG?	+ CEREG: <n>,<stat>[,<tac>],[<ci>],[<Act>[,<cause_type>,<reject_cause>]] OK
Test command	AT+CEREG=?	+ CEREG: (list of supported <n>s) OK
URCReport	+ CEREG: <stat>	<n>=1 When E-UTRAN Net EPS When the registration status changes
	+ CEREG: <stat>[,<tac>],[<ci>],[<Act>]]	<n>=2 When E-UTRAN Net EPS When the registration status or the registered community changes
	+ CEREG: <stat>[,<tac>],[<ci>],[<Act>][,<cause_type>,<reject_cause>]]	<n>=3 When E-UTRAN Net EPS When the registration status or the registered community changes

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	URCReport status	<u>0</u>	Reporting online registration status is prohibited. URC +CEREG
		1	Allow proactive reporting +CEREG: <stat>
		2	Allow proactive reporting +CEREG: <stat>[,<tac>,<ci>]
		3	Allow proactive reporting + CEREG: <stat>[,<tac>],[<ci>],[<Act>][,<cause_type>,<reject_cause>]]
<stat>	Current network registration status	0	Not registered; ME There are currently no new operators to search for for service registration.
		1	Registered, local network
		2	Unregistered, but ME Searching for new operators to register services with.
		3	Registration rejected
		4	Unknown (beyond) E-UTRAN (Network coverage area)
		5	Register on Roaming.net
		6	"Registered Location" SMS only business
		7	Register roaming location SMS only business

		8	Only attach emergency carrying services
		9	"Registered Location"CSFB not preferredbusiness
		10	Register roaming locationCSFB not preferredbusiness
		11	Emergency services only
<tac>	Tracking area code	-	String type,16number system
<ci>	residential areaid	-	String type,16number system
<act>	Access Mode	0	GSM
		1	GSM Compact
		2	UTRAN
		3	GSM w/EGPRS
		4	UTRAN w/HSDPA
		5	UTRAN w/HSUPA
		6	UTRAN w/HSDPA and HSUPA
		7	E-UTRAN
		8	UTRAN HSPA+(CAT1(module) EC-GSM-IoT (CAT4)(module)
<cause_type>	Integer type, definition <reject_cause>type	0	Show <reject_cause>Including oneEMMCause value (please refer to) 3GPP TS 24.301 Annex A)
		1	Show <reject_cause>Value defined by the manufacturer
<reject_cause>	Integer type, defining the reason for registration failure. because		The type of this value is determined by <cause_type>definition

5.6Configure network mode:AT+SYSCONFIG

This command sets the system mode.GSM/WCDMAAccess order, roaming, and business domain characteristics.

Syntax rules:

Command type	grammar	return
Setting commands	AT+SYSCONFIG=<mode>,<acqorder> , <roam>,<srvidoman>	OK
Query command	AT+SYSCONFIG?	+SYSCONFIG:<mode>,<acqorder>,<roam>,<srvidomain> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Network mode	2	Automatic selection
		13	GSM ONLY
		14	WCDMA ONLY
		15	TD-SCDMA ONLY
		16	LTE+UTRAN+GSM
<acqorder>	Network access sequence	0	Automatic
		1	GSM first, then UTRAN
		2	UTRAN first, then GSM
		3	LTE first, then GSM or UTRAN
<roam>	Roaming support	0	roaming disabled
		1	roaming enabled
		2	No Change
<srvdomain>	Domain settings	0	CS_ONLY
		1	PS_ONLY
		2	CS_PS
		3	ANY
		4	No Change

5.7QuerycidRelevant context definitions:AT+CGCONTRDP

Set command return <cid>Related <bearer_id>, <apn>, <local_addr and subnet_mask>, <gw_addr>, <DNS_prim_addr>, <DNS_sec_addr>, <P-CSCF_prim_addr>, <P-CSCF_sec_addr>, <IM_CN_Signalling_Flag>and <LIPA_indication>.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGCONTRDP[=<cid>]	[+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr>,<subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<LIPA_indication>]]]]]]]] [<CR><LF>+CGCONTRDP: <cid>,<bearer_id>,<apn>[,<local_addr>,<subnet_mask>[,<gw_addr>[,<DNS_prim_addr>[,<DNS_sec_addr>[,<P-CSCF_prim_addr>[,<P-CSCF_sec_addr>[,<IM_CN_Signalling_Flag>[,<L

		IPA_indication>]]]]]]]] [...] OK
Test command	AT+CGCONTRDP=?	+ CGCONTRDP: (list of <cid>s associated with active contexts) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>	Define a specificPDPContext.		Integer
<bearer_id>	A bearer is specified, for example:EPSIn the net EPSBear,UMTS/GPRSInNSAPI To carry.		Integer
<apn>	Access Point NameAccess Point Name (APN), used to selectGGSNor external packet data network		String type
<local_addr>	Module localIPAddress		String type
<subnet_mask>	Subnet mask		String type
<gw_addr>	gatewayIPAddress		String type
<DNS_prim_addr>	hostDNSserverIPAddress		String type
<DNS_sec_addr>	auxiliaryDNSserverIPAddress		String type
<P-CSCF_prim_addr>	hostP-CSCFserverIPAddress		String type
<P-CSCF_sec_addr>	auxiliaryP-CSCFserverIPAddress		String type
<IM_CN_Signalling_Flag>	Integer type, definitionPDPIs the context only related toIM CN	0	no
	Subsystem maximum value related	1	yes
<LIPA_indication>	Integer type, displayPDPIs the context related toLIPA PDN	0	no
	Related. This parameter cannot be set.	1	yes

For example:

Command (→)/ Return (←)	Example
→	AT+CGCONTRDP=5
←	+ CGCONTRDP: 5,5,"wonet.MNC001.MCC460.GPRS","10.192.44.242","0.0.0.0",,"112.65.184.255","210.22.84.3" OK
→	AT+CGCONTRDP=7
←	+ CGCONTRDP: 7,6,"CMNET","10.192.150.220","0.0.0.0",,"112.65.184.255","210.22.84.3" OK

5.8Carrier search and selection:AT+COPS

The configuration command is used to attempt to select and register a...GSM/UMTSNetwork operators.mode>Used to select whether to register automatically (<oper>(Ignored), or manually register to <oper>(<oper>The value of is determined by <format>(Definition). If the operator is manually selected <oper>If it's unavailable, then don't register with other carriers, unless <mode>=4.

When <mode>=2At that time, the network will be forcibly disconnected, and the disconnected state will remain until <mode>Set as0,1or4.

Setting this command will not be executed if the process of registering or deregistering a network is in progress.

The query command returns the current <mode>Currently registered operatorsoper>and the access technologies currently in use (Access Technology).

Syntax rules:

Command type	grammar	return
Setting commands	AT+COPS=<mode>[,<format>[,<oper>[,<AcT>[,<Domain>]]]]	OK
Query command	AT+COPS?	+ COPS: <mode>[,<format>,<oper>[,< AcT>>[, <Domain>]]] OK
Test command	AT+COPS=?	+ COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,< AcT>]]s][,((list of supported <mode>s),(list of supported <format>s)] OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Operator registration mode	0	Automatic mode;oper>Ignored
		1	Manually register an operator (<oper>It is necessary.AcT>(It is possible)
		2	Manually disconnect from the network and remain disconnected until <mode>Set as0,1,4
		3	Set only <format> (Used for query commands +COPS?)Do not attempt to register or deregister. (<oper>(Fields can be ignored)
		4	Manual/Automatic (<oper>(Fields cannot be ignored); if manual selection fails, it will enter automatic selection mode (<mode>=0)
<format>	Carrier format	0	Long string type <oper> (Using alphanumeric format, at most16character
		1	short string type <oper> (Using alphanumeric format, at most8character
		2	numeric string typeoper>
<oper>	With <format>relatively The corresponding operator value	-	Character type; <format>Indicate whether the string is alphanumeric or numeric; the method for representing the carrier type using numeric is as follows:MCC(3(position) +MNC(2(bits), namely the mobile country code + mobile network code.
<stat>	Network availability status	0	unknown
		1	Available network
		2	Current network
		3	Disable network

<AcT>	Access Technology,net <small>Network type</small>	0	GSM
		1	GSM Compact
		2	UTRAN
		3	GSM w/EGPRS
		4	UTRAN w/HSDPA
		5	UTRAN w/HSUPA
		6	UTRAN w/HSDPA and HSUPA
		7	E-UTRAN
		8	UTRAN HSPA+
<Domain>	domain	0	onlyCS
		1	onlyPS
		2	CS/PSAll

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+COPS?	Searching for online information
←	+ COPS: 0,2,"46001",7 OK	
→	AT+COPS=3,1	Settingsformat>=1Short string (in alphanumeric format)
←	OK	
→	AT+COPS?	Searching for online information
←	+ COPS: 0,1,"UNICOM",7 OK	
→	AT+COPS=3,0	Settingsformat>=0Long string (in alphanumeric format)
←	OK	
→	AT+COPS?	Searching for online information
←	+ COPS: 0,0,"CHN-UNICOM",7 OK	

5.9Automatic time zone update:AT+CTZU

The query command can be used to check whether access is enabled.NITZThis command updates the module time.

It does not support setting settings; it only supports querying. It is enabled by default.

Note:NITZ=Network Identity and Time ZoneLocal time can be provided through the operator's network.

Syntax rules:

Command type	grammar	return
Query command	AT+CTZU?	+ CTZU: <fun> OK
Test command	AT+CTZU=?	+ CTZU: (list of supported <fun>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<fun>	Time zone update status	1	allowNITZAutomatic updates

5.10OpenNITZAutomatic reporting:AT+CTZR

Use this command to set whether to open.NITZ URCAutomatic reporting. This command

does not support settings; it only supports querying. It is enabled by default.

Syntax rules:

Command type	grammar	return
Query command	AT+CTZR?	+ CTZR: <fun> OK
Test command	AT+CTZR=?	+ CTZR: (list of supported <fun>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<fun>	Report status	1	allowNITZ URCAutomatic reporting

5.11 (URC)NITZAutomatic reporting: +NITZ:<time>,<ds>

Syntax rules:

URC
+ NITZ:<time>,<ds>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<time>	time	yy/mm/dd,hh:mm:ss±tz	tz :Time zone, -48~+48 For example: + NITZ:11/08/02,09:27:39+32,0
<ds>	Daylight Saving Time	0	No adjustment to daylight saving time
		1	+1Hours (equal to)4individualquarter in <tz>)Adjusted to Daylight Saving Time
		2	+2Hours (equal to)8Quarterlytz>)Adjusted to Daylight Saving Time

5.12EnableHSDPAandHSUPA:AT*EHSDPA

Syntax rules:

Command type	grammar	return
Setting commands	AT*EHSDPA=<mode>[,<DL_CATEGORY>[,<UL_CATEGORY>[,<CPC_STATE>[,<DPA_CATEGORY_EXT>[,<EDCH_CATEGORY_EXT>[,<F-DPCHState>[,<enhanced F-DPCHState>]]]]]]	OK
Query command	AT*EHSDPA?	* EHSDPA:<mode>,<DL_CATEGORY>,<UL_CATEGORY>,<CPC_STATE>,<DPA_CATEGORY_EXT>,<EDCH_CATEGORY_EXT>,<F-DPCHState>,<enhanced F-DPCHState> OK
Test command	AT*EHSDPA=?	In TDSCDMA mode: * EHSDPA: (0-3),(1-11,13-16,23,35),(6),(0),(0),(0),(0),(0) OK In WCDMA mode: * EHSDPA: (0-2,4),(1-12),(1-6),(0,1),(1-14),(7),(0,1),(0,1) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>		0	disable HSDPA(also disable HSUPA if UE is supported) for Rel5
		1	enable HSDPA(also Enable HSUPA if UE is supported) for Rel7
		2	enable HSDPA only (not include HSUPA) for Rel5
		3	enable DLDC for Rel9 for TD production
		4	HSPA enabled only for Rel6
existTDSCDMAmodel:			
<DL_CATEGORY>	The default value is 14.	1,2,3	Max TB size: 2788 Max speed: 0.5M
		4,5,6	Max TB size: 5600 Max speed: 1.1M
		7,8,9	Max TB size: 8416 Max speed: 1.6M
		10,11	Max TB size: 11226Max speed: 2.2M
		13,14	Max TB size: 14043Max speed: 2.8M
<UL_CATEGORY>	The default value is 6.	6	Max TB size: 11160 Max speed: 2.2M
<CPC_STATE>		0	Not supported
existWCDMAmodel:			
<DL_CATEGORY>	The default value is 6.	1	Max TB size: 7298Max speed: 1.2M
		2	Max TB size: 7298 Max speed: 1.2M
		3	Max TB size: 7298 Max speed: 1.8M
		4	Max TB size: 7298 Max speed: 1.8M
		5	Max TB size: 7298 Max speed: 3.6M
		6	Max TB size: 7298 Max speed: 3.6M
<UL_CATEGORY>		0	Not supported
<CPC_STATE>		0	Not supported
<DPA_CATEGORY_EXT>	For WCDMA Rel7, support 1~20	1~20	default 14 for Rel7
<EDCH_CATEGORY_EXT>	For WCDMA Rel7, only 7 is supported.	7	
<F-DPCHState>	in TD mode	0	Not supported, default value
	In WCDMA mode	0	disabled
		1	enabled

5.13 GSM/UMTS/LTE Mode and frequency band settings: AT+**BAND**

Users can use the settings command to...GSM/UMTS/LTE Network type and frequency band selection. New parameter settings are automatically saved. NVMe will automatically load and take effect after restarting.

<mode>=0 Forced UE Only working in GSMnet; <mode>=1 Forced UE Only working in UMTSnet; <mode>=2 Forced UE register GSM and UMTS (Automatic selection); <mode>=3 Forced UE register GSM and UMTS (GSM priority); <mode>=4 Forced UE register GSM and UMTS (UMTS priority); <mode>=5 Forced UE Only working in LTE net; <mode>=6 Forced UE Working at GSM and LTE (Automatic selection); <mode>=7 Forced UE Working at GSM and LTE (GSM) priority; <mode>=8 Forced UE Working at GSM and LTE (LTE priority); <mode>=9 Forced UE Working at UMTS and LTE (Automatic selection); <mode>=10 Forced UE Working at UMTS and LTE (UMTS) priority; <mode>=11 Forced UE Working at UMTS and LTE (LTE priority); <mode>=12 Forced UE Working at GSM, UMTS, LTE (Automatic selection); <mode>=13 Forced UE Working at GSM, UMTS, LTE (GSM) priority; <mode>=14 Forced UE Working at GSM, UMTS, LTE (UMTS) priority; <mode>=15 Forced UE Working at GSM, UMTS, LTE (LTE) priority).

<roamingConfig>=0 Forced UE Roaming is not supported;
<roamingConfig>=1 Forced UE Roaming is supported;
<roamingConfig>=2 Forced UE Do not change roaming settings.

<srvDomain>=0 Forced UE Only works CS domain ((circuit service);
<srvDomain>=1 Forced UE Only works PS domain (GPRS service);
<srvDomain>=2 Forced UE Working at CS+PS domain; <srvDomain>=3 let UE Select a default business domain; <srvDomain>=4 Forced UE Do not change the business domain settings.

<bandPriorityFlag> =0 Default value <bandPriorityFlag> =1: set up TD-LTE frequency band priority. <bandPriorityFlag> =2: set up FDD-LTE frequency band priority.

If <mode> Set as GSM Network settings commands only support selection. GSM Frequency band: If <mode> Set as GSM
For network settings, at least one command can be selected. UMTS Frequency band;

If <mode>Set asLTEFor network settings, at least one command can be selected.LTEFrequency band;

If <mode>Set to dual network mode (Dual mode) and the three-network model (trip modeTherefore, there is no need to set <band>Parameters, because <band> The parameters will be reset to their default values. If you then enter <, this will cause issues.band>This parameter will be ignored.

<roamingConfig>and <srvDomain>The default value is0and2;

<bandPriorityFlag>The default value is0This parameter only applies when <mode>yesLTEIt is only effective when...

Syntax rules:

Command type	grammar	return
Setting commands	AT*BAND=[<mode>[<GSMband>,<UMTSband> ,<LTEbandH>,<LTEbandL>[,<roamingConfig>,<srvDomain>,<bandPriorityFlag>]]]	OK
Query command	AT*BAND?	* BAND:<mode>,<GSMband>,<UMTSband>,<LTEbandH>,<LTEbandL>,<roamingConfig>,<srvDomain>,< bandPriorityFlag> OK
Test command	AT*BAND=?	* BAND: (list ofsupported<mode>s),<GSMband>,<UMTSband>,<LTEbandH>,<LTEbandL>,<roamingConfig>,<srvDomain>,<bandPriorityFlag> OK

Parameter definition:

parameter	definition	Value	explain
<mode>	Network type, integer	0	GSM network
		1	UMTS network
		2	Dual mode (GSM and UMTS)(Automatic selection)
		3	Dual mode (GSM and UMTS) (GSM)priority)
		4	Dual mode (GSM and UMTS) (UMTS)priority)
		5	LTE network
		6	Dual mode (GSM and LTE) (auto)
		7	Dual mode (GSM and LTE) (GSM)priority)
		8	Dual mode (GSM and LTE) (LTE)priority)
		9	Dual mode (UMTS and LTE)(Automatic selection)
		10	Dual mode (UMTS and LTE) (UMTS)priority)
		11	Dual mode (UMTS and LTE) (LTE)priority)
		12	Trip mode ((Automatic selection)

		13	Trip mode (GSM)priority)
		14	Trip mode (TD)priority)
		15	Trip mode (LTE)priority)
<GSMband>	GSMOperating frequency band (bit mask) Integer type	1	PGSM 900
		2	DCS GSM 1800
		4	PCS GSM 1900
		8	EGSM 900
		16	GSM 450
		32	GSM 480
		64	GSM 850
<UMTSband>	UMTSOperating frequency band (bit mask)Integer type	1	UMTS_BAND_1
		2	UMTS_BAND_2
		4	UMTS_BAND_3
		8	UMTS_BAND_4
		16	UMTS_BAND_5
		32	UMTS_BAND_6
		64	UMTS_BAND_7
		128	UMTS_BAND_8
		256	UMTS_BAND_9
<LTEbandH>	TDD LTEOperating frequency band (bit mask),32bitInteger	2	TDLTE_BAND_34
		32	TDLTE_BAND_38
		64	TDLTE_BAND_39
		128	TDLTE_BAND_40
		256	TDLTE_BAND_41
<LTEbandL>	FDD LTEOperating frequency band (bit mask),32bitInteger	1	FDDLTE_BAND_1
		2	FDDLTE_BAND_2
		4	FDDLTE_BAND_3
		8	FDDLTE_BAND_4
		16	FDDLTE_BAND_5
		32	FDDLTE_BAND_6

		64	FDDLTE_BAND_7
	
		65536	FDDLTE_BAND_17
		524288	FDDLTE_BAND_20
<roamingConfig>	Roaming settings, integer type. This parameter This should not work. Roaming is supported across the board.	0	Roaming not supported
		1	Support roaming
		2	No change
<srvDomain>	Business domain settings, integer type	0	CS_ONLY
		1	PS_ONLY
		2	CS_PS
		3	ANY
		4	No Change
<bandPriorityFlag>	Priority frequency band, integer type	0	default
		1	TD-LTE
		2	FDD-LTE

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT*BAND?	
←	* BAND:15,74,129,482,133,0,2,0 OK	480 = LTEbandH =00000000 00000000 0000 0001 11100000 =2+32+64+128+256 =TDLTE_BAND_34&TDLTE_BAND_38&TDLTE_BAND_39& TDLTE_BAND_40&TDLTE_BAND_41 133 = LTEbandL =00000000 00000000 00000000 10000101 =1+4+128 =FDDLTE_BAND_1&FDDLTE_BAND_3&FDDLTE_BAND_8

5.14Query the current operating frequency band:AT*BANDIND

The settings command can enable automatic frequency band reporting.

The query command returns the current operating frequency band.

Syntax rules:

Command type	grammar	return
--------------	---------	--------

Setting commands	AT*BANDIND[=<n>]	OK
Query command	AT*BANDIND?	* BANDIND: <n>[,<band>,<Act>] OK
Test command	AT*BANDIND=?	* BANDIND: (0,1) OK
URC	<n>=1 Moreover, it automatically reports when the frequency band changes.URC:*BANDIND: <band>, <Act>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values	
<n>	<n>=1Moreover, it automatically reports when the frequency band changes. * BANDIND: <band>, <Act>	0	disable	
		1	enable	
<act>	Access TechnologyAccess mechanism	0	GSM	
		1	GSM Compact	
		2	UTRAN	
		3	GSM w/EGPRS	
		4	UTRAN w/HSDPA	
		5	UTRAN w/HSUPA	
		6	UTRAN w/HSPA	
		7	E-UTRAN	
		8	UTRAN HSPA+	
<band>	frequency band	0	PGSM 900	When <act>=0/1/3
		1	DCS GSM 1800	
		2	PCS GSM 1900	
		3	EGSM 900	
		4	GSM 450	
		5	GSM 480	
		6	GSM 850	
		0	UMTS BAND1	When <act>=2/4/5/6/8
		1	UMTS BAND2	
		2	UMTS BAND3	

		3	UMTS BAND4	
		4	UMTS BAND5	
		5	UMTS BAND6	
		6	UMTS BAND7	
		7	UMTS BAND8	
		8	UMTS BAND9	
		9	UMTS BAND10	
		10	UMTS BAND11	
		11	UMTS BAND12	
		12	UMTS BAND13	
		13	UMTS BAND14	
		14	UMTS BAND15	
		15	UMTS BAND16	
		16	UMTS BAND17	
		17	UMTS BAND18	
		18	UMTS BAND19	
		1	LTE BAND 1	When <act>=7
		2	LTE BAND 2	
		3	LTE BAND 3	
		4	LTE BAND 4	
		5	LTE BAND 5	
		6	LTE BAND 6	
		7	LTE BAND 7	
		8	LTE BAND 8	
		9	LTE BAND 9	
		10	LTE BAND 10	
		11	LTE BAND 11	
		12	LTE BAND 12	
		13	LTE BAND 13	
		14	LTE BAND 14	

		15	LTE BAND 15	
		16	LTE BAND 16	
		17	LTE BAND 17	
		18	LTE BAND 18	
		19	LTE BAND 19	
		20	LTE BAND 20	
		twenty one	LTE BAND 21	
		twenty two	LTE BAND 22	
		twenty three	LTE BAND 23	
		twenty four	LTE BAND 24	
		25	LTE BAND 25	
		26	LTE BAND 26	
		27	LTE BAND 27	
		28	LTE BAND 28	
		29	LTE BAND 29	
		30	LTE BAND 30	
		31	LTE BAND 31	
		32	LTE BAND 32	
		33	LTE BAND 33	
		34	LTE BAND 34	
		35	LTE BAND 35	
		36	LTE BAND 36	
		37	LTE BAND 37	
		38	LTE BAND 38	
		39	LTE BAND 39	
		40	LTE BAND 40	
		41	LTE BAND 41	

5.15Query access mechanism (Access Technology):AT^CACAP

The query command returns the access mechanism of the current cell.Access Technology).

Syntax rules:

Command type	grammar	return
Query command	AT^CACAP?	+ CACAP: <act> OK
Test command	AT^CACAP=?	+ CACAP:(0-7) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<act>		0	GSM
		1	GSM Compact
		2	UTRAN
		3	GSM w/EGPRS
		4	UTRAN w/HSDPA
		5	UTRAN w/HSUPA
		6	UTRAN w/HSPA
		7	E-UTRAN

5.16Query current system information:AT^SYSINFO

This command queries current system information, such as service status, business domain, roaming status, etc. Syntax rules:

Command type	grammar	return
Execute naming	AT^SYSINFO	^SYSINFO:<srv_status>,<srv_domain>,<roam_status>,<sys_mode>,<sim_state> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<srv_status>	Service Status	0	no service
		1	restricted service

		2	valid service
		3	restricted area service
		4	power service
<srv_domain>	Business domain	0	no service
		1	CS only
		2	PS only
		3	CS and PS
<roam_status>	roaming status	0	no roaming
		1	roaming
<sys_mode>	Network mode	0	no service
		1	reserved
		2	reserved
		3	GSM/GPRS
		4	WCDMA
		5	TD_SCDMA
		17	LTE
<sim_state>	SIMCard status	0	simInvalid card
		1	simCard valid
		255	SIMNot inserted orPINUnlocked code
<sys_submode>	Network sub-pattern	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

5.17Configure wireless access method:AT+CTEC

Note: This command only applies to the Cosmic Union.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4Module (Air720/ Air720G/ Air720H/ Air720D/ Air720S)

This command sets the user's preferred wireless access method.

RAT)Syntax rules:

Command type	grammar	return
Setting commands	AT+CTEC=<nCurrentRat>,<nPreferRat>	OK
Query command	AT+CTEC?	+ CTEC:<nCurrentRat>,<nCurrentRat> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<nCurrentRat>	CurrentRATmodel	0	auto mode
		2	GSM only
		4	LTE only
<nPreferRat>	Want to setRATmodel	0	auto mode
		2	GSM only
		4	LTE only

5.18Cell/Frequency Lockout:AT*CELL

Note: This command only applies to the Cosmic Union.Air720/Air720G/Air720H/Air720D/Air720S/Air72XCXSeries Modules.

This private propertyATUsed to enableCell/FrequencyLock.

Syntax rules:

Command type	grammar	return
Setting commands	AT*Cell=<mode>[,<network mode>[,<band>]][,<freq>[,<cellId>]]]	OK
Test command	AT*Cell=?	* Cell:<mode>,<act>,<band>,<freq>,<cellId> OK
URC	* Cell:<mode>,<network mode>,<band>,<freq>,<cellId>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	lock mode	0	Cell/Frequency lock disabled
		1	Frequency lock enabled
		2	Cell lock enabled

<network mode>	Network type	0	GSM
		1	UMTS_TD
		2	UMTS_WB
		3	LTE
<band>	When <network mode>=0	0	PGSM 900
		1	DCS GSM 1800
		2	PCS GSM 1900
		3	EGSM 900 (extended)
		4	GSM 450
		5	GSM 480
		6	GSM 850
		7	GSM 750
	When <network mode>=1 or 2 hour. When <network mode>=1 The value is 0~7 When <network mode>=2 The value is 0~8;	0	Band_1 arfcn 10562-10838
		1	Band_2 arfcn 9662-9938
		2	Band_3 arfcn 1162-1513
		3	Band_4 arfcn 1537-1738
		4	Band_5 arfcn 4357-4458
		5	Band_6 arfcn 4387-4413
		6	Band_7 arfcn 2237-2563
		7	Band_8 arfcn 2937-3088
		8	Band_9 arfcn 9237-9387
	When <network mode>=3	0~30	FDDLTE
		32~43	TDDLTE
	When <network mode>=0,1,2,3	255	Invalid value (invalid)
<freq>	ARFCN(Absolute radio frequency channel number) Absolute radio frequency Channel number	no need	No need in GSM
		UMTS-TD 0~7 of arfcn	UMTS-TD 0~7 of arfcn
		UMTS-WB 0~8 of arfcn	UMTS-WB 0~8 of arfcn
		0-599, 1200-1949, 2400-2649, 2750-3449, 3450-3799	LTENetwork mode arfcn

		5180-5279, 5730-5849, 6150-6449 37750-38249, 38250-386 49, 38650-39649, 39650-41589	
<cellId>	physical communityid	no need	No need in GSM
		0-127	in UMTS
		0-503	in LTE

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT*Cell=0	
←	OK	
→	AT*Cell=1,1,1,10700	Set frequency lock
←	OK	

5.19 Read base station location (LBS) information and time: AT+CIPGSMLOC

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPGSMLOC=<type>,<cid>	If <type>=1: + CIPGSMLOC:<locationcode>[,<latitude>,<longitude>,<date>,<time>] OK If <type>=2: + CIPGSMLOC: <locationcode>[,<date>,<time>] OK If error is related to ME functionality: + CME ERROR: <err>
Test command	AT+CIPGSMLOC=?	+ CIPGSMLOC:(list of supported <type>s),(range of <cid>) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<type>	Operation type	1	View accuracy, dimensions, and time.
		2	View only time

<cid>	as <cid> defined in + SAPBR	1-3	
Longitude	Current longitude (in degrees)		Longitude (retain decimal places)6Bit
latitude	Current latitude, expressed in degrees		Latitude (retain decimal places)6Bit
<date>	The format isyy/mm/dd		For example18/11/08
<time>	The format ishh/mm/ss		For example15:47:26
<locationcode>		0	success
		1	No data found
		6	Parameter error
		7	Unknown error
		404	not found
		408	Request timed out
		601	Network error
		602	Insufficient memory
		603	DNSmistake
		604	Stack busy
		65535	Other errors

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	Set the bearer type toGPRS
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDP Context, used forRNDISInternet access (this <apn>It can be done AT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To setAPN
←	OK	
→	AT+SAPBR=1,1	activationGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Check if activated
←	+ SAPBR: 1,1,010.169.179.213 OK	There is a return!PThe address indicates successful activation.

→	AT+CIPGSMLOC=1,1	Query location and time
←	+ CIPGSMLOC: 0,31.241045,121.472313,18/11/08,15:37:30 OK	
→	AT+CIPGSMLOC=2,1	Query time only
←	+ CIPGSMLOC: 0,18/11/08,15:47:26 OK	
→	AT+SAPBR=0,1	DeactivatePDPContext
←	OK	

5.20ReadWIFILocation information and time:AT+WIFILOC

Syntax rules:

Command type	grammar	return
Setting commands	AT+WIFILOC=<type>,<cid>	If <type>=1: + WIFILOC:<locationcode>[,<latitude>,<longitude>,<date>,<time>] OK If <type>=2: + WIFILOC: <locationcode>[,<date>,<time>] OK If error is related to ME functionality: + CME ERROR: <err>
Test command	AT+WIFILOC=?	+ WIFILOC:(list of supported <type>s),(range of <cid>) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<type>	Operation type	1	View accuracy, dimensions, and time.
		2	View only time
<cid>	as <cid> defined in +SAPBR	1-3	
Longitude	Current longitude (in degrees)		Longitude (retain decimal places)6Bit
latitude	Current latitude, expressed in degrees		Latitude (retain decimal places)6Bit
<date>	The format isyy/mm/dd		For example18/11/08

<time>	The format is hh:mm:ss		For example 15:47:26
<locationcode>		0	success
		1	No data found
		6	Parameter error
		7	Unknown error
		404	not found
		408	Request timed out
		601	Network error
		602	Insufficient memory
		603	DNS mistake
		604	Stack busy
		65535	Other errors

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	Set the bearer type to GPRS
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set up PDP Bearer APN parameter After the module registers with the network, it will automatically obtain < from the network.apn> And activate one PDP Context, used for RNDIS Internet access (this <apn> It can be done AT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN", "" That's it; the module will automatically retrieve the <apn> To set APN
←	OK	
→	AT+SAPBR=1,1	activation GPRS PDP Context
←	OK	
→	AT+SAPBR=2,1	Check if activated
←	+ SAPBR: 1,1,010.169.179.213 OK	There is a return IP The address indicates successful activation.
→	AT+WIFILOC=1,1	Query location and time
←	+ WIFILOC: 0,31.241045,121.472313,18/11/08,15:37:30 OK	
→	AT+WIFILOC=2,1	Query time only
←	+ WIFILOC: 0,18/11/08,15:47:26	

	OK	
→	AT+SAPBR=0,1	DeactivatePDPContext
←	OK	

5.21UDPMulti-base station positioning function:AT+CIPUDPGSMLOC

Note: >=V401881Version Support

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPUDPGSMLOC=<type>,<para>[,port]	<p>If <type>=0:</p> <p>OK</p> <p>If <type>=1:</p> <p>+ CIPUDPGSMLOC: <latitude>,<longitude>,<date>,<time></p> <p>OK</p> <p>If error is related to ME functionality:</p> <p>+ CME ERROR: <errcode></p>
Test command	AT+CIPUDPGSMLOC=?	+ CIPUDPGSMLOC: (0,1),(0,1,domainName,ipAddress),(port) OK
Read command	AT+CIPUDPGSMLOC?	+ CIPUDPGSMLOC: <addr>[,port] OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<type>	Operation type	0	set upUDP IP/Domain name and port (default is Hezhou)IP address 121.40.251.45port12411)
		1	Querying base station information andWiFiInformation acquisition and location information
<para>	Server address or location mode	server domain name or IPaddress	typefor0When setting the server domain name orIPaddress
		0	typefor1At that time, the location information is obtained by querying base station information.
		1	typefor1At that time, query the base station information andWiFiInformation acquisition and location information
<port>	server port	1~65535	
Longitude	Current longitude (in degrees)		Longitude (retain decimal places)7Bit)
latitude	Current latitude, expressed in degrees		Latitude (retain decimal places)7Bit)

<date>	The format isyy/mm/dd		For example2023/11/08
<time>	The format ishh:mm:ss		For example15:47:26
<errcode>		60	Location information acquisition error
		61	Network error
		62	DNSParsing error
		63	Connection error
		64	Server response timed out
		65	Server response timed out

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	Set the bearer type toGPRS
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPbearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate one PDPContext, used forRNDISInternet access (this <apn> It can be done AT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To setAPN
←	OK	
→	AT+SAPBR=1,1	activationGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Check if activated
←	+ SAPBR: 1,1,010.169.179.213 OK	There is a return!PThe address indicates successful activation.
→	AT+CIPUDPGSMLOC=1,0	Querying location information using base station information
←	+ CIPUDPGSMLOC: 31.8332347,117.1302124,2023/12/04,10:28:30 OK	
→	AT+CIPUDPGSMLOC=1,1	Querying base station information andWiFiInformation acquisition and location information
←	+ CIPUDPGSMLOC: 31.8332347,117.1302124,2023/12/04,10:29:14 OK	
→	AT+SAPBR=0,1	DeactivatePDPContext
←	OK	

5.22:AT+WIFISCAN

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+WIFISCAN=<channel>	+ WIFISCAN: <mac>, <rssi> OK	Specified channel scanning
Query command	AT+WIFISCAN?	+ WIFISCAN: <mac>, <rssi>, <channel> OK	Query all channels using blocking method
Execute command	AT+WIFISCAN	OK + WIFISCAN: <mac>, <rssi>, <channel>	Query all channels in a non-blocking manner. Return immediately, and proactively report upon completion of the query.

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<channel>	Channel		
<mac>	MACaddress		
<rssi>	Received signal strength indicator (Received Signal Strength Indication)		

5.23 (URC)System Mode: M0DE

The system mode has changed.

Syntax rules:

URC
M0DE:<SysMainMode>,<SysMode>

Parameter definition:

parameter	Value	explain
<SysMainMode>, <SysMode>	17,17	TD LTE capabilities(4G)
	5/15, 8	3G only (3G)
	5/15,7	3G, HSDPA, and HSDPA capabilities (3G)
	5/15,6	3G and HSUPA capabilities (3G)
	5/15,5	3G and HSDPA capabilities (3G)
	3,3	GSM, GPRS, and EGPRS capabilities(2G)
	3,2	GSM and GPRS capabilities (2G)
	3,1	GSM only (2G)
	0,0	No service

5.24Community information inquiry:AT+CCED

This command can query the current cell and the maximum number of cells.6Information about a neighboring community.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CCED=<mode>,<requested dump>	OK
Test command	AT+CCED=?	+ CCED: (list of <mode>s),(list of <requested dump>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	0	One report
		1	Periodic reporting
		2	Close reporting
<requested dump>	Message Type	1	Main community, i.e., service community information
		2	Information about neighboring communities In the case ofLTEIf it involves a neighboring community, then report it: MCC,MNC,frequency,cellid,rsrp,rsrq,tac,SrxLev,pcid in the case ofGSMIf it involves a neighboring community, then report it: MCC, MNC, lac, cellid, bsic, rxlev
		8	Main communityRSSIInstructions, i.e.Rxlev(0~31)

For example:

<requested dump>=1Report information about the main residential area or the service area: If the current isLTEIf the pattern is correct, then report it:

+ CCED:LTE current cell:MCC,MNC,imsi,roamingFlag,bandInfo,bandwidth,dLEarfcn,cellid,rsrp,rsrq,tac,SrxLev,pcid If the current isGSMIf the pattern is correct, then report it:

+ CCED:GSM current cell info:MCC,MNC,lac,cellid,bsic,rxlev,RxLevSub,Arfcn

For example:

One-time query of the current community (LTEmodel):

AT+CCED=0,1

+ CCED:LTE current cell:460,00,460045926307603,0,40,n100,39148,140542123,51,29,6334,34,351

OK

One-time query of the current community (GSMmodel):

AT+CCED=0,1

+ CCED:GSM current cell info:460,00,18be,5045,13,63,63,6

OK

Current community information is reported periodically.(LTEmodel):

AT+CCED=1,1

+ CCED:LTE current cell:460,00,460045926307603,0,40,n100,39148,140542123,61,31,6334,44,351

OK

+ CCED:LTE current cell:460,00,460045926307603,0,40,n100,39148,140542123,61,31,6334,44,351

+ CCED:LTE current cell:460,00,460045926307603,0,40,n100,39148,140542123,61,31,6334,44,351

+ CCED:LTE current cell:460,00,460045926307603,0,40,n100,39148,140542123,61,35,6334,44,351

Current community information is reported periodically.(GSMmodel):

AT+CCED=1,1

+ CCED:GSM current cell info:460,00,18be,5045,13,61,61,6

OK

+ CCED:GSM current cell info:460,00,18be,5045,13,63,63,6

+ CCED:GSM current cell info:460,00,18be,5045,13,63,63,6

+ CCED:GSM current cell info:460,00,18be,5045,13,63,63,6

+ CCED:GSM current cell info:460,00,18be,5045,13,63,63,6

<requested dump>=2Report information about neighboring communities: If the

current isLTEIf the pattern is correct, then report it:

+ CCED:LTE neighbor cell: MCC,MNC,frequency,cellid,rsrp,rsrq,tac,SrxLev,pcid

If the current isGSMIf the pattern is correct, then report it:

+ CCED:GSM neighbor cell info: MCC,MNC,lac,cellid,bsic,rxlev

For example:

One-time query of neighboring cells (LTEmodel):

AT+CCED=0,2

+ CCED:LTE neighbor cell:460,00,38950,140541985,57,24,6334,36,351

+ CCED:LTE neighbor cell:460,00,1300,26224401,48,24,6334,27,37

+ CCED:LTE neighbor cell:460,00,1300,26224402,43,15,6334,22,38

+ CCED:LTE neighbor cell:460,00,38400,26224397,42,23,6334,21,191

+ CCED:LTE neighbor cell:460,00,40936,12793923,34,15,6334,13,191

+ CCED:LTE neighbor cell:460,00,3590,26224415,44,9,6334,27,318

+ CCED:LTE neighbor cell:460,00,3590,26224416,47,19,6334,30,319

OK

One-time query of neighboring cells (GSMmodel):

AT+CCED=0,2

+ CCED:GSM neighbor cell info:460,00,6334,20522,31,75
+ CCED:GSM neighbor cell info:460,00,6334,0,21,80
+ CCED:GSM neighbor cell info:460,00,6334,20521,30,91

OK

Information on neighboring communities is reported periodically.(LTEmodel):

AT+CCED=1,2

+ CCED:LTE neighbor cell:460,00,38950,140541985,57,24,6334,36,351
+ CCED:LTE neighbor cell:460,00,1300,26224401,48,24,6334,27,37
+ CCED:LTE neighbor cell:460,00,1300,26224402,43,15,6334,22,38
+ CCED:LTE neighbor cell:460,00,38400,26224397,42,23,6334,21,191
+ CCED:LTE neighbor cell:460,00,40936,12793923,34,15,6334,13,191
+ CCED:LTE neighbor cell:460,00,3590,26224415,44,9,6334,27,318
+ CCED:LTE neighbor cell:460,00,3590,26224416,47,19,6334,30,319

OK

+ CCED:LTE neighbor cell:460,00,38950,140541985,57,24,6334,36,351
+ CCED:LTE neighbor cell:460,00,1300,26224401,48,24,6334,27,37
+ CCED:LTE neighbor cell:460,00,1300,26224402,43,15,6334,22,38
+ CCED:LTE neighbor cell:460,00,38400,26224397,42,23,6334,21,191
+ CCED:LTE neighbor cell:460,00,40936,12793923,34,15,6334,13,191
+ CCED:LTE neighbor cell:460,00,3590,26224415,44,9,6334,27,318
+ CCED:LTE neighbor cell:460,00,3590,26224416,47,19,6334,30,319

Information on neighboring communities is reported periodically.(GSMmodel):

AT+CCED=1,2

+ CCED:GSM neighbor cell info:460,00,6334,20522,31,76
+ CCED:GSM neighbor cell info:460,00,6334,0,21,80
+ CCED:GSM neighbor cell info:460,00,6334,20521,30,94

OK

+ CCED:GSM neighbor cell info:460,00,6334,20522,31,85

+ CCED:GSM neighbor cell info:460,00,6334,0,21,78
+ CCED:GSM neighbor cell info:460,00,6334,20521,30,83

5.25 Setting up the project mode:AT+EEMOPT

Syntax rules:

Command type	grammar	return
Setting commands	AT+EEMOPT=<option>[,<value>]	OK
Query command	AT+EEMOPT?	+ EEMOPT: <option>[,<value>]
		OK
Test command	AT+EEMOPT=?	list of options
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<option>	Work mode	0	Close Engineering Mode
		1	Query mode, can be accessed throughAT+EEMGINFO?Query network parameters
		2	Enable automatic periodic reporting of network parameters, with a reporting period of <value>definition Note: The automatically reported content is...URC: +EEMLTESVC, +EEMLTEINTRA, + EEMLTEINTERPlease refer to the relevant content in this article.
<value>	<option>= 2When, used to define Periodic reporting time interval		Integer value, in seconds

For example:

Command (→) /Return (←)	Example
→	AT+EEMOPT=?
←	AT+EEMOPT=0 :Turn off indicator. This is default mode after ME bootup
	AT+EEMOPT=1 :Set to query mode. User can use +EEMGINFO to query network parameter
	AT+EEMOPT=2,<interval> :Set to periodic mode. Report EM info in <value> seconds
	OK

5.26 Query in engineering modeGSM/UMTS/LTEinformation:AT+EEMGINFO

AT+EEMOPT=1At that time, it is used to query the current status in the engineering mode.GSM/UMTS/LTENetwork parameters.

Syntax rules:

Command type	grammar	return
Query command	AT+EEMGINFO?	+ EEMGINFO:<state>,<nw_type> OK + EEMLTESVC:<info> + EEMLTEINTRA:<info> + EEMLTEINTER:<info>

Parameter definition:

parameter	definition	Value	explain
<state>	MT state	0	Idlestate
		1	Dedicatedstate
		2	PS PTMstate
		3	valid state
<nw_type>	network type	0	GSM
		1	UMTS
		2	LTE

5.27 (URC)Basic information about the project mode: +EEMGINFOBASIC

Syntax rules:

URC
+ EEMGINFOBASIC: <state>

Parameter definition:

parameter	Value	explain
<state>	0	ME in Idle mode
	1	ME in Dedicated mode
	2	ME in PS PTM mode

5.28 (URC)GSMCurrent cell information in engineering mode: +EEMGINFOSVC

Syntax rules:

URC
+ EEMGINFOSVC: <mcc>, <mnc>, <lac>, <ci>, <nom>, <nco>, <bsic>, <C1>, <C2>, <TA>, <TxPwr>,<RxSig>, <RxSigFull>, <RxSigSub>, <RxQualFull>, <RxQualSub>, <ARFCN_tch>, <hopping_chnl>,<chnl_type>, <TS>, <PacketIdle>, <rac>, <arfcn>, <bs_pa_mfrms>, <C31>, <C32>, <t3212>, <t3312>,<pbccch_support>, <EDGE_support>, <ncc_permitted>, <rl_timeout>, <ho_count>, <ho_succ>,<chnl_access_count>, <chnl_access_succ_count>

Parameter definition:

parameter	explain	Range of values
<mcc>	Mobile Country Code	
<mnc>	Mobile Network Code	
<lac>	Location Area Code	
<ci>	Cell Identifier	
<nom>	Network Operation Mode	
<nco>	Network Control Order	
<bsic>	Base Station Identity Code	
<C1>	C1 value	
<C2>	C2 value	
<TA>	Timing Advance	
<TxPwr>	Transmit Power	
<RxSig>	Receive level BCCH	
<RxSigFull>	Receive level for full set of TCH	
<RxSigSub>	Receive level for sub set of TCH	
<RxQualFull>	BER in DTX mode	
<RxQualSub>	BER in non-DTX mode	
<ARFCN_tch>	Traffic Channel ARFCN (Absolute Radio Frequency Channel)	
<hopping_chnl>	Channel is hopping	
<chnl_type>	Channel type	
<TS>	Serving timeslot	
<PacketIdle>	In packet idle mode	
<rac>	Routing Area Code	
<arfcn>	Absolute Radio Frequency Channel	
<bs_pa_mfrms>	BS PA frames	
<C31>	C31 value	
<C32>	C32 value	
<t3212>	Timeout No. 3212	
<t3312>	Timeout No. 3312	
<pbccch_support>	Support PBCCH	
<EDGE_support>	Support EDGE	
<ncc_permitted>	NCC permitted	
<rl_timeout>	Radio link timeout	
<ho_count>	Total hand-over count	
<ho_succ>	Success hand-over count	
<chnl_access_count>	Total channel access count	
<chnl_access_succ_count>	Success channel access count	

5.29 (URC)GSMEngineering modePSInformation: +EEMGINFOPS

Syntax rules:

URC

+ EEMGINFOPS:<PS_attached>,<attach_type>,<service_type>,<tx_power>,<c_value>,<ul_ts>,<dl_ts>,<ul_cs>,<dl_cs>,<ul_modulation>,<dl_modulation>,<gmsk_cv_bep>,<8psk_cv_bep>,<gmsk_mean_bep>,<8psk_mean_bep>,<EDGE_bep_period>,<single_gmm_rej_cause>,<pdp_active_num>,<mac_mode>,<network_control>,<network_mode>,<EDGE_slq_measurement_mode>,<edge_status>

Parameter definition:

parameter	explain
<PS_attached>	GPRS/EDGE attached
<attach_type>	Attach type
<service_type>	Service type
<tx_power>	Transmit power
<c_value>	C value
<ul_ts>	Uplink timeslot
<dl_ts>	Downlink timeslot
<ul_cs>	Uplink Coding Scheme
<ul_cs>	Uplink Coding Scheme
<dl_cs>	Downlink Coding Scheme
<ul_modulation>	Uplink modulation
<dl_modulation>	Downlink modulation
<gmsk_cv_bep>	GMSK CV BEP (Block Error Probability)
<8psk_cv_bep>	8PSK CV BEP
<gmsk_mean_bep>	GMSK means BEP
<8psk_mean_bep>	8PSK means BEP
<EDGE_bep_period>	EDGE BEP period
<single_gmm_rej_cause>	Is single GMM reject cause
<pdp_active_num>	Activated PDP number
<mac_mode>	MAC mode
<network_control>	Network control
<network_mode>	networkmode
<EDGE_slq_measurement_mode>	EDGE SLQ measurement mode
<edge_status>	EDGE status

5.30 (URC)GSMInformation about adjacent cells in engineering mode: +EEMGINFONC

Syntax rules:

URC
+ EEMGINFONC: <nc_num>, [<mcc>, <mnc>, <lac>, <rac>, <ci>, <rx_lv>, <bsic>, <C1>, <C2>, <arfcn>, <C31>, <C32>, [...]]

