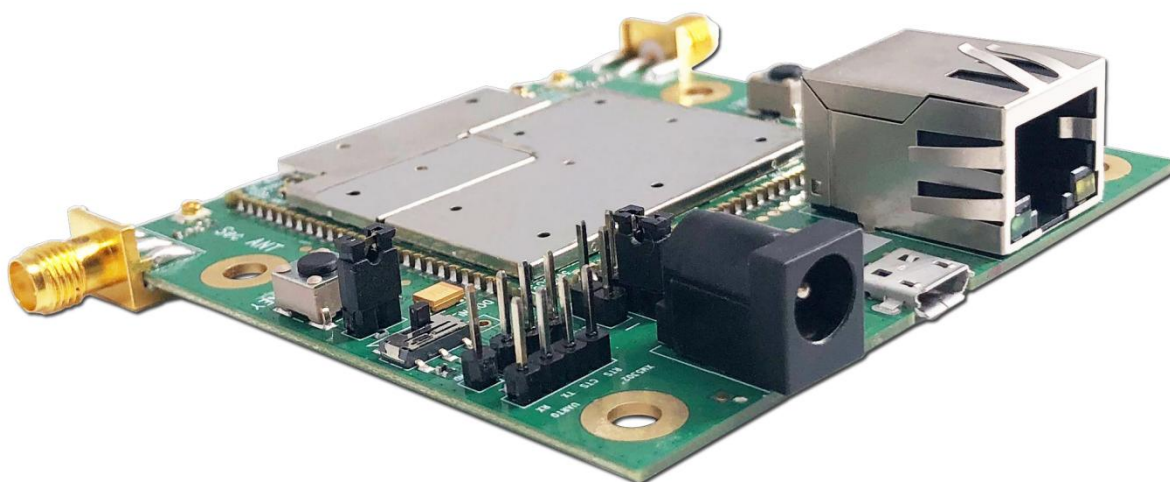


User Manual of FDM-6600

2*2 MIMO Wireless Point to Multi-Point Ethernet & Full Duplex
TTL Serial Data Board

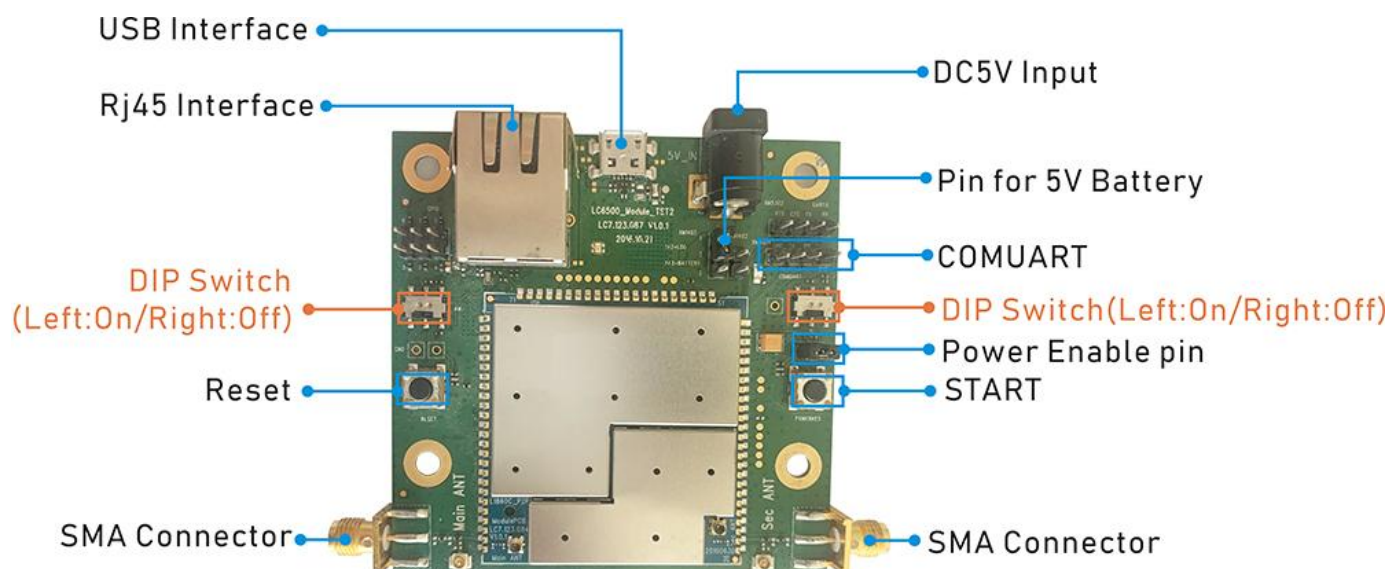


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1. Hardware

1.1. Interface



Note:

- Using a 5V/2A adapter for power supply.
- Before powering on, set the two DIP switches to the left side.
- Please install the antennas firstly before powering on. Or the device will be burn out.
- For short-distance test, distance between two units should be more than 10meters before powering on. Otherwise, the equipment may be damaged.
- We suggest to use IE browser (version 11) for Web login.

1.1.1.COMUART

COMUART is 2.85V voltage domain and compatible with 3V/3.3V level.

Control Data Transmission: TTL mode.

Baud rate: 115200bps, full-duplex communication

Transmission Mode: Pass-through mode

The data transmitting and receiving is broadcast in the network. After successful networking, each FDM-6600 node can receive serial data.

Note: If you want to distinguish between sending, receiving and control, you need to define the format yourself

Baud Rate: The max baud rate is 115200bps(The total rate of unidirectional receiving or unidirectional sending)

Baud rate 115200 = 115200 (bits/second)

If there is no check digit, it should be divided by 10 to get the bytes per second:

Baud rate 115200 = 115200 (bits/second) = 11520 (bytes/second)

Then divided by 1024, it is KB per second:

Baud rate 115200 = 115200 (bits/sec) = 11.25 (KB/sec)

= = = = =