Parameter definition:

parameter	explain
<nc_num>	Neighbor cell number
<mcc>	Mobile Country Code

<mnc>	Mobile Network Code
<lac>	Location Area Code
<rac>	Routing Area Code
<ci>	Cell Identifier
<rx_lv>	Receive signal level
<bsic>	Base Station Identity Code
<C1>	C1 value
<C2>	C2 value
<arfcn>	Absolute Radio Frequency Channel
<C31>	C31 value
<C32>	C32 value

5.31 (URC)Current network status in engineering mode: +EEMGINBFTM

Syntax rules:

URC
+ EEMGINBFTM:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>,<p12>,<p13>,<p14>,<p15>,<p16>,<p17>,<p18>,<p19>

Parameter definition:

parameter	explain
<p1>	Engineering Mode
<p2>	mcc
<p3>	mnc
<p4>	lac
<p5>	cell Identifier
<p6>	bsic
<p7>	C1
<p8>	C2
<p9>	Time Advance
<p10>	TxPowerLevel
<p11>	rxSigLevel
<p12>	rxSigLevelFull
<p13>	rxSigLevelSub
<p14>	rxQualityFull
<p15>	rxQualitySub
<p16>	arfcnTch
<p17>	hopping status
<p18>	channel type
<p19>	Server Timeslot

5.32 (URC)UMTSCurrent cell information in engineering mode: +EEMUMTSSVC

Syntax rules:

1. Non-TD mode:

URC

+ EEMUMTSSVC:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,...,<p10>],[<p11>,<p12>,...,<p28>],[<p29>,<p30>,...,<p55>]

Parameter definition:

parameter	explain
<p1>	Engineer Mode
<p2>	sCMeasPresent
<p3>	sCParamPresent
<p4>	ueOpStatusPresent
IfsCMeasPresentis TRUE, the following 6 items will be printed:	
<p5>	cpichRSCP
<p6>	utraRssi
<p7>	cpichEcN0
<p8>	sQual
<p9>	sRxLev
<p10>	txPower
IfsCParamPresentis TRUE, the following 18 items will be printed:	
<p11>	rac
<p12>	nom
<p13>	mcc
<p14>	mnc
<p15>	lac
<p16>	ci
<p17>	uraId
<p18>	psc
<p19>	arfcn
<p20>	t3212
<p21>	t3312
<p22>	hcsUsed
<p23>	attDetAllowed
<p24>	csDrxCycleLen
<p25>	psDrxCycleLen
<p26>	utranDrxCycleLen
<p27>	HSDPASupport
<p28>	HSUPASupport
If ueOpStatusPresent is TRUE, the following 27 items will be printed	
<p29>	rrcState
<p30>	numLinks

<p31>	srncId
<p32>	sRnti
<p33>	algPresent
<p34>	cipherAlg
<p35>	cipherOn
<p36>	algPresent
<p37>	cipherAlg
<p38>	cipherOn
<p39>	HSDPAActive
<p40>	HSUPAActive
<p41>	MccLastRegisteredNetwork
<p42>	MncLastRegisteredNetwork
<p43>	TMSI
<p44>	PTMSI
<p45>	IsSingleMmRejectCause
<p46>	IsSingleGmmRejectCause
<p47>	MMRejectCause
<p48>	GMMRejectCause
<p49>	mmState
<p50>	gmmState
<p51>	gprsReadyState
<p52>	readyTimerValueInSecs
<p53>	NumActivePDPCContext
<p54>	ULThroughput
<p55>	DLThroughput

2. TD mode:

URC
+ EEMUMTSSVC:<p1>,<p2>,<p3>,<p4>,[<p5>,<p6>,<p7>,<p8>],[<p9>,<p10>,...,<p26>],[<p27>,<p28>,...,<p 53>]

Parameter definition:

parameter	explain
<p1>	Engineer Mode
<p2>	sCMeasPresent
<p3>	sCParamPresent
<p4>	ueOpStatusPresent
IfsCMeasPresentis TRUE, the following 4 items will be printed:	
<p5>	pccpchRSCP
<p6>	utraRssi
<p7>	sRxLev
<p8>	txPower
IfsCParamPresentis TRUE, the following 18 items will be printed:	

<p9>	rac
<p10>	nom
<p11>	mcc
<p12>	mnc
<p13>	lac
<p14>	ci
<p15>	uraId
<p16>	cellParameterId
<p17>	arfcn
<p18>	t3212
<p19>	t3312
<p20>	hcsUsed
<p21>	attDetAllowed
<p22>	csDrxCycleLen
<p23>	psDrxCycleLen
<p24>	utranDrxCycleLen
<p25>	HSDPASupport
<p26>	HSUPASupport
IfueOpStatusPresent is TRUE, the following 27 items will be printed:	
<p27>	rrcState
<p28>	numLinks
<p29>	srncId
<p30>	sRnti
<p31>	algPresent
<p32>	cipherAlg
<p33>	cipherOn
<p34>	algPresent
<p35>	cipherAlg
<p36>	cipherOn
<p37>	HSDPAAActive
<p38>	HSUPAAActive
<p39>	MccLastRegisteredNetwork
<p40>	MncLastRegisteredNetwork
<p41>	TMSI
<p42>	PTMSI
<p43>	IsSingleMmRejectCause
<p44>	IsSingleGmmRejectCause
<p45>	MMRejectCause
<p46>	GMMRejectCause
<p47>	mmState
<p48>	gmmState
<p49>	gprsReadyState
<p50>	readyTimerValueInSecs
<p51>	NumActivePDPCContext

<p52>	ULThroughput
<p53>	DLThroughput

5.33 (URC)UMTSEngineering European frequency information: +EEMUMTSINTRA

exhibitUMTSSame frequency in engineering mode (intrafrequency)information.

Syntax rules:

URC
+ EEMUMTSINTRA:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>

Parameter definition:

parameter	explain
<p1>	index of ENGMODEINTRAFREQ
<p2>	pccpchRSCP
<p3>	utraRssi
<p4>	sRxLev
<p5>	mcc
<p6>	mnc
<p7>	lac
<p8>	ci
<p9>	arfcn
<p10>	cellParameterId

5.34 (URC)UMTSInter-frequency information in engineering mode: +EEMUMTSINTER

showUMTSInter-frequency communication in engineering mode (inter frequency)information.

Syntax rules:

URC
+ EEMUMTSINTER:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>

Parameter definition:

parameter	explain
<p1>	index of ENGMODEINTERFREQ
<p2>	pccpchRSCP
<p3>	utraRssi
<p4>	sRxLev
<p5>	mcc
<p6>	mnc
<p7>	lac

<p8>	ci
<p9>	arfcn
<p10>	cellParameterId

5.35 (URC)UMTSInformation between wireless access technologies in engineering mode: +EEMUMTSINTERRAT

exhibitUMTSWireless access technology in engineering mode (Inter RAT)information.

Syntax rules:

URC
+ EEMUMTSINTERRAT:<p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>,<p11>

Parameter definition:

parameter	explain
<p1>	index of ENGMODE INTERRAT
<p2>	gsmRssi
<p3>	rxLev
<p4>	C1
<p5>	C2
<p6>	mcc
<p7>	mnc
<p8>	lac
<p9>	ci
<p10>	arfcn
<p11>	bsic

5.36 (URC)LTEService community information under engineering mode: +EEMLTESVC

Syntax rules:

URC
<p>Air720series:</p> <p>+ EEMLTESVC: <mcc>,<length of mnc>,<mnc>,<tac>,<PCI>,<dIEuarfcn>,<ulEuarfcn>,<band>,<dIBandwidth>,<ci>,<transMode>,<rsrp>,<rsrq>,<sinr> , <MainRsrp>,<DiversityRsrp>,<MainRsrq>,<DiversityRsrq>,<rssi>,<cqi>,<currPuschTxPower>,<rankIndex>,<ErrorModeState>,<emmState>,<serviceState>,<IsSingleEmmRejectCause>,<EMMRejectCause>,<MmeGroupId>,<MmeCode>,<mTmsi></p> <p>Air720Sseries:</p> <p>+ EEMLTESVC:mcc, lenofmnc, mnc, tac, phyCellId, dIEuArfcn, ulEuArfcn, band, dIBandwidth, cellId, transMode, rsrp, rsrq, sinr, mainRsrp, errcModeState, emmState, serviceState, IsSingleEmmRejectCause, EMMRejectCause, mme GroupId, mmeCode, mTmsi, cellId, subFrameAssignType, specialSubframePatterns, transMode, mainRsrp, diversit yRsrp, mainRsrq, diversityRsrq, rssi, cqi, pathLoss, tb0DITpt, tb1DITpt, tb0DIPeakTpt, tb1DIPeakTpt, tb0UIPeakTpt, tb1UIPeakTpt, dlThroughPut, dlPeakThroughPut, averDIPRB, averCQITb0, averCQITb1, rankIndex, grantTotal, ul</p>

ThroughPut, ulPeakThroughPut, currPuschTxPower, averUIPRB, dlBler, ulBler

Parameter definition:

parameter	explain
<mcc>	Mobile Country Code
<length of mnc>	Length of mnc
<mnc>	Mobile Network Code
<tac>	Tracking area code
PCI	Physical Cell Identifier
<dlEuarfcn>	downlink arfcn
<ulEuarfcn>	uplink arfcn
<band>	band
<dlBandwidth>	dlBandwidth
<ci>	cellId
<transMode>	transMode
<rsrp>	rsrp
<rsrq>	rsrq
<sinr>	sinr
<MainRsrp>	Rsrp in main antenna
<DiversityRsrp>	Rsrp in slave antenna
<MainRsrq>	Rsrq in main antenna
<DiversityRsrq>	Rsrq in slave antenna
<rssi>	rssi
<cqi>	cqi
<currPuschTxPower>	current Pusch Tx Power in dBm
<rankIndex>	rankIndex
<ErrorModeState>	ErrorModeState
<emmState>	emmState
<serviceState>	serviceState
<IsSingleEmmRejectCause>	IsSingleEmmRejectCause
<EMMRejectCause>	EMMRejectCause
<MmeGroupId>	MmeGroupId
<MmeCode>	MmeCode
<mTmsi>	mTmsi

5.37 (URC)LTECo-frequency information in engineering mode: +EEMLTEINTRA

exhibitLTESame frequency in engineering mode (intrafrequency)information.

Syntax rules:

URC

+ EEMLTEINTRA: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>

Parameter definition:

parameter	explain
<p1>	index of ENGMODE INTRAFREQ
<p2>	phyCellId
<p3>	euArfcn
<p4>	rsrp
<p5>	rsrq
<p6>	mcc
<p7>	mnc
<p8>	tac
<p9>	cellId

5.38 (URC)LTEInter-frequency information in engineering mode: +EEMLTEINTER

exhibitLTEInter-frequency communication in engineering mode (inter frequency)information.

Syntax rules:

URC
+ EEMLTEINTER: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>

Parameter definition:

parameter	explain
<p1>	index of ENGMODE INTERFREQ
<p2>	phyCellId
<p3>	euArfcn
<p4>	rsrp
<p5>	rsrq
<p6>	mcc
<p7>	mnc
<p8>	tac
<p9>	cellId

5.39 (URC)LTEInformation between wireless access technologies in engineering mode: +EEMLTEINTERRAT

exhibitLTEWireless access technology in engineering mode (Inter RAT)information.

Syntax rules:

URC
UMTS: + EEMLTEINTERRAT: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>,<p10>
GSM:

+ EEMLTEINTERRAT: <p1>,<p2>,<p3>,<p4>,<p5>,<p6>,<p7>,<p8>,<p9>

Parameter definition:

parameter	explain
<p1>	networktype (0: GSM, 1: UMTS)
<p2>	number of INTERRAT
<p3>	mcc
<p4>	mnc
<p5>	lac
<p6>	ci
<p7>	arfcn (GSM) / uarfcn (UMTS)
<p8>	bsic(GSM)/psc_cellParameterId(UMTS)
<p9>	rssi (GSM) / rscp (UMTS)
<p10>	cpichEcN0(UMTS)

5.40 (URC)Event control indicator: +CIEV

Note: thisURCOnly applicable to the Union of Universes4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4Module (Air720/ Air720G/ Air720H/ Air720D/ Air720S).

Indicates the progress of events related to battery, calls, network, and text messages.

Syntax rules:

URC	Explanation
<cc>	
+ CIEV: "SOUNDER",1	audio on
+ CIEV: "SOUNDER",0	audio off
+ CIEV: "CALL",1	call on
+ CIEV: "CALL",0	call off
<nw>	
+ CIEV: service,1	Register network function
+ CIEV: service,0	Network registration failed
+ CIEV: roam,1	In roaming state
+ CIEV: roam,0	Not roaming
<sms>	
+ CIEV: "MESSAGE",1	Received a text message
+ CIEV: "MMS",1	Received an MMS
+ CIEV: "SMSFULL",1	SMS storage is full, no new messages are waiting.
+ CIEV: "SMSFULL",2	SMS storage is full, new SMS messages are waiting.

5.41 (URC)Network Service Type Indicator

Note: thisURCOnly applicable to the Union of Universes4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4Module (Air720/ Air720G/ Air720H/ Air720D/ Air720S).

URC	Explanation
+ E_UTRAN Service	Indicates entry4G LTENetwork services
+ GSM Service	Prompt to enter2G GSMNetwork services

6Call control and audio-related commands

Note: The content of this chapter applies only to the combined universe.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4Module (Air720/ Air720G/ Air720H/ Air720D/ Air720S).

6.1OpenVoLTEFunction:AT+SETVOLTE

For only supports4GofCAT1Module (Air720UG,Air724UGFor example, this command is required to open it.VoLTEOnly with this function can voice calls be made. Air720UH Module support4Gand2G,and2GVoice calls are supported, so it doesn't need to be turned on.VoLTEThen you can make voice calls.

Syntax rules:

Command type	grammar	return
Set line command	AT+SETVOLTE=<setting>	OK
Query command	AT+SETVOLTE?	+ SETVOLTE: <setting> OK
Test command	AT+SETVOLTE=?	+ SETVOLTE: 0,1 OK

Parameter definition:

parameter	definition	Value	explain
<setting>	VoLTEFunction switch	0	closureVoLTEFunction
		1	OpenVoLTEFunction, default value

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+SETVOLTE?	
←	+ SETVOLTE: 0 OK	
→	AT+SETVOLTE=1	OpenVoLTEFunction
←	OK	

6.2Initiate a call:ATD

Execute the command to make a voice call; the call number cannot exceed 20 characters.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	ATD<dial string>;	If the command succeeds, it will return: OK

		<p>If the connection is successfully established, the following will be returned:</p> <p>CONNECT</p> <p>If no dial tone is detected dial tone (And when ATX2 or ATX4 hour):</p> <p>NO DIAL TONE</p> <p>If busy (And when ATX3 or ATX4):</p> <p>BUSY</p> <p>The call was disconnected or failed to be established:</p> <p>NO CARRIER</p> <p>If the called party does not answer:</p> <p>NO ANSWER</p>
	ATD<dial string>	<p>If the data call is successful, the following will be returned:</p> <p>CONNECT</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<dial string>	Call number		<p>It consists of the following characters: 0-9, *, #, +, A, B, C</p> <p>Note: dial 112 An emergency call can be established; no further action is required. SIM Card.</p>

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+SETVOLTE=1	Open VoLTE Function
←	OK	Note: For those that only support 4G of CAT1 Module (Air720UG, Air724UG) In this regard, it is necessary to use AT+SETVOLTE=1 Open command VoLTE Only with this function can voice calls be made. Air720UH Module support 4G and 2G Therefore, it is not necessary to open it. VoLTE You can then make voice calls.
→	ATD131623***98;	Voice call number 131623***98 (***The actual numbers have been hidden to protect privacy. Please enter the correct numbers during the actual operation.)
←	OK CONNECT	The other party answered the phone
→	AT+CHUP	The module actively hangs up the call.
←	OK	return OK

6.3 Answer the call: ATA

There was only one incoming call. RING) Enter this command to answer the call. When there are more calls, please use ...AT+CHLD Command to answer new incoming calls.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	ATA	OK

--	--	--

For example:

Command (→) / Return (←)	Example	Explanation and clarification
← (URC)	RING	haveRINGThe call was reported, indicating that a phone call had been received. Note:RINGIt isURCOrder(Unsolicited Result Code)
→	ATA	Module answers incoming calls
←	OK	returnOKThis means the call was successfully answered.

6.4Hang up the call:ATH

During a call, entering an execution command will disconnect all calls, including the current one.active), waiting for a call (waiting) and hang up the call (holding).

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	ATH	OK

For example:

Command (→) / Return (←)	Example	Explanation and clarification
← (URC)	RING	haveRINGThe call was reported, indicating that a phone call had been received.
→	ATA	Module answers incoming calls
←	OK	Establish a call
→	ATH	Hang up the call
←	OK	OK

6.5Hang up the call:AT+CHUP

During a call, entering an execution command will disconnect all calls, including the current one.active), waiting for a call (waiting) and hang up the call (holdingFunction andATHsame.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CHUP	OK

6.6List all current calls:AT+CLCC

Syntax rules:

Command type	grammar	return
Execute command	AT+CLCC	[+CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha> >]][<CR><LF>+CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>]] [...]]

Test command	AT+CLCC=?	OK
--------------	-----------	----

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<idx>	Call identificationid	-	Integer type; please refer to 3GPP TS22.030The Middle4.5.5.1As described in the section, this parameter can be added...CHLDUsed in commands
<dir>	Call direction	0	Mobile-initiated calls (MOcall)
		1	Mobile-terminated calls (MTcall)
<stat>	Call status	0	active
		1	held
		2	dialing(MOcall)
		3	alerting(MOcall)
		4	incoming(MTcall)
		5	waiting(MTcall)
		7	Released (by network)
<mode>	Bearer/Telecommunications Services	0	voice
		1	data
		2	fax
<empty>	Is this a multi-party call?	0	Not belonging to
		1	belong
<number>	other party's number	-	String types must be enclosed in double quotes. Phone numbers must conform to the <format.type>definition
<type>	For call number types, please refer to [link/reference].3GPP TS 24008 10.5.4.7part	129	Unknown type
		145	International Number
		161	domestic number
		177	Special network number
<alpha>	<number>Name in the corresponding phone book	-	character type

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	ATD10086;	Voice call number10086
←	OK	
→	AT+CLCC	Check the call status before the other party answers the call.
←	+ CLCC: 1,0,2,0,0,"10086",129,""	<stat>=2This indicates that the call is in progress and the other party has not yet answered.
	OK	
←	CONNECT	The other party answered the call
→	AT+CLCC	Now check the call status again.
←	+ CLCC: 1,0,0,0,0,"10086",129,""	<stat>= 0Indicates the call is connected and remains active.
	OK	
→	AT+CHUP	Hang up the phone
←	OK	

→	AT+CLCC	Display call status
←	OK	Only oneOKThis indicates that there was no call.

6.7Set caller ID display:AT+CLIP

Syntax rules:

Command type	grammar	return
Setting commands	AT+CLIP=<n>	OK
Query command	AT+CLIP?	+ CLIP:<n>,<m> OK
Test command	AT+CLIP=?	+ CLIP:<n>{List of possible values} OK
URCReport	+ CLIP: <number>,<type> [,<subaddr>,<satype>,<alphaId>,<CLInvalidity>]	whenAT+CLIP=1At that time, thisURCThe automatic reporting function will be enabled. In this case, any incoming calls will be reported.URC

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	URCReport whether to enable	<u>0</u>	Disable
		1	Enable
<m>	Show userCLIPServices in the network state	0	Not providedCLIPbusiness
		1	supplyCLIPbusiness
		2	Unknown (e.g., no network connection)
<number>	Telephone number, type from <type>definition		
<type>	Phone number type	129	ISDN/Telephone numbering system design, country/international unknown
		145	ISDN/Telephone numbering system design, international numbers
		161	ISDN/Telephone numbering system design, country code
		128~255	Other values can be viewedGSM 04.08chapter10.5.4.7
<subaddr>	Sub-address, string type		
<satype>	Word address type		Depend onGSM 04.08chapter10.5.4.8definition
<alphaId>	The phone number name defined in the phone book		The encoding method is +CSCSdefinition
<CLInvalidity>	Caller ID display (CLI:Calling Line IndicationAvailability)	0	efficient
		1	Caller disabledCLI
		2	Due to inter-network connectivity issues or limitations of the originating network,CLIUnavailable
		3	Because the caller is using a payphone,CLIUnavailable
		4	For other reasons,CLIUnavailable

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CLIP?	Check the current caller ID status

←	+ CLIP: 0,1 OK	<n>=0This indicates that it is not enabled.URCReport <m>=1This indicates that the network has provided the user with caller ID display functionality.
← (URC)	RING	At this time, incoming calls will not display the caller ID.
→	AT+CHUP	
←	OK	
→	AT+CLIP=1	Set up caller IDURCReport to open
←	OK	
→	AT+CLIP?	
←	+ CLIP: 1,1 OK	<n>=1, indicating that it is enabledURCReport
← (URC)	RING + CLIP: "1360*****8",128,,,"TEST",0	If a call comes in at this time, it will be transmitted via +CLIPthisURCTo display the caller ID

6.8Call hold and multi-party calls:AT+CHLD

Using this command, you can controlTAAdditional services: Call hold and multi-party calling. Calls can be held, resumed, released, and joined to multi-party calls.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CHLD=<n>	OK
Test command	AT+CHLD=?	+ CHLD: (<n>{List of possible values}) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Integer	0	Release all held calls or set the user to busy for pending calls.UDUB)condition
		1	If there is a current call, release all current calls and answer another call that is held or waiting.
		1X	Release a specific callX
		2	If there is a current call, hold all current calls and answer another call that is held or waiting.
		2X	Keep except for callsXAll current calls except
		3	Keep one (heldThe call was added to the active (activeDuring a call (establishing a multi-party call)

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CCWA=1,1	
←	OK	
→	ATD137*****98;	call137*****98
←	OK	
← (URC)	CONNECT	The other party answers, the call is established, and the two parties are in conversation.

← (URC)	+ CCWA: "13601*****97",129,1	Another phone call came in, and at this moment...URCReport
→	AT+CHLD=2	HOLDFirst Route (+)CLCCmiddleid=1)Connect the second line (+CLCCmiddleid=2)
←	OK	
→	AT+CLCC	Query all currently active calls
←	+ CLCC: 1,0,1,0,0,"137*****98",129 + CLCC: 2,1,0,0,0,"13601*****97",128,"TEST" OK	The third parameter of the first path is <stat>=1This indicates that the second route is being maintained.stat=0This indicates that it is currently in an active state.
→	AT+CHLD=21	Switch back to the first lane
←	OK	
→	AT+CHLD=3	Establish a three-way call (provided that:SIM(This function has been activated on the card)
←	OK	
→	AT+CHLD=11	Release the first road
←	OK	

6.9produceDTMFsound:AT+VTS

DTMF(Double Tone Multiple FrequencyDual-tone multi-frequency (DTMF) dialers are used to dial extension numbers or access automated voice services after a phone call has been established.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+VTS=<dtmf>or AT+VTS=<dtmf>[,<duration>]	OK
Test command	AT+VTS=?	+ VTS:(<dtmf>(List of possible values), (<duration>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<dtmf>	singleDTMF		singleASCIICharacters, without double quotes "". The range is as follows:0-9, #,*, A,B,C,D.DTMF Duration is defined as follows: ifAT+VTS=<dtmf>The duration is then determined by the command +VTDTto set; if AT+VTS=<dtmf>,<duration>The duration is then passed through <duration>definition
<duration>	Duration	1~10	toneThe duration, in1/10Seconds

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+VTS=?	
←	+ VTS: (0-9,*,#,A,B,C,D),(1-10) OK	

The following example shows how to dial the switchboard and then use...DTMFdial extension109:

→	ATD10086;	Call10086
←	OK	Connect
	CONNECT	
→	AT+VTS=2	Select the automatic voice service2Serve
←	OK	

6.10 DTMF TONEcycle:AT+VTD

Syntax rules:

Command type	grammar	return
Setting commands	AT+VTD=<n>	OK
Query command	AT+VTD?	+ VTD:<n> OK
Test command	AT+VTD=?	+ VTD: (<n>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Tonelength	1~10	by1/10in secondstoneDuration

6.11 TTS(Text to Speech)Function:AT+CTTS

Syntax rules:

Command type	grammar	return
Setting commands	AT+CTTS=<mode>[,<text>][, <pcm>]	OK
Query command	AT+CTTS?	+ CTTS: <status> OK
Test command	AT+CTTS=?	OK
URC	whenTTSAfter playback ends, the following will appear.URCReport to: + CTTS:0	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	TTSWork mode	0	Stop playingTTS

		1	PlayTTS,text>useUCS2coding
		2	PlayTTS,text>useGBKEncoding (Chinese) andASCIIEncoding (Numbers)
<text>	TTS text		Chinese characters and numbers, maximum length2047byte
<status>	TTSWork status	0	TTSNon-playing state
		1	TTSPlayback status

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CTTS=2,"123Welcome!	Play numbers and Chinese characters. Note: English audio is currently unavailable.text>The English pronunciation in Chinese is not based on words, but on individual letters.
←	OK	
← (URC)	+ CTTS:0	After playback ends, this will appear.URCReport
→	AT+CTTS=0	This command can also be used to stop playback during the process.
←	OK	

6.12set upTTSPlayback mode:AT+CTTSPARAM

Syntax rules:

Command type	grammar	return
Setting commands	AT+CTTSPARAM=<volume>,<mode> ,<pitch>,<speed>[,<channel>][,<co dec>]	OK
Query command	AT+CTTSPARAM?	+ CTTSPARAM:<volume>,<mode>,<pitch>,<speed>,<channel>,<codec> OK
Test command	AT+CTTSPARAM=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<volume>	TTSPlay volume	0-100	The default value is50
<mode>	TTSPlayback mode range:0-3	<u>0</u>	Automatic number reading: First, read the numbers according to number rules.
		1	The system automatically reads numbers, first by reading the numbers according to telegraph rules.
		2	Read the numbers according to telegraph rules
		3	Read numbers according to number rules
<pitch>	TTSPlay pitch	1-100	The default value is50
<speed>	TTSPlayback speed	1-100	The default value is50
<channel>	TTSPlayback Channel	0	Main passage
		1	auxiliary channel

6.13 Audio recording: AT+CAUDREC

This command can be used locally. microphoneRecording, and voice calls (voice callRecording. Capable of local recording. micThe condition for recording is that no other audio applications are currently in use, for example...audio playas well asvoice callThis command can only be used during a voice call.voice callRecording.

If no recording time is specifiedtime>Then the recording continues until...AT+CAUDREC=2Stop recording.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CAUDREC=<oper>[,<filename>,<type>,<quality>[,time]]	OK
Query command	AT+CAUDREC?	+ CAUDREC: <state> OK
Test command	AT+CAUDREC=?	+ CAUDREC: (list of supported <oper>s), <filename>,(list of supported <type>s), (list of supported <quality>s),<time> OK
URCReport	1)AT+CAUDRECStart recording, withtimeWhen configuring parameters, the module reports the result after recording.CAUDREC: 1,<duration> 2)AT+CAUDRECStart recording, whether you bring it or not.timeParameters, if manualAT+CAUDREC=2Once recording ends, report it. + CAUDREC: 2,<duration>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<oper>	Recording Operation	1	Start recording
		2	Stop recording
<filename>	Recording file name		Strings must be enclosed in double quotes. Case sensitive. Only supportsWAVorAMRThe suffix format is case-insensitive. However, it must include the suffix.wav .WAV .amr .AMRFor example, as a suffix: voice.wav song.AMR
<type>	Audio file type	1	Microphone recording
		2	Call recording
<quality>	Audio file quality	0	low quality
		1	medium quality
		2	high quality
		3	Final quality
<time>	Recording time, unit:100ms		The default value is0 When <time>≠0The recording time is <time>When <time>=0Recording time untilAT+CAUDREC=2Recording will stop when the recording stops.
<state>	Recording status	0	Not recording
		1	Recording status
<duration>	Recording duration		Unit: milliseconds

6.14 Audio file playback: AT+CAUDPLAY

Syntax rules:

Command type	grammar	return
Setting commands	AT+CAUDPLAY=<mode>[,<filename>[,<type>]]	OK
Query command	AT+CAUDPLAY?	+ CAUDPLAY: <mode> OK
Test command	AT+CAUDPLAY=?	+ CAUDPLAY: (<mode>(List of possible value ranges), <filename> OK
URCReport	<p>1) AT+CAUDPLAY=1,<filename>Playback begins, and the module automatically ends playback with a + message.CAUDPLAY: 1,<duration> // <duration>Playback duration</p> <p>2) AT+CAUDPLAY=2End playback, prompt +CAUDPLAY: 2,<duration> //If playback was not paused during the process, then <duration>This represents the duration from the start of playback to the end of playback; if paused, then <duration>The duration from the last resumed playback to the last stopped playback.</p> <p>3) AT+CAUDPLAY=3Pause playback, prompt +CAUDPLAY: 3,<duration> //If playback was not paused during the process, then <duration>This represents the duration from the start of playback to the pause; if playback has been paused, then <duration>The duration from the last resumed playback to the paused playback.</p> <p>4) AT+CAUDPLAY=4Resume playback; the module will automatically end playback and display a + message.CAUDPLAY: 4,<duration> // <duration>The duration from when playback resumes to when playback ends.</p>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Usage Mode	1	Start playing (start)
		2	Stop playing (stop)
		3	Pause playback (pause)
		4	Resume playback (resume)
<filename>	Audio file name		AMR, WAV, MP3Format. A file extension is required; support is provided.8KSampled audio data
<duration>	Playback duration		Unit: milliseconds
<type>	Playback mode	1	local audio path (Default value:1)
		2	voice call path
Note:<type>Playback mode only in8910V301826Versions 1 and 2019 are supported.			

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+FSCREATE="111.mp3"	Create audio file
←	OK	
→	AT+FSWRITE="111.mp3",0,6314,20	Enter the audio file. (Length here)6314This is just an example; please refer to the actual situation.
←	>	Enter the audio file content here (in binary format).16(Base system)
←	OK	
→	AT+CAUDPLAY=1,"111.mp3"	Play audio files Note: Audio file names need to include a file extension.
←	OK	
→	AT+CAUDPLAY=3	Pause playback

←	OK	
→	AT+CAUDPLAY=4	Resume playback
←	OK	
→	AT+CAUDPLAY=2	Stop playing
←	OK	
Play an audio file to the other end during the call:		
→	AT+FSCREATE="111.mp3"	Create audio file
←	OK	
→	AT+FSWRITE="111.mp3",0,6314,20	Enter the audio file. (Length here)6314This is just an example; please refer to the actual situation.
←	>	Enter the audio file content here (in binary format).16(Base system)
←	OK	
→	AT+SETVOLTE=1	OpenVoLTEFunction
←	OK	Note: Only for modules that support 4G VoLTE (Air720UG, Air724UG). In this regard, it is necessary to use AT+SETVOLTE=1 Open command. Only with this function can voice calls be made. Air720UH module supports 4G and 2G. Therefore, it is not necessary to open it. VoLTE You can then make voice calls.
→	ATD131623***98;	Voice call number 131623***98 (***The actual numbers have been hidden to protect privacy. Please enter the correct numbers during the actual operation.)
←	OK CONNECT	The other party answered the phone
→	AT+CAUDPLAY=1,"111.mp3",2	Play audio files Note: Audio file names need to include a file extension.
←	OK	The other end of the call heard the playback 111.mp3 audio files
→	AT+CHUP	The module actively hangs up the call.
←	OK	return OK

6.15 Voice channel switching: AT+AUDCH

Syntax rules:

Command type	grammar	return
Setting commands	AT+AUDCH=<out_channel>,<in_channel>	OK
Query command	AT+AUDCH?	+ AUDCH: <out_channel>,<in_channel> OK
Test command	AT+AUDCH=?	+ AUDCH: (range of <out_channel>s,list of <in_channel>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<out_channel>	Audio output channel	0	aisle0,earpiece(receiver)
		1	aisle1,earphone(headphone)
		2	aisle2,trumpet(speaker)
<in_channel>	Audio input channel	0	main mic
		1	auxiliary mic
		3	headphone mic left
		4	Headphone mic right
Note:<in_channel>Input channel value3and4Represents the differential input on the corresponding hardware.micTwo feet, using headphonesmicWhen using3,4 Channel; the headphone jack on the development board requires a four-segment standard headphone.			

6.16Call volume control:AT+CLVL

Syntax rules:

Command type	grammar	return
Setting commands	AT+CLVL=<level>	OK
Query command	AT+CLVL?	+ CLVL:<level>
		OK
Test command	AT+CLVL=?	+ CLVL: (<level>)(range of values)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<level>	audio channel	0~100	0The sound is at its lowest.100Maximum volume. Default value.60

6.17Local audio playback volume control:AT+CRSL

This command affects the volume of the device's local audio playback, including...CTTSand

CAUDPLAYSyntax rules:

Command type	grammar	return
Setting commands	AT+CRSL=<level>	OK
Query command	AT+CRSL?	+ CRSL:<level>
		OK
Test command	AT+CRSL=?	+ CRSL: (<level>)(range of values)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<level>	audio channel	0~100	0The sound is at its lowest.100Maximum volume. Default value.60

6.18Audio amplifier type setting instructions:AT+SPKPA

This command sets the audio amplifier type.

Syntax rules:

Command type	grammar	return
Setting commands	AT+SPKPA=<class>	OK
Query command	AT+SPKPA?	+ SPKPA:<class> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<class>	Audio amplifier type	0	CLASSAB
		<u>1</u>	CLASSDdefault value
		2	CLASSK

6.19audioMICGain setting command:AT+CACCP

This command sets the audio microphone gain.

Note: Audio parameters for voice services must be set during the call.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CACCP=<mode>,<path>,<ctrl>,<gainHex>	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Equipment application mode	0	Voice Call NB
		2	Music Record
		5	Voice Call WB
<path>	aisle	0	HandSet
		1	HandFree
		2	Headset4P
		3	Headset3P
<ctrl>	Gain type	0	Ingain
		6	Recordgain
<gainHex>	Gain value		It consists of algorithmic gain and analog gain: Algorithm gain level0-7Analog gain0-15Little-endian encoding. For example: Set the algorithm gain to7The analog gain is14,butgainHexfor"07000E00

For example:

Command (→) /Return (←)	Example	Explanation and clarification
Call settingsMICGain:		
→	AT+SETVOLTE=1	OpenVoLTEFunction
←	OK	VoLTEThe call wasVoice Call WBcall
→	ATD131623***98;	Voice call number131623***98(***)The actual numbers have been hidden to protect privacy. Please enter the correct numbers during the actual operation.)
←	OK CONNECT	The other party answered the phone
→	AT+CACCP=5,1,0,"07000f00"	Set call modeMICGain, algorithm gain level is7The analog gain is15
←	+ CACCP: OK	returnOKSetup successful
→	AT+CHUP	The module actively hangs up the call.
←	OK	returnOK
Recording settingsMICGain:		
→	AT+CACCP=2,1,6,"07000f00"	Set recording modeMICGain, algorithm gain level is7The analog gain is15
←	+ CACCP: OK	returnOKSetup successful
→	AT+CAUDREC=1,1.amr,1,2,50	Use the recording command to record.
←	OK	returnOK
← (URC)	+ CAUDREC: 1,5000	Report recording status

6.20IMSRegistration status instructions:AT+CIREG

Note: This command applies only to Hezhou.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4 Module (Air720/Air720G/Air720H/Air720D/Air720S).

Syntax rules:

Command type	grammar	return
Set line command	AT+CIREG=<type>	OK
Query command	AT+CIREG?	+ CIREG: <type>,<reg_info>[,<ext_info>] OK
Test command	AT+CIREG=?	+ CIREG: (0-2) OK

Parameter definition:

parameter	definition	Value	explain
<type>	IMSRegistration information reporting status	0	Disable reporting
		<u>1</u>	Enable reporting (including parameters)reg_info)
		<u>2</u>	Enable reporting (including parameters)reg_infoandext_info)
<reg_info>	IMSRegistration status	<u>0</u>	Unregistered

		<u>1</u>	Registered
<ext_info>	IMSability	<u>1 ~ FFFFFFFF</u>	<p>whenIMSThis parameter does not exist when the registration status is "unregistered". 1:according toMMTELconductRTPFor voice transmission, see 3GPP TS 24.173[87]If the terminal cannot pass...PSThis function will not be displayed if you are speaking. Please refer to [link/reference].3GPP TS 24.229[89]. 2:according toMMTELbased onRTPFor text transmission, see3GPP TS 24.173[87].</p> <p>4:useIMSFor SMS functionality, see [link/reference].3GPP TS 24.341[101].</p> <p>8:according toMMTELbased onRTPFor video transmission, see [link/reference]. 3GPP TS 24.173[87].</p> <p>Note:ext_info>=5It means that it can be usedMMTELofRTP Voice transmission can also be usedIMSFunctionSMS.</p>

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CIREG=1	
←	OK	
→	AT+CIREG?	QueryIMSRegistration status
←	+ CREG: 1,1,5 OK	

6.21 (URC)IMSRegistration status information: +CIREGU

Note: This command applies only to Hezhou.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4 Module (Air720/Air720G/Air720H/Air720D/Air720S).

whenIMS When registration information changes, use AT+CIREG set up Command control does not request result codes + CIREGU: <reg_info>[, <ext_info>] The display.

Syntax rules:

URC
+CIREGU: <reg_info>[,<ext_info>]

Parameter definition:

parameter	explain
<reg_info>	IMSRegistration status
<ext_info>	pIMSability

7 Short message command

7.1 PDU Introduction to SMS Encoding Formats

Octet 1								Octet 2								Octet sequence
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	
SCA Length = n								1	TON			NPI				1 ~ 2
SCA																3 ~ (1+n)
RP	UDHI	SRR	VPF	R D	MTI	TP-MR										(2+n)~ (3+n)
DA – length = m								1	TON			NPI				(4+n)~(5+n)
Destination Address																(6+n) ~ (6 + n + (m+1) / 2)
PID								DCS								(7 + n + (m+1) / 2) ~ (8 + n + (m+1) / 2)
VP (Valid Period) (length = s , s= 1 octet or 7 octet according to VPF value)																(8 + n + (m+1) / 2)~ (8 + s + n + (m+1) / 2)
UDL (User Data Length) = x								UD (user data)								(9 + s + n + (m+1) / 2) ~ (10 + x + s + n + (m+1) / 2)
UD (user data)																

chart1:MO Short message PDU Format

Octet 1								Octet 2								Octet sequence	
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0		
SCA Length = n								1	TON			NPI			1 ~ 2		
SCA (Service Center Address)															3 ~ (1+n)		
R P	UDHI		SRI					M MS	MTI		OA length = m					(2+n)~ (3+n)	
1	TON					NPI			OA (Originating Address)							(4+n)~(5+n)	
OA (Originating Address)															(6+n) ~ (5 + n + (m+1) / 2)		
PID								DCS							(6 + n + (m+1) / 2) ~ (7 + n + (m+1) / 2)		
SCTS (Service Center Time Stamp)															(8 + n + (m+1) / 2)~ (14 + s + n + (m+1) / 2)		
UDL (User Data Length) = x								UD (user data)							(15 + x + n + (m+1) / 2) ~(16 + x + n + (m+1) / 2)		
UD (user data)																	

chart2:MTShort messagePDUFormat

Parameter definition:

parameter	definition	Explanation and clarification
MO	Mobile Originated	Module sent
MT	Mobile Terminated	Module received
SCA Length		Length of SMS center address
TON	Type of Number	Number type: 000:unknown 001:internationality 010:domestic 111: Reserved for expansion
NPI	Numbering Plan Identifier	Number verification: 0000:unknown 0001:ISDN/telephone number 1111: Reserved for expansion
SCA	Short Message Center Address	SMS center address
MTI	Message Type Identifier	Information type: Bit Explanation 11 Reserved 10 SMS-STATUS REPORT (SC => MS) SMS- 01 SUBMIT (MS => SC) 00 SMS-DELIVER (SC => MS)
RD	Reject Duplicate	Refuse duplicate text messages
VPF	Validity Period Format	Validity Format

SRR	Status Report Request	Status report request, inMOSetting in SMS
SRI	Status Report Indication	The status report indicates that,MTThe text message instructed thatMTIs the SMS a status report?
UDHI	User Data Header Indicator	User data header indication
RP	Reply Path	Reply path

7.2Select SMS service:AT+CSMS

Syntax rules:

Command type	grammar	return
Setting commands	AT+CSMS=<service>	+ CSMS:<mt>,<mo>,<bm> OK
Query command	AT+CSMS?	+ CSMS:<service>,<mt>,<mo>,<bm> OK
Test command	AT+CSMS=?	+ CSMS:(<service>)(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<service>	Short Message Service Level	0	GSM03.40and03.41 (SMS)ofATInstruction syntax andGSM07.05 Phase 2In 4.7.0Version compatibility; supports commands that do not require new instruction syntax.Phase 2+Features (e.g., usage) Phase 2+Message routing in the new encoding scheme)
		1	GSM03.40and03.41 (SMS)ofATInstruction syntax andGSM07.05 Phase 2+(Version compatibility)
		128	pduMode operation is forward compatible withphase2Inconsistent versions. At this point, it will be considered a text message. pdu It does not include the SMS center number (currently not supported).
<mt>	SMS-MO(Send text message)	0	Not supported
		1	support
<mo>	SMS-MT(Receive text message)	0	Not supported
		1	support
<bm>	Community broadcast message	0	Not supported
		1	support

7.3Short message priority storage area selection:AT+CPMS

This command allows you to configure the memory used for read, store, and other operations, including <mem1>, <mem2>and <mem3>.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPMS=<mem1>[,<mem2>[,	+ CPMS:<used1>,<total1>,<used2>,<total2>,<used3>,

	<mem3>]]	<total3> OK
Query command	AT+CPMS?	+ CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2> > , <mem3>,<used3>,<total3> OK
Test command	AT+CPMS=?	+ CPMS:(<mem1>(List of possible values), (<mem2>(List of possible values), (<mem3>(List of possible values) OK

Parameter definition:

!

parameter	definition	Value	Explanation of the possible values
<mem1>	The memory used when reading and deleting messages involves... Down3individualATinstruction:AT+CMGL AT+CMGR AT+CMGD	"SM"	SMRight nowSIMCard
		"ME"	MEFor module
<mem2>	The memory used for writing, storing, and sending messages involves and below2 individualATinstruction:AT+CMSSand AT+CMGW	"SM"	SMRight nowSIMCard
		"ME"	MEFor module
<mem3>	If not establishedTEThe route will then receive the message. Information is stored in this memory	"SM"	SMRight nowSIMCard
		"ME"	MEFor module
<used1><used2><used3>	<mem1,2,3>The number of messages currently stored in the middle	-	Integer
<total1><total2><total3>	<mem1,2,3>Total number of messages that can be stored	-	Integer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPMS=?	
←	+ CPMS: ("SM", "ME"),("SM", "ME"),("SM", "ME") OK	
→	AT+CPMS?	Query the current preferred storage area type
←	+ CPMS: "SM",8,50,"SM",8,50,"SM",8,50 OK	Note: Currently only "" is supportedSMStorage type. Please use: AT+CPMS="SM", "SM", "SM" Set the SMS storage type.

7.4Short Message Center Address:AT+CSCA

This instruction applies toPDUFormat andTEXTFormat, using setting commands, can update levelsSMSC (Short Message Service Center)Address. This address allows the mobile terminal to be sent.SMS,TEXTIn this mode, this setting can be used for both send and write commands;PDUIn this mode, sending and setting commands can also use this setting, but only if...PDUEncodedSMSCAddress length equals0It must be noted here that although users can set the service center address for SMS messages, they cannot do so arbitrarily; otherwise, the SMS messages will not be sent. Therefore, it is essential to understand this before sending an SMS message.SIMThe address of the SMS service center to which the card belongs.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CSCA=<sca>[,<tosca>]	OK
Query command	AT+CSCA?	+ CSCA:<sca>,<tosca> OK
Test command	AT+CSCA=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<sca>	SMS center address (Short Message Center Address)	-	Character type;BCDNumber (orGSM(Default alphabetic characters) need to be converted to characters; the format is determined by <tosca>Specify
<tosca>	SMS center address format (Type of sca)	-	8Bit-integer type (please refer to < for default value>)toda> 129 ISDN/The telephone numbering system is designed with the national/international designation unknown. 145 ISDN/Telephone numbering system design, international numbers. 161 ISDN/Telephone numbering system design, country code. 128~255Other values can be viewedGSM 04.08chapter10.5.4.7

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CSCA="+8613010314500",145	For a connectedSIMSIM card SMS center number settings
←	OK	
→	AT+CSCA?	Check the settings for the SMS center number.
←	+ CSCA: "+8613010314500",145 OK	Setup successful

7.5SMS format:AT+CMGF

The setting command is used to specify the format for inputting and sending short messages, that is, to tell...TAThe input and output message format isPDUFormat orTEXTFormat.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CMGF=[<mode>]	OK
Query command	AT+CMGF?	+ CMGF: <mode> OK
Test command	AT+CMGF=?	+ CMGF: (<mode>(List of possible values)

		OK
--	--	----

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Displays message sending, list, read and write commands, and receiving...	<u>0</u>	PDUMode, default value
	The format for proactively reporting received messages	1	TEXTmodel

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CMGF?	Query current mode
←	+ CMGF: 0	The current mode isPDUModel
	OK	

7.6Set up SMSTEXTMode parameters:AT+CSMP

In text mode (i.e.,AT+CMGF=1)When to the network sidesendSMS or SMSStorageWhen in memory, this setting command allows you to select the desired additional parameter values. In addition, the setting command can also be used to set values from...SMSCThe validity period is calculated from the time the message is received (<vp>The range of values is0... 255) or define the absolute time of expiration (<vp>(when it is a string).

Syntax rules:

Command type	grammar	return
Setting commands	AT+CSMP=[<fo>,<vp>,<pid>,<dc>]]]]	OK
Query command	AT+CSMP?	+ CSMP:<fo>,<vp>,<pid>,<dc> OK
Test command	AT+CSMP=?	+ CSMP: (<fo>(List of possible values), (<vp>(List of possible values), (<pid> (List of possible values), (<dc>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values														
<fo>	The first byte of the SMS message (First Octet)	17,21	To <fo>The specific description of the byte is as follows (in words)SMS-SUBMIT(For example)														
		, 33,3	<table border="1"><tr><td>b7</td><td>b6</td><td>b5</td><td>b4 b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>RP</td><td>UDHI</td><td>SRR</td><td>VPF</td><td>RD</td><td colspan="2">MTI</td></tr></table>	b7	b6	b5	b4 b3	b2	b1	b0	RP	UDHI	SRR	VPF	RD	MTI	
		b7	b6	b5	b4 b3	b2	b1	b0									
RP	UDHI	SRR	VPF	RD	MTI												
7,49, 53	MTIMessage type b1=0&b0=0 expressSMS-DELIVER b1=0&b0=1 expressSMS-SUBMIT For other message types, please refer to [link/reference].GSM03.40																
			VPF: Define the format for the validity period of an SMS message b4=1&b3=0:Relative formatAt this timevp>yes1Integer type of bytes b4=1&b3=1:Absolute formatAt this timevp>yes7Integer type of bytes SRR: Status Report RequestConfigure whether SMS status reports are required.														

			<div>UDHI:User Data Header Indicator,instructUser DataDoes the unit have one?</div> <div>header</div> <div>RP:Reply PathReply path RD:Reject Duplicate</div> <div>Refuse duplicate text messages</div>										
<vp>	SMS validity period (Valid Period)		<div>The value is determined by <fo>FieldsVPFDecide:</div> <div>ifVPF=10 (Binary), then <vp>In relative mode, the correspondence between the SMS validity period and the SMS message is as follows:</div> <table><thead><tr><th><vp>value</th><th>Valid Time</th></tr></thead><tbody><tr><td>0-143 (00 to 8F)</td><td>(vp + 1) x5minute</td></tr><tr><td>144-167 (90 to A7)</td><td>12Hours + (vp – 143)x30minute</td></tr><tr><td>168-196 (A8 to C4)</td><td>(vp – 166) x 1sky</td></tr><tr><td>197-255 (C5 to FF)</td><td>(vp – 192) x 1Week</td></tr></tbody></table> <div>ifVPF=11 (Binary), then <vp>For absolute mode, is7A character type of 1 byte, representing the time when the SMS message expires.</div>	<vp>value	Valid Time	0-143 (00 to 8F)	(vp + 1) x5minute	144-167 (90 to A7)	12Hours + (vp – 143)x30minute	168-196 (A8 to C4)	(vp – 166) x 1sky	197-255 (C5 to FF)	(vp – 192) x 1Week
<vp>value	Valid Time												
0-143 (00 to 8F)	(vp + 1) x5minute												
144-167 (90 to A7)	12Hours + (vp – 143)x30minute												
168-196 (A8 to C4)	(vp – 166) x 1sky												
197-255 (C5 to FF)	(vp – 192) x 1Week												
<pid>	TP:Protocol - Identifier	<u>0</u>	<div>Integer type, please refer to the following for details.GSM03.40</div>										
<dc>	SMS content encoding scheme		<div>Integer type, please refer to the following for details.GSM03.38Under normal circumstances:</div> <div>7-bit GSM Default</div> <div>4- 8-bit Data</div> <div>8- UCS2</div>										

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CSMP=17,11,0,0	<p>set upTEXTParameters for sending pattern SMS messages:</p> <p><fo>=17(Default) indicatesMTI=01(binary) =SMS-SUBMIT,and VPF=10(binary) = Relative format <vp>=11, indicating that the valid time is (11+1)x5minutes =1 Hours <dc>=0This indicates that the encoding format is7-bit GSM Default</p>
←	OK	

7.7controlTEXTSMS header information displayed in mode:AT+CSDH

The settings command controls whether to display detailed header information in the result code in text mode.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CSDH=[<show>]	OK
Query command	AT+CSDH?	<p>+ CSDH:<show></p> <p>OK</p>
Test command	AT+CSDH=?	<p>+ CSDH:<show></p> <p>OK</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<show>	Should header information be displayed?	0	forSMS-DELIVERandSMS-SUBMITSMS, not available.CMT, +CMGL, +CMGR The result code displays +CSCAand +CSMPThe parameters set by the command (<sca><tosca><fo>, <vp><pid><dc>)It doesn't display either.length><toda>or <tooa>;for + CMGRIn the instruction result codeSMS-COMMAND< Not displayedpid><mn>, <da><toda><length><cdata>
		1	These values are displayed in the result code.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CSDH?	Check if header information is displayed
←	+ CSDH: 0 OK	The query result was: No relevant header information was displayed.
→	AT+CMGR=8	The query location is8The text message contained the following content:Good!
←	+ CMGR: "REC READ", "+86131*****56", "12/08/08,10:43:04+32" Good! OK	The query results are not displayed. <tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>
→	AT+CNMI=2,2,0,0,0	Set up automatic SMS content reporting toTENo caching (will +CNMIThe second parameter <mt>Set as2 (That's all)
←	OK	
← (URC)	+ CMT: "+86131*****56", "12/08/08,11:09:23+32" Report	Send a content asReportThe SMS message sent to the module is not displaying the reported content.fo><vp><pid>and <dc><sca><tosca>
→	AT+CSDH=1	Settingsshow>=1That is, display header information
←	OK	
→	AT+CMGR=8	Still searching for location8text messages
←	+ CMGR: "REC UNREAD", "+86131*****56", "12/08/08,10:43:04+32",145,17,0,0,"+8613800210500",145,5 Good! OK	The query results show <tooa>,<fo>,<pid>,<dc>,<sca>,<tosca>,<length>
← (URC)	+ CMT: "+86131*****56", "12/08/08,11:05:45+32",145,17,0,0,"+8613800210500",145,7 weather	Send a content asweatherThe SMS message is sent to the module, and the reported content is displayed.fo><vp><pid>and <dc><sca><tosca>

7.8New message notification:AT+CNMI

This instruction is used forPDUFormat andTEXTFormat, whenTEWhen in use (e.g.:DTRThe signal is in "ON(Status), using the settings command, you can configure how new messages are displayed.

Send from the network sideTE.likeTEIn standby state (e.g.:DTRThe signal is in "OFF(Status), the message receiving process should followGSM 03.38According to the regulations.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CNMI=[<mode>,<mt>[,<bm>[,<ds>[,<bfr>]]]]]	OK
Query command	AT+CNMI?	+ CNMI:<mode>,<mt>,<bm>,<ds>,<bfr> OK
Test command	AT+CNMI=?	+ CNMI: (<mode>(List of possible values), (<mt>(List of possible values), (<bm>(List of possible values), (<ds>(List of possible values), (<bfr>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	TAGiveTEpass Text message sending model Mode	0	bufferTAThe non-request result code in; ifTAThe result code buffer is full. The result code indication can be buffered and stored in other storage space or the oldest unrequested result code indication can be discarded and replaced with the newly received indication.
		1	whenTA-TEIf the link between the two is occupied (e.g., in online data mode), discard the result code indication and reject non-requested result codes for newly received messages. Otherwise, forward directly to...TE.
		2	whenTA-TEThe link between them is occupied (e.g., in online data mode), bufferingTAThe non-requested result code; after the link is released, all result codes are sent toTEOtherwise, forward it directly toTE.
		3	existTAIn the case of data mode, use specificTA-TEThe connection technology transmits the result code and data simultaneously.TE.
<mt>	New SMS report way	0	NoSMS-DELIVERInstructions sent toTE
		1	likeSMS-DELIVERStored inME/TAThe storage location is based on the non-requested result code + CMTI: <mem>, <index>To give a hintTE.
		2	SMS-DELIVERMessages (Categories)2Messages and messages located in the message wait indicator group (stored messages) are sent directly toTE. Non-request result codes using the following instructions: + CMT:[<alpha>],<length><CR><LF><pdu> (EnablePDU(mode) or +CMT: <oa>,<alpha>],<scts> ,<tooa>[,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>(Enable TEXTMode. Whether italicized parts are displayed is indicated by +.CSDH(Settings command determine) Note: IFATThe command interface serves as the sole display device.MECategories must be supported0Storage of messages and messages located in the message wait indication group (discarded messages).
		3	By using <mt>=2Defined non-request result code, category3ofSMS-DELIVERMessages can be sent directly toTEThe message display results under other data encoding schemes all follow <mt>=1Definition.

		SMS-DELIVERResult code (+)CMT, +CMTI) and confirmation (+CNMA)Summary of relationships:				
		<div><mt></div>	<div>no class or class</div>	<div>0 or class 1</div> <div>message waiting indication group (discard)</div>	<div>class 2 or</div> <div>message waiting indication group (store)</div>	<div>class 3</div>
		1	+ CMTI	[+CMTI ₁]	+ CMTI	+ CMTI
		2	+ CMT & + CNMA ₃)	+ CMT [& +CNMA ₂]	+ CMTI	+ CMT & + CNMA ₃)
		3	+ CMTI	[+CMTI ₁]	+ CMTI	+ CMT& + CNMA ₃)
		<div>1)Apart fromATWhen there is no other way to display the command, this result code is displayed;</div> <div>2)When +CSMS <service>=1andMEonlyATWhen using this display method, you need to add +CNMAconfirm</div> <div>3)When +CSMS <service>=1It is necessary to addCNMAConfirmation Note: If no confirmation is received within a certain timeframe...CNMAconfirm,MTWill no longer send text message reminders toTE</div>				
<div><bm></div>	<div>Community broadcast short</div> <div>Reporting of messages</div> <div>Way</div>	<div>0</div>	noneCBMInstructions sent toTE			
		2	<div>ReceivedCBMSend directly using the following formatTE:</div> <div>+ CBM:<length><CR><LF><pdu>(EnablePDU(pattern) or</div> <div>+ CBM:<sn>,<mid>,<dc>,<page>,<pages><CR><LF><data>(Enable TEXTmodel)</div>			
<div><ds></div>	<div>SMS status report</div> <div>Reporting methods</div>	<div>0</div>	noneSMS-STATUS-REPORTSSend toTE.			
		1	<div>SMS-STATUS-REPORTSend the message directly using the following format.TE:</div> <div>+ CDS:<length><CR><LF><pdu>(EnablePDU(pattern) or</div> <div>+ CDS:<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>(EnableTEXT(Pattern) Note: <dt>,<st>Please refer to +CMGR</div>			
<div><bfr></div>		<div>0</div>	<div>When <mode>for1~3At that time, the instruction definedTAThe result code in the cache is sentTE (Before sending,OK (Should be received)</div>			
		1	<div>When <mode>for1~3When this happens, the code defined in the instruction will be cleared.TABuffering of non-requested result codes</div>			

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CNMI=?	Query parameter range
←	+ CNMI: (0-3),(0-3),(0-3),(0-1),(0-1) OK	Module query results
→	AT+CNMI=2,1	set upCNMIparameter
←	OK	
← (URC)	+ CMTI: "SM",1	At this moment, a text message is received, cached in <mem1>In the middle, only use +CMTIReport new SMS location index
→	AT+CNMI=1,2	Settingsmt=2This means that new text messages are not cached and are reported directly.
←	OK	
→	AT+CSMS=1	The + must be addedCSMSThe first parameter is set to1Only then does it support +CNMAOrder
←	OK	

→	AT+CMGF?	Check current SMS mode
←	+ CMGF: 0 OK	yesPDUmodel
← (URC)	+ CMT: ,24 0891683108200105F0040D91683129 634152F600002180804184422304F7 349B0D	At this time, I received onePDUThe text messages are analyzed in detail below: + CMT: ,24 24-PUDLength, excluding SMS center numberPDUInside 08- Length of SCASMS center address length (in bytes, packet) include91(included) 91-SMS center addressTON/NPI 683108200105F0- The SMS center address needs to be reversed pairwise. The reversed address is... 8613800210500. 04 - First Octet,PDUThe first byte 0D- Source address length (number length) 91683129634152F6- The source address needs to be reversed pairwise. The reversed address is...8613923614256 00- PID(Protocol Identifier) 00- DCS(Data Coding Scheme),0express7-bit GSM DEFAULT 21808041844223- SCTS(SM Center Time StampThe SMS center timestamp indicates...SC The time the text message was received was:12Year8moon8day 14:48:24,+8GMT 04-Length of user data F7349B0D- 7-bit GSM DEFAULTEncodedwill
→	AT+CNMA	Send immediately upon receiving the SMS message.AT+CNMAOrder
←	OK	
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
	AT+CNMI=1,2	
← (URC)	+ CMT: "+86131*****56",,"12/08/08,11:05 :45+32",145,17,0,0,"+86138002105 00",145,7 Will-go	I received a new text message.TEXTmodel
→	AT+CNMA	Send immediately upon receiving the SMS message.AT+CNMAOrder
←	OK	

7.9New SMS confirmed:AT+CNMA

You can use the execution command to confirm whether new messages have been received correctly.SMS-DELIVERorSMS-STATUS-REPORT)This new message is fromMTSend directly toTE
Instead of caching.

Simultaneously satisfy2Under these conditions, it is necessary to passAT+CNMA Send SMS confirmation:

→ ByAT+CSMS=1, willservice>Set as1;

→ ByAT+CNMIThe command will <mt>Set as2Or <ds>Set as1;

In accordance with the above requirements2After these conditions,TEIf you do not accept the message after receiving itAT+CNMAGiveMTconfirm,CNMIPParameters <mt>and <ds>It will be reset to0,MT No moreTE
Send a text message.

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	TEXTmodel(AT+CMGF=1): AT+CNMA	OK
	PDUmodel(AT+CMGF=0): AT+CNMA[=<n>[, <length>[<CR>PDUis given<ctrl-Z/ESC>]]]	OK
Test command	AT+CNMA=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	PDUmodel	0	This instruction is executed similarly to instructions defined in the text pattern.
		1	sendRP-ACK(or the correctly received buffer result code)
	Send confirmation SMS way	2	sendRP-ERROR(likePDUNot givenME/TAWill sendGSM 03.40 TP-FCSThe value is set to "FF"of SMS-DELIVER-REPORTMessage (not the reason for the request error)

For example:

Command (→) / Return (←)	Example	Explanation and clarification
		Please refer to the specific examples.CNMIentry

7.10sending a text message:AT+CMGS

Using the setting command, you canSMS (SMS Submit)fromTESend to the network side. Upon successful transmission, the message reference value is <mr>will be returned toTESyntax

rules:

Command type	grammar	Return and Explanation
Setting commands	Text mode (AT+CMGF=1In the following case: AT+CMGS=<da>[, <today>]<CR> > text to send<CTRL-Z/ESC>	If the message is sent successfully, the following will be returned: + CMGS:<mr> OK Note:CTRL-Z>Right now0x1AIt is to send, <ESC>Right now0x1BThis will terminate the transmission.
		If sending fails, return the following: + CMS ERROR:<err>
	PDUmodel(AT+CMGF=0In the following case: AT+CMGS=<length><CR> > PDU to send <CTRL-Z/ESC>	Successfully sent, returned: + CMGS:<mr> OK
		If sending fails, return the following: + CMS ERROR: <err>
Test command	AT+CMGS=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<da>	Destination address (Destination Address)	-	GSM 03.40 TP-Destination-AddressThe "Address-Value" field is a character type;BCD Numerical value (or default value)GSM(Character in alphabetical format) is converted to the currently selected...TECharacters in the character set (please refer to)TS 07.07+ inCSCS Instructions); address type is <tda>definition
<tda>	Destination address type (Type of <da>)	-	Integer typeGSM 04.11 TP-Destination-AddressIn8Bit "Type-Address" field (when <da>The first character is +(IRA 43)The default value is... 145Otherwise, the default value is129)
<length>	TPDUSMS length	-	Integer type. This length does not include the length of the SMS center number.
<mr>	<small>remove interest</small> 参 Test (MessageReference)	0~255	Integer typeGSM 03.40 TP-Message-Reference

For example:

Command (→) / Return (←)	Example	Explanation and clarification
sendTEXTEnglish SMS format:		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSMP?	Query the currentTEXTMode SMS parameters
←	+ CSMP: 17,11,0,0 OK	The current <dc>=0(GSM)
	AT+CSCS?	
	+ CSCS: "IRA" OK	
→	AT+CMGS="139****6785"	Send an English text message to the test phone. Note:139****6785This is the destination number; please fill it in accurately, do not copy it verbatim.
←	>	This will return >
→	Hello, world! <Ctrl+Z>	After returning, enter the message content, for example:Hello, worldThen type ! Ctrl+ZRight now0x1AIt can be sent out now.
←	+ CMGS: 108 OK	Sent successfully.mr>=108
sendTEXTChinese SMS Mode:		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSMP?	
←	+ CSMP: 17,167,0,0 OK	
→	AT+CSMP=17,167,0,8	Modify the last parameter<dc>=8
←	OK	

→	AT+CMGS="139***6785"	Note:139***6785This is the destination number; please fill it in accurately, do not copy it verbatim.																								
←	>	This will return >																								
→	611F8C22<Ctrl+Z>	After returning, enter the message content.611F8C22,yes16Number system format. That is: 0x610x1F0x8C0x22,Ctrl+Z>Send, <Ctrl+Z>That is, hexadecimal1A																								
←	+ CMGS: 73 OK	Sent successfully																								
sendPDUChinese SMS format:																										
→	AT+CMGF=0	Set toPDUmodel																								
←	OK																									
→	AT+CMGS=19 0011100D91683161450179F90008 004 611F8C22 [Ctrl+Z]	19-yesPDUThe length of the string (excluding SMS center units). 00-The length of the SMS center is indicated.0In this case, when sending a text message, directly fromSIMCard withdrawalSCA.Should00It is a text message center unit and is not included.PDUIn length 11- PDUSMS first byte <table><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>RP</td><td>UDHI</td><td>SRR</td><td colspan="2">VPF</td><td>RD</td><td colspan="2">MTI</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table> 10-TP-MR,benchmark 0D-Target address (DA)length 91683161450179F9-Destination address (recipient's phone number) 00 - Protocol Identifier (PID) 08- Data coding scheme (DCS),8expressUCS2 00 - Valid Period (VP) 04- User Datalength 611F8C22- User DataThe content of the text message sent (in this example, "Thank you" in Chinese).	b7	b6	b5	b4	b3	b2	b1	b0	RP	UDHI	SRR	VPF		RD	MTI		0	0	0	1	0	0	0	1
b7	b6	b5	b4	b3	b2	b1	b0																			
RP	UDHI	SRR	VPF		RD	MTI																				
0	0	0	1	0	0	0	1																			
←	+ CMGS: 110 OK	Sent successfully																								

7.11Write the message to memory:AT+CMGW

Using the setting command, you canSMS (SMS-DELIVER)orSMS-SUBMIT)fromTESend to memorymem2>And return the storage location of the stored message. <index> Parameters. Unless <stat>Specify other parameters; otherwise, the message status will be set to "stored but not sent". Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	TEXTIn mode (AT+CMGF=1): AT+CMGW[=<oa/da>[,<toa/toda>[, <stat>]]]<CR>text Entered <Ctrl-Z/ESC>	Success, returned: + CMGW: <index> OK
	PDUIn mode (AT+CMGF=0): AT+CMGW=<length>[,<stat>]<CR>	Returns if it fails: + CMS ERROR: <err> Success, returned: + CMGW: <index>

	PDU is given <Ctrl-Z/ESC>	OK
		Returns if it fails: + CMS ERROR: <err>
Test command	AT+CMGW=?	return: OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<da>	Destination address (Destination Address)	-	GSM 03.40 TP-Destination-AddressThe "Address-Value" field is a character type;BCD Numerical value (or default value)GSM(Character in alphabetical format) is converted to the currently selected...TECharacters in the character set (please refer to)TS 07.07+ inCSCS Instructions); address type is <toda>definition
<toda>	Destination address type (Type of <da>)	-	Integer typeGSM 04.11 TP-Destination-AddressIn8Bit "Type-Address" field (when <da>The first character is +(IRA 43)The default value is... 145Otherwise, the default value is129)
<oa>	Source address (Originating Address)	-	GSM 03.40 TP-Originating-AddressThe "Address-Value" field is a character type;BCD Numerical value (or default value)GSM(Character in alphabetical format) is converted to the currently selected...TECharacters in the character set (please refer to)TS 07.07+ inCSCS Instructions); address type is <tooa>definition
<tooa>	Source address type (Type of <oa>)	-	Integer typeGSM 04.11 TP-Originating-AddressIn8Bit "Type-Address" field (when <oa>The first character is +(IRA 43)The default value is... 145Otherwise, the default value is129)
<length>	PDUSMS length	-	Integer type. This length does not include the length of the SMS center number.
<stat>	SMS status	REC UNREAD	Received unread messages (TEXTIn mode, i.e. +CMGF=1)
		REC READ	Received read messagesTEXTIn mode, i.e. +CMGF=1)
		STO UNSENT	Store unsent messages (TEXTIn mode, i.e. +CMGF=1)
		STO SENT	Store sent messages (TEXTIn mode, i.e. +CMGF=1)
		0	Received unread messages (PDUIn mode, i.e. +CMGF=0)
		1	Received read messagesPDUIn mode, i.e. +CMGF=0)
		2	Store unsent messages (PDUIn mode, i.e. +CMGF=0)
		3	Store sent messages (PDUIn mode, i.e. +CMGF=0)

For example:

Command (→) /Return (←)	Example	Explanation and clarification
Store oneTEXTText message (in English):		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSCS="GSM"	orAT+CSCS="IRA"
←	OK	
→	AT+CSMP=17,167,0,0	
←	OK	
→	AT+CMGW="139****6785"	Send SMS to the target number

←	>	This will return >
→	HI! <Ctrl+Z>	After returning, enter the message content, then enter... Ctrl+Z Right now0x1AYou can save text messages
←	+ CMGW: 6 OK	Returnindex=6This indicates that the location of the text message in the storage area is the [number].6individual
Store oneTEXTSMS (Chinese):		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSCS="GSM"	set upATThe character encoding format in the command is as follows:UCS2
←	OK	
→	AT+CSMP=17,167,0,8	Dcs=8This indicates that the format in which the text messages are stored is...UCS2coding
←	OK	
→	AT+CMGW="10086"	The destination address is10086(UCS2(Encoding format)) The content is "thank you"UCS2(Encoding format)
←	>	This will return >
→	611F8C22<Ctrl+Z>	After returning, enter the message content.611F8C22(hex (format), then enter <Ctrl+Z>Right now0x1AYou can save text messages
←	+ CMGW: 7 OK	The text message exists.index=7Location
Store onePDUShort message:		
→	AT+CMGF=0	Set asPDUFormat
←	OK	
→	AT+CMGW=19	
←	>	This will return >
→	0011100D91683161450179F900080004611F8C22 <Ctrl+Z>	PDUThe format for the text message is "Thank you." Then type... Ctrl+ZRight now0x1AYou can save text messages
←	+ CMGW: 8 OK	The text message exists.index=8Location

7.12Send SMS from storage:AT+CMSS

Using the setting command, the message storage <mem2>In the middle, the position value parameter is <index>The message is sent to the network side (SMS-SUBMITorSMS-COMMAND)If givenSMS-SUBMITThe new receive address parameter for the messageda>This parameter should be used, not a parameter from a stored message. After successful transmission, the reference value is <mr>will be returned toE.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CMSS=<index>[,<da>[,<toda>]]	+ CMSS:<mr> OK

Test command	AT+CMSS=?	OK
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Parameter definition:

parameter	definition	Value	Explanation of the possible values
<index>	SMS messages to be sent in memory address	-	Integer type; values within the address range supported by associative memory.
<da>	Destination address (Destination Address)	-	GSM 03.40 TP-Destination-AddressThe "Address-Value" field is a character type;BCDNumerical value (or default value)GSM(Character in alphabetical format) is converted to the currently selected...TECharacters in the character set (please refer to)TS 07.07+ inCSCSInstructions); address type is < toda>definition
< toda>	Destination address type (Type of < da>)	-	Integer typeGSM 04.11 TP-Destination-AddressIn8"bit" type - Address field (when < da>The first character is +(IRA 43)The default value is...145Otherwise, the default value is...129)
< mr>	remove interest 参 Test (MessageReferenc e)	0~255	Integer typeGSM 03.40 TP-Message-Reference

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSCS="GSM"	orAT+CSCS="IRA"
←	OK	
→	AT+CMSS=6	Send +CMGWIn the example, it was +CMGWThe stored number is6The text message received still has the recipient's number as +CMGWDeposited number
←	+ CMSS: 11 OK	Sent successfully.mr>=11
→	AT+CMSS=7,"13192310560	Send +CMGWIn the example, it was +CMGWThe stored number is7The Chinese text message was changed to a different recipient number.13192310560
←	+ CMSS: 12 OK	Sent successfully

7.13SMS link control commands:AT+CMMS

SETCommand and Control SMS Relay Protocol (CMR)RPThe continuity of links at the layer. When this feature is enabled and the network supports it, sending multiple consecutive text messages...RP The layer's links will remain indefinitely, eliminating the need for breaking and rebuilding links between every two text messages, thus significantly increasing the sending speed. READThe command returns the current parameter value.

TESTThe command returns the parameter values supported by the command.

Command type	grammar	Return and Explanation
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Setting commands	AT+CMMS= [<n>]	OK
Query command	AT+CMMS?	+ CMMS: <n> OK
Test command	AT+CMMS=?	+ CMMS: (<n>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	state	<u>0</u>	Energy ban
		1	Enable once. The interval between the return of the current sent SMS and the next sent SMS is less than [time period missing].1-5seconds (the specific value depends on)MS(implementation)RPThe link remains active. When it exceeds...1-5seconds, RPThe link is broken, and <n>The value will be automatically set back.0This means that it will no longer be enabled.
		2	Always enabled. The interval between the return of the current sent SMS and the sending of the next SMS is less than [time period missing].1-5seconds (the specific value depends on)MS(implementation)RPThe link remains active. When it exceeds...1-5seconds, RPThe link is broken, and <n>The value remains unchanged.2That is, continue to enable

7.14Read the text message:AT+CMGR

Using the setting command, the message storage <mem1>In the middle, the index is <index>Message returnedTEIf the message is in the "received but not read" state, then change its state to "received and read".

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CMGR=<index>	<p>PDUIn mode (AT+CMGF=0),return: + CMGR:<stat>,<[alpha]>,<length><CR><LF><pdu></p> <p>OK</p>
		<p>in the case ofTEXTmodel(AT+CMGF=1 ForSMS-DELIVER: + CMGR:<stat>,<oa>,<[alpha]>,<scts>,<[tooa>,<fo>,<pid>,<dc s>,<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p>
		<p>forSMS-SUBMIT: + CMGR:<stat>,<da>,<[alpha]>,<[toda>,<fo>,<pid>,<dcs>,<[v p>],<sca>,<tosca>,<length>]<CR><LF><data></p> <p>OK</p> <p>forSMS-STATUS-REPORT: + CMGR:<stat>,<fo>,<mr>,<[ra>,<[tora>,<scts>,<dt>,<st></p>

		<p>OK</p> <p>forSMS-COMMAND: + CMGR:<stat>,<fo>,<ct>[,<pid>,<mn>],<da>,<toda>,<length><CR><LF><cdata>]</p> <p>OK</p> <p><small>Note: Whether the italicized text above is displayed is determined by the + symbol.CSDHThe settings determine</small></p>
Test command	AT+CMGR=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<da>,<oa>			Please refer toAT+CMGWentry
<toda>,<tooa>			
<length>			
<stat>			
<alpha>	MTCorresponding phone book records <da>or <oa>Display		character type
<pid>	Protocol Identification		Please refer toAT+CSMPentry
<fo>	PDUSMS first byte		
<vp>	Valid Period		
<dc>	Data Coding System		
<scts>	SMS center timestamp (Short Message Center Time Stamp)		Time - StringGSM 03.40 TP-Service-Centre-Time-Stamp
<dt>	Discharge time		Time - StringGSM 03.40 TP-Discharge-Time, and <st> appearing in pairs
<st>	Status		IntegerGSM 03.40 TP-Status Describe the last one that has been sentMOSMS status
<ct>	Command Type		IntegerGSM 03.40 TP-Command-TypeThe default is0
<ra>	Receiving address		string typeGSM 03.40 TP-Recipient-AddressAddress - Value Field
<cdata>	TEXT mold Mode Down SMS-COMMANDThe return		TP-Command-Data (GSM 03.40)
<mr>	News Reference (MessageReference)		TP-Message-Reference(GSM 03.40),Integer
<mn>	Message sequence number		TP-Message-Number (GSM 03.40)Integer

For example:

Command (→) / Return (←)	Example	Explanation and clarification
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useTEXTRead SMS messages using the following method:		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CSCS="GSM"	+ CSCSThe command determines the encoding method of the SMS content to be read.
←	OK	
→	AT+CMGR=6	Readindex=6English text messages
←	+ CMGR: "REC READ", "+86139*****9", "12/03/30,20: 40:31+32" HI! OK	The content of this English text message is:HI"
→	AT+CMGR=1	Air720SThe series of modules reads a text message containing Chinese characters.
←	+ CMGR: "REC READ", "002B00380036003100330031003 60032003300310030003200360033", "13 / 01/06,10:11:47+32" 611F8C2200310032 OK	Note: TEXTIn modeAir720SThe module receives a text message containing Chinese characters and displays the message content.UCS2The visible character form of the code, for example in this case, is "thank you".12"ofUCS2Visible character form of the code TEXTIf in modeAir720SIf the received SMS message does not contain Chinese characters, the content will be displayed directly.
→	AT+CMGR=2	Air720UThe series of modules reads a text message containing Chinese characters.
←	+ CMGR: "REC READ", "002B00380036003100330031003 60032003300310030003200360033", "13 / 01/06,10:11:47+32" grateful34 OK	Note: Air720UOne of the modules in the series uses a text message with Chinese content. GB2312coding
usePDUThe pattern reads an SMS message:		
→	AT+CMGF=0	Set asPDUModel
←	OK	
→	AT+CMGR=9	Readindex=9text messages
←	+ CMGR: 0,,24 0891683108200105F0240D916831614501 79F9 00082180904121102304611F8C22 OK	

7.15List of short messages:AT+CMGL

Using the setting command, you can query the preferred message storage.mem1>In the middle, the state value is <stat>The message showsTEIf the message is in the "received but not read" state, then change its state to "received and read".

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CMGL=<stat>	<p>in the case ofPDUModel(AT+CMGF=0), then <stat>The possible values are as follows:0</p> <p>Received unread messages</p> <ol style="list-style-type: none"> Received and read messages Stored unsent text messages Stored sent SMS messages

		<p>4All SMS messages</p> <p>And the following is returned:</p> <p>+ CMGL:<index>,<stat>,<[alpha]>,<length><CR><LF><pdu><CR><LF>+CMGL:<index>,<stat>,<[alpha]>,<length><CR><LF><pdu>[...]</p> <p>OK</p> <p>in the case ofTEXTmodel(AT+CMGF=1), then <stat>The possible values are as follows: "REC UNREAD" Received unread messages "REC READ" Received and read messages "STO UNSENT" Stored unsent text messages "STO SENT" Stored sent SMS messages "ALL" All SMS messages</p> <p>Note: All letters should be uppercase for the above values. Double quotes are optional.</p> <p>forSMS-DELIVERorSMS-SUBMITThen return (Note: Whether italicized text is displayed is determined by +)CSDH (Determined by settings)</p> <p>+ 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>[...]</p> <p>OK</p> <p>forSMS-STATUS-REPORTThen return:</p> <p>+ CMGL:<index>,<stat>,<fo>,<mr>,<[ra]>,<[tora]>,<scts>,<dt>,<st>[<CR><LF>+CMGL:<index>,<stat>,<fo>,<mr>,<[ra]>,<[tora]>,<scts>,<dt>,<st>[...]</p> <p>OK</p> <p>forSMS-COMMANDThen return:</p> <p>+ CMGL:<index>,<stat>,<fo>,<ct>[<CR><LF>+CMGL:<index>,<stat>,<fo>,<ct>[...]</p> <p>OK</p>
Test command	AT+CMGL=?	<p>+ CMGL: (<stat>(List of possible values)</p> <p>OK</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
			All parameters for this entry have been described in detail in previous commands, and will not be repeated here.

For example:

Command (→) /Return (←)	Example	Explanation and clarification
existTEXTList SMS messages in the mode:		
→	AT+CMGF=1	Set asTEXTmodel
←	OK	
→	AT+CMGL=?	Querystat>List of values
←	+ CMGL: "REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL" OK	
→	AT+CMGL="ALL"	Search all text messages (Note:ALL(Must be uppcase)
	+ CMGL: 8,"REC READ","+8613162310263","12/08/08,10:43:04 + 32" hi + CMGL: 9,"REC READ","+8613162310263","12/08/09,14:12:01 + 32" a☒" OK	All SMS messages Index = 1~7It was simply deleted.
existPDULList SMS messages in the mode:		
→	AT+CMGF=0	Set asPDUmodel
←	OK	
→	AT+CMGL=?	
←	+ CMGL: (0-4) OK	
→	AT+CMGL=4	Search all text messages
←	+ CMGL: 8,1,,24 0891683108200105F0240D91683161320162F3 00002180800134402304D7A2930A + CMGL: 9,1,,24 0891683108200105F0240D91683161320162F3 00082180904121102304611F8C22 OK	Display query results

7.16Delete private messages:AT+CMGD

The preferred message storage can be deleted using the setting command.mem1>In the middle, the location number parameter is <index>The news.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CMGD=<index>	return: OK Note: This setting command deletes <mem>1The index isindextext messages
	AT+CMGD=<index>,<delflag>	return: OK Note: This setting command deletes all instances where the status is <delflag>The text message. When <delflag>Not equal to0At that time,index>Parameters ignored
Test command	AT+CMGD=?	+ CMGD:(<index>(List of possible values), (<delflag>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<index>	SMS location index	-	Integer type; values within the address range supported by associative memory.
<delflag>	The deletion type is integer. When <delflag>=1, 2,3,4At that time,index> The parameters will be ignored.	0	Delete the specified position number as <index>SMS
		1	Delete all read SMS messages from the preferred storage, retaining unread SMS messages and stored SMS messages.MO Short message (whether or not it is sent) MO:Mobile Originated
		2	Delete all read and sent messages from the preferred storage.MOSMS messages, including unread and unsent ones, are stored.MOSMS
		3	Delete all read, sent, and unsent stored short messages from the preferred storage.MOSMS messages, keep unread SMS messages
		4	Delete all short messages, including unread ones, from the preferred storage.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPMS="SM"	Set the storage area asSIM
←	OK	
→	AT+CMGD=1	Deleteindex=1text messages
←	OK	
→	AT+CMGD=1,4	All text messages were deleted.
←	OK	

7.17Community broadcast SMS type selection:AT+CSCB

Note: This command applies only to Hezhou.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4 Module (Air720/Air720G/Air720H/Air720D/Air720S).

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	return: OK

Query command	AT+CSCB?	return: + CSCB:<mode>,<mids>,<dcss> OK
Test command	AT+CSCB=?	return: + CSCB: (<mode>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>		0	Accepted by <mids>and <dcss>Specified message type
		1	Not accepted by <mids>and <dcss>Specified message type
<mids>	All possibleCBMCombination of message identifiers	-	character type
<dcss>	All possibleCBMData encoding scheme combination	-	Character type, default value is an empty string.

7.18SMS service failure result code:CMS ERROR:<err>

Short Message Service (SMS) failure result codes describe an error in a mobile device or network. Their function is similar to error result codes. This code is often used when a command fails.

It appeared. The returned result code is: +CMS ERROR: <err>

Numeric typeerr> Value	verbose styleerr>Value	explain
1	Unassigned(unallocated) number	
3	No route to destination	
6	Channel unacceptable	
8	Operator determined barring	
10	Call barred	
11	Reserved	
16	Normal call clearing	
17	User busy	
18	No user response	
19	User alerting, no answer	
twenty one	Short message transfer rejected	
twenty two	Number changed	
25	Pre-emption	
26	Non-selected user clearing	
27	Destination out of service	
28	Invalid number format (incomplete number)	
29	Facility rejected	
30	Response to STATUS ENQUIRY	
32	Normal, unspecified	

34	No circuit/channel available	
38	Network out of order	
41	Temporary failure	
42	Switching equipment Congestion	
43	Access information discarded	
44	Requested circuit/channel not available	
47	Resources unavailable, unspecified	
49	Quality of service unavailable	
50	Requested facility not subscribed	
55	Requested facility not subscribed	
57	Bearer capability not authorized	
58	Bearer capability not presently available	
63	Service or option not available, unspecified	
65	Bearer service not implemented	
68	ACM equal or greater than ACM maximum	
69	Requested facility not implemented	
70	Only restricted digital information bearer capability is available	
79	Service or option not implemented, unspecified	
81	Invalid transaction identifier value	
87	User not a member of CUG	
88	Incompatible destination	
91	Invalid transit network selection	
95	Semantically mandatory information	
96	Invalid mandatory information	
97	Message type non-existent or not implemented	
98	Message type not compatible with protocol state	
99	Information element non-existent or not implemented	
100	Conditional information element error	
101	Message not compatible with protocol	
102	Recovery on timer expiry	
111	Protocol error, unspecified	
127	Interworking, unspecified	
128	Telematic interworking not supported	
129	Short message Type 0 not supported	
130	Cannot replace short message	
143	Unspecified TP-PID error	
144	Data coding scheme (alphabet) not supported	
145	Message class not supported	
159	Unspecified TP-DCS error	
160	Command cannot be acted	
161	Command unsupported	
175	Unspecified TP-Command error	
176	TPDU not supported	

192	SC busy	
193	No SC subscription	
194	SC system failure	
195	Invalid SME address	
196	Destination SME barred	
197	SM Rejected-Duplicate SM	
198	TP-VPF not supported	
199	TP-VP not supported	
208	SIM SMS storage full	
209	No SMS storage capability in SIM	
210	Error in MS	
211	Memory Capacity Exceeded	
212	SIM Application Toolkit Busy	
213	SIM data download error	
224	CP retry exceed	
225	RP trim timeout	
226	SMS connection broken	
255	Unspecified error cause	
300	ME failure	ME mistake
301	SMS service of ME reserved	ReservedMEofSMSbusiness
302	Operation not allowed	Operation not allowed
303	Operation not supported	Operation not supported
304	invalid PDU mode parameter	PDUInvalid parameters in the mode
305	invalid text mode parameter	TEXTInvalid parameters in the mode
310	(U)SIM not inserted	SIMCard not inserted
311	(U)SIM PIN required	needSIMCardPIN
312	PH-(U)SIM PIN required	needPH-SIMCardPIN
313	(U)SIM failure	SIMCard malfunction
314	(U)SIM busy	SIMCard Encounter Busy
315	(U)SIM wrong	SIMmistake
316	(U)SIM PUK required	needSIMCardPUK
317	(U)SIM PIN2 required	needSIMCardPIN2
318	(U)SIM PUK2 required	needSIMCardPUK2
320	memory failure	Storage error
321	invalid memory index	Invalid stored index
322	memory full	Storage full
330	SMSC address unknown	SMS center number unknown
331	No network service	No network service
332	network timeout	Network timeout
340	no +CNMA acknowledgement expected	Unexpected +CNMAconfirm
500	unknown error	Unknown error
512	USER ABORT	(Applicable to)cat1(Module)
513	Unable to store	(Applicable to)cat1(Module)
514	INVALID STATUS	(Applicable to)cat1(Module)

515	INVALID ADDR CHAR	(Applicable to)cat1(Module)
516	INVALID LEN	(Applicable to)cat1(Module)
517	INVALID PDU CHAR	(Applicable to)cat1(Module)
518	INVALID PARA	(Applicable to)cat1(Module)
519	INVALID LEN OR CHAR	(Applicable to)cat1(Module)
520	INVALID TXT CHAR	(Applicable to)cat1(Module)
521	TIMER EXPIRED	(Applicable to)cat1(Module)
528		PDUInvalid (non-)16(Base) characters
529		PDUIncorrect length
530	SMS SEND FAIL	(Applicable to)cat1(Module)
531		It varies depending on the manufacturer.
532		The address contains invalid (non-)16(Base) characters
533		Invalid address
534		PDUlength(UDLIncorrect
536		SCAIncorrect length
537		The first invalid8Bit byte (should be)2or34)
538		Invalid command type
539		SRRBit not set
540		SRRset up
604	unspecified parsing error	Unspecified parsing error

8Phonebook commands

8.1Select phonebook storage type:AT+CPBS

Select the storage type of the current phonebook for use by other phonebook commands.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CPBS=<storage>	+ CPBS:<storage>[,<used>,<total>] OK
Query command	AT+CPBS?	+ CPBS:<storage>[,<used>,<total>] OK
Test command	AT+CPBS=?	+ CPBS: (<storage>)(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<storage>	Storage type	"SM"	SIM/USIMTelephone book
		"FD"	SIMFixed dial number phonebook (this function and storage capacity depend on...)SIMCard)
		"DC"	MERecently dialed phonebook (non-standard)
		"LD"	SIM/UICCThe phone book of the most recent call
		"ON"	SIMCard (orME)The number inMSISDN)List (you can also use +)CNUM(Command to read information from the memory)
		"AP"	ApplicationTelephone Book
<used>	Used locations	-	The integer value represents the location number used in the selected memory.
<total>	Total number of positions	-	The integer value represents all location numbers used in the selected memory.

For example:

Command (→)	Example	Explanation and clarification
Return (←)		
→	AT+CPBS=?	Query all storage types in the phonebook
←	+ CPBS:("SM","FD","ON","AP") OK	Note: This return value may vary depending on the module type.
→	AT+CPBS?	Query the currentPBStorage type
←	+ CPBS: "SM", 6,250 OK	
→	AT+CPBR=1,10	Query1~10Contacts in the phone book
←	+ CPBR: 1,"131*****98",129,"AA"	

	+ CPBR: 2,"139*****56",128,"BB" + CPBR: 3,"138*****68",128,"CC" + CPBR: 4,"133*****09",128,"DD" + CPBR: 5,"10087",128,"EE" + CPBR: 6,"1233333",128,"FF" + CPBR: 7,"10010",128,"GG" + CPBR: 8,"10011",128,"HH" + CPBR: 9,"2222222",128,"II" + CPBR: 10,"888888",128,"JJ" OK	
--	---	--

8.2Read phonebook records:AT+CPBR

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPBR=<index1>[,<index2>]	return: [+CPBR:<index1>,<number>,<type>,<text>[...]<CR><LF> + CPBR:<index2>,<number>,<type>,<text>]] OK Note: Using the execution command, the range of location numbers that can be returned is <index1>--<index2>The phone book record shows the range of numbers for that location using +CPBSSelect from the current phonebook storage. <index2>If empty, only return <index1>Records
Test command	AT+CPBR=?	+ CPBR:(<index>(list of possible values), [<nlength>], [<tlength>]) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<index1>,<index2>	Phonebook Record Index		Integer type, representing the location index within the range of location numbers in the phone book memory.
<number>	telephone number		Character type, formatted by <type>definition
<type>	Number type		Integer octet address type (please refer to)GSM 04.08No. 10.5.4.7Section) andAT+CSTAentry
<text>	Names recorded in the phone book		Character type, and "select"TECharacter set "instructions"+"CSCSSame specified character set
<nlength>	Maximum length of telephone number		Integer type, representing <number>Maximum length of field
<tlength>	Maximum length of phone book records		Integer type, representing <text>Maximum length of field

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPBS=SM	set upPBThe storage type isSIM

←	OK	
→	AT+CPBR=1,5	Listindex=1~5Phone book records
←	+ CPBR: 1,"137***8187",129,"Test" + CPBR: 2,"139***8096",129,"TEST" + CPBR: 5," 13601***187",129,"zhangsan" OK	Query results
→	AT+CPBR=2	If <index2>If empty, only return <index1>Records
←	+ CPBR: 2,"139***8096",129,"TEST" OK	
→	AT+CPBR=?	Query parameter range, defaultPBStorage type isSM
←	+ CPBR: (1-500), 40 OK	
→	AT+CPBS="ON"	set upPBThe storage type isON
←	OK	
→	AT+CPBR=1,10	
←	+ CPBR:1,0,"+8613312345678",145,"" OK	Find out the SIM card's own service number.
→	AT+CPBR=?	
←	+ CPBR: (1-2), 40 OK	

8.3Find phone book records:AT+CPBF

Set the command user terminal to return and <find text>Matching phonebook record (search from the current phonebook storage, stored using +)CPBS(To specify).

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPBF=<find text>	[+CPBF:<index1>,<number>,<type>,<text>[[...]<CR><LF>+CBPF:<index2>,<number>,<type>,<text>]] OK
Test command	AT+CPBF=?	+ CPBF:[<nlength>],[<tlength>] OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<index1>,<index2>	Phonebook Record Index	-	Integer type, representing the location index within the range of location numbers in the phone book memory.
<number>	telephone number	-	Character type; formatted by <type>definition,

<type>	Number type	-	Integer octet address type (please refer to)GSM 04.08 No. 10.5.4.7Section) andAT+CSTAentry
<text>,<findtext>	Names recorded in the phone book	-	Character type, and "select"TECharacter set "instructions+"CSCSSame specified character set
<nlength>	Maximum length of telephone number	-	Integer type, representing <number>Maximum length of field
<tlength>	Maximum length of names in the phone book	-	Integer type, representing <text>Maximum length of field

For example:

Command (→) / Back(←)	return	Example	Explanation and clarification
→		AT+CPBF=?	
←		+ CPBF: 40,14 OK	The maximum length of a phone book number is indicated as .40bytes, the maximum length of a name is14bytes
→		AT+CPBS=SM	
←		OK	
→		AT+CPBF="zhangsan"	Looking for the name in the phone book.zhangsan"Contact Person
←		+ CPBF: 5,"13601***187",129," zhangsan" OK	Found it.index=5

8.4Recording in the phone book:AT+CPBW

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CPBW=[<index>][,<number>[, <type>, [<text>]]]	<p>return:</p> <p>OK</p> <p>Note: Using the settings command, you can select the location number in the current phonebook storage. <index>Write phone book records. Via +CPBSYou can select the current phonebook storage.</p> <p>Note:</p> <p>If only <index>If other fields are empty, then theindexThe phone book records will be deleted;</p> <p>If <index>Empty, but given <number>If the record is found, it will be written to the first available space in the phone book.</p>
Test command	AT+CPBW=?	<p>+ CPBW: (<index>(list of possible values), <nlength>,<type>(list of possible values), <tlength></p> <p>OK</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<index>	Phonebook Record Index		Integer type, representing the location index within the range of location numbers in the phone book memory.
<number>	telephone number		Character type, formatted by <type>definition

<type>	Number type		Integer octet address type (please refer to)GSM 04.08No. 10.5.4.7Section) andAT+CSTAentry
<text>	Names recorded in the phone book		String type, and "selection"TEcharacter set "instructions+"CSCSSame specified character set
<nlength>	Maximum length of telephone number		Integer type, representing <number>Maximum length of field
<tlength>	Maximum length of phone book records		Integer type, representing <text>Maximum length of field

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPBW=?	Query parameter range
←	+ CPBW: (1-250),40,(128-255),14 OK	
→	AT+CPBS=SM	
←	OK	
→	AT+CPBW=1,"150*****58",129,"T"	existindex=1Write a phone book record at the location
←	OK	
→	AT+CPBR=1,200	Search all phone book records
←	+ CPBR: 1,"150*****58",129,"T" + CPBR: 2,"152*****59",129,"LIAO" + CPBR: 3,"1502650",129,"" + CPBR: 4,"021*****52",129,"W" + CPBR: 5,"021*****68",129,"A" + CPBR: 6,"1",129,"" OK	Total6One record
→	AT+CPBW=1	deleteindex=1Records
←	OK	
→	AT+CPBW=2	deleteindex=2Records
←	OK	
→	AT+CPBW=,"123456	If <index>Empty, but given <number>If the record is found, it will be written to the first available space in the phone book.
←	OK	
→	AT+CPBR=1,6	Query all records again
←	+ CPBR: 1,"123456",129,"" + CPBR: 3,"1502650",129,"" + CPBR: 4,"02131252252",129,"W" + CPBR: 5,"02131252252",129,"A" + CPBR: 6,"1",129,"" OK	

8.5Phone number:AT+CNUM

Syntax rules:

Command type	grammar	return
Execute command	AT+CNUM	+ CNUM:[<alpha1>,<number1>,<type1><CR><LF>+CNUM:[<alpha2>,<number2>,<type2>[...]] OK
Test command	AT+CNUM=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<alphax>	Number identifier		With <numberx>This pertains to optional, alphanumeric mixed strings. The character set used should use "select".TECharacter set "instructions+"CSCSThe selected character set.
<numberx>	This number		<typex>Specified character phone number
<typex>	Type of local number		Integer octet address type (please refer to)GSM 04.08No.10.5.4.7 Festival)

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CPBS="ON"	Select the phonebook type asON (Own Number)
←	OK	
→	AT+CPBW=1,"+180*****",145	Write the local number
←	OK	
→	AT+CNUM	Look up your phone number
←	+ CNUM:"","+180*****",145 OK	

9Group domain related commands

9.1 GPRSONline registration status:AT+CGREG

Setting commands to control aboutGPRSThe registration status is not displayed as a request result code.

When <n>=1andMTofGPRSThe registration status has changed, which will result in a + sign.CGREG:<stat>ofURCReport it to higher authorities.

When <n>=2And orGPRSThe registration status changes or the registered community changes, there will be: +CGREG: <stat>[,<lac>,<ci>,<act>,<rac>] ofURCReport it to higher authorities.

When <n>=3And orGPRSThe registration status changes or the registered community changes, there will be: +CGREG: <stat>[,<lac>,<ci>,<act>,<rac>[,<cause_type>,<reject_cause>]]ofURCReport it to higher authorities.

The display format of the query command return result code <n>And a can showMTPParameters of network registration statusstat>Only when <n>=2andMTLocation information elements are only returned after registration on the network.lac>and <ci>.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CGREG=[<n>]	OK
Query command	AT+CGREG?	+ CGREG:<n>,<stat>[,<lac>,<ci>] OK
Test command	AT+CGREG=?	+ CGREG:(<n>{List of possible values}) OK
URCReport	+ CGREG: <stat>	If set <n>=1When the network registration status changes, the following will occur.URC(unsolicited result code)
	+ CGREG: <stat>[,<lac>,<ci>,<act>,<rac>]	If set <n>=2When the network registration status or the registered community (ci)When changes occur, there will be thisURCReport
	+ CGREG: <stat>[,<lac>,<ci>,<act>,<rac>[,<cause_type>,<reject_cause>]]	If set <n>=3When the network registration status or the registered community (ci)When changes occur, there will be thisURCReport

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Report status	0	Disable network registration without request result code +CGREG:
		1	Enable network registration without request result code +CGREG: <stat>
		2	Enable network registration and location information non-request result code + CGREG:<stat>[,<lac>,<ci>,<act>,<rac>]
		3	Enable network registration and location information non-request result code + CGREG: <stat>[,<lac>,<ci>,<act>,<rac>[,<cause_type>,<reject_cause>]]
<stat>	Current network registration status	0	Not registered;METhere are currently no new operators offering search registration services.
		1	Registered, local network

		2	Unregistered, butMESearching for new operators to register services, but there are currently no available public terrestrial mobile networks.PLMN),oncePLMNefficient,UEWill beginGPRSAttachment.
		3	Registration was rejected.GPRSThe service is disabled, even if a user requests it.UETAttachment is also not allowed. GPRSnetwork
		4	unknown
		5	Registered, roaming
		6	"Registered Location"SMS onlybusiness
		7	Register roaming locationSMS onlybusiness
		8	Only attach emergency carrying service (See NOTE 2)
		9	"Registered Location"CSFB not preferredbusiness
		10	Register roaming locationCSFB not preferredbusiness
		11	Emergency services only
<lac>	Location area code (Location Area Code)	-	Character type;2Byte hexadecimal location code (e.g.:00C3Equivalent to decimal 195)
<ci>	Community number (Cell Id)	-	Character type;2Hexadecimal cell number
<rac>	Routing area code (Routing area code)		
<cause_type>	Definition same as +CEREG		
<reject_cause>	Definition same as +CEREG		

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGREG?	Query currentGPRSRegistration status
←	+ CGREG:0,1 OK	<n>=0,<stat>=1
→	AT+CGREG=1	Settingsn>=1When the module registration status changes, there will be a URC Report +CGREG: <stat>
← (URC)	+ CGREG:1	When the module registration status changes
→	AT+CGREG=2	Settingsn>=2When the module registration status changes, there will be aURC Report +CGREG: <stat>[,<lac>,<ci>]
← (URC)	+ CGREG: 5,"18be","9363"	When the module's registration status changes, or when the module is moved, causing a change in the cell number it is located in, there will be a...URCReport it up
→	AT+CGREG?	Check registration status
←	+ CGREG: 2,1,"1863","00a2c315" OK	

9.2 GPRSAttachment separation:AT+CGATT

The setting command is used to...MTAdhesionGPRSBusiness, orMTfromGPRSSeparate business functions.

The query command returns the currentGPRSAttachment state.

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CGATT=<state>	OK
Query command	AT+CGATT?	+ CGATT: <state> OK
Test command	AT+CGATT=?	+ CGATT: (<state>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	GPRSAdhesion state	0	Separation
		1	Adhesion

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGATT?	View currentGPRSAdhesion state
←	+ CGATT: 1 OK	<state>=1Indicate the currentGPRSAlready attached
→	AT+CGATT=?	View <state>The range of values
←	+ CGATT: (0-1) OK	Query results

9.3 PDPContext definition:AT+CGDCONT

Configure command settingscidAs a symbolPDPContext parameters.

The query command retrieves all...PDPContext definition.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>]]]]	OK
Query command	AT+CGDCONT?	[+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd1>[,...[,<pdN>]]] [<CR><LF>+CGDCONT:<cid>,<PDP_type>,<APN>,<PDP_addr>,<d_comp>,<h_comp>[,<pd 1>[,...[,<pdN>]]] [...]]]

		OK
Test command	AT+CGDCONT=?	+ CGDCONT: (<cid>(list of possible values), <PDP_type>,,(<d_comp>(List of possible values), (<h_comp>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>	PDPContext identifier, used to identify onePDPContext Definition	1~8	Integer type. This parameter is for...TE-MTIn terms of the interface, these are local parameters and can be used in other ways.PDPContext-dependent instructions
<PDP_type>	Packet data protocol type; Character type	"IP"	support"IPInternet ProtocolIP(Internet Protocol)(IETF STD5),default value
		IPv6	Internet Protocol, version 6 (IETF RFC 2460)
		PPP	Point to Point Protocol (IETF STD 51)
<APN>	Access Point Name (Access Point Name)		String type, used for selectionGGSNOr the logical name of the external packet data network. If this parameter is empty or omitted, a request is required. Signing value.
<PDP_address>	Packet Data Protocol (PaDR) address		Character type, this isIPProtocol address, format: "<n>.<n>.<n>.<n>"Among them <n>=0~255; used to identify specificPDP Context,MTThe allocated address space. If this parameter is empty or equal to "0.0.0.0 ",MTYou will be required to allocate a dynamic address. Use +CGPADDRThe command can read this allocated address.
<d_comp>	Used for controlPDPData compression. Only. Applicable toSNDTCP.	0	closurePDPData compression (default)
		1	OpenPDPHeader compression (compression method defined by the vendor) Not supported at this time!
		2	V.42bis
<h_comp>	controlPDPHead compression. Numeric parameters	0	closurePDPHeader compression (default)
		1	RFC1144(Only applicable)SNDTCP)
		2	RFC2507(Not supported at present)
<pd1>... <pdN>	With <PDP_type>Related parameters number		String type

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+CGDCONT?	Check current status after startup and registrationPDPContext
←	+ CGDCONT: 5,"IP","cmnbiot.mnc004.mcc460.gprs","100.93.134.100",,,802110030100108106d388116b8306d38814cb000d04d388116b000d04d38814cb, OK	There is already one by default.PDPContext, thisPDP Context, used for modulesRNDISNetwork card functions and TCP/IP/HTTP/MQTT/FTPData services, etc.
→	AT+CGDCONT=?	Query parameter value range
←	+ CGDCONT:(1-8),"IP", , ,(0-2),(0-2)	Query results

	+ CGDCONT:(1-8),"PPP", , ,(0-2),(0-2) + CGDCONT:(1-8),"IPv6", , ,(0-2),(0-2) OK	
←	+ CGDCONT: (1-15),(1-15),(IP,IPv6,IPv4V6,PPP,Non-IP)	Air780E/Air600EQuery results

9.4 PDPContext authentication parameters:AT+CGAUTH

Note: This command applies only to Hezhou.4G CAT1Module (Air720U/Air724(Series), not applicable to Hezhou4G CAT4 Module (Air720/Air720G/Air720H/Air720D/Air720S).

This command isAT+CGDCONTCommand extensions, setting related informationPDPContext-specific authentication methods. The query command retrieves all.PDPContextual authentication information.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGAUTH=<cid>[,<auth_prot>[,<userid>[,<password>]]]	OK
Query command	AT+CGAUTH?	[+CGAUTH: <cid>,<auth_prot>,<userid>,<password> [<CR><LF>+CGAUTH: <cid>,<auth_prot>,<userid>,<password> [. . .]]
Test command	AT+CGAUTH=?	+ CGAUTH: (range of supported <cid>s), (list of supported <auth_prot>s), (range of supported <userid>s), (range of supported <password>s)

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>	PDPContext identifier, used to identify a individualPDPContext Definition		Integer type. This parameter is for...TE-MTIn terms of the interface, these are local parameters and can be used in other ways.PDPContext-dependent instructions
<auth_prot>	Authentication types	<u>0</u>	None
		1	PAP
		2	CHAP
<userid>	username		
<password>	password		

9.5showPDPAaddress:AT+CGPADDR

Using the settings command returns <cid>The markedPDPAaddress; Using this command will return a specified context identifier.cid>ofPDPAaddress list; whenPDPAWithout a defined context, this command cannot be used to query or display data.PDPAaddress.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGPADDR=<cid>	+ CGPADDR:<cid>,<PDP_addr> OK
Execute command	AT+CGPADDR	+ CGPADDR:<cid>,<PDP_addr>[<CR><LF>+CGPADDR:<cid> , <PDP_addr>[...]] OK
Test command	AT+CGPADDR=?	+ CGPADDR: (<cid>[List of possible values]) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>	PDPContext identifier	1~8	Integer type. This parameter is for...TE-MTIn terms of the interface, these are local parameters and can be used in other ways. PDP Context-dependent instructions
<PDP_address>	Packet Data Protocol (PaDR) address		Character type, this isIPProtocol address, format: "<n>.<n>.<n>.<n>" Among them <n>=0~255; used to identify specificPDPContext,MTThe allocated address space.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CGACT?	Query the currentPDPContext activation state
←	+ CGACT: 5,1 OK	<state>=1This indicates thatcid>=5ofPDPThe context is already active.
→	AT+CGPADDR=5	Querycid>=5ofPDPContext correspondingPDP Address (i.e.)IPaddress)
←	+ CGPADDR: 5, "100.93.134.100" OK	<cid>=5 PDPContext allocationIPaddress

9.6 PDPContext activation:AT+CGACT

The execution command can be used to activate or deactivate the specified command.PDPContext. After the instruction is executed successfully,MTKeepV.250terCommand status. If...PDPIf the context is already in the requested state, then that state remains unchanged.

When the activation form of this instruction is executed, ifMTNo attachmentGPRS,MTFirst of allGPRSAttach, and then attempt to activate the specified context. If no < is specified...cid>The activation form of the instruction activates all defined contexts. If no < is specified...cid>The invalidation form of the instruction invalidates all active contexts.

The query command returns all defined...PDPContextual information.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGACT=<state>,<cid>	OK

Query command	AT+CGACT?	+ CGACT:<cid>,<state>[<CR><LF>+CGACT:<cid>,< state>[...]] OK
Test command	AT+CGACT=?	+ CGACT: (<state>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	PDPContext activation state	0	Not activated
		1	activation
<cid>	PDPContext identifier		Integer type. This parameter is for...TE-MTIn terms of the interface, these are local parameters and can be used in other ways. PDP Context-dependent instructions.

For example:

Command (→) / Return (←)	Example	Explanation and clarification
		Please refer to the specific examples.CGPADDRInstances of entries

9.7Acceptable minimum quality of service briefing:AT+CGQMIN

Configure command to allowTESpecify a minimum acceptable quality of service brief, which corresponds to the "quality of service" returned by the network.PDPThe context activation accepts the negotiation briefing returned by the message.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>,<mean>]]]]]	OK
Query command	AT+CGQMIN?	+ CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF>+CGQMIN: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]] OK
Test command	AT+CGQMIN=?	+ CGQMIN:<PDP_type>,<precedence>(List of possible values),(<delay>(List of possible values),(<reliability>(List of possible values),(<peak>(List of possible values),(<mean>(List of possible values)...] OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>			Please refer toAT+CGDCONTentry
<precedence>	Service qualityQOSPRIORITY	<u>0</u>	By default, signedQOSPRIORITY
		1~3	QOSPRIORITY
<delay>	Service qualityQOSDelay level	<u>0</u>	Signed service quality (QOSDelay level)
		1~4	QOSLatency level
<reliability>	Service qualityQOSReliability level	<u>0</u>	Signed service quality (QOSReliability level)
		1~5	QOSReliability level
<peak>	Service qualityQOSPeak throughput level	<u>0</u>	Signed service quality (QOSPeak throughput level)
		1~9	QOSPeak throughput level
<mean>	Service qualityQOSAVERAGE throughput level	<u>0</u>	Signed service quality (QOSAVERAGE throughput level)
		1~18	QOSAVERAGE throughput level
		31	Do your bestQOSAVERAGE throughput level

9.8Requested Quality of Service Briefing:AT+CGQREQ

The configuration command can set a <cid>The Quality of Service (QoS) briefing for the identified Context Activation Request message. The Context Activation Request message is...MTSend to the network. Syntax rules:

Command type	grammar	return
Setting commands	AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>,<mean>]]]]]	OK
Query command	AT+CGQREQ?	+ CGQREQ: <cid>,<precedence>,<delay>,<reliability> , <peak>,<mean>[<CR><LF>+CGQREQ: <cid>,<precedence>,<delay>,<reliability> , <peak>,<mean>[...]] OK
Test command	AT+CGQREQ=?	+ CGQREQ:<PDP_type> , (<precedence>(List of possible values), (<delay>(List of possible values), (<reliability>(List of possible values), (<peak>(List of possible values), (<mean>(List of possible values) ...] OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>			Please refer toAT+CGDCONTentry
<precedence>	Service qualityQOSPRIORITY	<u>0</u>	By default, signedQOSPRIORITY
		1~3	QOSPRIORITY
<delay>	Service qualityQOSDelay level	<u>0</u>	Signed service quality (QOSDelay level)
		1~4	QOSLatency level

<reliability>	Service qualityQOSReliability level	<u>0</u>	Signed service quality (QOSReliability level
		1~5	QOSReliability level
<peak>	Service qualityQOSPeak throughput level	<u>0</u>	Signed service quality (QOSPeak throughput level
		1~9	QOSPeak throughput level
<mean>	Service qualityQOSAverage throughput level	<u>0</u>	Signed service quality (QOSAverage throughput level
		1~18	QOSAverage throughput level
		31	Do your bestQOSAverage throughput level

9.9Control non-requestGPRSIncident reporting:AT+CGEREP

Enable or disable the command.URCHint+CGEV: XXXWhen enabled, this will occur when certain events happen on the data domain terminal or network side.URCReport it to higher authorities.

Syntax rules:

For AIR720Series Modules:

Command type	grammar	return
Setting commands	AT+CGEREP=<mode>[,<bfr>]	OK
Query command	AT+CGEREP?	+ CGEREP:<mode>,<bfr>
		OK
Test command	AT+CGEREP=?	+ CGEREP:(<mode>(List of possible values), (<bfr>(List of possible values)
		OK
URCReport	+ CGEV: XXX	If <mode>=1or2,whenMTOor when something happens on the network side, this will occur. URC Report

For AIR720SSeries Modules:

Command type	grammar	return
Setting commands	AT+CGEREP=<mode>	OK
Query command	AT+CGEREP?	+ CGEREP:<mode>
		OK
Test command	AT+CGEREP=?	+ CGEREP:(<mode>(List of possible values)
		OK
URCReport	+ CGEV: XXX	If <mode>=1,whenMTOor when something happens on the network side, this will occur.URC Report

Parameter definition:

For AIR720/AIR780ESeries Modules:

parameter	definition	Value	Explanation of the possible values
<mode>	The result code reporting mode	0	bufferMTThe non-request result code in; ifMTIf the result code buffer is full, discard the oldest result code. Do not forward the result code to...TE.
		1	whenMT-TEWhen the link is in a reserved state (e.g., in an online data state), discard non-requested result codes; otherwise...MTForward the non-request result code directly toTE.

Parameter definition:

For AIR720Series Modules:

parameter	definition	Value	Explanation of the possible values
<mode>	The result code reporting mode	0	bufferMTThe non-request result code in; ifMTIf the result code buffer is full, discard the oldest result code. Do not forward the result code to...TE.
		1	whenMT-TEWhen the link is in a reserved state (e.g., in an online data state), discard non-requested result codes; otherwise...MTForward the non-request result code directly toTE.
		2	whenMT-TEWhen the link is in a reserved state (e.g., in an online data state), save the non-requested result codes and send them all when the link is restored.TE;otherwiseMTForward the non-request result code directly to TE.

9.10 (URC)Group Domain EventsURCReport: +CGEV

This printout is automatically reported when there is an event reported on the group domain or network side.

Syntax rules:

URC
+ CGEV: XXX

Incident reporting:

event	explain
+ CGEV: NWDEACT <PDP_type>, [<PDP_addr>], <cid>	The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command + CGDCONT. Examples: + CGEV: "IP", "10.0.0.0", 1 + CGEV: "PPP", "", 2 + CGEV: NWDETACH
+ CGEV: ME DEACT <p_cid>, <cid>	The mobile termination has forced a context deactivation. The associated <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command + CGDSCONT
+ CGEV: ME ACT <p_cid>, <cid>	The network has responded to an ME initiated Traffic Flow activation request with an EPS bearer activation or modification. The associated MT allocated context identifier <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command + CGDSCONT
+ CGEV: ME ACT <PDP_type>, <PDP_addr>, <cid>	The mobile termination has forced a context activation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters

	<PDP_type>, <PDP_addr> and <cid> are found in command +CGDCONT
+ CGEV: NWACT <PDP_type>, <PDP_addr>, <cid>	The network has forced a context activation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>, <PDP_addr> and <cid> are found in command + CGDCONT.
For network attachment, the following unsolicited result codes and the corresponding events are defined:	
+ CGEV: NWDETACH	The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.
+ CGEV: ME DETACH	The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately.
For PDP context activation, the following unsolicited result codes and the corresponding events are defined:	
+ CGEV: EPS PDN ACT <cid>	The network has activated a PDN connection. The format of the parameter <cid> is found in command +CGDCONT
+ CGEV: NWPDN ACT <cid>	The network has activated a PDN connection. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. Note: the event is not applicable for EPS
+ CGEV: ME PDN ACT <cid>[,<reason>[,<cid_other>]]	<p>The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are found in command +CGDCONT <reason>: integer type; indicates the reason why the context activation request for PDP type Ipv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is Ipv4v6, and the PDP type assigned by the network for <cid> is either Ipv4 or Ipv6.</p> <p>0 IPv4 only allowed 1 IPv6 only allowed 2 single address bearers only allowed. 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful. <cid_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if</p>

	<reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid_other>.
+ CGEV: EPS PDN DEACT <cid>	The network has deactivated a PDN connection. The associated <cid> is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.
+ CGEV: ME PDNDEACT <cid>	The mobile termination has deactivated a PDN connection. The associated <cid> is provided to the TE. The format of the parameter <cid> is found in command + CGDCONT
+ CGEV: EPSDED ACT <p_cid>, <cid>	The network has activated an EPS dedicated bearer. The associated MT allocated secondary context identifier <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command + CGDSCONT
+ CGEV: EPSDED DEACT <p_cid>, <cid>	The network has deactivated an EPS dedicated bearer. The associated <cid> is provided to the TE in addition to the PDN connection associated <p_cid>. The format of the parameters <p_cid> and <cid> are found in command + CGDSCONT
+ CGEV:EPS ACT <cid>	The network has activated a PDP context. The associated <cid> is provided to the TE, its format is found in command +CGDCONT
+ CGEV:EPSMODIFY <cid>, <change_reason>	<p>The network has modified EPS bearer context parameter(s). The associated <cid> is provided to the TE in addition of the change reason: TFT and/or QoS modification. The format of the parameter <cid> is found in command +CGDCONT.</p> <p><change_reason> integer type parameter indicates what kind of change occurred.</p> <p>1: TFT only changed 2: Qos only changed 3: Both TFT and QoS changed</p>
ForPDPcontextmodification,thefollowingunsolicitedresultcodesandthecorrespondingeventsaredefined:	
+ CGEV:NWMODIFY<cid>,<change_reason>,<event_type>	The network has modified a context.The format of the parameter <cid> is found in command +CGDCONT or + CGDSCONT. The format of the parameters <event_type> and <change_reason> are defined above.
+ CGEV:NWME <cid>,<change_reason>,<event_type>	The mobile termination has modified a context.The format of the parameter <cid> is found in command + CGDCONT or +CGDSCONT. The format of the

	parameters <event_type> and <change_reason> are defined above.
--	--

For example:

URCs	explain
+ CGEV: "IP","10.0.0.0",1	
+ CGEV: "PPP","",2	
+ CGEV: NW DETACH	

10NTPRelated commands

Network Time Protocol(NTPSynchro is a protocol used to synchronize computer time. It allows computers to synchronize with their servers or clock sources (such as quartz clocks),GPS(etc.) Synchronization can provide highly accurate time correction.LANThe deviation between the upper and standard deviations is less than1millisecond,WAN(tens of milliseconds), and can be protected against malicious protocol attacks through encrypted confirmation. Time is...NTPServer hierarchy propagation. Based on distance from the outside... UTCThe proximity of the source groups all servers into different categories.Stratum(Layer)

Module supportSNTPprotocol(Simple Network Time Protocol), and has a setATThis command enables network time synchronization.

10.1set upGPRSSupporting scenariosID:AT+CNTPCID

Command type	grammar	return
Setting commands	AT+CNTPCID=<cid>	OK
Query command	AT+CNTPCID?	+ CNTPCID:<cid>
		OK
Test command	AT+CNTPCID=?	+ CNTPCID:(<cid>(range of values)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cid>	Supporting scenariosid	1-3	The value is the same as +SAPBRThe command <cid>

10.2Synchronize network time:AT+CNTP

Command type	grammar	return
Setting commands	AT+CNTP=<NTP server>[,<time zone>]	OK
Execute command	AT+CNTP	OK
		+ CNTP: <code>
Query command	AT+CNTP?	+ CNTP: <NTP server>,<time zone>
		OK
Test command	AT+CNTP=?	+ CNTP: <NTP server>,<time zone>
		OK
Precautions	After successful network time synchronization, you can useAT+CCLK?Command to query the module's current time	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
-----------	------------	-------	------------------------------------

<NTP server>	NTPserver	Domain name or IPaddress	
<time zone>	Local time zone	- 47~+48	unit:1/4Time zone. A time zone is...12~+12However, some countries use half-time zones, or even...1/4Time zones, to accommodate these countries, are defined as follows:1/4Time zones. A minus sign indicates the Western Time Zone, and a plus sign indicates the Eastern Time Zone.
<code>	opcode	1	Network time synchronization successful
		61	Network error
		62	DNSParsing error
		63	Connection error
		64	Service response error
		65	Service response timeout

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+SAPBR=3,1,"Contype","GPRS"	activationPDPis usingCNTPPrequisites for command time synchronization
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDP Context, used forRNDISInternet access (this <apn>It can be done AT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To setAPN
←	OK	
→	AT+SAPBR=1,1	Activatecid>=1 ofPDP
←	OK	
→	AT+CNTPCID=1	Settings usedPDPofcid>=1
←	OK	
→	AT+CNTP	
←	OK + CNTP:1	
→	AT+CCLK?	
←	+ CCLK: "18/05/16,15:49:28+32" OK	

11File system read and write commands

11.1Create a file:AT+FSCREATE

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSCREATE=<filename>	OK or ERROR
Query command	AT+FSCREATE=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filename>	file name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].64bytes

11.2Read the file:AT+FSREAD

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSREAD=<filename>,<mode>,<filesize>,<position>	<data> OK or ERROR
Query command	AT+FSREAD=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filename>	file name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].64bytes
<mode>	file reading mode	0	Read the file from the beginning.
		1	From the file <position>Start reading file at position
<filesize>	The length of the file to be read		Cannot be greater than10240This is one byte. If the actual length of the file is less than this value, then the actual length of the file is read.
<position>	Starting position of the file to read		This value should be smaller than the file size.mode>=0This value is invalid at that time.
<data>	Read file data		

11.3Write a file:AT+FSWRITE

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSWRITE=<filename>,<mode>,<filesize>,<inputtime>	> (Data is written after > appears) OK or ERROR or TimeOut
Query command	AT+FSWRITE=?	OK or ERROR
Precautions	When the length of the input data reaches <filesize>Automatic writing will occur when the time for data input exceeds <inputtime>When, returnTimeOut	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filename>	file name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value],64bytes
<mode>	Write file mode	0	Start writing the file from the beginning.
		1	Start writing to the end of the file.
<filesize>	The length of the data to be written		Cannot be greater than10240bytes
<inputtime>	Enter duration	1~4294967295	Unit: seconds

11.4Get drive letter:AT+FSDRIVE

Syntax rules:

Command type	grammar	return
Execute command	AT+FSDRIVE=<n>	+ FSDRIVE:<drive> OK
Query command	AT+FSDRIVE=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Drive type	0	Local drive letter
		1	SDCard letter
<drive>	disk		String type. Adding or omitting double quotes is optional. If it is local storage, the drive letter isC;in the case ofSDIf it's a card, then the drive letter is...D

11.5Display a list of file directories:AT+FSL

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSL=<filepath>	list of subdirectories/files OK
Query command	AT+FSL=?	OK
Precautions	1)If the last character of the returned result is a backslash (\), it represents a directory name; otherwise, it represents a file name. 2)Local query moduleFLASHRoot directory usage:AT+FSL="/"orAT+FSL="C:/" 3)Query externalTFCard root directory usage:AT+FSL="D:/"	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filepath>	File path		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].641 byte.

11.6Get available space size:AT+FSMEM

The command is used to obtain the remaining space in the file system.

Syntax rules:

Command type	grammar	return
Execute command	AT+FSMEM	+ FSMEM: <size> OK
Query command	AT+FSMEM=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<size>	File system available space		Unit: bytes

11.7Create directory:AT+FSMKDIR

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSMKDIR=<dir_name>	OK or ERROR
Query command	AT+FSMKDIR=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<dir_name>	Directory Name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].64bytes

11.8Delete directory:AT+FSRMDIR

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSRMDIR=<dir_name>	OK or ERROR
Query command	AT+FSRMDIR=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<dir_name>	file name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].64bytes

11.9Delete file:AT+FSDEL

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSDEL=<filename>	OK or ERROR
Query command	AT+FSDEL=?	OK or ERROR

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filename>	file name		Strings do not need to be enclosed in double quotes and should not exceed [a certain value].64bytes

11.10Get file size:AT+FSFLSIZE

Syntax rules:

Command type	grammar	return
Setting commands	AT+FSFLSIZE=<filename>	+ FSFLSIZE: <size> OK

Query command	AT+FSFSIZE=?	OK
---------------	--------------	----

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filename>	file name		Strings do not need to be enclosed in double quotes and should not exceed (a certain value).64bytes
<size>	File size		Unit: bytes

11.11Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→) / Return (←)	Example	Explanation and clarification
How to use local file system read/write commands:		
→	AT+FSMKDIR="/testdir"	Create a first-level directory
←	OK	
→	AT+FSMKDIR="/testdir/testdir"	Create a second-level directory
←	OK	
→	AT+FSCREATE="/testdir/test.txt"	Create a file in the first-level directory
←	OK	
→	AT+FSLS="/testdir"	Display the list of top-level directories.
←	testdir\ test.txt OK	
→	AT+FSWRITE="/testdir/test.txt",0,10,10	Write file
→	> 1234567890	When ">" appears, enter the data you want to write:1234567890.
←	OK	
→	AT+FSREAD="/testdir/test.txt",0,10,10	Read file data
←	1234567890 OK	
→	AT+FSMEM	Get the available space size of the file system
←	+ FSMEM: 1304000 bytes OK	
→	AT+FSFSIZE="/testdir/test.txt"	Get file size
←	+ FSFSIZE: 10 OK	
→	AT+FSDEL="/testdir/test.txt"	Delete file
←	OK	
→	AT+FSRMDIR="/testdir/testdir"	Delete directory
←	OK	

SDHow to use card file system read/write commands:		
→	AT+FSMKDIR="D:/testdir"	Create a first-level directory
←	OK	
→	AT+FSMKDIR="D:/testdir/testdir"	Create a second-level directory
←	OK	
→	AT+FSCREATE="D:/testdir/test.txt"	Create a file in the first-level directory
←	OK	
→	AT+FSLS="D:/testdir"	Display the list of top-level directories.
←	testdir\ test.txt OK	
→	AT+FSWRITE="D:/testdir/test.txt",0,10,10	Write file
→	> 1234567890	When ">" appears, enter the data you want to write:1234567890.
←	OK	
→	AT+FSREAD="D:/testdir/test.txt",1,5,2	Read file data
←	34567 OK	
→	AT+FSFLSIZE="D:/testdir/test.txt"	Get file size
←	+ FSFLSIZE: 10 OK	
→	AT+FSDEL="D:/testdir/test.txt"	Delete file
←	OK	
→	AT+FSRMDIR="D:/testdir/testdir"	Delete directory
←	OK	

12EmbeddedTCPIPOrder

12.1Startup MultipleIPconnect:AT+CIPMUX

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPMUX=<n>	OK
Query command	AT+CIPMUX?	+ CIPMUX: <n> OK
Test command	AT+CIPMUX=?	+ CIPMUX: (0,1) OK
Precautions	- Only inIP initialThe status must be met for this command to be successfully configured.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Multi-way switch	<u>0</u>	Single-path connection (default)
		1	Multiple connections

12.2Start the task and set up the access pointAPNUsername and password:AT+CSTT

Syntax rules:

Command type	grammar	return
Setting commands	AT+CSTT=<apn>[,<username>[,<password>]]	OK
Query command	AT+CSTT?	+ CSTT: <apn>,<user name>,<password> OK
Test command	AT+CSTT=?	+ CSTT: "APN","USER","PWD" OK
Precautions	1Setting and executing commands are only available when...IP INITIALThe action is effective while the status is active. After executing the setting command, the status changes to [status].IP START 2After the module registers with the network, it will automatically obtain [the necessary information].apn>And activate onePDPContext, used forRNDISInternet access (this <apn>It is possible to pass PassAT+CGDCONT?(To search), so just enter...AT+CSTTThat's it, the module will automatically retrieve the <apn>To setCSTT of APN	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<apn>	GPRSAccess Point Name	-	String parameters (double quotes optional), not exceeding128characters
<user name>	GPRSusername	-	String parameters (double quotes optional), not exceeding32characters

<password>	GPRSPassword	-	String parameters (double quotes optional), not exceeding 32 characters
------------	--------------	---	---

12.3 Private network card settings APN Username, password, and authentication method: AT+CPNETAPN

Syntax rules:

Command type	grammar	return
Setting commands	AT+CPNETAPN=<mode>,<apn>,<user>,<pwd>,<authmode>	OK
Query command	AT+CPNETAPN?	MODE:<mode> APN:<apn> USR:<user> PWD:<password> AUTHMODE:<authmode> OK
Test command	AT+CPNETAPN=?	+ CPNETAPN: (0-3),<apn>,<user>,<pwd>,<authmode> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Parameter saving mode	0	Save and restart for the changes to take effect.
		1	The changes will take effect immediately if not saved. Note: If you can use both dedicated network cards and regular cards, modePlease set it to 1
		2	Save and apply immediately Note: If you continue to use a dedicated network card...modePlease set it to 2
		3	Delete saved parameters
<apn>	GPRSAccess Point Name		String parameters (double quotes optional), not exceeding 128 characters. Note: This parameter cannot be empty.
<user>	GPRSusername		String parameters (double quotes optional), not exceeding 32 characters. If empty, it is represented as "".
<pwd>	GPRSPassword		String parameters (double quotes optional), not exceeding 32 characters. If empty, it is represented as "".
<authmode>		0	No authentication
		1	PAP
		2	CHAP

For example:

Command (→)/ Return (←)	Example	Explanation and clarification
→	AT+CPNETAPN=2,jscmiot,u9682,iot98765,2	Configure a private network card APN. Please fill in all parameters accurately, do not copy verbatim. The module will automatically configure this command when you set it. AT+AUTOAPN=0 No need to enter in advance AT+AUTOAPN=0
←	OK	Setup successful. The parameters will be saved after successful setup. NVThe module will restart automatically.

	<p>Default after restartPDPBearing (<cid>=5)Already setAPNIt is already active and available. This is the default.PDPCarrier, used for modulesRNDISNetwork card functions andTCP/IP/HTTP/MQTT/FTPData services, etc. AT+CGDCONT?</p> <p>+ CGDCONT: 5,"IP"," jscmiot.MNC011.MCC460.GPRS","10.134.28.241",0,0,,,,</p> <p>OK</p> <p>Subsequent data applicationsCSTTorSAPBRset upAPNWhen, you only needAPNEmpty or set <private network>apn>That's it, no further settings are needed. <user>and <pwd></p> <p>For example:</p> <p>AT+CSTT=jscmiot</p> <p>AT+CSTT</p> <p>AT+SAPBR=3,1,"APN","jscmiot"</p> <p>AT+SAPBR=3,1,"APN",""</p>
--	---

12.4Activate the mobile scene (or initiate)GPRSorCSDWireless connection):AT+CIICR

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CIICR	<p>If activation is successful, the following will be returned:</p> <p>OK</p> <p>If activation fails, the following will be returned:</p> <p>ERROR</p>
Test command	AT+CIICR=?	<p>return:</p> <p>OK</p>
Precautions	<ul style="list-style-type: none"> - AT+CIICROnly whenIP STARTThe movement scene can only be activated in a certain state, and the state changes after execution.IP CONFIGAfter the module accepts - the scene activation operation, if the mobile scene activation is successful, the status changes to...IPGPRSACT,returnOKOtherwise return ERROR. 	

12.5Query localIPaddress:AT+CIFSR

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CIFSR	<IP address>
Test command	AT+CIFSR=?	OK
Precautions	<p>Only when the mobile scene is active:IP GPRSACT,TCP/UDP CONNECTING,CONNECT OK,IP CLOSEOnly then can it be passedAT+CIFSRThe query returned localIPAddress, otherwise returnERROR</p>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<IP address>	IPaddress	-	String parameters (strings need to be enclosed in quotes)

12.6set upTCPuseSSLFunction:AT+CIPSSL

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPSSL=<n>	OK
Query command	AT+CIPSSL?	+ CIPSSL: <n> OK
Test command	AT+CIPSSL=?	+ CIPSSL: (0-1) OK
Precautions	existCIPSTARTPreviously entered the settings commandAT+CIPSSL=1OpenSSLFunction. OpenSSLAfter the function is implemented, the module will beTCP Automatically after connection is establishedSSLverify. Currently only supports asSSL Clientapplication.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	SSLFunction switch	<u>0</u>	closureSSL
		1	OpenSSL

12.7ConfigurationTCP SSLparameter:AT+SSLCFG

The setting command is used to set...SSLVersion,SSLEncryption algorithm (ciphersuites), security level (security level),CACertificate(Certificate Authority Certificate), client certificate (client certificate) and client key (client keyThese parameters are inSSLIt is used during the handshake process of the protocol.

Syntax rules:

Command type	grammar	return
Setting commands	AT+SSLCFG="sslversion",<n>[,<sslversio n>]	If <sslversion>If missing, then query <n>correspondingSSLVersion: + SSLCFG: "sslversion",<n>,<sslversion> OK Otherwise, set <n>correspondingSSLVersion: If the format and parameters are correct, return: OK <small>If the command format or parameters are incorrect, the following will be returned:</small> ERROR
	AT+SSLCFG="ciphersuite",<n>[,<ciphers uites>]	If <ciphersuites>If missing, then query <n>Corresponding encryption algorithm: + SSLCFG: ciphersuite",<n>,<ciphersuites> OK

		<p>Otherwise, set <n>Corresponding encryption algorithm:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the directory format or parameters are incorrect, return:</p> <p>ERROR</p>
	AT+SSLCFG="cacert",<n>[,<certpath>]	<p>If <certpath>If parameters are missing, query <n>correspondingCA Certificate path:</p> <p>+ SSLCFG:"cacert",<n>,<certpath></p> <p>OK</p> <p>Otherwise, set <n>correspondingCACertificate path: If the format and parameters are correct, return:</p> <p>OK</p> <p>If the directory format or parameters are incorrect, return:</p> <p>ERROR</p>
	AT+SSLCFG="clientcert",<n>[,<client_cert_path>]	<p>If <client_cert_path>If the parameter is missing, then the query is <n></p> <p>Corresponding client certificate path:</p> <p>+ SSLCFG:"clientcert",<n>,<client_cert_path></p> <p>OK</p> <p>Otherwise, set <n>Corresponding client certificate path:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="clientkey",<n>[,<client_key_path>]	<p>If <client_key_path>If it is missing, then the query is <n></p> <p>Corresponding client key path:</p> <p>+ SSLCFG:"clientkey",<n>,<client_key_path></p> <p>OK</p> <p>Otherwise, set <n>Corresponding client key path:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="seclvl",<n>[,<seclvl>]	<p>If <seclvl>If the parameter is missing, then the query is <n>Relevant security levels:</p> <p>+ SSLCFG:"seclvl",<n>,<seclvl></p> <p>OK</p> <p>Otherwise, set <n>Corresponding security level:</p> <p>If the format and parameters are correct, return:</p>

		<p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="hostname",<n>[,<hostname>]	<p>If <hostname>If the parameter is missing, then the query is <n>Related domain names:</p> <p>+ SSLCFG:"hostname",<n>,<hostname></p> <p>OK</p> <p>Otherwise, set <n>Corresponding hostname:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="ignorelocaltime",<n>[,<ignorelocaltime>]	<p>If <ignorelocaltime>If it is missing, then the query is <n>The relevant certificate expiration time check setting is as follows:</p> <p>+ SSLCFG:"ignorelocaltime",<n>,<ignoretime></p> <p>OK</p> <p>Otherwise, set <n>Corresponding certificate expiration time check parameters: If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="negotiatetimeout",<n>[,<negotiate_time>]	<p>If <negotiate_time>If the parameter is missing, then the query is <n>Corresponding maximumSSLNegotiation time:</p> <p>+ SSLCFG:"negotiatetimeout",<n>,<negotiate_time></p> <p>OK</p> <p>Otherwise, set <n>Corresponding maximumSSLWrite down the negotiation time:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="clientrandom",<n>[,<randbytes>]	<p>If <randbytes>If it is missing, then the query is <n>Related random numbers:</p> <p>+ SSLCFG:"clientrandom",<n>,<randbytes></p> <p>OK</p> <p>Otherwise, set <n>The corresponding random number:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>

	AT+SSLCFG="premaster",<n>[,<premaster>]	<p>If <premaster>If it is missing, then the query is <n> Related <premaster>: + SSLCFG:"premaster",<n>,<premaster></p> <p>OK</p> <p>Otherwise, set <n>correspondingpremaster:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="verifymode",<n>[,<verifymode>]	<p>If <verifymode>If missing, then query <n>Relevant certificate verification</p> <p>The pattern, at this point, returns:</p> <p>+ SSLCFG:"verifymode",<n>,<verifymode></p> <p>OK</p> <p>Otherwise, set the certificate authentication mode to root certificate authentication or other certificate authentication:</p> <p>If the format and parameters are correct, return:</p> <p>OK</p> <p>If the command format or parameters are incorrect, the following will be returned:</p> <p>ERROR</p>
	AT+SSLCFG="XXXXX",<n>,<	<p>Erase the corresponding parameters.XXXXX"It refers to:sslversion, "ciphersuite""cacertKeywords such as ...</p> <p>Note:>There must be a comma after it. If <n>If there is no comma after the query, it is a simple query.</p>
Test command	AT+SSLCFG=?	OK
Precautions	TCP SSLFor functional examples, please refer to the examples later in this chapter.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	SSLContextid	0~5,34,88,153	<p>Integer type.</p> <p>TCPFunctional time andCIPSTART< inn>Binding. For example: In multiple links...CIPSTARTSet the link number in the middle.1,but SSLContextidAlso for1.</p> <p>TCPIn a single linkSSLContextidFixed as0.</p> <p>FTPFunctionalityn>=34(Decimal) MQTT</p> <p>Functionalityn>=88(Decimal) HTTP</p> <p>Functionalityn>=153(Decimal)</p>
<sslversion>	SSLVersion	0	SSL3.0
		1	TLS 1.0
		2	TLS 1.1
		3	TLS 1.12
		4	ALL above

<ciphersuites>	SSL ciphersuites	0X0035	TLS_RSA_WITH_AES_256_CBC_SHA
		0X002F	TLS_RSA_WITH_AES_128_CBC_SHA
		0X0005	TLS_RSA_WITH_RC4_128_SHA
		0X0004	TLS_RSA_WITH_RC4_128_MD5
		0X000A	TLS_RSA_WITH_3DES_EDE_CBC_SHA
		0X003D	TLS_RSA_WITH_AES_256_CBC_SHA256
		0XFFFF	ALL above
<cacertpath>	TrustedCACertificate path		String type
<client_cert_path>	Client certificate path		String type
<client_key_path>	Client key path		String type
<seclvl>	Security level	<u>0</u>	No authentication
		1	Server authentication
		2	服务器鉴权和客户端鉴权（如果服务器要求的话）
<hostname>	主机名		
<ignoreltime>	该参数决定如何对待过期证书	0	关心证书的过期时间
		<u>1</u>	忽略证书的过期时间
<negotiate_time>	SSL 协商阶段的最大时间	10~300	单位：秒
<clientrandom>	随机数，十六进制数组成的字符串，支持 56 和 64 个字节	数字和字母的组合	字符串型，双引号可加可不加，数字的范围：0~9，字母的范围：ABCDEF（大小写不敏感）。例如 56 个字节的： 101B12C3141516171F192021222324252 62728293031323334353637
<premaster>	premaster		
<verifymode>	证书验证模式	<u>0</u>	根证书认证
		1	其他证书认证

12.8 配置本地 TCP 端口：AT+CLPORT

语法规则：

命令类型	语法	返回	
设置命令	单链接： AT+CLPORT=<mode>,<port>	OK 或 ERROR	
	多链接： AT+CLPORT=<n>,<mode>,<port> >		
查询命令	AT+CLPORT?	+ CLPORT: <TCP port>,<UDP port> OK	单链接 (CIPMUX=0)
		+ CLPORT: 0,<TCP port>,<UDP port> + CLPORT: 1,<TCP port>,<UDP port> + CLPORT: 2,<TCP port>,<UDP port> + CLPORT: 3,<TCP port>,<UDP port>	多链接 (CIPMUX=1)

		+ CLPORT: 4,<TCP port>,<UDP port> + CLPORT: 5,<TCP port>,<UDP port> OK	
测试命令	AT+CLPORT=?	+ CLPORT: ("TCP","UDP"),(0-65535) OK	单链接 (CIPMUX=0)
		+ CLPORT: (0-5),("TCP","UDP"),(0-65535) OK	多链接 (CIPMUX=1)

参数定义：

<n>	Link No.	0~5	整数型，表示连接序号
<mode>	连接类型，字符串型 (双引号可加可不加)	"TCP"	建立TCP连接
		"UDP"	建立UDP连接
<port>	模块端口	1~65535	整数型

12.9 建立 TCP 连接或注册 UDP 端口号：AT+CIPSTART

语法规则：

命令类型	语法	返回和说明
设置命令	单路连接(+CIPMUX=0)时： AT+CIPSTART=<mode>,<server>,<port>	如果格式正确且处于IP INITIAL 或者 IP STATUS 或TCP/UDP CLOSE状态，返回： OK 否则返回： + CME ERROR <err> 紧接着会有URC上报，上报内容如下： 如果连接已经存在，返回： ALREADY CONNECT 如果连接成功(非透传)，返回： CONNECT OK 如果连接成功(透传)，返回： CONNECT 否则返回： STATE: <sl_state> CONNECT FAIL
	多路连接(+CIPMUX=1)时： AT+CIPSTART=<n>,<mode>,<server>,<port>	如果格式正确且处于 IP STATUS或IP PROCESSING时，返回： OK 否则返回： + CME ERROR <err> 紧接着会有URC上报，上报内容如下： 如果连接已经存在，返回： <n>,ALREADY CONNECT

		如果连接成功，返回： <n>,CONNECT OK 否则返回： <n>,CONNECT FAIL
测试命令	AT+CIPSTART=?	单路连接(+CIPMUX=0)时返回： + CIPSTART: (<mode>取值列表),(IP address range), (port range) + CIPSTART: (<mode>取值列表),(domain name),(port range) OK 多路连接(+CIPMUX=1)时返回： + CIPSTART: (<n> 取值 列表),(<mode> 取值 列表), (IP addressrange),(port range) + CIPSTART: (<n>取值列表),(<mode>取值列 表),(domain name),(portrange) OK
注意事项	<ul style="list-style-type: none"> - 此命令应用于建立 TCP/UDP 连接； - 当前状态可用 AT+CIPSTATUS 查询； - 单路连接时只当前状态为 IP INITIAL 或者 IP STATUS 或 TCP/UDP CLOSE 时可执行，多路连接时当前状态为 IP STATUS 或 IP PROCESSING 时可执行； 在当前状态不是上述可执行状态时，需执行 AT+CIPSHUT 后再开始建立连接； 多路连接时，设置此命令前，必须先执行 AT+CSTT, AT+CIICR,AT+CIFSR 这三个命令。 - 	

参数定义：

参数	定义	取值	对取值的说明
<n>	Link No.	0~5	整数型，表示连接序号
<mode>	连接类型，字符串型 (双引号可加可不加)	"TCP"	建立TCP连接
		"UDP"	建立UDP连接
<server>	远端服务器 IP 地址 或域名皆可	最大128个字节	字符串参数（双引号可加可不加）
<port>	远端服务端口	1~65535	整数型
<sl_state>	单连接状态	IP INITIAL	初始化
		IP START	启动任务
		IP CONFIG	配置场景
		IP GPRSACT	场景已激活
		IP STATUS	获得本地 IP 状态
		TCP CONNECTING/UDP CONNECTING/SERVER LISTENING	TCP 连接中/UDP 端口注册中/服务器侦听 中
		CONNECT OK	连接建立成功
		TCP CLOSING/UDP CLOSING	正在关闭 TCP 连接，正在注销 UDP 端口
		TCP CLOSED/UDP CLOSED	连接断开 /UDP 端口被注销
		PDP DEACT	场景被释放

12.10 选择 TCPIP 应用模式：AT+CIPMODE

语法规则：

命令类型	语法	返回
设置命令	AT+CIPMODE=<mode>	OK
查询命令	AT+CIPMODE?	+ CIPMODE: <mode> OK
测试命令	AT+CIPMODE=?	+ CIPMODE: (0-NORMAL MODE,1-TRANSPARENT MODE) OK
注意事项	此命令只有在IP INITIAL状态下才能进行设置 只有TCP单链接才支持透明传输模式	

参数定义：

参数	定义	取值	对取值的说明
<mode>	TCPIP 应用模式	0	非透明传输模式
		1	透明传输模式

12.11 选择非透传数据发送模式：AT+CIPQSEND

语法规则：

命令类型	语法	返回
设置命令	AT+CIPQSEND=<n>	OK
查询命令	AT+CIPQSEND?	+ CIPQSEND: <n> OK
测试命令	AT+CIPQSEND=?	+ CIPQSEND: (0,1,2) OK

参数定义：

参数	定义	取值	对取值的说明
<n>	非透传数据发送模式	0	缺省值。快发模式0。 当服务器收到数据，模块返回： SEND OK (单链接) 或 <n>, SEND OK (多链接)
		1	快发模式1。当数据发送到模块，终端返回：DATA ACCEPT:<length> (单链接) DATA ACCEPT:<n>,<length> (多链接)
		2	慢发模式 当服务器收到数据，模块返回： SEND OK (单链接) 或 <n>, SEND OK (多链接)

注：

- 慢发模式每发送一笔数据需要服务器那边的确认，而快发则发送到模块就可以了，不需要服务器的确认。推荐使用 0 或 1，即快发模式；
- The two fast-send modes have the same implementation mechanism; the only difference lies in the mode after the data is sent.0hintSEDN OK,model1hintDATA ACCEPT;
- Recommended useCIPACKThe command queries whether the other end has received each piece of data.

12.12Configure whether to automatically add a carriage return and line feed at the end of received data:AT+CIPRXF

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPRXF=<n>	OK
Query command	AT+CIPRXF?	+ CIPRXF:<n> OK
Test command	AT+CIPRXF=?	+ CIPRXF: (<n>{List of possible values}) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	model	0	A newline character (\n) is automatically added to the end of each received data entry.r\n)
		1	No newline character (\n) is added at the end of each received data entry.r\n)

12.13Configure transparent transmission mode:AT+CIPCCFG

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPCCFG=<NmRetry>,<WaitTm>,<SendSz>,<esc>[,<Rxmode>,<RxSize>,<Rxtimer>,<BufClean>]	OK
Query command	AT+CIPCCFG?	+ CIPCCFG: <NmRetry>,<WaitTm>,<SendSz>,<esc>,<Rxmode>,<RxSize>,<Rxtimer>,<BufClean> OK
Test command	AT+CIPCCFG=?	+ CIPCCFG: (NmRetry:3-8),(WaitTm:2-10),(SendSz:1-14 60), (esc:0,1),(Rxmode:0,1),(RxSize:50-1460) , (Rxtimer:20-1000),(BufClean:0,1)

		OK
Precautions	This command is only used in single-path connections.AT+CIPMUX=0)andAT+CIPMODE=1In this case, you can set	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<NmRetry>	oneIPNumber of packet retransmissions	3~8	The default value is5
<WaitTm>	Interval transmission time	2~10	Units are100msThe default value is2.
<SendSz>	Number of bytes of data sent each time	1~1460	The default value is1024
<esc>	Enable escape sequences? [The software does not support escaping functionality. Ignore the meaning of this parameter.]	1	Enable escape sequence
		0	Escape sequences are not enabled; default value.
<Rxmode>	The time interval for receiving data from the serial port set up	1	Set the time interval, the interval is <Rxtimer>
		0	No time interval
<RxSize>	Length of data received each time	50~1460	Units arebytes
<Rxtimer>	The time interval for receiving data from the serial port	20~1000	Units aremsThe default value is50ms
<BufClean>	Should the send buffer be cleared after exiting pass-through? storage area	0	Do not clear the buffer If an error occurs and the system automatically exits pass-through mode, it will retain the cached data. Upon reconnecting and re-entering pass-through mode, it will send the previously buffered data to the server.
		1	Clear cache Once an error occurs and the system automatically exits pass-through mode, the cache is cleared. Upon reconnecting and re-entering pass-through mode, the data previously cleared from the buffer will not be sent to the server.

12.14Send data:AT+CIPSEND

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	Single-path connection (AT+CIPMUX=0): AT+CIPSEND=<length>	<p>This command is used to send data of immutable length in single-link mode.</p> <p>1)Normally return>(There is a space after this)</p> <p>> (Enter < after a spacelength>If the data is of a certain length, it will be sent out automatically.</p> <p>If it's in fast delivery mode0In slow transmission mode, the following response will be returned after successful data transmission: SEND OK</p> <p>If it's in fast delivery mode1If the data is successfully sent, the following response will be returned:</p> <p>DATA ACCEPT:<length></p> <p>If data transmission fails, the following response will be returned:</p> <p>SEND FAIL</p> <p>2)If the connection is not established or is broken, return: + CME ERROR <err></p>
	Multiple connections (+)CIPMUX=1): AT+CIPSEND=<n>[,<length>]	<p>When <length>If omitted, this command is used to send variable-length data in multi-connection mode. The response is "> ", at which point you can enter data to execute.CTRL+Z(0x1A)Send, or execute ESC(0x1B) Operation suspended;</p> <p>When <length>If not omitted, this command is used to send data of immutable length in multi-connection mode. The response is "> ", followed by <length>If the data is of a certain length, it will be sent out automatically.</p>

		<p>If the connection is not established or is broken, return: + CME ERROR <err></p> <p>If it's in fast delivery mode0In slow transmission mode, the following response will be returned after successful data transmission: <n>, SEND OK</p> <p>If it's in fast delivery mode1If the data is successfully sent, the following response will be returned: DATA ACCEPT:<n>,<length></p> <p>If data transmission fails, return: <n>, SEND FAIL</p>
Execute command	AT+CIPSEND	<p>This command is used to send variable-length data in single-link mode.</p> <p>response">"Enter data at this point and execute.CTRL+Z(0x1A)Send, or execute ESC(0x1B)Stop operation</p> <p>If the connection is not established or has been disconnected, return: + CME ERROR <err></p> <p>If it is in slow transmission mode, the following response will be returned after the data is successfully sent: SEND OK</p> <p>If it is in fast send mode, the following response will be returned after the data is successfully sent: DATA ACCEPT:<length></p> <p>If data transmission fails, return: SEND FAIL</p>
Query command	AT+CIPSEND?	<p>Single-path connection (AT+CIPMUX=0)return: + CIPSEND: <size></p> <p>OK</p> <p>Multiple connections (AT+CIPMUX=1)return: + CIPSEND: <n>,<size></p> <p>OK</p>
Test command	AT+CIPSEND=?	<p>Single-path connection (AT+CIPMUX=0)return: + CIPSEND: <length></p> <p>OK</p> <p>Multiple connections (AT+CIPMUX=1)return: + CIPSEND: <0-7>,<length></p> <p>OK</p>
Precautions	<ul style="list-style-type: none"> - The maximum data transmission length is determined by the network. - passAT+CIPATSDData can be sent automatically within a set time period. - Data can only be sent when the connection has been established. - The maximum number of bytes that can be sent at one time is no greater than <size>value - Slow send mode is not recommended! - Send commandAT+CIPSENDorAT+CIPSEND=<length>by\ror\r\nEnding with \. If the user ends with \rAt the end, if the first byte of the sent data is exactly \nThe module will determine whether the command to be sent is \r\nThe ending character causes the first character of the sent data to be \nIt was swallowed. Therefore, it is recommended that users use [the appropriate method/method] at this time.CIPSENDSend data with \r\nEnding with. For example: AT+CIPSEND\r > \n123456 The module will determine asAT+CIPSEND\r\nIt will remove the first character \ from the data.nEat it. The data received by the server is...123456. 	

	<p>The solution is:</p> <p>AT+CIPSEND\r\n</p> <p>> \n123456</p> <p>For example:</p> <p>AT+CIPSEND=7\r</p> <p>> \n123456</p> <p>The module will determine asAT+CIPSEND\r\nIt will remove the first character \ from the data.nIf the data is missing a character, it will fail to be sent. The solution is:</p> <p>AT+CIPSEND=7\r\n</p> <p>> \n123456</p>
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Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Link No. with +CIPSTRATCHinan>Consistent definition	0~5	Integer type, representing the connection sequence number.
<length>	Send data length	-	Integer type, it must be less than <size>
<size>	Maximum data sent each time	-	Integer type, currently1460byte

12.15Set the timeout before automatically sending data:AT+CIPATS

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPATS=<mode>[,<time>]	OK
Query command	AT+CIPATS?	+ CIPATS: <mode>, <time> OK
Test command	AT+CIPATS=?	+ CIPATS: (<mode>(List of possible values), (<time>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Should I set an automatic sending time (integer type)?	<u>0</u>	Automatic data sending is not set (default value).
		1	Set up automatic data sending
<time>	In how many seconds will the data be sent?	1~100	Integer type, in seconds

12.16Configure whether to display ">" and sending status prompts when sending data:AT+CIPSPRT

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPSPRT=<send prompt>	OK

Query command	AT+CIPSPRT?	+ CIPSPRT: <send prompt> OK
Test command	AT+CIPSPRT=?	+ CIPSPRT: (<send prompt>)(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<send prompt>	implementAT+CIPSENDDoes it appear afterward? Show '>' and send status prompts (i.e., 'SEND OKor'DATA ACCEPT'Integer type	0	It does not display ">", but returns "SEND OKor'DATA ACCEPT Note: return"SEND OKor'DATA ACCEPTDepend on AT+CIPQSENDThe settings of this command determine
		1	Displays '>' and returns "SEND OKor'DATA ACCEPT Default value Note: return"SEND OKor'DATA ACCEPTDepend on AT+CIPQSENDThe settings of this command determine
		2	Do not display ">", do not return "SEND OKor'DATA ACCEPT

12.17Query the current connection status:AT+CIPSTATUS

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CIPSTATUS	If it is a single-path connection (AT+CIPMUX=0),return: OK STATE: <sl_state>
		If it is a multi-way connection (AT+CIPMUX=1),return: OK STATE:<ml_state> C:<n>,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state>
Query command	AT+CIPSTATUS=<n> (Support for multiple connections)	Multiple connections (AT+CIPMUX=1),return: <n>,<bearer>, <TCP/UDP>, <IP address>, <port>, <client state>
Test command	AT+CIPSTATUS=?	return: OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Link No.	0~5	Integer type, representing the connection sequence number. with +CIPSTRATChinan>Consistent definition
<bearer>	GPSPbearing method	0~1	The default is0

<IP address>	IPaddress	-	String parameters (strings need to be enclosed in quotes)
<port>	port number	-	Integer
<sl_state>	Single connection state	IP INITIAL	initialization
		IP START	Start task
		IP CONFIG	Configuration scenario
		IP GPRSACT	The scene has been activated.
		IP STATUS	Get localIPstate
		TCP CONNECTING/UDP CONNECTING/SERVER LISTENING	TCPConnecting/UDPPort registration in progress / Server listening in progress
		CONNECT OK	Connection established successfully
		TCP CLOSING/UDP CLOSING	ClosingTCPConnection is being logged out.UDPport
		TCP CLOSED/UDP CLOSED	Disconnection /UDPThe port was deregistered
		PDP DEACT	The scene was released
<ml_state>	Multiple Link States	IP INITIAL	initialization
		IP START	Start task
		IP CONFIG	Configuration scenario
		IP GPRSACT	The scene has been activated.
		IP STATUS	Get localIPstate
		IP Processing	IPData phase
		PDP DEACT	The scene was released
<client state>	Client status	INITIAL	initialization
		CONNECTING	Connecting
		CONNECTED	Connected
		REMOTE CLOSING	Closed on the other end
		CLOSING	Closing
		CLOSED	Closed

12.18Query the status of connected data transmission:AT+CIPACK

Syntax rules:

Command type	grammar	return
Setting commands	Multiple connections (+)CIPMUX=1):	+ CIPACK: <txlen>, <acklen>, <nacklen>
	AT+CIPACK=<n>	OK
Execute command	Single-path connection (AT+CIPMUX=0):	+ CIPACK: <txlen>, <acklen>, <nacklen>
	AT+CIPACK	OK
Test command	AT+CIPACK=?	OK
Precautions	Once the link is established, queryAT+CIPACK,txlen>, <acklen>, <nacklen>The initial values of all three parameters are0Each time data is sent, these three parameters will increase cumulatively.	

	AT+CIPSHUTAfter the link is broken and reconnected, check.AT+CIPACKAll three parameters were reset to0
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Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	Link No.	0~5	Integer type, representing the concatenation sequence number. (And +)CIPSTRATChina>Consistent definition
<txlen>	Link <n>The cumulative number of data words sent since its establishment Number of sections	-	Integer
<acklen>	Link <n>Since its establishment, the server has received a total of [number] confirmed payments. Number of bytes of data received	-	Integer
<nacklen>	Link <n>The server has not yet confirmed receipt since its establishment. Data bytes	-	Integer

12.19Set asCSDorGPRSConnection mode:AT+CIPCSGP

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CIPCSGP=<mode>,[<apn>,<user>,<pwd> >	OK
Query command	AT+CIPCSGP?	+ CIPCSGP: <mode>, <apn>, <user>, <pwd> OK
Test command	AT+CIPCSGP=?	+ CIPCSGP: 1-GPRS,APN,USER NAME,PASSWORD OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Wireless connection mode	<u>1</u>	GPRSconnect
GPRSThe following parameters need to be set:			
<apn>	GPRSAccess Point Name	-	String parameters (strings need to be enclosed in quotes)
<username>	GPRSusername	-	String parameters (strings need to be enclosed in quotes)
<password>	GPRSpassword	-	String parameters (strings need to be enclosed in quotes)

12.20Configure Domain Name ServerDNS:AT+CDNSCFG

Syntax rules:

Command type	grammar	return
Setting commands	AT+CDNSCFG=<pri_dns>,<sec_dns>,<cid>]]	OK
Query command	AT+CDNSCFG?	PrimaryDns: <pri_dns> SecondaryDns: <sec_dns> OK

Test command	AT+CDNSCFG=?	+ CDNSCFG: ("Primary DNS"),("Secondary DNS") OK
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Parameter definition:

parameter	definition	Value	Explanation of the possible values
<pri_dns>	The main domain name server IP address		String parameters (strings need to be enclosed in quotes)
<sec_dns>	Backup domain name server IP address		String parameters (strings need to be enclosed in quotes)
<cid>	Definition same as +SAPBRChinacid>	1~3	When using SAPBR activation pdp After the load is applied, use the belt if necessary. <cid> Command settings DNS server

For example:

Command (→)	Example	Explanation and clarification
Return (←)		
+ CDNSCFG Application scenarios for querying and modifying domain name servers using commands1 (TCP/IP, MQTT Application):		
→	AT+CREG?	Query current GPRS Registration status
←	+ CREG:0,1 OK	<n>=0, indicates disabled URRC Report <stat>=1 The logo has been registered. GPRS Network, and a local network at that.
→	AT+CSTT	
←	OK	
→	AT+CIICR	
←	OK	
→	AT+CIFSR	
←	10.113.72.66	
→	AT+CDNSCFG?	Query default DNS server
←	PrimaryDns: 211.136.112.50 SecondaryDns: 211.136.150.66 OK	
→	AT+CDNSCFG=ip1,ip2	The customer can modify it if needed. DNS server ip1 and IP2 Please follow the actual situation. DNS Enter the server address. ip1 and IP2 You can add double parentheses, or you can omit them.
←	OK	
→	AT+CIPSTART=TCP,<server domain>,<port>	Connect to a domain name address. All parameters can be enclosed in double brackets, or omitted. This example is TCP IP Examples of applications. If it is... MQTT Application, at this point you can enter the following in sequence: AT+MCONFIG,AT+MIPSTART,AT+MCONNECT For commands such as [command name], please refer to [reference/reference] for details. MQTT Example of usage
←	OK CONNECT OK	
+ CDNSCFG Application scenarios for querying and modifying domain name servers2 (HTTP, FTP Application):		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	
←	OK	

→	AT+SAPBR=3,1,"APN",""	
←	OK	
→	AT+SAPBR=1,1	activationcid=1ofPDPCContext
←	OK	
→	AT+SAPBR=2,1	
←	+ SAPBR: 1,1,010.169.179.213 OK	
→	AT+CDNSCFG=ip1,ip2,1	
←	OK	
→	AT+CDNSCFG?	QueryDNSServer. In this application scenario, execution must be performed first. + CDNSCFGYou need to configure the command to query.
←	Primary DNS: ip1 SecondaryDns: ip2 OK	aboveIP1, IP2All are real.DNSDomain Name ServerIPAddresses can be enclosed in double brackets or omitted.
→	<p>HTTPFor the application, enter the following in sequence:AT+HTTPINIT,AT+HTTTPARA,AT+HTTPACTIONFor commands such as those mentioned above, please refer to the following: HTTPExample of usage</p> <p>FTPFor the application, enter the following in sequence:AT+FTPCID,AT+FTPSERV,AT+FTPUN,AT+FTPPWFor commands such as those mentioned above, please refer to the following: FTPExample of usage</p>	

12.21Domain name resolution:AT+CDNSGIP

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CDNSGIP=<domain name>	<p>If the command is correct and the domain name resolution is successful, the response will be:</p> <p>OK</p> <p>+ CDNSGIP: 1, <domain name>,<IPaddress></p> <p>If the command is correct, but domain name resolution fails, the response will be:</p> <p>OK</p> <p>+ CDNSGIP:0,<DNS error code></p> <p>If the command syntax is incorrect, the response is:</p> <p>ERROR</p>
Test command	AT+CDNSGIP=?	<p>return:</p> <p>OK</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<domain name>	InternetDomains registered online	-	String parameters (strings must be enclosed in quotes), not exceeding [number of characters],128bytes
<IP address>	Domain nameIPaddress	-	String parameters (strings need to be enclosed in quotes)
<DNS error code>	DNSRelated error codes	10	GENERAL ERROR
		11	MAX RETRIES
		12	NO SERVER ADDR

		13	NO MEMORY
		14	INVALID NAME
		15	INVALID RESP
		other	Some other error codes

12.22 Configure whether to display the sender's information when receiving data via a single connection. IP Address and port number: AT+CIPSRIP

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPSRIP=<mode>	OK
Query command	AT+CIPSRIP?	+ CIPSRIP: <mode> OK
Test command	AT+CIPSRIP=?	+ CIPSRIP: (<mode>)(List of possible values) OK
Precautions	This command is only valid in single-connection mode (+CIPMUX=0)	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Should the sender's name be displayed? IP	<u>0</u>	No prompts displayed (default)
	Address and port number	1	The prompt will be displayed in the following format: RECV FROM:<IP ADDRESS>:<PORT>

12.23 Configure whether to display data received via a single connection. IP head: AT+CIPHEAD

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPHEAD=<mode>	OK
Query command	AT+CIPHEAD?	+ CIPHEAD: <mode> OK
Test command	AT+CIPHEAD=?	+ CIPHEAD: (<mode>)(List of possible values) OK
Precautions	This command is only available in single-connection mode (+CIPMUX=0) Only then will it be effective	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Should I add when receiving data? IP Header prompt	<u>0</u>	Not set IP head
		1	set up IP The header, in the format "+IPD, data length:"

12.24Configure whether single-connection data reception is enabled.IPHeader displays the transmission protocol:AT+CIPSHOWTP

Syntax rules:

Command type	grammar	return
Setting commands	AT+CIPSHOWTP=<mode>	OK
Query command	AT+CIPSHOWTP?	+ CIPSHOWTP: <mode> OK
Test command	AT+CIPSHOWTP=?	+ CIPSHOWTP: (<mode>)(List of possible values) OK
Precautions	This command is only available in single-connection mode (+CIPMUX=0)andAT+CIPHEAD=1Only effective at certain times	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	When receiving data, is it in	0	Do not display the transport protocol (default value)
	IPHeader display transmission protocol	1	The transmission protocol is displayed in the format ".IPD,<data Size>,<TCP/UDP>;<data>"

12.25ConfigurationTCPProtocol parameters:AT+TCPUSEPARAM

Syntax rules:

Command type	grammar	return
Setting commands	AT+TCPUSEPARAM=<P1>,<P2>	OK
Query command	AT+TCPUSEPARAM?	+ RXTRTTVAR: <P1> + RXTMAXCNT:<P2> OK
Test command	AT+TCPUSEPARAM=?	RXTRTTVAR: (1-60) RXTMAXCNT: (0-12) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<P1>	First retransmission timed out time	1~60	Integer type, unit is seconds, default value is1 In fact, theThe timeout period for the second retransmission isP1<<config[i] Note: << is the left shift symbol. config[i]={0,1,2,3,4,5,6,7,7,7,7,7},Right now: config[1]=0, No.1The timeout period for the second retransmission is1(1<<0) config[2]=1, No.2The timeout period for the second retransmission is2(1<<1) config[3]=2, No.3The timeout period for the second retransmission is4(1<<2) config[4]=3, No.4The timeout period for the second retransmission is8(1<<3) config[5]=4, No.5The timeout period for the second retransmission is16(1<<4) config[6]=5, No.6The timeout period for the second retransmission is32(1<<5)

			<p>config[7]=6, No.7The timeout period for the second retransmission is64(1<<6)</p> <p>config[8]=7, No.8The timeout period for the second retransmission is128(1<<7)</p> <p>config[9]=7, No.9The timeout period for the second retransmission is128 (1<<7)</p> <p>config[10]=7, No.10The timeout period for the second retransmission is128 (1<<7)</p> <p>config[11]=7, No.11The timeout period for the second retransmission is128 (1<<7)</p> <p>config[12]=7, No.12The timeout period for the second retransmission is128 (1<<7)</p> <p>For example:</p> <p>AT+TCPUSERPARAM=1,6In the following circumstances: 15:57:34startSEND,</p> <p>Then1If there is no response within seconds,15:57:35Start of1The second retransmission, and then...2If there is no response within seconds,15:57:37Start of2The second retransmission, and then...4If there is no response within seconds,15:57:41Start of3The second retransmission, and then...8If there is no response within seconds,15:57:49Start of4The second retransmission, and then...16If there is no response within seconds,15:58:05Start of5The second retransmission, and then...32If there is no response within seconds,15:58:37Start of6Second pass.</p>
<P2>	Number of retransmissions	0~12	Integer type, default value6

12.26Receiving data with multiple connections: +RECEIVE

Syntax rules:

Command type	grammar	Return and Explanation
URCReport	<p>+ RECEIVE,<n>,<length>:</p> <p>Received data</p>	<p>Note:Received dataIt is the received data, and</p> <p>+ RECEIVE,<n>,<length>Separate, start a new line</p>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<n>	<p>Link No.</p> <p>with +CIPSTRATChinan></p> <p>Consistent definition</p>	0~5	Integer type, representing the connection sequence number.
<length>	Length of received data	-	Integer

12.27saveTCPIPApplication context:AT+CIPSCONT

The execution command of this command is saved with the corresponding...TCPIP ATCommand parameters, i.e.TCPIPThe application context is automatically loaded when the system restarts. The query command retrieves the current...TCPIPApplication context settings.

Syntax rules:

Command type	grammar	Return and Explanation
Query command	AT+CIPSCONT?	<p>+ CIPSCONT:<value></p> <p>+ CIPCSGP:<mode></p> <p>Gprs Config APN:<apn></p> <p>Gprs Config UserId:<user name> Gprs</p> <p>Config Password:<password></p>

		+ CIPHEAD:<mode> + CIPSHOWTP:<mode> + CIPSRIP:<mode> + CIPATS:<mode>,<time> + CIPSPRT:<send prompt> + CIPQSEND:<n> + CIPMODE:<mode> + CIPCCFG:<NmRetry>,<WaitTm>,<SendSz>,<esc>,<Rxmode> ,<RxSize>,<Rxtimer> + CIPMUX:<n> + CIPDPDP:<mode>,<interval>,<timer> + CIPRXGET:<mode> + CIPRDTIMER: 2000, 3500 OK
Execute command	AT+CIPSCONT	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	Save context?	<u>0</u>	saveTCPIPApplication Context
		1	The default value indicates that the data will not be saved.TCPIPApplication Context

12.28Manually obtain network data:AT+CIPRXGET

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	single link (AT+CIPMUX=0)hour: AT+CIPRXGET=<mode>[,<len>]	Enable manual data retrieval: AT+CIPRXGET=1(or5,fromV867Version 1 and later support setting to5) OK Set as1After that, the first data report will have a +.CIPRXGET:1ofUROnce reported, subsequent data will not be reported until...AT+CIPRXGET=2or3Only after it is read will it be reported again. Set as5After that, every time data came in, it was reported, regardless of whether the previous data had been read.
		Received +CIPRXGET:1Enter the following command to manually read the data: AT+CIPRXGET=2,<len> + CIPRXGET:2,<cnlen>,<rlen> data... OK
		Received +CIPRXGET:1It is also possible16Number base reading: AT+CIPRXGET=3,<len> + CIPRXGET:3,<cnlen>,<rlen> data... OK

		<p>How much data is left unread? AT+CIPRXGET=4</p> <p>+ CIPRXGET:4,<rlen> OK</p>
	<p>Multiple links (AT+CIPMUX=1)hour: AT+CIPRXGET=<mode>,<n>[,<len>]</p>	<p>To enable the manual data acquisition function, enter: AT+CIPRXGET=1(or5,fromV867Version 1 and later support setting to5)</p> <p>OK</p> <p>The data will be positive in the future.CIPRXGET:1ofURCReport</p>
		<p>Received +CIPRXGET:1Enter the following command to manually read the data: AT+CIPRXGET=2,<n>,<len></p> <p>+ CIPRXGET:2,<n>,<cnlen>,<rlen>data ... OK</p>
		<p>Received +CIPRXGET:1It is also possible16Number base reading: AT+CIPRXGET=3,<n>,<len></p> <p>+ CIPRXGET:3,<n>,<cnlen>,<rlen>data ... OK</p>
		<p>How much data is left unread? AT+CIPRXGET=4,<n></p> <p>+ CIPRXGET:4,<n>,<rlen> OK</p>
Query command	AT+CIPRXGET?	<p>+ CIPRXGET:<mode></p> <p>OK</p>
Test command	AT+CIPRXGET=?	OK
URCReport	+ CIPRXGET:1	Single link, settingsAT+CIPRXGET=1or5Then, when network data is received, this will happen.URCReporting indicates that data has been received.
	+ CIPRXGET:1,<n>	Multiple links, settingsAT+CIPRXGET=1or5Then, when network data is received, this will happen.URC Reporting indicates that data has been received.

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	model	<u>0</u>	The manual data retrieval function is disabled. (Default value)
		1	Enable the manual data acquisition function. Set as1After that, the first data report will have a +.CIPRXGET:1of URC Once reported, subsequent data will not be reported until... AT+CIPRXGET=2or3It will only be reported again after it is read.
		2	Read data
		3	Read data (16(Base system)
		4	How much data is still unread?
		5	Enable the manual data acquisition function. Set as5After that, every time data came in, it was reported.
<n>	Multiple linksLink id	0-5	Definition same as +CIPSTARTThe command <n>

<len>	The length of the data to be read	1-1460	When reading in normal character mode
		1-730	HEXWhen reading in this way
<cnlen>	Data already read		Unit: bytes
<rlen>	Data not yet read		Unit: bytes

For example:

Command (→) /Return (←)	Example	Explanation and clarification
How to manually read network data during a single connection		
→	AT+CIPRXGET=1	Enable manual network data acquisition function
←	OK	
→	AT+CGREG?	Query currentGPRSRegistration status
←	+ CGREG:0,1 OK	<n>=0, indicates disabledURCReport <stat>=1The logo has been registered.GPRSNetwork, and a local network at that.
→	AT+CIPSTART="TCP","36.9.88.120",6001	Connect to the server (single link)
←	OK	
← (URC)	CONNECT OK	It's already connected.
← (URC)	+ CIPRXGET: 1	The server has sent the data.
→	AT+CIPRXGET=2,150	Read data, read150Each character is read as a normal character.
←	+ CIPRXGET: 2,10,0 1234567890 OK	I read10One data point:1234567890,besides0Data not read
→	AT+CIPRXGET=4	Check how much data is still unread.
←	+ CIPRXGET: 4,0 OK	0Unread
← (URC)	+ CIPRXGET: 1	The server has sent data again.
→	AT+CIPRXGET=3,150	Read data, read150characters, toHEXread in the way
←	+ CIPRXGET: 3,5,0 48454C4C4F OK	I read5One data point:HELLO,besides0Data not read
How to manually read network data when there are multiple connections		
→	AT+CIPRXGET=1	Enable manual network data acquisition function
←	OK	
→	AT+CIPMUX=1	
←	OK	
→	AT+CSTT	After the module registers with the network, it will automatically obtain < from the network.apn>And activate one PDPContext (this <apn>It can be done AT+CGDCONT?(To search), so just enter...AT+CSTTThat's it, the module will automatically retrieve the <apn>To setCSTTofAPN
←	OK	
→	AT+CIICR	
←	OK	

→	AT+CIFSR	
←	OK	
→	AT+CIPSTART=3,"TCP","36.9.88.120",6001	Establish multiple links
←	OK	
← (URC)	3. CONNECT OK	
← (URC)	+ CIPRXGET: 1,3	id=3On the link, data was received from the server.
→	AT+CIPRXGET=2,3,10	Read the link3Data, read10Each character is read as a normal character.
←	+ CIPRXGET: 2,3,5,0 AAAAA OK	In the link3Read from5One character:AAAAA,besides0Unread
→	AT+CIPRXGET=4,3	Search for the link3How much data is still unread?
←	+ CIPRXGET: 4,3,0 OK	0Unread

12.29closureTCPorUDPconnect:AT+CIPCLOSE

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	When connected in a single channel AT+CIPCLOSE=<id>	return: CLOSE OK
	When multiple connections are used AT+CIPCLOSE=<n>[,<id>]	return: <n>, CLOSE OK
Execute command	AT+CIPCLOSE	If the closure is successful, the following will be returned: CLOSE OK If closing fails, return: ERROR
Test command	AT+CIPCLOSE=?	return: OK
Precautions	<ul style="list-style-type: none"> - The command execution is only effective for single links; in multi-link mode, it returns an error.ERROR - Execute commandAT+CIPCLOSEOnly whenTCP/UDP CONNECTINGorCONNECT OKThe connection will only be closed if the connection is in a certain state; otherwise, it will be considered a failure to close and a return value will be returned.ERROR - In single-path connection mode, the state after being closed is:IP CLOSE 	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<id>	Off mode	<u>0</u>	Slow shutdown (default value)
		1	Close quickly
<n>	Link No.	0~5	Integer type, representing the concatenation sequence number. (And +)CIPSTRATCHinan>Consistent definition

12.30Turn off mobile scenes:AT+CIPSHUT

Syntax rules:

Command type	grammar	Return and Explanation
Execute command	AT+CIPSHUT	If the closure is successful, the following will be returned: SHUT OK If closing fails, return: ERROR
Test command	AT+CIPSHUT=?	return: OK
Precautions	<ul style="list-style-type: none">- It can be usedAT+CIPSHUTNormally, when a mobile scene is closed, the status after closing is:IPINITIAL- Execute during multiple connections.AT+CIPSHUTAllIPAll connections will be closed.- If report "+"PDP:DEACT"logoGPRSReleased from the network, it still needs to be executed.AT+CIPSHUTTo change the state.	

12.31ReviseRNDISNetwork card gatewayIPaddress:AT+ROUTEIP

Syntax rules:

Command type	grammar	return
Setting commands	AT+ROUTEIP=<newip>	OK
Query command	AT+ROUTEIP?	<oldip>,<newip> OK
Test command	AT+ROUTEIP=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<oldip>	CurrentRNDISNetwork card gatewayIPaddress		IPAddress, double quotes are optional, only supports 192.168.X.1
<newip>	It's already set up; a restart is required for it to take effect.RNDIS Network card gatewayIPaddress		IPAddress, double quotes are optional, only supports 192.168.X.1

12.32 PingEcho Request Command:AT+CIPPING

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CIPPING=<IPaddr>[,<retry Num>[,<dataLen>[,<timeout>[,<ttl>]]]]	+ CIPPING: <replyId>,<Ip Address>,<replyTime>,<ttl>[<CR><LF> +CIPPING: <replyId>,<Ip Address>,<replyTime>,<ttl> [...]]

		OK
Query command	AT+CIPPING?	+ CIPPING: <retryNum>,<dataLen>,<timeout>,<tTl> OK
Test command	AT+CIPPING=?	+ CIPPING: (list of supported <retryNum>s),(list of supported <dataLen>s),(list of supported <timeout>s),(list of supported <tTl>s) OK
Precautions	<ul style="list-style-type: none"> - sendPINGActivation is required before issuing the command.GPRS PDPContext. - When sendingPINGIf there is no response by then, the returned information will display <replyTime>=600And <tTl>=255When executing this command, if - GPRS PDPIf the context is deactivated for some reason, such as a network outage, then this command will terminate immediately. 	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<IPAddr>	PINGThe target server address.IPBoth addresses and domain names are supported.	IP address	
		Domain name	
<retryNum>	Need to be sentPINGquantity	1-100	Default value:4
<dataLen>	PINGRequest length	0-1024	Default value:32
<timeout>	The timeout waiting for a single Echo Reply	1-600	unit:100 ms
<tTl>	Time to live	1-255	Default value:64
<replyId>	Echo Reply serial number		
<IP Address>	IP Address of the remote host		
<replyTime>	Time to receive the response		unit:1ms

For example:

Command (→) / Return (←)	Example	Explanation and clarification
→	AT+CSTT	
←	OK	
→	AT+CIICR	
←	OK	
→	AT+CIFSR	
←	10.207.9.213	
→	AT+CIPPING="www.baidu.com"	
←	+ CIPPING: 1,"36.152.44.96",35,54 + CIPPING: 2,"36.152.44.96",20,54 + CIPPING: 3,"36.152.44.96",20,54 + CIPPING: 4,"36.152.44.96",35,54	

	OK	
--	----	--

12.33set upTCPkeep alive (keep-alive)parameter:AT+CIPTKA

Note: This command only applies to the Cosmic Union.4G CAT1Module (Air720U/Air724U(Series), not applicable to Hezhou4G CAT4Module (Air720/Air720G/ Air720H/ Air720D/ Air720S)

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT+CIPTKA=<mode>[,<keepIdle>[,<keepInterval>,<keepCount>]]]	OK
Query command	AT+CIPTKA?	+ CIPTKA:<mode>,<keepIdle>,<keepInterval>,<keepCount> OK
Test command	AT+CIPTKA=?	+ CIPTKA:(listofsupported<mode>s),(listofsupported<keepIdle>s),(listofsupported<keepInterval>s), (listofsupported<keepCount>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Enable or disable?TCPkeep alive (keep-alive)	0	closure
		1	Open
<keepIdle>	In <keepIdle>No links were established within the specified time period. Data interaction involves sending an initial keep-alive probe.initial keep-alive probe)	30~7200	The unit is seconds, and the default value is...7200
<keepInterval>	Keep-alive probe retransmission interval	30~600	The unit is seconds, and the default value is...75
<keepCount>	Maximum number of keep-alive probes sent	1~9	The unit is times, and the default value is9

12.34Heartbeat packet parameter settings:AT^HEARTCONFIG

This command is used to configure heartbeat-related parameters (whether to allow sending heartbeat packets),socket id(heart rate interval).

Syntax rules:

Command type	grammar	Return and Explanation
Setting commands	AT ^HEARTCONFIG=<option>,<socket_id> , <heartbeat_time>	OK
Query command	AT ^HEARTCONFIG?	^HEARTCONFIG: <enable>,<socket_id>,<heartbeat_time>

		OK
Test command	AT $\hat{\text{H}}\text{EARTCONFIG}=?$	OK
Precautions	Currently, only one connection is supported for setting a heartbeat packet.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<option>	Enable heartbeat function?	<u>0</u>	disabled
		1	enabled
<socket_id>	connectid, definition same as +CIPSTARTChinan>	0~5	If it's a single link, it's fixed as follows:0 If there are multiple links, the value should be...0~5
<heartbeat_time>	Heart rate interval	5~600	The unit is seconds, and the default value is...120

For example:

Command (→)/ Return (←)	Example	Explanation and clarification
→	AT $\hat{\text{H}}\text{EARTCONFIG}?$	Query current heartbeat configuration
←	$\hat{\text{H}}\text{EARTCONFIG: 0,0,120}$ OK	The default configuration is: heartbeat is off, heartbeat interval is [missing information],120Second
→	AT $\hat{\text{T}}\text{H EARTCONFIG=1,0,180}$	Enable heartbeat function.cid=0And set the heart rate interval to180Second
←	OK	
→	AT $\hat{\text{H}}\text{EARTCONFIG}?$	Check heartbeat settings again
←	$\hat{\text{H}}\text{EARTCONFIG: 1,0,180}$ OK	The heartbeat function is enabled; when establishing a connection with the server... cid=0After the link (which can be a single link or multiple links), it will automatically... Send a heartbeat packet; the heartbeat packet content defaults to the module's...IMEI

12.35Set the heartbeat packet content:AT $\hat{\text{T}}\text{H EARTBEAT}$

This command sets the content of the heartbeat packet. By default, it sets its own...IMEIAs part of the heartbeat packet. Syntax rules:

Command type	grammar	return
Setting commands	AT $\hat{\text{H}}\text{EARTBEAT}=<\text{socket_id}>,<\text{data}>$	OK
Query command	AT $\hat{\text{H}}\text{EARTBEAT}?$	$\hat{\text{H}}\text{EARTBEAT: } <\text{socket_id}>,<\text{data}>$
		OK
Test command	AT $\hat{\text{H}}\text{EARTBEAT}=?$	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<socket_id>	connectid, definition same as +CIPSTARTChinan>	0~5	If it's a single link, it's fixed as follows:0 If there are multiple links, the value should be...0~5
<data>	Heartbeat Package Contents		String type, longest length256byte

For example:

Command (→)/ Return (←)	Example	Explanation and clarification
→	AT ^HEARTBEAT?	Query current heartbeat information
←	^HEARTBEAT: 0,866714044915436 OK	The default heartbeat isIMEI
→	AT ^HEARTBEAT=0,TCP-heart	Set new heartbeat content
←	OK	
→	AT ^HEARTBEAT?	Search again
←	^HEARTBEAT: 0,TCP-heart OK	

12.36set upHEXEncoded heartbeat packet content:AT^HEARTBEATHEX

This command sets the contents of the heartbeat packet to hexadecimal data.

Syntax rules:

Command type	grammar	return
Setting commands	If it is a single link (i.e.)AT+CIPMUX=0) AT ^HEARTBEATHEX=<len>,<data>	OK
	If it is a multi-link (i.e.)AT+CIPMUX=1) AT ^HEARTBEATHEX=<socket_id>,<len>,<data>	Upon returning, the heartbeat message you set will be automatically sent.
Query command	AT ^HEARTBEATHEX?	^HEARTBEATHEX: <socket_id>,<data> OK
Test command	AT ^HEARTBEATHEX=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<socket_id>	connectid, definition same as +CIPSTARTChinan>	0~5	If it's a single link, it's fixed as follows:0 If there are multiple links, the value should be...0~5
<len>	Data length		
<data>	Heartbeat Package Contents		String type, longest length256byte

For example:

Command (→)/ Return (←)	Example	Explanation and clarification

→	AT+CIPMUX=1	Set as multiple links
←	OK	
→	AT+CSTT	
←	OK	
→	AT+CIICR	
←	OK	
→	AT+CIFSR	
←	10.134.100.30	
→	AT+CIPSTART=5,"TCP","116.28.164.159",40117	Connect to a loopback server (i.e., it responds to everything you send). Note: This address and port are arbitrary; please do not copy them verbatim.
←	OK	
	5. CONNECT OK	
→	AT+HEARTCONFIG=1,5,120	Open the heartbeat of the road connection
←	OK	
→	AT+HEARTBEATHEX=5,6,414243444546	Set new heartbeat content asABCDEF
←	OK	
←	+ RECEIVE,5,6: ABCDEF	

12.37Check heartbeat packet sending status:AT+HEARTINQUIRE

This command is used to query the heartbeat packet sending status.

Syntax rules:

Command type	grammar	Return and Explanation
Query command	AT+HEARTINQUIRE?	<div>HEARTINQUIRE: <suctime>,<nextime>,<heartbeat_time></div> <div>OK</div>
Test command	AT+HEARTINQUIRE=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<suctime>	A message was successfully sent a few seconds ago.		Unit: seconds
<nextime>	How many seconds are left to send the next message?		Unit: seconds
<heartbeat_time>	How many messages have been sent in total?		Unit: Item

For example:

Command (→)/ Return (←)	Example	Explanation and clarification
----------------------------	---------	-------------------------------

→	AT +HEARTCONFIG=1,0,120	Enable the heartbeat feature in settings.
←	OK	
→	AT+CIPSTART="TCP", "36.6.*.*",12345	Connect to a server Please fill in the server address and port according to your actual situation; do not copy verbatim.
←	OK CONNECT OK	
→	AT +HEARTINQUIRE?	Check heartbeat packet sending status
←	+HEARTINQUIRE: 115,5,8 OK	
→	AT +HEARTCONFIG=0	Heartbeat function disabled in settings.
←	OK	
→	AT +HEARTINQUIRE?	Check heartbeat packet sending status
←	+HEARTINQUIRE: 0,0,0 OK	The statistics have been cleared.

12.38From data patterns orPPPSwitch from online mode to command mode: +++

+++ Character sequences can makeTAIgnore the currentATData transmission via the interface, and switching to command mode. It allows...TAWhile maintaining a data connection with the remote server, you can still input...ATOrder.

Syntax rules:

Command type	grammar	return
Execute command	+++	OK illustrate To avoid +++ being incorrectly identified as data, the following steps need to be followed: 1. "+++"Before inputT1time(1No characters were input within (seconds). 2.exist0.5 secondsEnter three consecutive "+" signs, with no other characters between each "+" sign. 3. "+++"After inputT1time(0.5No characters were input within (seconds). 4.Switch to command mode, otherwise re-enter the steps.1.

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	ATD*99#	Data dialing
←	CONNECT ~~~ÿ}#À!;!} }<!}\$&@}#\$À#}%&Êê}*h }"} } } }"} { "7S~~ÿ}#À!;!} }<!}\$&@}#\$À#}%&Êê}*h }"} } } } }" { "ĩ¥~~ÿ }#À!;!}# }<!}\$&@}#\$À#}%&Êê}*h }" & } } } } }"}{ "S÷~~ÿ}#À!;!}\$ }<!}\$&@}#}	Data dialing successful

5	Network error	Network error
6	Remote host unreachable	Remote host is unreachable
7	Address in use	The address is already in use
8	Invalid address	The address is not available
9	Too much or too little data	The supplied buffer is too large or small
10	Invalid parameter	Invalid parameter
11	Remote host refuses connection	Remote host has rejected the connection
12	time out	Time out
13	The connection was terminated.	An established connection is aborted
14	The connection was reset	Remote host has reset the connection
15	socketThe connection has been established.	The socket is already connected
16	socketNo connection	The socket is not connected
17	socketThe connection has been disconnected.	The socket has been shut down.
18	Unknown error	Undefined error

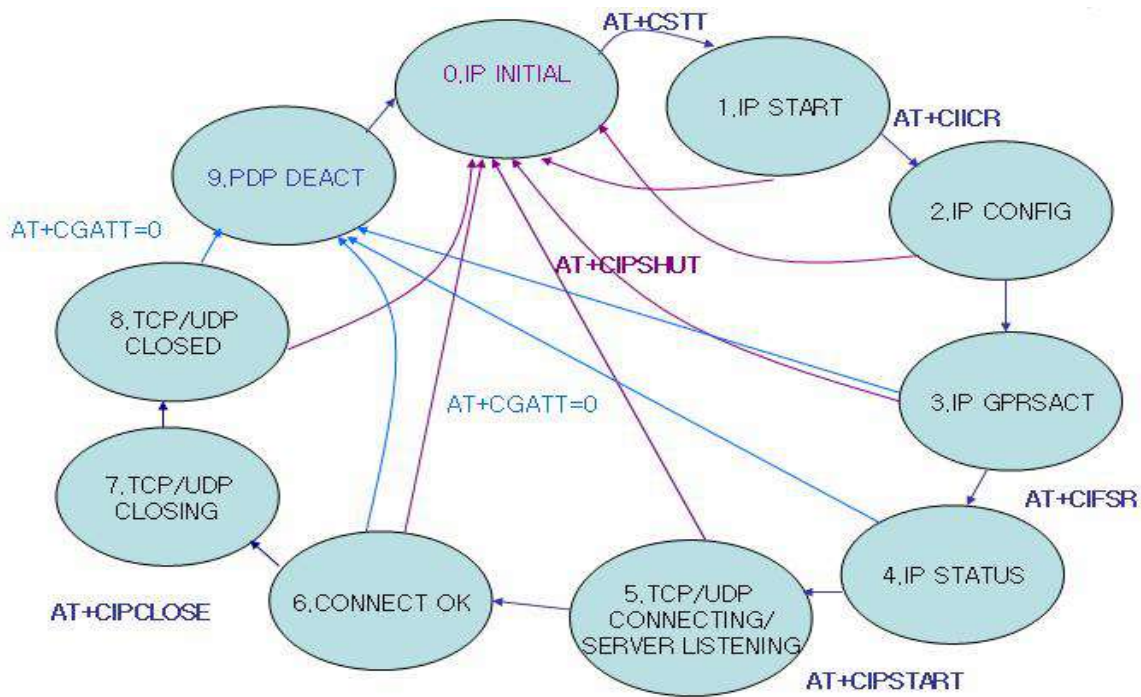
existUDPIf an error occurs during the application, it will be resolved by...UDP ERROR: <err code>The form is reported. UDP

Error code:

Error code <err code>	Chinese definition	English definition
0	success	No error
1	TCPIPThe thread was not used.	TCP/IP is idle
2	No availabletsapi	No tsapi
3	Invalidtsapi	Invalid tsapi
4	Callback not registered	The callback has not been registered
5	Insufficient space	No buffer
6	Network error	Network error
7	Remote host refuses connection	Remote host has rejected the connection
8	Remote host unreachable	Remote host is unreachable
9	Address in use	The address is already in use
10	Invalid address	The address is not available
11	Too much or too little data	The supplied buffer is too large or small
12	Invalid parameter	Invalid parameter
13	TCIPThread busy	TCP/IP is busy.
14	Unknown error	Undefined error
15	socketThe connection has been established.	The socket is already connected

12.41state machine

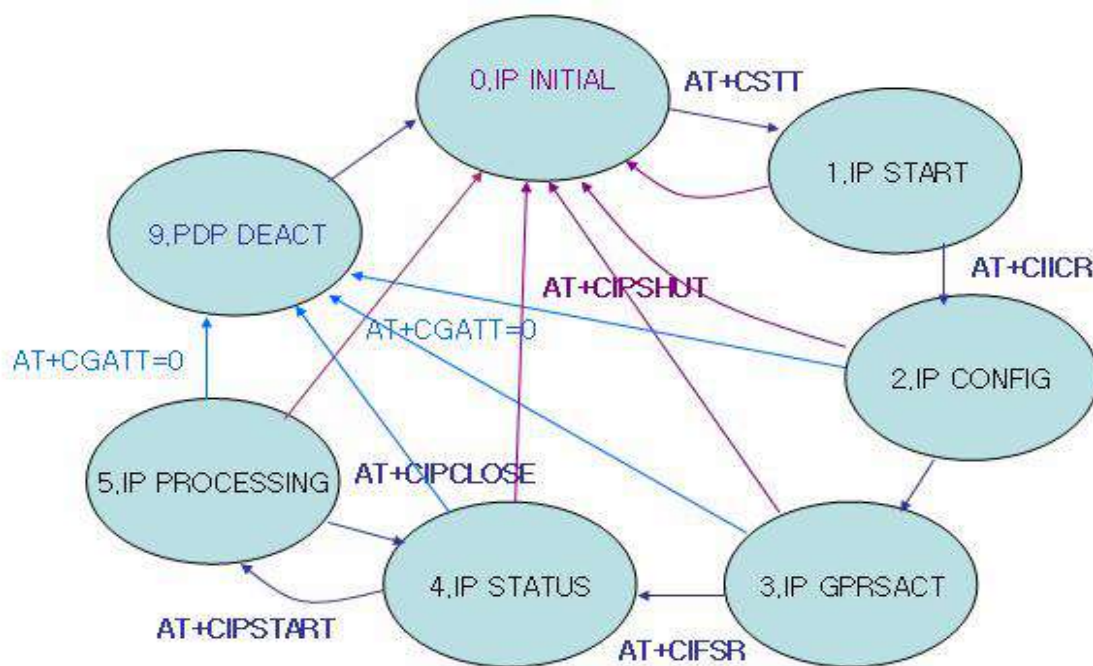
When inputTCIPFollowing the relevant commands, the module's state will also change accordingly. The command to query the state is...AT+CIPSTATUS.



picture1State machine in single-linkage mode

Several points regarding single-connection state machines:

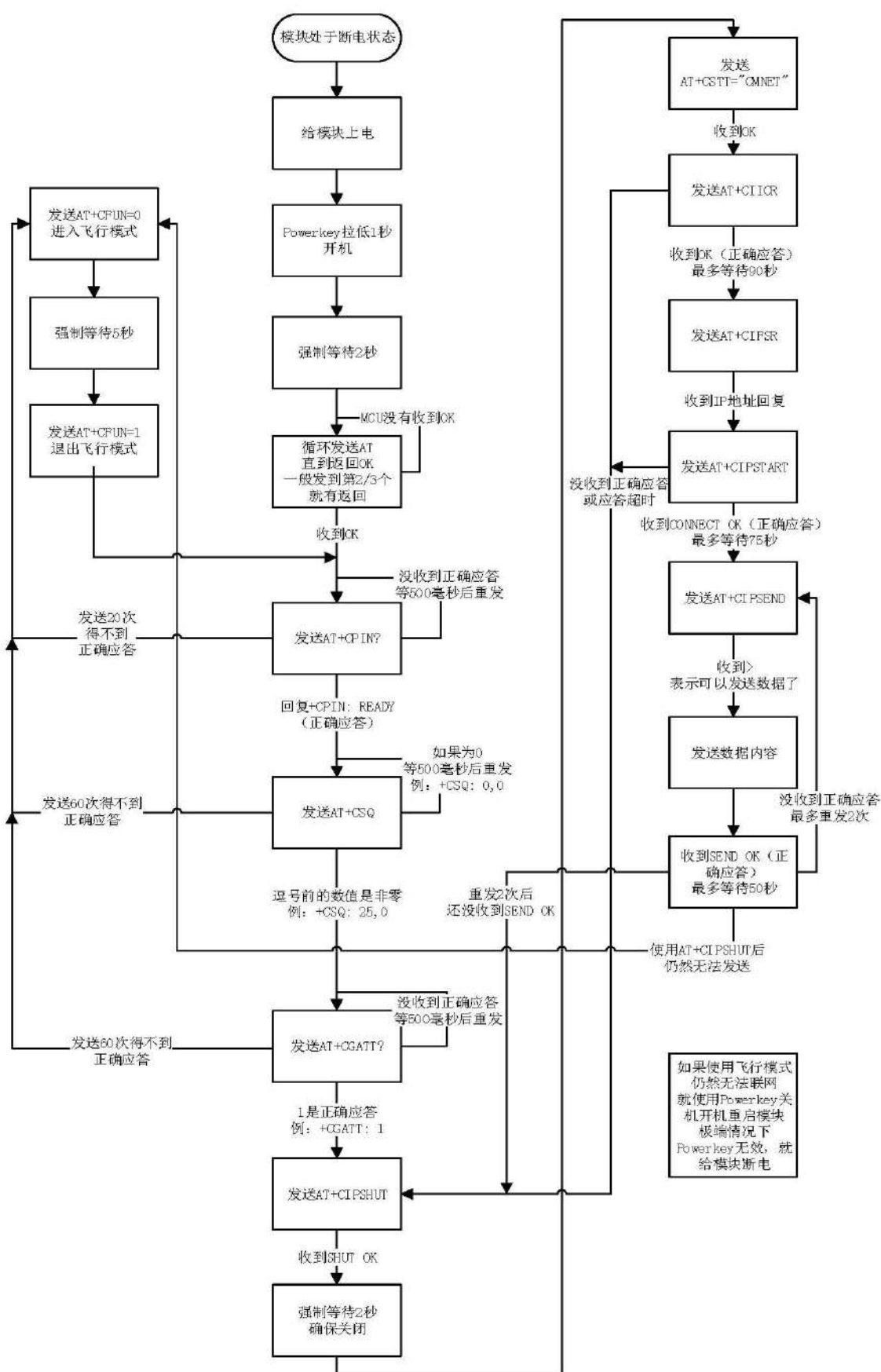
- ◆ Input AT+CIICR, will enter immediately IP CONFIG status, when returning OK After that, it will enter IP GPRSACT state;
- ◆ Input AT+CIPSTART After that, it will immediately enter IP/UDP CONNECTING status, if reported by subsequent modules CONNECT OK this URCThis indicates a successful connection to the server; you can now proceed. CONNECT OK state;
- ◆ Input AT+CIPCLOSE Then, immediately enter TCP/UDP CLOSING status, if the module reports at this time CLOSE OK This indicates that the connection with the server was successfully closed, and the module then enters...TCP/UDP CLOSED state;
- ◆ If the module reports +PDP DEACT this URCThis indicates that the module has been released. PDP Context, and entered PDP DEACT state;
- ◆ In IP GPRSACT, IP STATUS, CONNECT OK as well as TCP/UDP CLOSED In the state, input AT+CGATT=0 This also allows the module to release its context and enter...PDP DEACT state;
- ◆ Module Entry PDP DEACT Status still requires input AT+CIPSHUT, Enter IP INITIAL state;
- ◆ Input is allowed in all states of the module. AT+CIPSHUT, Enter IP INITIAL state.



picture2State machine in multi-link scenarios

12.42 Module power-on initialization and TCPIP process

See the image below:



12.43 Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→)	Example	Explanation and clarification
/Return (←)		
<p>TCPNon-transparent transmission applications1The module acts as a client, with a single connection, sending data.</p> <p>(In fact,TCPThere are two sending methods: fast sending and slow sending, determined by +CIPQSENDCommands are used to set the sending method. The difference is: slow sending requires confirmation from the server for each piece of data sent, while fast sending only requires sending the data to the module and does not require server confirmation.</p> <p>Slow-speed delivery may result in prolonged periods of no response.ATThe passage is blocked, so it is recommended to use...Quickly send(model)</p>		
→	AT+CREG?	Query currentGPRSRegistration status
←	+ CREG:0,1 OK	<n>=0, indicates disabledURCReport <stat>=1The logo has been registered.GPRSNetwork, and a local network at that.
→	AT+CGATT?	View currentGPRSAdhesion state
←	+ CGATT: 1 OK	<state>=1Indicate the currentGPRSAlready attached
→	AT+CIPMUX=0	Set to single link mode
←	OK	
→	AT+CIPQSEND=1	Set to fast send mode (this mode is recommended).
←	OK	
→	AT+CSTT	Start the task and set it up.APN
		After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext (this <apn>It can be done AT+CGDCONT?(To search), so just enter... AT+CSTTThat's it; the module will automatically retrieve the data. <apn>To setCSTTofAPN
←	OK	
→	AT+CIICR	Activate the mobile scene and obtainIPAddress
←	OK	
→	AT+CIFSR	Query allocationIPAddress
←	010.083.172.111	
→	AT+CIPSTATUS	Check the link status
←	OK STATE: IP STATUS	
→	AT+CIPSTART="TCP","60.166.18.9",7500 or AT+CIPSTART="TCP","60.166.18.9","7500"	in: TCPProtocol type for the link "60.166.18.9"For the peer serverIPAddress 7500For the peer serverTCP Port number note:CIPSTARTSets all parameters for the command; double brackets are optional.
←	OK	
← (URC)	CONNECT OK	If the link is successful, you will see something like this.URCReport
→	AT+CIPSTATUS	Check the link status

←	OK	Link established successfully
	STATE: CONNECT OK	
→	AT+CIPSEND	Send data (variable length, sent manually).
→	> 1234567890<CTRL-Z>	When ">" appears, enter the data to be sent: 0123456789 <CTRL-Z>Used to send data, send16number system0x1A That is equivalent to sending <CTRL-Z>.
←	DATA ACCEPT:10	The data was sent successfully and received by the receiving server.
→	AT+CIPACK	For each data transmission, check the transmission status to see the previous data. Has the server received it?
←	+ CIPACK: 10,10,0 OK	The first10This indicates the number of bytes of data that have been sent, the second one. 10This indicates the number of bytes of data received by the server.0Indicates the number of data bytes that the server has not yet received.
→	AT+CIPSEND=10	Send data (determine length)
→	> 1234567890	
←	DATA ACCEPT:10	Input data reached101 byte, no need to send <CTRL-Z> Data will be sent automatically
→	AT+CIPATS=1,10	Set up automatic sending, with the automatic sending timer set to [time].10s
←	OK	
→	AT+CIPSEND	Send data
→	> 1234567890	
←	DATA ACCEPT:10	10sTimer overflow, no need to send <CTRL-Z>The data will be sent automatically.
→	AT+CIPSEND=100	
→	> 123	
←	DATA ACCEPT:3	10sTimer overflow, input content does not need to reach the limit100Bytes, no need to send <CTRL-Z>The data will be sent automatically.
→	AT+CIPCLOSE	closureTCPLink
←	CLOSE OK	Closing successful
→	AT+CIPSTATUS	Check the link status
←	OK	TCPThe link is closed.
	STATE: TCP CLOSED	
→	AT+CIPSHUT	Turn off mobile scenes
←	SHUT OK	Closing successful
→	AT+CIFSR	Query the current moduleIP
←	ERROR	IPThe address is no longer available.
TCPNon-transparent transmission applications2The module acts as a client, with a single connection, sending data and enabling...SSLFunction		
→	AT+CIPMUX=0	Set to single link mode
←	OK	
→	AT+CIPQSEND=1	Sending mode is fast.
←	OK	
→	AT+CIPSTATUS	Query link status

←	OK	
	STATE: IP INITIAL	
→	AT+CIPSSL=1	OpenSSLFunction (in this example, both parties) No Certificate verification required)
←	OK	
→	AT+CIPSTART="TCP","60.166.18.9",7500	When the module is set to single-link and its status is IP INITIAL Sometimes, it can also be used CIPSTART Establish a connection directly, without needing to enter anything first. CSTT CIICR CIFSR Please write the actual server address and port; do not copy verbatim.
←	OK	
← (URC)	CONNECT OK	If the link is successful, you will see something like this. URC Report
→	AT+CIPSEND	Send data
→	> 1234567890<CTRL-Z>	<CTRL-Z>Used to send data, send 16 number system 0x1A That is equivalent to sending <CTRL-Z>.
←	DATA ACCEPT:10	This indicates that the module received from TE Input 10 bytes of data to be sent
	...	+ CIPCLOSE, +CIPSHUT No further details will be provided.
TCP Non-transparent transmission applications 3 The module acts as a client, with a single connection, sending data and enabling... SSL Functionality (Two-way certificate verification)		
→	AT+CIPMUX=0	Set to single link mode
←	OK	
→	AT+CIPQSEND=1	Set to send quickly
←	OK	
→	AT+CIPSSL=1	OpenSSLFunction switch is on
←	OK	
→	AT+FSCREATE="ca.crt"	create CA Certificate file
←	OK	
→	AT+FSCREATE="client.crt"	Create client certificate file
←	OK	
→	AT+FSCREATE="client.key"	Create client key file
←	OK	
→	AT+FSWRITE="ca.crt",0,2080,15	File length 2080 This is just an example; please fill in the information according to your actual situation. The same applies below.
←	>	Enter here CA Certificate file
←	OK	
←	AT+FSWRITE="client.crt",0,128,10	
→	>	Enter the client certificate file here.
←	OK	
→	AT+FSWRITE="client.key",0,188,10	
←	>	Enter the client key file here.
←	OK	
→	AT+SSLCFG="cacert",0,"ca.crt"	Configure the server CA Certificate SSLContextid In the case of a single link, the default is 0
←	OK	
→	AT+SSLCFG="clientcert",0,"client.crt"	Configure client certificate
←	OK	
→	AT+SSLCFG="clientkey",0,"client.key"	Configure the client KEY

←	OK	
→	AT+SSLCFG="seclvl",0,2	Set security level
←	OK	
→	AT+SSLCFG="ciphersuite",0,0X0035	Set up encryption suite
←	OK	
→	AT+SSLCFG="clientrandom",0,101B12C31415161 71F1920212223242526272829303132333435363 7	Set random number
←	OK	
→	AT+CIPSTART=TCP,tcplab.openluat.com,57513	
←	OK	
← (URC)	CONNECT OK	
→	AT+CIPSEND=10	Send data (determine length)
→	> 1234567890	
←	DATA ACCEPT:10	Input data reached 101 byte, no need to send <CTRL-Z> Data will be sent automatically
→	AT+CIPSHUT	
←	OK	
→	AT+CIPSSL=0	closureSSLFunction
←	OK	
UDP Non-transparent transmission applications The module acts as a client, with a single connection, and sends data.		
→	AT+CIPMUX=0	Set to single link mode
←	OK	
→	AT+CIPQSEND=1	Set to fast send mode
←	OK	
→	AT+CSTT	Start the task and set it up. APN After the module registers with the network, it will automatically obtain < from the network.apn> And activate one PDP Context (this <apn> It can be done AT+CGDCONT? (To search), so just enter... AT+CSTT That's it; the module will automatically retrieve the data. <apn> To set CSTT of APN
←	OK	
→	AT+CIICR	Activate the mobile scene and obtain IP address
←	OK	
→	AT+CIFSR	Query allocation IP address
←	010.083.172.111	
→	AT+CIPSTART="UDP","60.166.18.9",6100	Establish UDP Links, including: "UDP" Protocol type for the link "60.166.18.9" For the peer server IP address 6100 For the peer server UDP port number
←	OK	
← (URC)	CONNECT OK	If the link is successful, you will see something like this. URC Report
→	AT+CIPSEND	Send data
→	> 1234567890<CTRL-Z>	
←	DATA ACCEPT:10	Data successfully sent to the module
	...	+ CIPCLOSE, + CIPSHUT No further details will be provided.

<p>Multi-connection applications1The module acts as a client, supporting multiple connections and sending data.SSLTwo-way certificate authentication is enabled (fast issuance).</p> <p>Note: This example connects to two different servers simultaneously.</p>		
→	AT+CIPSSL=1	OpenSSLFunction switch
←	OK	
→	AT+CIPMUX=1	
←	OK	
→	AT+FSCREATE="server1.crt"	createserver1ofCACertificate file
←	OK	
→	AT+FSCREATE="server2.crt"	createserver2ofCACertificate file
←	OK	
→	AT+FSCREATE="client.crt"	Create client certificate file
←	OK	
→	AT+FSCREATE="client.key"	Create client key file
←	OK	
→	AT+FSWRITE="server1.crt",0,2080,15	File length2080This is just an example; please fill it in according to the actual situation. Write. (The same applies below.)
←	>	Enter the server here.1ofCACertificate file
←	OK	
→	AT+FSWRITE="server1.crt",0,1962,15	
←	>	Enter the server here.2ofCACertificate file
←	OK	
←	AT+FSWRITE="client.crt",0,128,10	
→	>	Enter the client certificate file here.
←	OK	
→	AT+FSWRITE="client.key",0,188,10	
←	>	Enter the client key file here.
←	OK	
→	AT+SSLCFG="cacert",1,"server1.crt"	Configure the server1ofCACertificate Multiple linksSSLContextidand multiple linksid Binding, link1ofSSLContextidToo1
←	OK	
→	AT+SSLCFG="cacert",2,"server2.crt"	Configure the server2ofCACertificate
←	OK	
→	AT+SSLCFG="clientcert",1,"client.crt"	set upSSLContext1(i.e., link)1Client certificate
←	OK	
→	AT+SSLCFG="clientcert",2,"client.crt"	set upSSLContext2(i.e., link)2Client certificate
←	OK	
→	AT+SSLCFG="clientkey", 1,"client.key"	set upSSLContext1(i.e., link)1) clientKEY
←	OK	
→	AT+SSLCFG="clientkey", 2,"client.key"	set upSSLContext2(i.e., link)2) clientKEY
←	OK	
→	AT+SSLCFG="seclvl",1,2	set upSSLContext1(i.e., link)1Security level: Two-way authentication

←	OK	
→	AT+SSLCFG="seclvl",2,2	set upSSLContext2(i.e., link)2Security level: Two-way authentication
←	OK	
→	AT+SSLCFG="ciphersuite",1,0X0035	set upSSLContext1(i.e., link)1Encryption suite
←	OK	
→	AT+SSLCFG="ciphersuite",2,0X0035	set upSSLContext2(i.e., link)2Encryption suite
←	OK	
→	AT+SSLCFG="clientrandom",1,10B12C3141516171F19 202122232425262728293031323334353637D	Set link1random numbers
←	OK	
→	AT+SSLCFG="clientrandom",2,581B12C3141516171F1 920214A23249C262728293031323334353632	Set link2random numbers
←	OK	
→	AT+CIPQSEND=1	Set to fast send mode
←	OK	
→	AT+CSTT	Settings ModuleAPN After the module registers with the network, it will automatically obtain [data/equipment] from the network. <apn>And activate onePDPCContext (this <apn> It can be doneAT+CGDCONT?(To search), so just enter...AT+CSTTThat's it; the module will automatically retrieve the <apn>To setCSTTofAPN
←	OK	
→	AT+CIICR	
←	OK	
→	AT+CIFSR	
←	010.083.172.111	
→	AT+CIPSTART=1,"TCP","60.166.12.210",7500	
←	OK	
← (URC)	1. CONNECT OK	Id=1ofTCPLink successfully established
→	AT+CIPSTART=2,"TCP","60.166.13.215",6100	
←	OK	
← (URC)	2. CONNECT OK	Id=2ofTCPLink successfully established
→	AT+CIPSTATUS	Query current link status
←	OK STATE: IP PROCESSING C: 0,,,"","","INITIAL" C: 1,0,"TCP","60.166.12.210","7500","CONNECTED" C: 2,0,"TCP","60.166.12.210","7500","CONNECTED" C: 3,,,"","","INITIAL" C: 4,,,"","","INITIAL" C: 5,,,"","","INITIAL"	
→	AT+CIPSEND=1	existTCP 1Sending data on the link

→	> 1234567890<CTRL-Z>	
←	DATA ACCEPT: 1, 10	
→	AT+CIPSEND=2	existTCP 2Sending data on the link
→	> 1234567890<CTRL-Z>	
←	DATA ACCEPT: 2,10	
	...	Other data sending actions
→	AT+CIPSHUT	If you want to close all connections
←	SHUT OK	
→	AT+CIPMUX=0	To disable multi-connection mode, you must... AT+CIPSHUTOnly then can
←	OK	
→	AT+CIPSSL=0	closureSSLFunction.
←	OK	
Multi-connection applications2The module acts as a client, supporting multiple connections and sending data; this feature is not enabled.SSLFunction		
→	AT+CIPMUX=1	Set to multi-link mode
←	OK	
→	AT+CIPQSEND=1	Set to fast send mode
←	OK	
	...	imitationTCPNon-transparent transmission applications1For example,Send in sequence CSTT CIICR CIFSRTThese three commands
→	AT+CIPSTART=4,"TCP","60.166.12.210",7500	
←	OK	
← (URC)	4. CONNECT OK	Id=6ofTCPLink successfully established
→	AT+CIPSTART=5,"UDP","60.166.12.210",6100	
←	OK	
← (URC)	5. CONNECT OK	Id=7ofUDPLink successfully established
→	AT+CIPSEND=4,10	existTCPSEND data over the link, fixed length transmission
→	> 1234567890	
←	DATA ACCEPT: 4,10	
→	AT+CIPSEND=5	existUDPSend data over the link, with varying lengths.
→	> 1234567890<CTRL-Z>	
←	DATA ACCEPT: 5, 10	
→	AT+CIPATS=1,10	Set to send automatically, and set the timer to...10S, Return from the commandOKStart timing
←	OK	
→	AT+CIPSEND=4	existid=6ofTCPSending data on the link
→	TEST Auto fast send	Enter the string to send (no need to enter anything) <CTRL-Z>)
←	DATA ACCEPT: 4,19	10SData will be sent automatically when the timer expires.
	...	+ CIPCLOSE, +CIPSHUTNo further details will be provided.
Data reception during single-link non-transparent transmission:		
	...	EstablishTCPThe link has already been detailed above and will not be repeated here.
→	AT+CIPHEAD=1	When setting up data reception, there is a data header.

←	OK	
← (UCR)	+ IPD,4:TEST	Module receivedSERVERA string of characters sent from the other end:TEST
→	AT+CIPSHOWTP=1	When setting up data reception, display the protocol used for the data.
←	OK	
← (UCR)	+ IPD,4,TCP:TEST	Module receivedSERVERThe data sent from over there:TESTThe protocol used will also be displayed. in the case ofUDPThe link will then display: + IPD,4,UDP:TEST
→	AT+CIPSRIP=1	Display the sender's information when receiving data.IPAddress and port
←	OK	
← (URC)	RCV FROM: 60.166.12.210:7500 + IPD,4:TEST	The data received from the server is a single character.TEST, length is4
→	AT+CIPSHOWTP=0	Do not display the protocol type in the received data header
←	OK	
→	AT+CIPHEAD=0	Do not display data header
←	OK	
→	AT+CIPSRIP=0	The data sender is not displayed.IPAddress and port
←	OK	
← (URC)	TEST	Data received at this time:TEST
Receiving data in multi-link non-transparent transmission mode:		
	...	imitationTCPNon-transparent transmission applications1 For example,Send in sequence CSTT CIICR CIPSRThese three commands, and establish a connection number of...0of TCPThe link and the connection number are1of UDPLink
← (URC)	+RECEIVE,0,7: TEST123	In the link0of TCPReceived via link7A string of 100 characters: TEST123
← (URC)	+RECEIVE, 1, 10: TEST123456	In the link1of UDPReceived via link10A string of 100 characters: TEST123456
Transparent transmission applications1:TCPData transmission		
→	AT+CIPMODE=1	set upTCPApplication is transparent transmission mode
←	OK	
→	AT+CIPSTART="TCP","60.166.18.9",7500	EstablishTCPLinks, including: TCPProtocol type for the link "60.166.18.9"For the peer serverIPaddress 7500 For the peer serverTCPport number
←	OK	
← (URC)	CONNECT	If the link is successful, you will see something like this.URCReport
→ /←	Transmission begins here. Enter and send data here, and you can also receive data from the server at this time.
→+++	If you want to returnATIn command mode, type +++ after the data. Note: +++ will only be recognized by the module if certain conditions are met. escape sequenceOtherwise it will be considered data. 1The first plus sign needs to be preceded by a plus sign.1000msinterval 2The last plus sign needs to be followed by a plus sign.500msinterval

		3The interval between the three plus signs cannot exceed (a certain value)500ms
←	OK	OKThis indicates that you have returned toATCommand mode
→	ATO	ATOUsed to return data patterns
←	CONNECT	CONNECTIndicates entry into pass-through mode
→ /←	Data transmission can now begin again.
←	TCP ERROR:xx or CLOSED	When a protocol stack error occurs during transmission, it will switch to...ATThe command status should be updated, and the error code should be reported.
→	AT+CIPSHUT	When this happens, +CIPSHUTClose the connection. If no error occurs, return +++.ATCommand status, then + CIPSHUTClose connection
←	SHUT OK	
Transparent transmission applications2:UDPDData transmission		
→	AT+CIPMODE=1	set upTCPApplication is transparent transmission mode
←	OK	
→	AT+CSTT	Settings ModuleAPN After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPCContext (this <)apn>It can be done AT+CGDCONT?(To search), so just enter...AT+CSTT That's it; the module will automatically retrieve the <apn>To set CSTTofAPN
←	OK	
→	AT+CIICR	Activate the mobile scene and obtainIPaddress
←	OK	
→	AT+CIFSR	Query allocationIPaddress
←	010.083.172.111	
→	AT+CIPSTART="UDP","60.166.18.9",6100	EstablishUDPLinks, including: "UDP"Protocol type for the link "60.166.18.9"For the peer serverIPaddress 6100 For the peer serverUDPport number
←	OK	
← (URC)	CONNECT	If the link is successful, you will see something like this.URCReport
→ /←	Transmission begins here. Enter and send data here, and you can also receive data from the server at this time.
←	UDP ERROR:xx	When a protocol stack error occurs during transmission, it will switch to...ATThe command status should be updated, and the error code should be reported.
→	AT+CIPSHUT	When this happens, +CIPSHUTClose the connection. If no error occurs, return +++.ATCommand status, then + CIPSHUTClose connection
←	SHUT OK	
←	OK	
Domain name resolution: Note: This command will only be executed after completion.at+cstt,at+ciicr,at+cifsrOnly after these steps will the code work correctly. Please refer to the following instructions for inputting these three commands: TCPNon-transparent transmission applications Examples		
→	AT+CDNSGIP="WWW.SINA.COM.CN"	Resolving Sina's website domain name

←	OK + CDNSGIP:1,"WWW.SINA.COM.CN","221.179.18076"	returnIPAddress
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Summary of sending and receiving formats:

Data transmission (multi-link mode, with link number <n>=5(For example))

	Link Protocol	Quickly send	Slow development
single link	TCP	AT+CIPSEND > test TCP DATA ACCEPT:8	AT+CIPSEND > test TCP SEND OK
	UDP	AT+CIPSEND > test UDP DATA ACCEPT:8	AT+CIPSEND > test UDP SEND OK
Multiple links	TCP	AT+CIPSEND=5 > test TCP DATA ACCEPT: 5,8	AT+CIPSEND=5 > test TCP 5. SEND OK
	UDP	AT+CIPSEND=5 > test UDP DATA ACCEPT: 5,8	AT+CIPSEND=5 > test UDP 5. SEND OK

Data reception (multi-link mode with link number <n>=1(For example))

	Link Protocol	AT+CIPHEAD=0	AT+CIPHEAD=1	
			+ CIPSHOWTP=0	+ CIPSHOWTP=1
single link	TCP	TEST123	+ IPD,7:TEST123	+ IPD,7,TCP:TEST123
	UDP	TEST123	+ IPD,7:TEST123	+ IPD,7,UDP:TEST123
Multiple links	TCP	+ RECEIVE,1,7: TEST123	+ RECEIVE,1,7: TEST123	+ RECEIVE,1,7: TEST123
	UDP	+ RECEIVE,1,7: TEST123	+ RECEIVE,1,7: TEST123	+ RECEIVE,1,7: TEST123

If a module actively reports context deactivation, how should this be handled?

←(URC)	+ PDP DEACT	PDPTo activate, you will need to reactivate one.PDPContext is required for continued use TCPIPofATOrder
--------	-------------	--

→	AT+CIPSHUT	Turn off mobile scenes
←	OK	
	There are two ways to handle this, see the right side.	1)AT+CFUN=0,AT+CFUN=1Then, re-establish the connection. 2)AT+RESET Re-establish the connection after restarting the module.

13 IPApplication related commands

13.1 IPApplication settings:AT+SAPBR

Syntax rules:

Command type	grammar	return
Execute command	AT+SAPBR=<cmd_type>,<cid>[,<ConParamTag>,<ConParamValue>]	If <cmd_type> = 2 + SAPBR: <cid>,<Status>,<IP_Addr> OK
		If <cmd_type> = 4 + SAPBR:<ConParamTag>,<ConParamValue> OK
		the remaining OK
Test command	AT+SAPBR=?	+ SAPBR: (0-4),(1-3),"ConParamTag","ConParamValue" OK
URCReport	+ SAPBR <cid>: DEACT	This report will be generated when the mobile scene is deactivated.
Precautions	SAPBRSet load parametersAPNThe following points should be noted: After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISInternet access (this <apn>It can be done AT+CGDCONT?(To search), so just enter...AT+SAPBR=3,<cid>,"APN",""That's it; the module will automatically retrieve the < apn>To setAPN	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cmd_type>	Command type	0	Shut down the bearer
		1	Open the carrier
		2	Query bearing status
		3	Set load parameters
		4	Obtain bearing parameters
<cid>	Bearing context identifier	1~3	
<Status>	The state of bearing	0	Connecting
		1	Already connected
		2	Closing
		3	It has been closed.
<IP_Addr>	BearingIPAddress		
<ConParamTag>	Bearing parameters	"CONTYPE"	Internet connection type. Please refer to the parameter for the possible values.ConParamValue_ConType>
		"APN"	Access point names, maximum supported50characters

		"USER"	Username: Longest Supported50characters
		"PWD"	Password: Longest supported50characters
		PHONENUM "	CSDtelephone number
		"RATE"	CSDConnection speed. Please refer to the value list.ConParamValue_Rate>.
<ConParamValue>			
<ConParamValue_ ConType>	Internet connection types	"CSD"	CSDCircuit-switched data services
		"GPRS"	GPRSGeneral Packet Radio Service Note:GPRSJust compatibility2GThe input format of module instructions will not be forcibly switched.GPRSOn the internet, the actual data carrier network depends on the network standard registered by the module at the time of its creation.
<ConParamValue_ Rate>	CSDConnection speed	0	2400
		1	4800
		2	9600
		3	14400

14 HTTPRelated commands

14.1initializationHTTPServe:AT+HTTPINIT

Syntax rules:

Command type	grammar	return
Execute command	AT+HTTPINIT	OK
Test command	AT+HTTPINIT=?	OK
Precautions	1.In useHTTPBefore providing the service, you should first useAT+HTTPINITCommand to initializeHTTPProtocol stack 2.If you are usinghttpsFor settings related to certificates, encryption suites, and encryption levels, please refer to [link/reference].SSLCFGinstruction	

14.2EnableSSL:AT+HTTPSSL

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPSSL=<n>	OK
Read command	AT+HTTPSSL?	+ HTTPSSL: <n> OK
Test command	AT+HTTPSSL=?	+ HTTPSSL: (0-1) OK

parameter	definition	Value	Explanation of the possible values
<n>	HTTP SSLFunction switch	0	closureSSLFunction
		<u>1</u>	OpenSSLFunction

14.3set upHTTPParameter values:AT+HTTPPARA

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPPARA=<HTTPParamTag>,<HTTPParamValue>	OK
Query command	AT+HTTPPARA?	+ HTTPPARA: list of <HTTPParamTag>:<HTTPParamValue> OK
Test command	AT+HTTPPARA=?	+ HTTPPARA: "HTTPParamTag"," HTTPParamValue" OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<HTTPParamTag> :HTTPParameters, including:			
"CID"	Bearer context number (required parameter number)	1~3	
"URL "	HTTPorHTTPS URL(Required parameters) Note: Supports bothHTTPS and HTTP URL	"http://server/path:tcpPort" or: "https://server/path:tcpPort " Maximum length500bytes	Server: FQDN or IP-address Path: path of file or directory tcpPort:If the parameters are omitted, the service will be connected. HTTPDefault port80. refer to"IETF-RFC 261
"UA"	The application must set the user code The mechanism is used to identify mobile terminals. Typically... Operating system and software version information A browser is included in the settings. Identifier.	-	The default value is:AM_MODULE
"PROIP"	HTTPproxy serverIP address	-	
"PROPORT"	HTTPproxy server PORT	-	
"REDIR"	AsHTTPWhen using the client This flag controls the redirection mechanism. If this flag is set to1,when The server sends a redirect code (Example) Encirclement30x)At that time, the client automatically sends Send newHTTPask	-	The default value is0((Non-directional)
"BREAK"	HTTPmethod"GETThe parameter is an integer.	-	Obtain partial data from the breakpoint to the end point, note that... It is allHTTPAll servers support this. <BREAK> parameter.BREAKThe minimum value is0.
"BREAKEND"	and"BREAKUse together, Includes the resume function. Integer type.	-	if"BREAKENDGreater than "BREAKThe range of resumed transmission is from "BREAKENDarrive" BREAK. if"BREAKENDLess thanBREAKThe range of resumed transmission is from "BREAKEnd of file. If "BREAKEND"and"BREAKAll0It will not be continued.
"USER_DEFINED"	User-defined parameters, for compatibility Rong Hezhou2GModule		The value of a user-defined parameter. For example: AT+HTTPPARA="USER_DEFINED", "Content-type: json-user-define" Note If you need to set multiple user-defined parameters, Enter them one by one. Later entries will not overwrite previous ones. In the past.
"USERDATA"	User-defined parameters have the same function. "USER_DEFINED,for compatibleSIMCOMModule		The value of a user-defined parameter. For example: AT+HTTPPARA="USERDATA", "Con tent-type: json-user-define"

			<p>NoteIf you want to set multiple user-defined parameters, then...</p> <p>Parameters can be separated by \r\nConnection. For example:</p> <p>AT+HTTPPARA="USERDATA","Content-Type:application/json\r\nAPP KEY:FW"</p> <p>existMCUThe program needs to include \r\nWritten as\r\n\r\n</p> <p>It is worth mentioning that somePCSerial port tools, such as SSCOM, will\r\n\r\nTreat it as a control character, so it also needs to be...\r\n\r\nWritten as\r\n\r\n\r\nOther tools, such asXCOM, will not\r\n\r\nTreat it as a control character, so input it directly.</p> <p>\r\n\r\n</p>
<p><HTTPParamValue> :That is <HTTPParamTag>The value of .</p> <p>Note:"USER_DEFINED"and"USERDATAEmbedded double quotes are enclosed in backticks (`).twenty twoExpress.</p>			

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+HTTPPARA?	
←	+ HTTPPARA: CID: 1 URL: UA: AM_MODULE PROIP: 0.0.0.0 PROPORT: 0 REDIR: 0 BREAK: 0 BREAKEND: 0 TIMEOUT: 120 CONTENT: USERDATA: OK	

14.4Write data:AT+HTTPDATA

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPDATA=<size>,<time>	DOWNLOAD

		OK
Test command	AT+HTTPDATA=?	+ HTTPDATA: (<size>(List of possible values), (<time>(List of possible values) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<size>	POSTData size	0-319488	Maximum length is319488
		0	If the second parameter is not evaluated, it's equivalent to clearing the content.
<time>	Longest time for input data	1000-120000	unit:ms
Note: It is strongly recommended to set the time <time>To ensure all data can be entered, the actual size of the downloaded data cannot exceed <size>			

14.5 HTTPActivation method:AT+HTTPACTION

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPACTION=<method>	OK Followed closely behindUnsolicited Result Code: + HTTPACTION: <Method>,<StatusCode>,<DataLen>
		Or if there is an errorMEIf the function is relevant, then return: + CME ERROR: <err> Followed closely behindUnsolicited Result Code: + HTTPACTION: <Method>,<StatusCode>,<DataLen>
Test command	AT+HTTPACTION=?	+ HTTPACTION: (0-2) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<Method>	HTTPMethod Description	0	GET
		1	POST
		2	HEAD
<DataLen>	Length of data obtained	-	Integer
<StatusCode>	HTTPStatus codes, provided by the remote service Device response, reference TTP1.1 (RFC2616)	100	continue(Continue)
		101	Exchange Protocol (Switching Protocols
		200	Sure(OK)
		201	Created (Created)
		202	Accepted (Accepted)
		203	Unofficial information (Non-Authoritative Information)
		204	No content (No Content)
		205	Reset content (Reset Content)
		206	Partial content (Partial Content)

	300	Multiple choice (Multiple Choices
	301	Permanently delete (Moved Permanently)
	302	turn up(Found)
	303	See other (See Other)
	304	Unmodified (Not Modified)
	305	Use a proxy server (Use Proxy)
	307	Temporary redirection (Temporary Redirect
	400	Error request (Bad Request)
	401	Unauthorized (Unauthorized)
	402	Payment request (Payment Required)
	403	prohibit(Forbidden)
	404	Cannot find (Not Found
	405	Method not allowed (Method not allowed)
	406	UnacceptableNot Acceptable)
	407	Proxy identity verification is required.Proxy AuthenticationRequired)
	408	Request timed out (Request Timeout)
	409	conflict(Conflict)
	410	The requested resource is not valid on the server, and the forwarding address is unknown.Gone)
	411	Length needs to be entered (Length Required)
	412	Preconditions failed (Precondition Failed)
	413	The request entity is too large ((Request Entity Too Large)
	414	askURIToo long (Request-URI Too Large
	415	Media type not supported (Unsupported Media Type)
	416	The requested range cannot be satisfied.Requested range not satisfiable)
	417	Execution failed (Expectation Failed
	500	Internal Server Error(Internal Server Error)
	501	Not executed (Not Implemented
	502	Gateway error (Bad Gateway)
	503	Service unavailableService Unavailable
	504	Gateway timeout (Gateway Timeout
	505	HTTPVersion not supported ((HTTP Version not supported)
	600	NoHTTP PDUFormat(Not HTTP PDU)
	601	Network error (Network Error
	602	Insufficient memory (No memory)
	603	DNSmistake(DNS Error)
	604	Stack busy (Stack Busy)
	605	SSLChannel establishment failed
	606	SSLCommunication warning error

14.6QueryHTTPService Response:AT+HTTPREAD

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPREAD=<start_address>,<byte_size>	+ HTTPREAD:<date_len><data> OK
Execute command	AT+HTTPREAD	+ HTTPREAD:<date_len><data> OK ReadAT+HTTPACTION=0 orAT+HTTPDATAAll sounds of the command According to the data. The execution command is used to...HTTPThe server's response output is toUARTOr the output is ready. POSTData sent to the server.
Test command	AT+HTTPREAD=?	+ HTTPREAD: (list of supported <start_address>s),(list of supported<byte_size>s) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<date_len>	Actual output data length		
<data>	HTTPserverAT+HTTPACTION=0Command response data		
<start_address>	The starting point of the output data	0~319488	Unit: bytes
<byte_size>	Length of output data	1~319488	Unit: bytes

14.7GetHTTPService response data:AT+HTTPGET

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPGET=<path>	+ HTTPGET:<date_len> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<date_len>	Actual output data length		
<path>	httpDownload file path		Length not exceeding255ofASCII String.

14.8QueryHTTPHeader information:AT+HTTPHEAD

Syntax rules:

Command type	grammar	return
Execute command	AT+HTTPHEAD	+ HTTPREAD:<date_len> <data> OK
Test command	AT+HTTPHEAD=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<date_len>	Actual length of header information		
<data>	Header information		

14.9saveHTTPApplication context:AT+HTTPSCONT

Execute command to save contentsATcommand parametersHTTPThe application context will be automatically loaded when the system restarts.

Query command returnsHTTPApplication context.

Syntax rules:

Command type	grammar	return
Execute command	AT+HTTPSCONT	+ HTTPREAD: (list of supported <start_address>s),(list of supported<byte_size>s) OK
Query command	AT+HTTPSCONT?	+ HTTPSCONT:<mode> CID:<value> URL: <value> UA: <value> PROIP: <value> PROPORT: <value> REDIR: <value> BREAK: <value> BREAKEND: <value> USERDATA:<data> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	HTTPContext saving mode	0	Save, value retrieved fromNVRAM

		1	Not saved, value taken fromRAM
--	--	---	--------------------------------

14.10terminationHTTPTask:AT+HTTPTERM

Syntax rules:

Command type	grammar	return
Setting commands	AT+HTTPTERM	OK
Test command	AT+HTTPTERM=?	OK

14.11 HTTPError code:ERROR:<err code>

HTTPError codes will beERROR: <err code>The form is reported.

<err code>definition:

Value	English instructions	Chinese instructions
0	Unknown session id	Unknown conversationID
1	File is too short	The file content is too short.
2	DNS is failing.	Domain name resolution failed
3	HTTP is busy	HTTPThe task is in progress
4	The socket is wrong.	Socket failure
5	Connect fail	Connection failed
6	File is error	File error
7	Connection is closed	Connection closed
8	Connection is destroyed	The connection has been destroyed.
9	HTTP header not found	HTTPThe head does not exist
10	HTTP authentication scheme is not supported	HTTPThe authentication mechanism does not support
11	PDP active is wrong	PDPActivation failed
12	Param is wrong	Incorrect parameters
13	No buffer	Insufficient buffer
14	PDP deactive is wrong	PDPDeactivation failed

14.12Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→)	Example	Explanation and clarification
/Return (←)		
HTTP GETCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upHTTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set updpd Bearing parametersAPN

		After the module registers with the network, it will automatically obtain <from the network.apn>And activate one PDPContext, used forRNDISInternet access (this <apn>It can be doneAT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN",""That's it; the module will automatically retrieve the <apn>To setAPN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
→	AT+HTTINIT	HTTPProtocol stack initialization
←	OK	
→	AT+HTTPPARA="CID",1	set upHTTPSession parameters:CID
←	OK	
→	AT+HTTPPARA="URL","www.baidu.com"	set upHTTPSession parameters:URL
←	OK	
→	AT+HTTPACTION=0	GETstart
←	OK	
←	+ HTTPACTION:0,200,1348 + HTTPACTION:0,200,1348 + HTTPACTION:0,200,1348	These appearedURCThe report indicatesGETData successfully processed, awaiting...READ
→	AT+HTTPREAD	Read fromHTTPserverGETData
←	+ HTTPREAD: 9592 OK	...expressHTTPdata
→	AT+HTTPTERM	FinishHTTPServe
←	OK	
HTTP POSTCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upHTTPFunctional carrying type SAPBRIn order to activatePDPContext
←	OK	
→	AT+SAPBR=3,1,"APN",""	set upAPN After the module registers with the network, it will automatically obtain <from the network.apn>And activate one PDPContext, used forRNDISInternet access (this <apn>It can be doneAT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN",""That's it; the module will automatically retrieve the <apn>To setAPN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier

←	+ SAPBR: 1,1,010.169.179.213	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
	OK	
→	AT+HTTPINIT	HTTPProtocol stack initialization
←	OK	
→	AT+HTTPSSL=1	Setup and usageSSLConnect (no certificate verification required)
←	OK	
→	AT+SSLCFG="hostname",153,"fanyi.baidu.c om"	
←	OK	
→	AT+HTTPPARA="CID",1	set upHTTPSession parameters:CID
←	OK	
→	AT+HTTPPARA="URL","https://fanyi.baidu.c om"	set upHTTPSession parameters:URL
←	OK	
→	AT+HTTPDATA=4,100000	enter4byte, waiting time is10SThe input time should be set long enough to ensure data input.
←	DOWNLOAD	DOWNLOADThis indicates that you are ready to input data.
→	China	Enter China (the two characters for China occupy space)4(bytes)
←	OK	OKThe appearance indicates the end of input.
→	AT+HTTPACTION=1	POSTstart
←	OK	
←	+ HTTPACTION:1,200,207751	expressPOSTsuccess
→	AT+HTTPREAD	Read content
←	+ HTTPREAD: 207751 <!DOCTYPE html> <html> <head> <meta charset="utf-8"> <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1"> <title>鋼惧害缈昏瘡</title> <meta name="keywords" content="缈昏瘡, 鏹一嚎缈昏瘡, 鋼惧害缈昏瘡, 璇螯吁, 鐳辨,"/> <meta name="description" content="鋼惧害缈昏瘡鎖慎縵錦虫禄 ... "https://fex.bdstatic.com"+d:"http://fex.bdstatic.com"+d,k&&l&&l>k (g(function(){alog("speed.set","lt",+new Date),e=b.createElement(c),e.async=!0,es rc=d+"?v="+~(new Date/864e5)+~(new Date/864e5),f=b.getElementsByTagName(c) [0],f.parentNode.insertBefore(e,f)),j()}})(window,document,"script","/hunter/alog/dp	

	<pre> .min.js"); }); !function(){ require('translation:widget/translate/common/sectrans'); }();</script></body> </html> OK </pre>	
→	AT+HTTPTERM	FinishHTTPServe
←	OK	downloadHTTPThe conversation started fromAT+SAPBR=2,1Initially, if this command queries!PIf the address still exists, thenHTTPINIT HTTPPARAContinue executing in sequence
bringSSLCertificate verification functionHTTPSPprocess:		
→	AT+FSCREATE="ca.crt"	Create serverCACertificate file
←	OK	
→	AT+FSCREATE="client.crt"	Create client certificate file
←	OK	
→	AT+FSCREATE="client.key"	Create client key file
←	OK	
→	AT+FSWRITE="ca.crt",0,2080,15	File length2080The bytes are just an example; please fill in the actual data. The same applies below.
←	>	Enter hereCACertificate file
←	OK	
←	AT+FSWRITE="client.crt",0,128,10	
→	>	Enter the client certificate file here.
←	OK	
→	AT+FSWRITE="client.key",0,188,10	
←	>	Enter the client key file here.
←	OK	
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	
←	OK	
→	AT+SAPBR=3,1,"APN", ""	<p>set upPDPBearingAPNparameter</p> <p>After the module registers with the network, it will automatically obtain <from the network.apn>And activate one PDPContext, used forRNDISInternet access (this <apn>It can be doneAT+CGDCONT?(To query), so enter AT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To setAPN</p>
←	OK	
→	AT+SAPBR=1,1	
←	OK	
→	AT+SAPBR=2,1	
←	+ SAPBR: 1,1,010.169.179.213	
	OK	
→	AT+HTTPSSL=1	OpenSSLFunction switch is on
←	OK	

→	AT+SSLCFG="cacert",153,"ca.crt"	Configure the serverCACertificate SSLContextid,existTCPIn the case of a single link, the default is0; existHTTPS The link below is153The same applies below.
←	OK	
→	AT+SSLCFG="clientcert",153,"client.crt"	Configure client certificate
←	OK	
→	AT+SSLCFG="clientkey",153,"client.key"	Configure the clientKEY
←	OK	
→	AT+SSLCFG="secllevel",153,2	Set security level
←	OK	
→	AT+SSLCFG="ciphersuite",153,0X0035	Set up encryption suite
←	OK	
→	AT+SSLCFG="clientrandom",153,01B12C31 41516171F19202122232425262728293031 323334353637D	Set random number
←	OK	
→	AT+HTTPINIT	HTTPProtocol stack initialization
←	OK	
→	AT+HTTPPARA="CID",1	set upHTTPSession parameters:CID
←	OK	
→	AT+HTTPPARA="URL","https://**.***.***"	set upHTTPSession parameters:URL Please write the specific URL, not just copy it.
←	OK	
→	AT+HTTPACTION=0	GETstart
←	OK	
←	+ HTTPACTION:0,200,1348 + HTTPACTION:0,200,1348 + HTTPACTION:0,200,1348	These appearedURCThe report indicatesGETData successfully processed, awaiting...READ
→	AT+HTTPREAD	Read fromHTTPserverGETData
←	+ HTTPREAD:1592 OK	...expressHTTPdata
→	AT+HTTPTERM	FinishHTTPServe
←	OK	
HTTP HEADprocess:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	
←	OK	
→	AT+SAPBR=3,1,"APN",""	
←	OK	
→	AT+SAPBR=1,1	
←	OK	

→	AT+SAPBR=2,1	
←	+ SAPBR: 1,1,010.169.179.213	
	OK	
→	AT+HTTPINIT	
←	OK	
→	AT+HTTPPARA="CID",1	
←	OK	
→	AT+HTTPPARA="URL","https://**.***.***"	
←	OK	
→	AT+HTTPACTION=2	AT+HTTPACTION=0It is also possible
←	OK	
→	AT+HTTPHEAD	
←	+ HTTPHEAD: <date_len> - - - data--- OK	<date_len>These are specific numbers.data---It is the specific header information.

15 FTPRelated commands

15.1set upFTPControl port:AT+FTPPORT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPORT=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPPORT?	+ FTPPORT:<value> OK	
Test command	AT+FTPPORT=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPControl port number	1~65535	The default value istwenty one

15.2set upFTPActive or passive mode:AT+FTPMODE

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPMODE=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPMODE?	+ FTPMODE:<value> OK	
Test command	AT+FTPMODE=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPActive and passive modes	0	Active mode (not currently supported)
		<u>1</u>	Passive mode

15.3set upFTPData transmission type:AT+FTPTYPE

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPTYPE=<value>	OK	Normal return
		ERROR	Input format is incorrect

Query command	AT+FTPTYPE?	+ FTPTYPE:<value>	
		OK	
Test command	AT+FTPTYPE=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPData transmission type	"A"	FTP ASCIIcharacter set
		"I"	FTP Binarycharacter set

15.4set upFTPInput type:AT+FTPPUTOPT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPUTOPT=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPPUTOPT?	+ FTPPUTOPT:<value>	
		OK	
Test command	AT+FTPPUTOPT=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPData transmission type	"APPE"	Add file
		"STOU"	Store unique files
		" <u>STOR</u> "	Storage Files

15.5set upFTPBearing Identification:AT+FTPCID

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPCID=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPCID?	+ FTPCID:<value>	
		OK	
Test command	AT+FTPCID=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPBearing Identifier	1~3	Same +SAPBRChinacid>Definition. Default value is1.

15.6set upFTPDownload resume:AT+FTPREST

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPREST=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPREST?	+ FTPREST:<value>	
		OK	
Test command	AT+FTPREST=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	The breakpoint to resume the download		

15.7set upFTPServer address:AT+FTPSERV

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPSERV=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPSERV?	+ FTPSERV:<value>	
		OK	
Test command	AT+FTPSERV=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPServer address,IPor domain name		32-bitDecimal numbers, using . Separate, in the form of: XXX.XXX.XXX.XXX. in the case ofDNSThen the length does not exceed49ofASCIIString.

15.8set upFTPUsername:AT+FTPUN

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPUN=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPUN?	+ FTPUN:<value>	
		OK	

Test command	AT+FTPUN=?	OK	
--------------	------------	----	--

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPusername		For length not exceeding 49 of ASCIIString.

15.9 set up FTP password: AT+FTPPW

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPW=<pw>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPPW?	+ FTPPW:<pw> OK	
Test command	AT+FTPPW=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<pw>	FTPpassword		For length not exceeding 49 of ASCIIString.

15.10 set up FTP Download file name: AT+FTPGETNAME

Set the name of the target file on the server side.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPGETNAME=<name>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPGETNAME?	+ FTPGETNAME:<name> OK	
Test command	AT+FTPGETNAME=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<name>	FTPDownload file name		For length not exceeding 99 of ASCIIString.

15.11 set up FTP Download file path: AT+FTPGETPATH

This command sets the path of the target file on the server.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPGETPATH=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPGETPATH?	+ FTPGETPATH:<value>	
		OK	
Test command	AT+FTPGETPATH=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPDownload file path		Length not exceeding 255 of ASCIIString.

15.12 set up FTP Uploaded file name: AT+FTPPUTNAME

Set the name to save the file after it is uploaded to the server.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPUTNAME=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPPUTNAME?	+ FTPPUTNAME:<value>	
		OK	
Test command	AT+FTPPUTNAME=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPUuploaded file name		Length not exceeding 99 of ASCIIString.

15.13 set up FTP Upload file path: AT+FTPPUTPATH

Set the directory to save files after they are uploaded to the server.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPUTPATH=<value>	OK	Normal return
		ERROR	Input format is incorrect
Query command	AT+FTPPUTPATH?	+ FTPPUTPATH:<value>	
		OK	
Test command	AT+FTPPUTPATH=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<value>	FTPUpload file path		Length not exceeding99ofASCIIString.

15.14Create a file directory on the remote server:AT+FTPMKD

Syntax rules:

Command type	grammar	return	illustrate
Execute command	AT+FTPMKD	OK + FTPMKD: 1,0	Creation successful
		OK + FTPMKD: 1,<error>	Creation failed
		+ CME ERROR: <err>	If it's a command error
Test command	AT+FTPMKD=?	OK	
Precautions	The file directory created by executing the command is determined by the command.AT+FTPGETPATHdefinition		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<error>	Error code		andAT+FTPGETThe command <error>Same definition

15.15Delete a file directory on a remote server:AT+FTPRMD

Syntax rules:

Command type	grammar	return	illustrate
Execute command	AT+FTPRMD	OK + FTPRMD: 1,0	Deletion successful
		OK + FTPRMD: 1,<error>	Deletion failed
		+ CME ERROR: <err>	If it's a command error
Test command	AT+FTPRMD=?	OK	
Precautions	The file directory deleted by executing the command is determined by the command.AT+FTPGETPATHdefinition		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<error>	Error code		andAT+FTPGETThe command <error>Same definition

15.16Download file:AT+FTPGET

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPGET=<mode>[,<reqlength>]	OK	enterAT+FTPGET=1The return
		+ FTPGET:2,<cnlength>data.....	enter: AT+FTPGET=2, <reqlength> The return
		OK	
URCReport	+ FTPGET:1,1	enterAT+FTPGET=1Afterwards, this report indicates that data has been received; the first parameter... 1Indicates <mode>for1	
	+ FTPGET:1,<error>	enterAT+FTPGET=1Subsequently, this was reported, indicatingFTPDownload failed, first parameter1Indicates <mode>for1	
	+ FTPGET:1,0	The first parameter indicates the end of data transmission.1Indicates <mode>for1	
Test command	AT+FTPGET=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	1	OpenFTPconversation
		2	Read inFTPDownload data
<reqlength>	Requested data length	1~1460	
<cnlength>	Confirm the length of the data read.	1~1460	Possibly less thanreqlength>.0This indicates that no data can be read in.
<error>	Error code	61	Network errornet error
		62	DNSmistakeDNS error
		63	Connection errorconnect error
		64	time outtimeout
		65	Server errorserver error
		66	Operation prohibitedOperation not allowed
		70	Response errorreply error
		71	User erroruser error
		72	Incorrect passwordpassword error
		73	Type errortype error
		74	Keep the errorrest error
		75	Passive errorpassive error
		76	Active erroractive error
		77	Operational errorOperate error
		78	Upload errorupload error
		79	Download errorDownload error
		80~84	FTP SSLConnection error
		85	File error
		86	Voluntary withdrawal

15.17 Upload file:AT+FTPPUT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPPUT=<mode>[,<reqlength> >	OK	enterAT+FTPPUT=1The return
		+ FTTPUT:2,<cnlength> ... //input data here	enter: AT+FTPPUT=2, <reqlength> The return
		OK	enter: AT+FTPPUT=2,0 The return
		OK + FTTPUT: 1,0	
URCReport	+ FTTPUT:1,1,<maxlength>	enterAT+FTTPUT=1After this report is received, it indicates that data can be uploaded. At this point, you can input...AT+FTTPUT=2,<reqlength>The first parameter for uploading data1Indicates <mode>for1	
	+ FTTPUT:1,0	This indicates the end of the data transmission session. The first parameter...1Indicates <mode>for1	
	+ FTTPUT:1,<error>	If <mode>=1,andFTPSession failed. Error code <error>Please refer to the definition. AT+FTPGETError code <error>definition	
Test command	AT+FTPPUT=?	OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	FTPUpload working mode	1	OpenFTPConversation
		2	WriteFTPUpload data
<reqlength>	Length of data to be uploaded	0-<maxlength>	
<cnlength>	Confirm the allowed data length		
<maxlength>	The maximum length that can be uploaded in a single session depends on the network conditions.		

15.18 Download file (extended):AT+FTPEXTGET

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPEXTGET=<mode>	OK	When <mode>=0or1
	AT+FTPEXTGET=<mode>,<filename>	+ FTPEXTGET:2,<totalLength> OK	When <mode>=2
	AT+FTPEXTGET=<mode>,<readpos>,<readlen>	+ FTPEXTGET:3,<outputLength> //This is the data output to the serial port. OK	When <mode>=3
	AT+FTPEXTGET=<mode>	OK	When <mode>=4

		+ FTPEXTGET: 4,<outputLength> // outputLengthData length	AT+FTPEXTGET= 4, outputLength //Read data
Query command	AT+FTPEXTGET?	+ FTPEXTGET: <status>[,<receivedLength>] OK	
Test command	AT+FTPEXTGET=?	OK	
URCReport	+ FTPEXTGET:1,0	<mode>=1andFTPEXTGETThe end will result in such a report.	
	+ FTPEXTGET:1,<error>	<mode>=1andFTPEXTGETAn error will be reported like this. Error code <error> Please refer to the definition.AT+FTPGETError code <error>definition	
	+ FTPEXTGET:2,<totalLength>	<mode>=2	
	+ FTPEXTGET:3,<outputLength>	<mode>=3	
Precautions	<p>1) whenFTPEXTPUT<mode>=1This command cannot be used at this time.</p> <p>2If the file size is less thanreceivedLength>)<300KBYou can use this command; if the file size... (<receivedLength>)>=300KBPlease use the default.FTPGET method (AT+FTPEXTGET=0) 3For instructions on how to use this command, please refer to the last part of this chapter: Examples of Usage.</p>		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	<u>0</u>	Use the defaultFTPGETmethod
		1	Use extendedFTPGETmethod
		2	Save the downloaded data to a file
		3	Output downloaded data to serial port
		4	Streaming data acquisition
<filename>	file name		String type, longest64One character. Note: Only specify the filename, do not specify the path, because The save path is fixed.C:/USER/FTP
<totalLength>	The total length of all data saved to the file, used for mode 2	<302512	Unit: bytes
<outputLength>	The length of data output to the serial port is used formode 3or4	<302512	Unit: bytes
<readpos>	The starting position for reading file data, used for mode 3		0
<readlen>	Read length, used formode 3		Unit: bytes
<status>	FTPEXTGETstatus	0	Not hereFTPEXTGETDuring the process
		1	InFTPEXTGETprocess
<receivedLength>	Length of downloaded data		Unit: bytes
<error>	Error code		andAT+FTPGETThe command <error>Same definition

15.19Upload Files (Extended):AT+FTPEXTPUT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPEXTPUT=<mode>[,<pos>,<len>,<timeout>]	OK	When <mode>=0or1
		+ FTPEXTPUT: <pos>,<len>	When <mode>=2
		... OK	
Test command	AT+FTPEXTPUT=?	OK	
Precautions	For instructions on how to use this command, please refer to the last part of this chapter: Examples of Usage.		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	0	Use the defaultFTPPUTmethod
		1	Use extendedFTPPUTmethod
		2	DataPUTarriveRAM
<pos>	every timePUTstarting position	0-300K	unit:byte
<len>	every timePUTData length	0-300K	unit:byte
<timeout>	Timeout for serial data transmission	1000-1000000	unit:ms

15.20Download the file and save it to the file system:AT+FTPGETTOFS

Syntax rules:

Command type	grammar	return	
Setting commands	AT+FTPGETTOFS=<loc>,<filename>[,<num>,<time>]	OK	success
		ERROR	fail
Query command	AT+FTPGETTOFS?	+ FTPGETTOFS: <status>[,<rcvlen>,<writelen>] OK	
URCReport	+ FTPGETTOFS:0,<totalLength>	If the download is successful	
	+ FTPGETTOFS:<error>	If the download fails	
Test command	AT+FTPGETTOFS=?	OK	
Precautions	After reconnecting, the download will resume. If two downloads use the same filename, the content of the previous download will be overwritten.		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<status>	Work mode	0	Not hereFTPGETTOFSprocess
		1	InFTPGETTOFSprocess
<loc>	The file is saved in the following location:ROMstillSDCard.	0	Saved inROMThe folder is fixed as

	Disk1 or Disk2 Can be AT+FSDRIVEGet		"Disk1:/USER/FTP"
		1	Saved in SDCards and folders are fixed as "Disk2:/FTP"
<filename>	file name		String type, longest 64 characters
<num>	Automatic reconnection count	0-255	Default value: 3
<time>	How many seconds until automatic reconnection starts?	0-60	Unit: seconds, Default value: 5
<rcvlen>	Current from FTP server GET How much data		
<writelen>	How much data is currently saved to the file system?		
<totalLength>	How much data was saved to the file system in total?		
<error>	Error code		and AT+FTPGET The command <error> Same definition

15.21 Upload files from the file system to the server: AT+FTPPUTFRMFS

Syntax rules:

Command type	grammar	return
Execute command	AT+FTPPUTFRMFS=<filepath>[,<num>,<time> >	OK
Query command	AT+FTPPUTFRMFS?	+FTPPUTFRMFS: <status>[,<putLength>] OK
Test command	AT+FTPPUTFRMFS=?	OK
URCReport	+FTPPUTFRMFS:0,<totalLength>	This report is submitted when the upload is complete.
	+FTPPUTFRMFS:<error>	This is a report that is generated when an upload fails. <error>Please refer to the definition. AT+FTPGET The command <error> definition
Precautions	Automatic reconnection resumes the download from the breakpoint.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<filepath>	file name		String type, consisting of numbers and letters, with a maximum length of...128 byte
<num>	Automatic reconnection count	0-255	Default value: 3
<time>	How many seconds until automatic reconnection starts?	0-60	Unit: seconds, Default value: 5
<status>	FTPUpload status	0	Not uploading
		1	Uploading
<putLength>	How much data has been uploaded from the file system so far?		Unit: bytes
<totalLength>	How much data was uploaded from the file system?		Unit: bytes

15.22 Load from file system RAM Using both Chinese and Western FTPPUTUpload: AT+FTPFILEPUT

Syntax rules:

Command type	grammar	return
Setting commands	AT+FTPFILEPUT=<mode>[,<filename>]	OK
Test command	AT+FTPFILEPUT=?	OK
Precautions	whenFTPEXTPUTCommand <mode>=1This command is unavailable at this time.	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Work mode	0	End of loading from file system toRAM
		1	Start loading from the file systemRAMAnd upload
<filename>	file name	0-128byte	when modefor1You must enter a filename, for0unnecessary

15.23Retrieve file directories on a remote server:AT+FTPLIST

Syntax rules:

Command type	grammar	return
Execute command	AT+FTPLIST=<mode>[,<reqlen>]	<p>If <mode>=1The command format is: AT+FTPLIST=1</p> <p>The return value is: OKor +CME ERROR: <err></p>
		<p>If <mode>=2The command format is: AT+FTPLIST=2,<reqlen></p> <p>The return value is: + FTPLIST:2,<cnflen> data... OK</p>
Test command	AT+FTPLIST=?	OK
URCReport	<p>enterAT+FTPLIST=1back,</p> <p>If it is a successFTPThe following will be part of the conversation:URCReport to: + FTPLIST:1,1</p> <p>in the case ofFTPData transmission complete. The following will follow:URCReport to: + FTPLIST:1,0</p> <p>ifFTPThe session failed. The following will follow:URCReport to: + FTPLIST:1,<error></p>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
-----------	------------	-------	------------------------------------

<mode>	Work mode	1	OpenFTPGet file directory session
		2	ReadFTPGet data from file directory
<reqlen>	Length of requested data	1~1460	
<cnflen>	Actual data length	1~1460	
<error>	Same +FTPGETChinaerror>definition		

15.24Get the file size on the remote server:AT+FTPSIZE

Syntax rules:

Command type	grammar	return	illustrate
Execute command	AT+FTPSIZE	OK + FTPSIZE: 1,0,<size>	File size retrieved successfully
		OK + FTPSIZE: 1,<error>,0	Failed to retrieve file size
		+ CME ERROR: <err>	If it's a command error
Test command	AT+FTPSIZE=?	OK	
Precautions	The file is generated by the command.AT+FTPGETNAMEandAT+FTPGETPATHSpecify		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<size>	File size		Unit: bytes
<error>	Error code		andAT+FTPGETThe command <error>Same definition

15.25GetFTPstate:AT+FTPSTATE

Syntax rules:

Command type	grammar	return
Execute command	AT+FTPSTATE	+ FTPSTATE: <state> OK
Test command	AT+FTPSTATE=?	OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Work status	0	Idle
		1	FTPThe conversation is in progress, includingFTPGET,FTPPUT,FTPDELE

15.26saveFTPApplication context:AT+FTPSCONT

Syntax rules:

Command type	grammar	return	illustrate
Query command	AT+FTPSCONT?	+ FTPSCONT: <value> + FTPSERV: <value> + FTPPORT: <value> + FTPUN: <value> + FTPPW: <value> + FTPCID: <value> + FTPMODE: <value> + FTPTYPE: <value> + FTPPUTOPT: <value> + FTPREST: <value> + FTPGETNAME: <value> + FTPGETPATH: <value> + FTPPUTNAME: <value> + FTPPUTPATH: <value> + FTPTIMEOUT: <value> OK	
Execute command	AT+FTPSCONT	OK	WillFTPThe context is saved, and the context parameters will be automatically loaded and take effect after the module restarts.

15.27Delete the specified file on the server:AT+FTPDELE

Syntax rules:

Command type	grammar	return
Execute command	AT+FTPDELE	OK
Test command	AT+FTPDELE=?	OK
URCReport	+ FTPDELE:1,0	This indicates successful deletion. The first parameter...1expressFTPSession open
	+ FTPDELE:1,<error>	expressFTPFile deletion failed. Error code <error>Please refer to the definition. AT+FTPGETError code <error>definition
Precautions	The file is generated by the command.AT+FTPGETNAMEandAT+FTPGETPATHSpecify	

15.28Exit the currentFTPConversation:AT+FTPQUIT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+FTPQUIT	OK	success
		ERROR	fail

Test command	AT+FTPQUIT=?	OK	
--------------	--------------	----	--

15.29 Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→) /Return (←)	Example	Explanation and clarification
FTPGETCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter
		After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT? (To query), so enterAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213	First parameter1expresscid
		The second parameter1Indicates that a connection has been established.
	OK	The third parameter indicates what the module obtains.IPaddress
→	AT+FTPCID=1	set upcid
←	OK	
→	AT+FTPSERV="36.7.2.150"	Configure the serverIPAn address can also be a domain name. This article is just an example; please fill in your own server address and do not copy it verbatim.
←	OK	
→	AT+FTPUN="user556"	Set your server username. Please enter your own.FTPDo not copy the server username verbatim.
←	OK	
→	AT+FTPPW="222333"	Enter your password. Please enter your own password.FTPDo not copy the server password.
←	OK	
→	AT+FTPGETPATH="/"	Set the path for downloaded files.
←	OK	
→	AT+FTPLIST=1	
←	OK	
	+ FTPLIST: 1,1	
→	AT+FTPLIST=2,1460	
←	+ FTPLIST: 2,1460 drwxr-xr-x 1 ftp ftp February 24, 2018.1	drwxr-xr-x The first letter indicates the file type. d:File Directory -: Regular Files

	<pre> - rw-r--r-- 1 ftp ftp 107 Jul 10 17:08 1.txt 0 drwxr-xr-x 1 ftp ftp Apr 27 2018 11 - rw-r--r-- 1 ftp ftp drwxr-xr-x 0 Sep 19 2018 111.txt ftp 0 Dec 19 2018 1221 - rw-r--r-- 1 ftp ftp 7 Apr 25 2019 1222.txt - rw-r--r-- 1 ftp ftp 18380 May 07 2018 12220.txt - rw-r--r-- 1 ftp ftp 0 Apr 26 2019 12222.txt - rw-r--r-- 1 ftp ftp 10 Apr 28 2018 122343.txt - rw-r--r-- 1 ftp ftp 254 Sep 04 2018 123456.txt - rw-r--r-- 1 ftp ftp 601283 Jul 21 2018 2018_7_21.sdl - rw-r--r-- 1 ftp ftp 8 Apr 26 2019 33333.txt - rw-r--r-- 1 ftp ftp October 14, 2013 2017 66.txt - rw-r--r-- 1 ftp ftp 11525352 Mar 13 2019 Air720_CSDK_demo_flash.blf - rw-r--r-- 1 ftp ftp 65536 Jul 31 2018 app2_flash.bin - rw-r--r-- 1 ftp ftp 0 Sep 29 2017 ccc.txt - rw-r--r-- 1 ftp ftp 65536 Jan 18 2018 demo_ota_flash.bin - rw-r--r-- 1 ftp ftp 65536 Jul 30 2018 demo_timer_flash.bin - rw-r--r-- 1 ftp ftp 131072 Oct 10 2017 demo_timer_flash_org.bin - rw-r--r-- 1 ftp ftp 纒€ 534110 Feb 24 2018 FM320X 湢.pdf - rw-r--r-- 1 ftp ftp 16384 Mar 26 2019 FOTA_APP_720D.bin - rw-r--r-- 1 ftp ftp 5103616 Mar 26 2019 FOTA_CORE_APP_720D.bin drwxr-xr-x 1 ftp ftp 0 Dec 12 2018 get OK </pre>	<p>The following three characters are grouped together for analysis.rw,rx,rx.</p> <p>Group 1 rwyesrootPermissions for group-part files; SecondrxThis refers to the permissions granted to files by regular users (or user groups); the third one...rxThese are the permissions other users have for the file.</p> <p>rIt is readable.wIt is writable.xIt is executable. rwxIt means readable, writable, and executable; rxIt is readable, executable, but not writable;</p> <p>Similarly:</p> <p>r-- It is readable, not writable, and not executable. rw- It is readable, writable, but not executable.</p>
→	AT+FTPQUIT	<p>quitFTP LISTA session must be completed before a subsequent session can begin.</p> <p>Exit.FTP LISTThere are two methods for conversation: one is to wait.</p> <p>+ FTP LIST:1,0The first option is to report, and the second is to voluntarily withdraw.FTP LIST conversation</p>
←	<p>OK</p> <p>+ FTP LIST: 1.86</p>	This uses a proactive exit mechanism.FTP LIST conversation
→	AT+FTPGETNAME="1.txt"	Set the name of the download file
←	OK	
→	AT+FTPGET=1	startFTP Download Session
←	OK	
←	+ FTPGET: 1,1	This isURCReporting means that data is available.
→	AT+FTPGET=2,20	Read in20Data
←	+ FTPGET: 2, 10	I'm sure I read it.10Data

	??/ ??/ OK	
← (URC)	+ FTPGET: 1,0	A prompt will appear after a while.FTPDownload session ended
→	AT+FTPREST=6	ifFTPIf the connection or session is closed unexpectedly, you can alsoResuming interrupted downloadsResume downloading from the point where it stopped.
←	OK	
→	AT+FTPGET=1	
←	OK + FTPGET: 1,1	+ FTPGET: 1,1This indicates that there is data available for reading.
→	AT+FTPQUIT	You can also add a hint.FTPGET: 1,0Forward active use AT+FTPQUITExit the currentFTPconversation
←	OK + FTPGET: 1.86	
FTPPUTCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISInternet access (this) <apn>It can be doneAT+CGDCONT? (To query), so enterAT+SAPBR=3,<cid>,"APN","", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
→	AT+FTPCID=1	
←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPAn address can also be a domain name. This article is just an example; please fill in your own server address and do not copy it verbatim.
←	OK	
→	AT+FTPUN="test112"	Set your server username. Please enter your own.FTPDo not copy the server username verbatim.
←	OK	
→	AT+FTPPW="777888"	Enter your password. Please enter your own password.FTPDo not copy the server password.
←	OK	
→	AT+FTPPUTNAME="1222.txt"	Set the name of the uploaded file.
←	OK	
→	AT+FTPPUTPATH="/11/"	Set the path for uploaded files.

←	OK	
→	AT+FTPPUT=1	
←	OK	
←	+ FTTPUT:1,1,1360	This isURCThe notification indicates that data can be uploaded. The maximum length of a single upload is [length missing].1360
→	AT+FTTPUT=2,7	
←	+ FTTPUT: 2,7 //Enter now7characters OK	enter7After a certain number of characters, it will return...OKThis indicates the end of input and that the upload has been completed.
(URC)	+ FTTPUT: 1,0	If no action is taken after a period of time, a prompt will appear.FTP PUTEnd of session
→	AT+FTPQUIT	You can also add a hint.FTPPUT: 1,0Previously used AT+FTPQUITActively end the session
←	OK + FTTPUT: 1.86	
FTPTEXTGETCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT?Come and check. Enter hereAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
→	AT+FTPCID=1	
←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPAddress, or domain name.
←	OK	
→	AT+FTPUN="test112"	Set username
←	OK	
→	AT+FTPPW="777888"	Enter password
←	OK	
→	AT+FTPGETNAME="TEST2.txt"	Set the name of the downloaded file (please note:FTPTEXTGETThe command only supports less than300K(Download the file)
←	OK	
→	AT+FTPGETPATH="/11/"	Set the folder where the downloaded files are located.
←	OK	

→	AT+FTPEXTGET=1	startFTPdownload
←	OK	
→	AT+FTPEXTGET?	Query how many bytes were downloaded
←	+ FTPEXTGET: 1,246840 OK	
← (URC)	+ FTPEXTGET: 1,0	Yes, this is available.URCThe report indicates that the file download is complete and it can be saved or read.
→	AT+FTPEXTGET=2,hello	The saved file name ishelloworld
←	+ FTPEXTGET: 2, 296895 OK	
→	AT+FTPEXTGET=3,0,296895	Display data on serial port
←	+ FTPEXTGET: 3, 296895This is the data displayed on the serial port.... OK	
→	AT+FTPEXTGET=0	set upFTPEXTGETMode off
←	OK	
← (URC)	+ FTPEXTGET: 4,1460	Data reporting
→	AT+FTPEXTGET=4,1460	Read data
→	+ FTPEXTGET: 4,1460 ...This is the data displayed on the serial port.... OK	
FTPEXTPUTHow to use:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain <cid> from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT?Come and check. Enter hereAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
→	AT+FTPCID=1	
←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPAddress, or domain name.
←	OK	

→	AT+FTPUN="test112"	Set username
←	OK	
→	AT+FTPPW="777888"	Enter password
←	OK	
→	AT+FTPPUTPATH="/11/"	
←	OK	
→	AT+FTPPUTNAME="TEST8861.txt"	
←	OK	
→	AT+FTPEXTPUT=1	
←	OK	
→	AT+FTPEXTPUT=2,0,5,10000	Input file data from the serial port to the module RAM. No.2The parameters are offset, No.3The first parameter is the data length, and the second parameter is the data length.4The parameter is the timeout period.10s
←	+ FTPEXTPUT: 0,5 //Enter here5One character:12345 OK	
→	AT+FTPEXTPUT=2,5,7,10000	this time offset yes5, length is 7
←	+ FTPEXTPUT: 5,7 //Enter here7One character:67890AB OK	
→	AT+FTPPUT=1	Will RAM Files transferred from FTP server
←	OK	
← (URC)	+ FTPPUT: 1,0	A prompt will appear after a while.FTPThe upload session has ended. Now check the server/11/TEST8861.txtThe content I saw was: 1234567890AB
→	AT+FTPEXTPUT=0	Change to ordinary FTP PUT model
←	OK	
FTPGETTOFS Command usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set up FTP Functional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set up PDP Bearing APN parameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate one PDP Context, used for RNDIS For internet access. <apn>It can be done AT+CGDCONT?Come and check. Enter here AT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearer GPRS PDP Context
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter 1 express cid The second parameter 1 Indicates that a connection has been established. The third parameter indicates what the module obtains.IP address
→	AT+FTPCID=1	

←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPAddress, or domain name.
←	OK	
→	AT+FTPUN="test112"	Set username
←	OK	
→	AT+FTPPW="777888"	Enter password
←	OK	
→	AT+FTPGETNAME="TEST.mp3"	
←	OK	
→	AT+FTPGETPATH="/11/"	
→	OK	
→	AT+FTPGETTOFS=0,"TEST-1.mp3"	Start downloading and save locally.ROMIn the middle. If the first parameter is1 Then it is saved inSDOn the card. Whether saved locally or...SD For cards, you can only specify the filename, not the path, because it's stored... The placement path is fixed. This download method supports automatic resume download.
←	OK	
→	AT+FTPGETTOFS?	Check download status
←	+ FTPGETTOFS: 1,245900,207715 OK	Downloaded245900byte,207715The bytes have been stored in the file system.
← (URC)	+ FTPGETTOFS: 0,245900	Download successful. Total bytes downloaded. Available file systems. Commands operate on files
→	AT+FSLS=C:/USER/FTP/	Search saved files
←	hello TEST-1.mp3 OK	
→	AT+CAUDPLAY=1,"C:/USER/FTP/TEST-1.mp3"	Play the saved file
←	OK	
← (URC)	+ CAUDPLAY: 1,600	Playback ended
FTPPUTFRMFSCCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT?Come and check. Enter hereAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier

←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid <small>The second parameter1Indicates that a connection has been established.</small> <small>The third parameter indicates what the module obtains.IPaddress</small>
→	AT+FTPCID=1	
←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPaddress, or domain name.
←	OK	
→	AT+FTPUN="test112"	Set username
←	OK	
→	AT+FTPPW="777888"	Enter password
←	OK	
→	AT+FTPPUTPATH="/"	
←	OK	
→	AT+FTPPUTNAME="TEST001.txt"	Files sent to the serverTEST001.txtThis name is stored
←	OK	
→	AT+FTPPUTFRMFS="C:/USER/FTP/TEST-1.txt"	WillC:\USER\FTP\TEST-1.txtThe file was transferred to the server
←	OK + FTPPUTFRMFS: 0.41580	Upload complete
FTPFILEPUTCommand usage:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT?Come and check. Enter hereAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid <small>The second parameter1Indicates that a connection has been established.</small> <small>The third parameter indicates what the module obtains.IPaddress</small>
→	AT+FTPCID=1	
←	OK	
→	AT+FTPSERV="36.7.33.111"	Configure the serverIPaddress, or domain name.
←	OK	
→	AT+FTPUN="test112"	Set username
←	OK	
→	AT+FTPPW="777888"	Enter password

←	OK	
→	AT+FTPPUTPATH="/"	
←	OK	
→	AT+FTPPUTNAME="TEST_80.txt"	The filename saved after being uploaded to the server
←	OK	
→	AT+FTPFILEPUT=1,"C:/USER/FTP/TEST-1.txt"	WillC:\USER\FTP\TEST-1.txtLoad into memory
←	OK	
→	AT+FTPPUT=1	Start uploading
←	OK	
←	+ FTTPUT: 1,0	Upload complete
→	AT+FTPFILEPUT=0	FinishFTPFILEPUTmodel
←	OK	
FTPRemotely create/delete directories or files:		
→	AT+SAPBR=3,1,"CONTYPE","GPRS"	set upFTPFunctional carrying type
←	OK	
→	AT+SAPBR=3,1,"APN", ""	set upPDPBearingAPNparameter After the module registers with the network, it will automatically obtain < from the network.apn>And activate onePDPContext, used forRNDISFor internet access. <apn>It can be doneAT+CGDCONT?Come and check. Enter hereAT+SAPBR=3,<cid>,"APN", ""That's it; the module will automatically retrieve the <apn>To set APN
←	OK	
→	AT+SAPBR=1,1	Activate the bearerGPRS PDPContext
←	OK	
→	AT+SAPBR=2,1	Query the status of the carrier
←	+ SAPBR: 1,1,010.169.179.213 OK	First parameter1expresscid The second parameter1Indicates that a connection has been established. The third parameter indicates what the module obtains.IPaddress
→	AT+FTPCID=1	set upcid
←	OK	
→	AT+FTPSERV="36.7.87.100"	Configure the serverIPAddress, or domain name.
←	OK	
→	AT+FTPUN="user"	Set username
←	OK	
→	AT+FTPPW="123456"	Enter password
←	OK	
→	AT+FTPGETPATH="/test"	Set the directory where files will be created.
←	OK	
→	AT+FTPMKD	Create directory
←	OK	
←	+ FTPMKD: 1,0	
→	AT+FTPAMD	Delete directory
←	OK	

←	+ FTPRMD: 1,0	
→	AT+FTPGETPATH="/"	
←	OK	
→	AT+FTPGETNAME="HI.txt"	
←	OK	
→	AT+FTPDELE	deleteHI.txtThis file
←	OK + FTPDELE: 1,0	

16 MQTTRelated commands

16.1set upMQTTRelevant parameters:AT+MCONFIG

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MCONFIG=<clientid>[,<username>,<password>[,<will_qos>,<will_retain>,<will_topic>,<will_message>,<HostNameFlag>]]	OK	Normal return
		ERROR	Input format is incorrect
Test command	AT+MCONFIG=?	+ MCONFIG: <clientid>[,<username>,<password>[,<(0-2)>,<(0,1)>,<will_topic>,<will_message>,<(0,1)>]] OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<clientid>	Client identity	String	maximum256One byte. You can enclose it in quotation marks (" or not"). (They cannot be the same, otherwise the last one to connect to the server will be kicked out.)
<username>	Username for logging into the server	String	maximum256One byte. You can enclose it in quotation marks (" or not").
<password>	Password to log in to the server	String	maximum256One byte. You can enclose it in quotation marks (" or not").
<will_qos>	Service quality	0	At most once
		1	At least once
		2	Make sure it only happens once.
<will_retain>	Reserved mark	0	ifwill_topicIf a field is not set, it also needs to be set.0 ifwill_topicThe field is configured such that the server must publish the will message as non-reserved information.
		1	ifwill_topicThe field is configured such that the server must publish the will information as reserved information.
<will_topic>	The subject of the will message	String	maximum256One byte. It needs to be enclosed in quotation marks (""). (The topics of the wills cannot be the same, otherwise the will message will not be received.)
<will_message>	Will message content	String	maximum1360One byte. It needs to be enclosed in quotation marks ("").
<HostNameFlag>	uss1Encrypted data transmission server domain Has the name been reported?(>=V401880(Version Support)	0	Do not report (default)
		1	Report

16.2EstablishTCPconnect:AT+MIPSTART

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	Regular link: AT+MIPSTART=<svraddr>,<port> SSLLink: AT+SSLMIPSTART=<svraddr>,<port>	OK	Normal return
		ERROR	Input format is incorrect
		After entering this setting command, there will be subsequent...URCReport it to higher authorities.	
		1)single link (AT+CIPMUX=0) If the link is successfully established, report: CONNECT OK If the link already exists, report it: ALREADY CONNECT If the link fails, report the following: STATE:<state> CONNECT FAIL	
		2)Multiple links (AT+CIPMUX=1If the link is successfully established, report the following: 7. CONNECT OK If the link already exists, report it: ALREADY CONNECT If the link fails, report the following: 7. CONNECT FAIL	
Test command	AT+MIPSTART=?	+ MIPSTART:"(0,255).(0,255).(0,255).(0,255)",(1-65535) + MIPSTART:"DOMAIN NAME",(1-65535) OK	
	AT+SSLMIPSTART=?	+ SSLMIPSTART:"(0,255).(0,255).(0,255).(0,255)",(1- 65535) + SSLMIPSTART:"DOMAIN NAME",(1-65535) OK	
Precautions	When usingSSLWhen transferring data via a link, the link command is:AT+SSLMIPSTART=<svraddr>,<port> Everything else is the same as a regular link. Please be aware of this!		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<svraddr>	serverIPAddress orDNSaddress	domain nameor XXX.XXX.XXX.XXX	XXXValue range:0~255 You can use quotation marks ("" or not") to enclose it.
<port>	server port	1-65535	You can use quotation marks ("" or not") to enclose it.

16.3The client requests a session connection from the server:AT+MCONNECT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MCONNECT=<clean_session>,<keepalive>	OK	Setup successful
Test command	AT+MCONNECT=?	+ MCONNECT:(0-1),(1-65535) OK	The test command returns the following: <clean_session>and <keepalive>The range of values
URC	The configuration command was successfully set and returned.OKAfterwards, it will automatically report based on the connection status.URCIf the connection is successful, the following will be returned:CONNACK OK If the connection fails, return:ERROR		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<clean_session>		0	The server must resume communication with the client based on the state of the current session (identified by the client identifier). If no session is associated with this client identifier, the server must create a new session. After the connection is closed, both the client and server must save the session information.[MQTT-3.1.2-4]When the session cleanup flag is0After the session connection is closed, the server must send subsequent messages.QoS 1and QoS 2Messages at the specified level are saved as part of the session state if these messages match any subscriptions the client made when the connection was closed.[MQTT-3.1.2-5]The server can also save data that meets the same conditions.QoS 0Messages at the level of [level].
		1	clientandserverEach session will discard the previous session and establish a new one. The session duration is the same as the network connection duration. Session state data associated with this session is not used in subsequent sessions.
<keepalive>	Keep alive time	1-65535	Time unit: seconds The device needs to send at least one message during the keep-alive period, includingPINGRequest. If the server does not receive any messages within the keep-alive period, it will disconnect, and the device will need to initiate a reconnection. Recommended value is300sabove.

16.4Announcement:AT+MPUB

This command transmits application messages from the client to the server.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MPUB=<topic>,<qos>,<retain>,<message>	OK	qos=0
		OK	qos=1
		PUBACK	

		OK	qos=2
		PUBREC	
		PUBCOMP	
		ERROR	fail
Test command	AT+MPUB=?	+ MPUB:<topic>,(0-2),(0-1),<message>	
		OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<qos>	Service quality	0	At most once
		1	At least once
		2	Make sure it only happens once.
<retain>	Reserved mark	0	The server cannot store this message, nor can it remove or replace any existing reserved messages.
		1	The server must store this application message and its service level quality. (QOS)This is so that it can be distributed to future subscribers whose topic names match.
<topic>	Message Subject	String	maximum256One byte. You can enclose it in quotation marks (" or not".)
<message>	Message content	String	maximum2384One byte. String type, must be enclosed in double quotes. Note: Please use \ for embedded double quotes in the message.twenty two Expression; control character Enter \r(0x0D)Please use \0DExpression; control character newline \n(0x0A)Please use \0AExpression; control character backslash \ (0x5C)Please use \5C Express in the case ofMCUSending a message may require using \twenty two, 0D, \0A,5C To express this, the \ needs to be escaped as \\

16.5Announcement of fixed length:AT+MPUBEX

This command transmits application messages from the client to the server in a fixed-length format.

Note:Air720U/Air724USeries (version >=V1624) or (version >=V301831Supports maximum10KData transmission and reception, as well as variable-length transmissions. Only versions with a maximum length other than those mentioned above are supported.2384It supports sending and receiving bytes, but does not support sending variable-length bytes.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MPUBEX=<topic>,<qos>,<retain>,[len]	First, return a > 1If specifiedlenWhen the length is greater than or equal tolenTo exit data mode, send data and return.OK. 2If not specifiedlenThen1AAs a terminator, or5sTimeout (interval between two data points exceeds 100%)5sSend data returnOK	qos=0

		<p>First, return a ></p> <p>1If specifiedlenWhen the length is greater than or equal tolenTo exit data mode, send data and return.OK.</p> <p>2If not specifiedlenThen1AAs a terminator, or5sTimeout (interval between two data points exceeds 100%)5sSend data returnOK</p> <p>PUBACK</p>	qos=1
		<p>First, return a ></p> <p>1If specifiedlenWhen the length is greater than or equal tolenTo exit data mode, send data and return.OK.</p> <p>2If not specifiedlenThen1AAs a terminator, or5sTimeout (interval between two data points exceeds 100%)5sSend data returnOK</p> <p>PUBREC</p> <p>PUBCOMP</p>	qos=2
		ERROR	<p>fail.</p> <p>Generally based on grammar</p> <p>Error or condition</p> <p>Not capable of causing</p>
Test command	AT+MPUBEX=?	<p>+ MPUBEX:<topic>,(0-2),(0-1),<len></p> <p>OK</p>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<qos>	Service quality	0	At most once
		1	At least once
		2	Make sure it only happens once.
<retain>	Reserved mark	0	The server will not store this message, nor can it remove or replace any existing reserved messages.
		1	The server must store this application message and its service level quality. (QOS)This is so that it can be distributed to future subscribers whose topic names match.
<topic>	Message Subject	String	maximum256One byte. You can enclose it in quotation marks ("" or not".)
<len>	Data length	1~1238 4	Air720U/Air724U Series (version >=V1624) or (version >=V301831)

16.6Subscribe to the topic:AT+MSUB

This command is transmitted from the client to the server and is used for one or more subscribed topics.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MSUB=<topic>,<qos>	OK	success
		SUBACK	
		ERROR	fail
Test command	AT+MSUB=?	+ MSUB:<topic>,(0-2)	
		OK	
URC	<p>If you receive a message after the setup command is successfully executed.MQTTThe message will have a corresponding</p> <p>URCReporting: If already setAT+MQTTMSGSET=0,receiveMQTTThe message will be reported at the meeting:</p> <p>+ MSUB:<topic>,<len>,<message></p> <p>If already setAT+MQTTMSGSET=1,receiveMQTTThe message will be reported at the meeting:</p> <p>+ MSUB:<store_addr></p>		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<topic>	Message Subject	String	maximum256One byte. You can enclose it in quotation marks (" or not".)
<qos>	Service quality	0	At most once
		1	At least once
		2	Make sure it only happens once.
<len>	Received data length		Unit: bytes
<message>	Data content	String	maximum1360bytes
<store_addr>		0-3	Location of cache when receiving messages

16.7Unsubscribe from the topic:AT+MUNSUB

This command, transmitted from the client to the server, is used to unsubscribe from a topic.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MUNSUB=<topic>	OK	success
		UNSUBACK	
		ERROR	fail
Test command	AT+MUNSUB=?	+ MUNSUB:<topic>	success
		OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<topic>	Message Subject	String	maximum256One byte. You can enclose it in quotation marks (" or not".)

16.8Print all received subscription messages:AT+MQTTMSGGET

Syntax rules:

Command type	grammar	return	illustrate
Execute command	AT+MQTTMSGGET	[+MSUB: <topic>,<len>,<message>] [+MSUB: <topic>,<len>,<message>] [+MSUB: <topic>,<len>,<message>] [+MSUB: <topic>,<len>,<message>] OK	Executing the command will print the received saved data. existcacheThe topic subscription message in the middle. After execution, <status>It will become invalid.
Query command	AT+MQTTMSGGET?	+ MQTTMSGGET:0,<status> + MQTTMSGGET:1,<status> + MQTTMSGGET:2,<status> + MQTTMSGGET:3, <status> OK	
Test command	AT+MQTTMSGGET=?	OK	
Precautions	whenAT+MQTTMSGSET=1Executing the command will print the subscribed messages. A maximum of [number] messages can be printed at a time.4Items. If more than [number] items are reported at once.4If the item is missing, then print the latest one.4The oldest one will be overwritten.		

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<topic>	Message Subject	String	maximum2561 byte.
<len>	Received message length		Unit: bytes
<message>	Message content	String	maximum13601 byte.
<status>	Message Status	VALID	Valid dataAT+MQTTMSGGETThe execution module can print these messages.
		INVALID	Invalid data

16.9Set the printing mode for subscribed messages:AT+MQTTMSGSET

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MQTTMSGSET=<mode>	OK	success
		ERROR	fail
Query command	AT+MQTTMSGSET?	+ MQTTMSGSET:<mode> OK	
Test command	AT+MQTTMSGSET=?	+ MQTTMSGSET:(0,1) OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Message reporting mode	<u>0</u>	Actively report to the serial port. Report when there is a new subscription message.URCfor: + MSUB:<topic>,<len>,<message>
		1	Caching mode. When a new subscription message is received, it is reported.URCfor: + MSUB:<store_addr> Then use AT+MQTTMSGGETRead the news

16.10 MQTTMessage encoding format switching:AT+MQTTMODE

This command setsMQTTThe encoding format for publishing messages isASCIIstillHEX

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MQTTMODE=<mode>	OK	success
		ERROR	fail
Query command	AT+MQTTMODE?	+ MQTTMODE: <mode> OK	
Test command	AT+MQTTMODE=?	+ MQTTMODE: (0,1) OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	MQTTEncoding format for published messages	<u>0</u>	ASCIIFormat
		1	HEXFormat

For example:

Command (→) /Return (←)	Example	Explanation and clarification
→	AT+MQTTMODE=1	Set up publishingMQTTThe message format is:HEX
←	OK	
→	AT+MPUB="test",0,0,"313233"	For example, the content of the message is123The published format is a hexadecimal visible mode, and the actual message content received by the message recipient is... 123
←	OK	
→	AT+MQTTMODE=0	Set up publishingMQTTThe message format is:ASCII
←	OK	
→	AT+MPUB="test",0,0,"123"	The content of the released message123
←	OK	

16.11 closureTCPconnect:AT+MIPCLOSE

Syntax rules:

Command type	grammar	return	illustrate
--------------	---------	--------	------------

Setting commands	AT+MIPCLOSE	OK	success
		ERROR	fail
Test command	AT+MIPCLOSE=?	OK	returnOKThis indicates support for the command.

16.12closureMQTTconnect:AT+MDISCONNECT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+MDISCONNECT	OK	success
		ERROR	fail
Test command	AT+MDISCONNECT=?	OK	returnOKThis indicates support for the command.

16.13QueryMQTTConnection status:AT+MQTTSTATU

Syntax rules:

Command type	grammar	return	illustrate
Execute command	AT+MQTTSTATU	+ MQTTSTATU :<state>	success
		OK	
		ERROR	fail
Test command	AT+MQTTSTATU=?	OK	returnOKThis indicates support for the command.

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	MQTTConnection status	0	Offline
		1	I've already logged in and verified, that's fine.PUBData
		2	Not verified yet, need to sendMCONNECTOrder

16.14Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→)	Example	Explanation and clarification
/Return (←)		
Normal process andSSLVerification process without certificate:		
→	AT+CGREG?	Query currentGPRSRegistration status
←	+ CGREG:0,1 OK	<n>=0, indicates disabledURCReport <stat>=1The logo has been registered.GPRSNetwork, and a local network at that.
→	AT+CGATT?	View currentGPRSAdhesion state
←	+ CGATT: 1	<state>=1Indicate the currentGPRSAlready attached

	OK	
→	AT+MCONFIG=<clientid>,XXXX,\$\$\$\$	<p>Notice:</p> <p>XXXXUsername</p> <p>\$\$\$It's a password.</p> <p>Please have the developers write the truth.clientid>Username and password (do not copy verbatim).</p> <p>The quotation marks around these three parameters are optional. If the username and password are empty, it can be written as:</p> <p>AT+MCONFIG=<clientid>,"",""</p>
←	OK	
→	AT+MIPSTART="ipor domain name","port"	<p>Please fill in your own information here.mqttsverIPAddress or domain name, and port number</p> <p>Note:</p> <p>1) After the module is registered upon startup, one is activated by default.PDP Carry, queryAT+CGDCONT?You can see oneIPAt this point, you can use it directly.MQTTofATOrder.</p> <p>2When usingSSLWhen transferring data via a connection (without certificate verification), the connection command format is:</p> <p>AT+SSLMIPSTART=<svraddr>,<port> Everything else is the same as a regular link. Please be aware of this!</p>
←	OK	
←(URC)	CONNECT OK	
→	AT+MCONNECT=1,60	Establishmqttconversation
←	OK	<p>Note: InMIPSTARTreturnCONNECT OKOnly after that can it be sent MCONNECTThe command must be sent immediately, otherwise the server will disconnect you.</p>
	CONNACK OK	
		receiveCONNACK OKOnly after that can the message be released.
→	AT+MSUB="mqtt/topic",0	subscription
←	OK	
	SUBACK	
→	AT+MPUB="mqtt/topic",0,0,"SSSSddddd"	Publish, message format defaults toASCIIFormat
←	OK	
→	AT+MQTTMODE=1	Set the message format as followsHEXFormat
←	OK	
→	AT+MPUB="mqtt/topic",0,0,"313233"	Send message123"To the topicmqtt/topic"
←	OK	
←(URC)	+ MSUB: 0	The reporting method iscacheThe method requires the use of +MQTTMSGGETCome and read
→	AT+MQTTMSGGET?	
←	+ MQTTMSGGET: 0,VALID + MQTTMSGGET: 1,INVALID + MQTTMSGGET: 2,INVALID + MQTTMSGGET: 3,INVALID OK	
→	AT+MQTTMSGGET	
←	+ MSUB: mqtt/topic,9 byte,SSSSddddd	

	OK	
→	AT+MQTTMSGSET=0	Configure to directly report messages
←	OK	
→	AT+MPUB="mqtt/topic",0,0,"SSSSddddd"	
←	OK	
←(URC)	+ MSUB: "mqtt/topic",9 byte,SSSSddddd	
→	AT+MDISCONNECT	Module shut down firstMQTTconnect
←	OK	
→	AT+MIPCLOSE	closureTCPLink
←	OK	
SSLCertificate verification process (one-way authentication):		
→	AT+CGATT?	View currentGPRSAdhesion state
←	+ CGATT: 1	<state>=1Indicate the currentGPRSAlready attached
	OK	
→	AT+FSCREATE="ca.crt"	createCACertificate file
←	OK	
→	AT+FSWRITE="ca.crt",0,1282,15	1282It is the certificate file length.15This is an example of the timeout period; please enter your actual data, do not copy it verbatim.
←	OK	
→	AT+SSLCFG="cacert",88,"ca.crt"	set upCACertificate file name,ca.crtforCACertificate file name
←	OK	
→	AT+SSLCFG="seclvel",88,1	Set the authentication mode to server-only authentication.
←	OK	
→	AT+MCONFIG=<clientid>,XXXX,\$\$\$	<p>Notice:</p> <p>XXXXUsername</p> <p>\$\$\$It's a password.</p> <p>Please have the developers write the truth.clientid>Username and password (do not copy verbatim).</p> <p>The quotation marks around these three parameters are optional. If the username and password are empty, it can be written as:</p> <p>AT+MCONFIG=<clientid>,"",""</p>
←	OK	
→	AT+SSLMIPSTART=<svraddr>,<port>	<svraddr>,<port>Please change it to the real one.MQTTServer and port
←	OK	
→	AT+MCONNECT=1,60	Establishmqttconversation
←	OK	<p>Note: InMIPSTAReturnCONNECT OKOnly after that can it be sent MCONNECTThe command must be sent immediately, otherwise the server will disconnect you.</p>
	CONNACK OK	
		receiveCONNACK OKOnly after that can the message be released.
		The subsequent process is the same as the normal process described above.
SSLCertificate verification process (two-way authentication):		
→	AT+FSCREATE="ca.crt"	createCACertificate file
←	OK	
→	AT+FSWRITE="ca.crt",0,1282,15	1282It is the certificate file length.15This is an example of the timeout period; please enter your actual data, do not copy it verbatim.
	Enter hereCACertificate file content,1282bytes	
←	OK	

→	AT+FSCREATE="client.crt"	Create client certificate file
←	OK	
→	AT+FSWRITE="client.crt",0,1026,15	
	Enter the client certificate file here.1026bytes	
←	OK	
→	AT+FSCREATE="client.key"	Create a clientkeydocument
←	OK	
→	AT+FSWRITE="client.key",0,1706,15	
	> Enter the client herekeyFile content,1706bytes	
←	OK	
→	AT+SSLCFG="cacert",88,"ca.crt"	set upCAThe certificate file isca.crt
←	OK	
→	AT+SSLCFG="clientcert",88,"client.crt"	Set the client certificate file toclient.crt
←	OK	
→	AT+SSLCFG="clientkey",88,"client.key"	Set the client key file as followsclient.key
←	OK	
→	AT+SSLCFG="secllevel",88,2	Set the authentication mode to two-way authentication.
←	OK	
→	AT+MCONFIG=<clientid>,XXXX,\$\$\$	<p>Notice:</p> <p>XXXXUsername</p> <p>\$\$\$It's a password.</p> <p>Please have the developers write the truth.clientid>Username and password (do not copy verbatim).</p> <p>The quotation marks around these three parameters are optional. If the username and password are empty, it can be written as:</p> <p>AT+MCONFIG=<clientid>,"",""</p>
←	OK	
→	AT+SSLMIPSTART=<svraddr>,<port>	<svraddr>,<port>Please change it to the real one.MQTTServer and port
←	OK	
→	AT+MCONNECT=1,360	Establishmqttconversation
←	OK	<p>Note: InMIPSTARTreturnCONNECT OKOnly after that can it be sent MCONNECTThe command must be sent immediately, otherwise the server will disconnect you.</p>
	CONNACK OK	<p>receiveCONNACK OKOnly after that can the message be released.</p>
		The subsequent process is the same as the normal process described above.

If the module appearsTCPHow should we handle proactive reporting of connection failures?

←(URC)	CLOSED	TCPChain breakage
→	AT+MQTTSTATU	QueryMQTTConnection status
←	+ MQTTSTATU :0	0For offline
	OK	
		From the backMIPSTARTStart reconnecting

If a module actively reports context deactivation, how should this be handled?

←(URC)	+ PDP DEACT	PDPTo activate, you will need to reactivate one.PDPContext is required for continued use MQTTofATOrder
→	AT+CIPSHUT	Turn off mobile scenes
←	OK	
	There are three ways to handle this, see the right side.	3)AT+CGDCONT=5,"IP","<apn>"//<apn>Please fill in the actual information. APN AT+CGACT=1,5 From againMIPSTARTstart 4)AT+CFUN=0,AgainAT+CFUN=1 5) AT+RESETRestart module

17Bluetooth related commands

The module supports Bluetooth.4.2Version with dual-mode (Classic Bluetooth/Bluetooth Low Energy).

Note: Bluetooth is only compatible with Hezhou.4G CAT1Module (Air720U/Air724U(Series) (Version >=V301826Not applicable to the universe4G CAT4 Module (Air720/Air720G/Air720H/Air720D/Air720S).

17.1Bluetooth switch:AT+BTCOMM=ENABLE

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BTCOMM=ENABLE,<state>[,<mode> >	OK	Switch is working properly
		ERROR/ + CME ERROR: <err>	Switch failure
Query command	AT+BTCOMM=ENABLE?	+ BTCOMM: ENABLE=state,mode OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Switch status	0	closure
		1	Open
<mode>	Mode Selection	<u>0</u>	<u>From the pattern</u>
		1	Main mode

17.2Set name:AT+BLECOMM=NAME

Note: Applicable to slave mode

Note: Set nameATThe command, along with its type and length, will be parsed into broadcast packet data. If used...AT+BLEADV=ADVDATAIf the command data includes the Bluetooth name, then it is not necessary to use it.AT+BLECOMM=NAMEIf you are familiar with the Bluetooth protocol, you can use it.AT+BLEADV=ADVDATA.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=NAME,<name>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BLECOMM=NAME?	+ BLECOMM: NAME=name OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<name>	Bluetooth name	String	Device name, longest26bytes

17.3Configure broadcast data:AT+BLEADV=ADVDATA

Note: Applicable to slave mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ADVDATA,<len>,<data>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BLEADV=ADVDATA?	+ BLEADV: DATA=<len>,<data> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<len>	Data length	numerical values	Hexadecimal data length. For example...datafor 02010603ff3132Then the value is7,longest31bytes
<data>	Data content	Hexadecimal data string	The longest string corresponding to hexadecimal data311 byte, for example: To output,0x02,0x01,0x06,0x03,0xff, 0x31, 0x32 ,butdatafor"02010603ff3132"The data format must conform to the Bluetooth broadcast protocol, and the format is as follows: length(1byte) type(1byte) data.exist5.1The first in the specification3roll PARTCThe11There is a festivalAdvertising and Scan Response data format"(page2204)This is the section. The specific agreement is as follows: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080

17.4Set response data:AT+BLEADV=SCANRSPDATA

Note: Applicable to slave mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=SCANRSPDATA,<len>,<dat a>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BLEADV=SCANRSPDATA?	+ BLEADV: DATA=<len>,<data> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<len>	Data length	numerical values	Hexadecimal data length. For example...datafor"03ff3132"Then the value is4,longest31bytes
<data>	Data content	Hexadecimal data string	The longest string corresponding to hexadecimal data311 byte, for example: To output0x03,0xff, 0x31,0x32,butdatafor "03ff3132"The data format needs to conform to the Bluetooth broadcast protocol.

			<p>The formula is length(1 byte) type(1 byte) data.exist5.1 The first in the specification3rollPARTCThe11There is a festival "Advertising and Scan Response data format"(page2204)This is the section. The specific agreement is as follows:</p> <p>https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080</p>
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17.5 Configure broadcast parameters: AT+BLEADV=ADVPARAM

Note: Applicable to slave mode

This command is used to set broadcast parameters, and has...6One or8There are several parameters; when the broadcast type is directional broadcast, the parameters are...8individual.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ADVPARAM,<advmin>,<advmax>,<advtype>,<ownaddrtype>[,<directaddrtype>,<directaddr>],<advchannmap>,<advfilter>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BLEADV=ADVPARAM?	+ BLEADV:ADVPARAM=<advmin>,<advmax>,<advtype>,<ownaddrtype>,<directaddrtype>,<directaddr>,<advchannmap>,<advfilter> OK	

Parameter definition:

(See details for specific setup requirements)1321Page:https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080)

parameter	definition	Value	Explanation of the possible values
<advmin>	Minimum broadcast interval	numerical values	Minimum broadcast interval, unit0.625ms, scope 20ms~10.24s ((Required)
<advmax>	Maximum broadcast interval	numerical values	Maximum broadcast interval, in units0.625ms, scope 20ms~10.24s ((Required)
<advtype>	Broadcast type	numerical values	Broadcast type (required): 0: Connectable undirected advertising (ADV_IND) 1: Connectable high duty cycle directed advertising 2: Scannable undirected advertising (ADV_SCAN_IND) 3: Non connectable undirected advertising (ADV_NONCONN_IND) 4: Connectable low duty cycle directed advertising
<ownaddrtype>	Broadcast local address type	numerical values	Broadcast local address type (required): 0:Public Device Address

			1:Random Device Address 2:Controller generates Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, use the public address 3:Controller generates Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, use the random address from LE_Set_Random_Address
<directaddrtype>	Directed address type	numerical values	Targeted address type (optional): 0: Public Device Address 1: Random Device Address
<directaddr>	Directed address	String	Targeting address (optional)
<advchannmap>	broadcastchannel map	numerical values	broadcastchannel map, 3individualbit, bit0correspond37Channel,bit1 correspond38Channel,bit2correspond39Channel,3Select all channels corresponding to 7 ((Required)
<advfilter>	Broadcast filtering strategy	numerical values	Broadcast filtering strategy (required): 0: Process scan and connection requests from all devices. 1: Process connection requests from all devices and only scan requests from devices that are in the White List. 2: Process scan requests from all devices and only connection requests from devices that are in the White List. 3: Process scan and connection requests only from devices in the White List

17.6Add service:AT+BLEADV=ADDSERVICE

Note: This applies to slave mode. After calling this command, the default service will be cleared and no longer used.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ADDSERVICE,<uuid_s>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_s>	Serve16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee0",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7".

			For specific configuration requirements, please see [link/details]. 2034 Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
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17.7Add features:AT+BLEADV=ADDCHARACTERISTIC

Note: This applies to slave mode. The Add Service command must be called before calling this command. Add Feature and Add Service are subordinate to each other. The Add Feature command must be set after the corresponding Add Service command.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ADDCHARACTERISTIC,<uuid_c>,<type>,<permission>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_c>	feature16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
type	Feature attributes	numerical values	BROADCAST 1 READ 2 WWP 4 WRITE 8 NOTIFY 16 INDICATE 32 ASW 64 EX_PROP 128 If two or more attributes are needed, then accumulate them.
permission	Feature-based permissions	numerical values	READABLE 1 WRITEABLE 2 R_AUTHENT_REQUIRED 4 R_AUTHORIZE_REQUIRED 8 R_ENCRYPTION_REQUIRED 16 R_AUTHENT_MITM_REQUIRED 32 W_AUTHENT_REQUIRED 64 W_AUTHORIZE_REQUIRED 128 W_ENCRYPTION_REQUIRED 256 W_AUTHENT_MITM_REQUIRED 512

			BR_ACCESS_ONLY 1024
			If two or more permissions are required, then increment them.

17.8Add description:AT+BLEADV=ADDDESRIPTOR

Note: This applies to slave mode. The Add Feature instruction must be called before calling this instruction. Add Description and Add Feature are subordinate to each other. The Add Description instruction must be set after the corresponding Add Feature instruction.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ADDDESRIPTOR,<uuid_d>, <value>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_d>	describe16BitUUID	Sixteen-round	The Bluetooth protocol defines a unique identifier, such as...16The bit used is "2902". For specific configuration requirements, please see [link/details]. 2034 Page: https://www.bluetooth.org/docman/handlers/downloadaddoc.ashx?doc_id=457080
		Character	
		string	
value	Description attribute	string/	uuid_dfor0x2901or0x2904hour,valueIt is a string. uuid_dFor other valuesvalueforumbertype. For specific configuration requirements, please see [link/details]. 2359 Page: https://www.bluetooth.org/docman/handlers/downloadaddoc.ashx?doc_id=457080
		numerical values	

17.9Clear all custom services:AT+BLEADV=CLEANALLSERVICE

Note: This applies to slave mode. After calling this command, the default service will be restored.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=CLEANALLSERVICE	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition: None

17.10Add to whitelist:AT+BLECOMM=ADDWHITELIST

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=ADDWHITELIST,<addrtype>,<address>	OK	success
		ERROR/ + CME ERROR: <err>	fail

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	Bluetooth address of the other device	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"
<addrtype>	Bluetooth address type of peer device	0	public
		1	random

17.11Remove from whitelist:AT+BLECOMM=REMOVEWHITELIST

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=REMOVEWHITELIST,<addrtype>,<address>	OK	success
		ERROR/ + CME ERROR: <err>	fail

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	Bluetooth address of the other device	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"
<addrtype>	Bluetooth address type of peer device	0	public
		1	random

17.12Clear blank list:AT+BLECOMM=CLEANWHITELIST

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=CLEANWHITELIST	OK	success
		ERROR/ + CME ERROR: <err>	fail

Parameter definition: None

17.13set upbeacondata:AT+BLEADV=BEACONDATA

Note: Applicable to slave mode

This command is incompatible with the commands for setting a name, setting broadcast data, and setting response data.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=BEACONDATA,<uuid>,<major>,<minor>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BLEADV=BEACONDATA?	+ BLEADV:BEACONDATA=<uuid>,<major>,<minor> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid>	128BitUUID	hexadecimal string	The Bluetooth protocol defines a unique identifier, such as... 128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81 E7". For specific configuration requirements, please see [link/details]. 2034 Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
<major>	serial number	numerical values	0~65535
<minor>	serial number	numerical values	0~65535

17.14Broadcast switch:AT+BLEADV=ENABLE

Note: Applicable to slave mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLEADV=ENABLE,<state>	OK	Switching on successfully
		ERROR/ + CME ERROR: <err>	Switch failure
Query command	AT+BLEADV=ENABLE?	+ BLEADV: ENABLE=<state> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Bluetooth broadcast switch	0	Turn off broadcast
		1	Turn on the radio

17.15 (URC)Connection status reporting: +BLEIND=CONNECT

Syntax rules:

Command type	grammar	illustrate
URCReport	+ BLEIND=CONNECT[,<address>]	When the module acts as a slave or master device, the peer device connects... Successfully connected
	+ BLEIND=CONNECT FAIL	Connection failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	Bluetooth address of the other device	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"

17.16 (URC)Disconnection status reporting: +BLEIND=DISCONNECT

Syntax rules:

Command type	grammar	illustrate
URCReport	+ BLEIND=DISCONNECT[,<address>]	When the module acts as a slave or master device, the peer device disconnects. Successfully opened

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	Bluetooth address of the other device	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"

17.17Set scan parameters:AT+BLES SCAN=SCANPARAM

Note: Applicable to main mode

This command is used to set scan parameters.5One parameter.

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLES SCAN=SCANPARAM,<scanType>,<scanInterval>,<scanWindow>,<filterPolicy>[,<own_addr_type>	OK ERROR/ + CME ERROR: <err>	Setup successful Setup failed.
Query command	AT+BLES SCAN=SCANPARAM?	+ BLES SCAN:SCANPARAM=<scanType>,<scanInterval>,<scanWindow>,<filterPolicy>[,<own_addr_type> > OK	

Parameter definition:

(See details for specific setup requirements)1331Page:https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080)

parameter	definition	Value	Explanation of the possible values
<scanType>	Scan type	numerical values	0 passive 1 active
<scanInterval>	Scan interval	numerical values	unit0.625ms,scope2.5ms~10.24s
<scanWindow>	Scan window	numerical values	unit0.625ms,scope2.5ms~10.24s
<filterPolicy>	Scanning Filtering Strategy	numerical values	0:Accept all advertising and scan response PDUs except directed advertising PDUs not addressed to this device (default) 1:Accept only advertising and scan response PDUs from devices where the advertiser's

			address is in the White List. Directed advertising PDUs which are not addressed to this device shall be ignored
own_addr_type	Local address type	numerical values	0:Public Device Address 1: Random Device Address 2:Controller generates Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, use the public address 3:Controller generates Resolvable Private Address based on the local IRK from the resolving list. If the resolving list contains no matching entry, use the random address from LE_Set_Random_Address

17.18 Scan switch: AT+BLESCAN=ENABLE

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLESCAN=ENABLE,<state>	OK	Switching on successfully
		ERROR/ + CME ERROR: <err>	Switch failure
Query command	AT+BLESCAN=ENABLE?	+BLESCAN:ENABLE=<state> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Bluetooth scan switch	<u>0</u>	Turn off scanning
		1	Open Scan

17.19 (URC) Scan results reporting: +BLEIND=SCAN

Note: Applicable to main mode

Syntax rules:

Command type	grammar	Return and Explanation
URCReport	+ BLEIND=SCAN,<address>,<addrtype>,<rssi>,<raw>	Note: Scan result reporting will only stop after scanning is stopped.

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	Device Bluetooth address	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:01:02:03"

<addrtype>	Device Bluetooth address type	0	public
		1	random
<rssi>	signal strength	numerical values	- 128~127
<raw>	Broadcast raw data	hexadecimal String	longest31bytes

17.20Connect to the device:AT+BLECOMM=CONNECT

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=CONNECT,<addrtype>,<address>	OK	Connection successful
		ERROR/ + CME ERROR: <err>	Connection failed
Query command	AT+BLECOMM=CONNECT?	+ BLECOMM: CONNECT=<state>[,address] OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<state>	Connection status	0	Disconnected
		1	Connection status
<address>	Bluetooth address of the other device	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"
<addrtype>	Bluetooth address type of peer device	0	public
		1	random

17.21Disconnect from device:AT+BLECOMM=DISCONNECT

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=DISCONNECT	OK	Disconnection successful
		ERROR/ + CME ERROR: <err>	Disconnection failed

Parameter definition: None

17.22Discovery Serviceuuid:AT+BLECOMM=FINDSERVICE

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=FINDSERVICE	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition: None

17.23 (URC)ServeuuidReport: +BLEIND=FINDSERVICE

Note: Applicable to main mode

Syntax rules:

Command type	grammar	Return and Explanation
URCReport	+ BLEIND=FINDSERVICE,<uuid_s>	Services sent by the peer deviceuuiddata

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_s>	Serve16BitUUID(Currently only supports)16 Bit)	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is "fee1". For specific configuration requirements, please see [link/details]. 2034 Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080

17.24Discover features within the service:AT+BLECOMM=FINDCHARACTERISTIC

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=FINDCHARACTERISTIC, <uuid_s>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_s>	Serve16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080

17.25Based on the characteristics within the handle query service:AT+BLECOMM=FINDCHARACTERISTICHAN

Note: Applicable to main mode>=V401880Version Support

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=FINDCHARACTERISTIC, <uuid_s>,0,<start>,<end>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_s>	Serve16BitUUID/128BitUUID	hexadecimal String	The Bluetooth protocol defines a unique identifier, such as...16The bit used is "fee1", 128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7" . For specific configuration requirements, please see [link/details]. 2034 Page: https://www.bluetooth.org/docman/handler.s/downloadaddoc.ashx?doc_id=457080
start	start	0-65535	
end	Finish	0-65535	

17.26 (URC)featureuuidReport: +BLEIND=FINDCHARACTERISTIC

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=FINDCHARACTERISTIC, <uuid_s>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_s>	Serve16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloadaddoc.ashx?doc_id=457080

Note: Applicable to main mode

Syntax rules:

Command type	grammar	Return and Explanation
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URCReport	+ BLEIND=FINDCHARACTERISTIC,<uuid _c>	Features sent by the peer deviceuuiddata
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Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid _c>	feature16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080

17.27Notification switch:AT+BLECOMM=NOTIFICATION

Note: Applicable to main mode

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=NOTIFICATION, <uuid _c>,<state>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid _c>	feature16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
<state>	Switch status	0	closure
		1	Open

17.28Send data:AT+BLECOMM=SENDDATA

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BLECOMM=SENDDATA,<uuid _c>,<len>,<data>	OK	Sent successfully
		ERROR/ + CME ERROR: <err>	Send failed

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid _c>	feature16BitUUID/128BitUUID	Sixteen-round	The Bluetooth protocol defines a unique identifier, such as...16Bit usage

		Character string	yes "fee1",128 Bit make use of yes "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
<len>	Data length	numerical values	Hexadecimal data length, longest244Bytes. For exampledata for"3132"Then the value is2
<data>	Data content	Sixteen-round Data production String	The longest string corresponding to hexadecimal data2441 byte. For example: To output0x31,0x32,butdatafor"3132"

17.29 (URC)Receive data report: +BLEIND=DATA

Syntax rules:

Command type	grammar	Return and Explanation
URCReport	+ BLEIND=DATA,<uuid_c>,<len>, <data>	Data sent by the peer device

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<uuid_c>	feature16BitUUID/128BitUUID	Sixteen-round Character string	The Bluetooth protocol defines a unique identifier, such as...16The bit used is"fee1",128The bit used is "F2C3F0AEA9FA158C9D49AE73710A81E7"For specific setup requirements, please see [link/reference].2034Page: https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=457080
<len>	Data length	numerical values	Hexadecimal data length, longest244Bytes. For exampledata for"3132"Then the value is2
<data>	Data content	Sixteen-round Data production String	The longest string corresponding to hexadecimal data2441 byte. For example: To output0x31,0x32,butdatafor"3132"

17:30BluetoothMACaddress:AT+BTMAC

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+BTMAC=<address>	OK	Setup successful
		ERROR/ + CME ERROR: <err>	Setup failed.
Query command	AT+BTMAC?	+ BTMAC: <address> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<address>	This machineMACaddress	String	Device addresses (little-endian sorted, total)6(bytes), for example: "40:45:DA:33:22:11"

17.31Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→)	Example	Explanation and clarification
/Return (←)		
BLEHow to use the mode command:		
→	AT+BTComm=ENABLE?	Check if Bluetooth is turned on
←	+ BTComm:ENABLE=0,0 OK	0It is not opened.
→	AT+BTComm=ENABLE,1,0	Turn on Bluetooth slave mode
←	OK	
→	AT+BLEComm=NAME,"Luat_Air724UG"	Set Bluetooth name
←	OK	
→	AT+BLEADV=ADVData,6,"02010602ff01"	Set broadcast packet data
←	OK	
→	AT+BLEADV=SCANRSPData,3,"020A04"	Set response packet data
←	OK	
→	AT+BLEADV=ENABLE,1	Open the broadcast and wait for the connection to succeed.
←	OK	
→	AT+BLEADV=ENABLE?	Query broadcast status
←	+ BLEADV:ENABLE=1 OK	1It is already open.
←	+ BLEIND=CONNECT,"40:45:DA:33:22:11"	Connection status reporting
←	+ BLEIND=DATA,"fee1",10,"31323334353637383930"	Received data
→	AT+BLEComm=SENDDATA,"fee2",10,"31323334353637383930"	Send data
←	OK	
BLEHow to use the main mode command:		
→	AT+BTComm=ENABLE?	Check if Bluetooth is turned on
←	+ BTComm:ENABLE=0,0 OK	0It is not opened.
→	AT+BTComm=ENABLE,1,1	Turn on Bluetooth main mode
←	OK	
→	AT+BLESscan=ENABLE,1	Start Scan
←	OK	
←	+ BLEIND=SCAN,"40:45:DA:33:22:11",0,-75,"0201060E094"	Scan result reporting

	C7561745F4169723732345547"	
→	AT+BLESCAN=ENABLE,0	Turn off scanning
←	OK	
→	AT+BLECOMM=CONNECT,0,"40:45:DA:33:22:11"	Connect via Bluetooth
←	OK	
←	+ BLEIND=CONNECT	Connection status reporting
→	AT+BLECOMM=FINDSERVICE	Discovery Service
←	OK	
←	+ BLEIND=FINDSERVICE,"fee0"	ServeuuidReport
→	AT+BLECOMM=FINDCHARACTERISTIC,"fee0"	Discover features within the service
←	OK	
←	+ BLEIND=FINDCHARACTERISTIC,"fee1" + BLEIND=FINDCHARACTERISTIC,"fee2"	featureuuidReport
→	AT+BLECOMM=NOTIFICATION,"fee2",1	Open notifications
←	OK	
→	AT+BLECOMM=SENDDATA,"fee1",10,"31323334353637383930"	Send data
←	OK	
←	+ BLEIND=DATA,"fee2",10,"31323334353637383930"	Received data
BLEHow to use the whitelist:		
→	AT+BTCOMM=ENABLE?	Check if Bluetooth is turned on
←	+ BTCOMM:ENABLE=0,0 OK	0It is not opened.
→	AT+BTCOMM=ENABLE,1,0	Turn on Bluetooth slave mode
←	OK	
→	AT+BLECOMM=NAME,"Luat_Air724UG"	Set Bluetooth name
←	OK	
→	AT+BLEADV=ADVDATA,6,"02010602ff01"	Set broadcast packet data
←	OK	
→	AT+BLEADV=SCANRSPDATA,3,"020A04"	Set response packet data
←	OK	
→	AT+BLECOMM=ADDWHITELIST,0,"40:45:DA:33:22:11"	Add to whitelist
←	OK	
→	AT+BLEADV=ADVPARAM,128,160,0,0,7,2	Configure broadcast parameters (allow only whitelisted devices connect)
←	OK	
→	AT+BLEADV=ENABLE,1	Open the broadcast and wait for the connection to succeed.
←	OK	
→	AT+BLEADV=ENABLE?	Query broadcast status
←	+ BLEADV:ENABLE=1 OK	1It is already open.
←	+ BLEIND=CONNECT,"40:45:DA:33:22:11"	Connection status reporting
BLE beaconHow to use:		
→	AT+BTCOMM=ENABLE?	Check if Bluetooth is turned on
←	+ BTCOMM:ENABLE=0,0	0It is not opened.

	OK	
→	AT+BTComm=ENABLE,1,0	Turn on Bluetooth slave mode
←	OK	
→	AT+BLEADV=BEACONDATA,"F2C3F0AEA9FA158C9D49AE73710A81E7",10107,50179	set upbeacondata
←	OK	
→	AT+BLEADV=ENABLE,1	Turn on the radio
←	OK	
BLEHow to use custom services:		
→	AT+BTComm=ENABLE?	Check if Bluetooth is turned on
←	+ BTComm:ENABLE=0,0 OK	0It is not opened.
→	AT+BTComm=ENABLE,1,0	Turn on Bluetooth slave mode
←	OK	
→	AT+BLEADV=ADDSERVICE,"fee0"	Add service0xfee0
←	OK	
→	AT+BLEADV=ADDCHARACTERISTIC,"fee1",12,2	Add features0xfee1
←	OK	
→	AT+BLEADV=ADDCHARACTERISTIC,"fee2",16,1	Add features0xfee2
←	OK	
→	AT+BLEADV=ADDDESCRIPTOR,"2902",1	Add description0x2902
←	OK	
→	AT+BLEADV=ENABLE,1	Turn on the radio
←	OK	

18 GPSRelated commands

Note: This command only applies to the Cosmic Union.4G CAT1Module (Air820Useries andCAT1cheatAir530,Air530Z).

18.1 GPSswitch:AT+CGNSPWR

Syntax rules:

Command type	grammar	return	illustrate
Setting commands	AT+CGNSPWR=<status>[,<port>[,<band>[,<model>]]]	OK	Switch is working properly
		ERROR	Switch failure
Query command	AT+CGNSPWR?	+ CGNSPWR: <status> OK	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<status>	Switch status	0	closure
		1	Open
		2	Adaptive openingGPSChip (only applicable)Air820(Only one parameter is needed for the switch state)
<port>	The serial port to open	0	serial port1
		1	serial port2
		2	serial port3(Serial port is used by default)3)
<band>	baud rate used	Common baud rates	baud rate1200~921600,default9600
<model>	GPSmodel	0	Zhongke MicroAT6558
		1	National Science9501
		2	Hexin XingtongUC6226

18.2ReadGNSSinformation:AT+CGNSINF

Syntax rules:

Command type	grammar	return
Execute command	AT+CGNSINF	+ CGNSINF: <GNSS run status>,<Fix status>, <UTC date & Time>,<Latitude>,<Longitude>, <MSL Altitude>,<Speed Over Ground>, <CourseOver Ground>, <Fix Mode>,<Reserved1>,<HDOP>,<PDOP>,<VDOP>,<Reserved2>,<GNSS Satellites in View>, <GNSS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>, <HPA>,<VPA> OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
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<GNSS run status>	GNSSRunning status	0	GNSS OFF
		1	GNSS ON
<Fix status>		0	not fixed position
		1	fixed position
<UTC date & time>		yyyyMMddhhmmss	yyyy: [1980,——] MM: [1,12] dd: [1,31] hh: [0,23] mm: [0,59] ss:[0,60]
<Latitude>	latitude	±dd.ddd ddd	[-90.000000,90.000000]
Longitude	longitude	±ddd.ddd ddd	[-180.000000,180.000000]
<MSL Altitude>			unit:meters
<Speed Over Ground>		0~999.99	Unit: nautical miles per hour
<Course Over Ground>		0~360.00	unit:degress
<Fix Mode>		0,1,2	The specific value depends onGPSchip
<Reserved1>			
<HDOP>		0~99.9	
<PDOP>		0~99.9	
<VDOP>		0~99.9	
<Reserved2>			
GNSS Satellites in View>		0~99	
<GNSS Satellites Used>		0~99	
GLONASS Satellites Used>		0~99	
<Reserved3>			
<C/N0 max>		0~55	unit:dBHz
<HPA>		0~9999.9	unit:meters
<VPA>		0~9999.9	unit:meters

18.3OpenGNSS URCReport to:AT+CGNSURC

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSURC=<period_time>	OK
	OK	+ CME ERROR:<err>
Query command	AT+CGNSURC?	+ CGNSURC: <period_time> OK
Test command	AT+CGNSURC=?	+ CGNSURC: (0-255)

		OK
URC	andAT+CGNSINFThe return format is the same: + CGNSINF: <GNSS run status>,<Fix status>, <UTC date & Time>,<Latitude>,<Longitude>, <MSL Altitude>,<Speed Over Ground>, <Course Over Ground>, <Fix Mode>,<Reserved1>,<HDOP>,<PDOP>,<VDOP>,<Reserved2>,<GNSS Satellites in View>, <GNSS Satellites Used>,<GLONASS Satellites Used>,<Reserved3>,<C/N0 max>,<HPA>,<VPA>	

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<period_time>		<u>0</u>	Turn off navigation dataURCReport
		1~255	Enable navigation dataURCPeriodic reporting and setting the period time

18.4ReadGNSSData sent toATmouth:AT+CGNSTST

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSTST=<mode>	OK
	OK	+ CME ERROR:<err>
Test command	AT+CGNSTST?	+ CGNSTST:<mode> OK
Test command	AT+CGNSTST=?	+ CGNSTST:(0-1) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	switch	<u>0</u>	switch off
		1	switch on

18.5GiveGNSSSend control commands:AT+CGNSCMD

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSCMD=<cmdType>,<cmdString>,<CmdHeadString>]	OK
	OK	+ CME ERROR:<err>
Test command	AT+CGNSCMD=?	+ CGNSCMD:(0-1),"cmdString OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<cmdType>	Command type	0	NMEA style commandThis is the only one currently supported.
		1	HEX style command.
<cmdString>	command string		String type
<CmdHeadString>	Response characteristics		Enter the characteristic characters of the response to capture the result of the command.

18.6ReadGNSSVersion:AT+CGNSVER

Syntax rules:

Command type	grammar	return
Execute command	AT+CGNSVER	<version> OK

18.7Set up auxiliary positioning:AT+CGNSAID

Positioning in seconds, with time-assisted positioning.time>,EPOFile assistanceepo>Location information assistanceloc> 3This is accomplished by the combined effect of several parameters.3After all auxiliary positioning is enabledAT+CGNSPWR=1OpengpsThis will involve a process of positioning the device in seconds.

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSAID=<mode>,<time>,<epo>,<loc>	OK
		+ CME ERROR:<err>
Test command	AT+CGNSAID=?	+ CGNSAID: (0-31)(0-1)(0-1)(0-1) OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	Parameter retention	0-31	This parameter is currently not in use.
<time>	SynchronizationGNSS UTCtime	<u>0</u>	Disable
		1	Enable (recommended to be enabled)
<epo>	Synchronizationepo(Extended Pridiction Orbit)document	<u>0</u>	Disable
		1	Enable (recommended to be enabled)
<loc>	Enable position-assisted positioning	<u>0</u>	Disable
		1	Enable (recommended to be enabled)

18.8deleteEPOdocument:AT+CGNSDEL

Syntax rules:

Command type	grammar	return
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Setting commands	AT+CGNSDEL=<mode>	+ CGNSDEL: <mode>,0,0
		OK
		+ CME ERROR:<err>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	model	1	1and2reserve 3deleteEPodocument
		2	
		3	

18.9IncreaseVIBVoltage output:AT+LDO

Syntax rules:

Command type	grammar	return
Setting commands	AT+LDO=<ldo>,<level>	+ LDO:<ldo>,<level>
		OK
		+ CME ERROR:<err>

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<ldo>	ldoaisle	<u>0</u>	ldoaisle
<level>	voltage level	0	Indicates to close
		1-7	Indicates voltage level

18.10definitionNMEAAnalysis:AT+CGNSSEQ

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSSEQ="str"	OK
		+ CME ERROR:<err>
Query command	AT+CGNSSEQ?	+ CGNSSEQ: %s
		OK
Test command	AT+CGNSSEQ=?	+ CGNSSEQ: (GGA,GSA,RMC,GSV)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
str	String		String type

18.11IncomingAGPSFor location services, the approximate latitude and longitude information required is as follows:AT+CRFLOC

The system internally already automatically obtains information based on base station data; this command is

invalid. Syntax rules:

Command type	grammar	return
Setting commands	AT+CRFLOC=<lat>,<lng>	+ CRFLOC: <lat>,<lng>
		OK
		+ CME ERROR:<err>
Test command	AT+CRFLOC=?	+ CRFLOC: \"location\"
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<lat>	latitude	- 180 — +180	180 degrees east of the Prime Meridian is considered East Longitude and is designated by "E (+)"; 180 degrees west of the Prime Meridian is considered West Longitude and is designated by "W (-)".
<lng>	longitude	- 90 — +90	90 degrees north of the equator is considered North Latitude and is designated by "N (+)"; 90 degrees south of the equator is considered South Latitude and is designated by "S (-)".

18.12examineEPOFile attributes:AT+CGNSCHK

Syntax rules:

Command type	grammar	return
Setting commands	AT+CGNSCHK=<mode>,[<time>]	+ CGNSCHK: <mode>,[<time>]
		OK
		+ CME ERROR:<err>
Test command	AT+CGNSCHK=?	+ CGNSDEL: (1-3)
		OK

Parameter definition:

parameter	definition	Value	Explanation of the possible values
<mode>	model	0-2	reserve
		3	EPO file
<time>	Optional, default 0	0	Expiration date not displayed
		1	DisplayEPOFile availability hours

18.13Example of usage

Because these commands are highly related, application routines for each command are described together. For

example:

Command (→)	Example	Explanation and clarification
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/Return (←)		
useAir820Module example		
→	AT+CGNSPWR?	QueryGPSIs it already open?
←	+ CGNSPWR: 0 OK	0It is not opened.
→	AT+CGNSPWR=1	OpenGPSDefault parameter: serial port3,9600 Baud rate, Zhongke Micro
←	OK	
→	AT+CGNSAID=31,1,1,1	Enable position-assisted positioning (return)OKLater needs (Wait for a while)
←	OK	
→	AT+CGNSINF	QueryGNSSinformation
←	+ CGNSINF: 1,1,20201110032427,31.820789,117.117390,78.500,0.00,130.07,3,,1.79,0.89,4.00,,12,11,,,34,, OK	
→	AT+CGNSURC=1	Set up automatic location information reporting, every [time/time]Sindividual fixReport once
←	OK	
←(URC)	+ UGNSINF: 1,1,20201110031835,31.820751,117.117314,63.900,0.00,0.00,3,,1.50, 0.89, 4.00,, 13, 13,,, 39,, + UGNSINF: 1,1,20201112031836,31.820751,117.117314,63.400,0.00,0.00,3,,1.50, 0.89, 4.00,, 13, 13,,, 38,, + UGNSINF: 1,1,20201110031837,31.820754,117.117314,63.000,0.00,0.00,3,,1.50, 0.89, 4.00,, 13, 13,,, 38,,.....	Every5Each location is reported once.
→	AT+CGNSURC=0	Turn off automatic location information reporting
←	OK	
→	AT+CGNSVER	QueryGPSVersion
←	\$GPTXT,01,01,02,SW=URANUS5,V5.3.0.0*1D OK	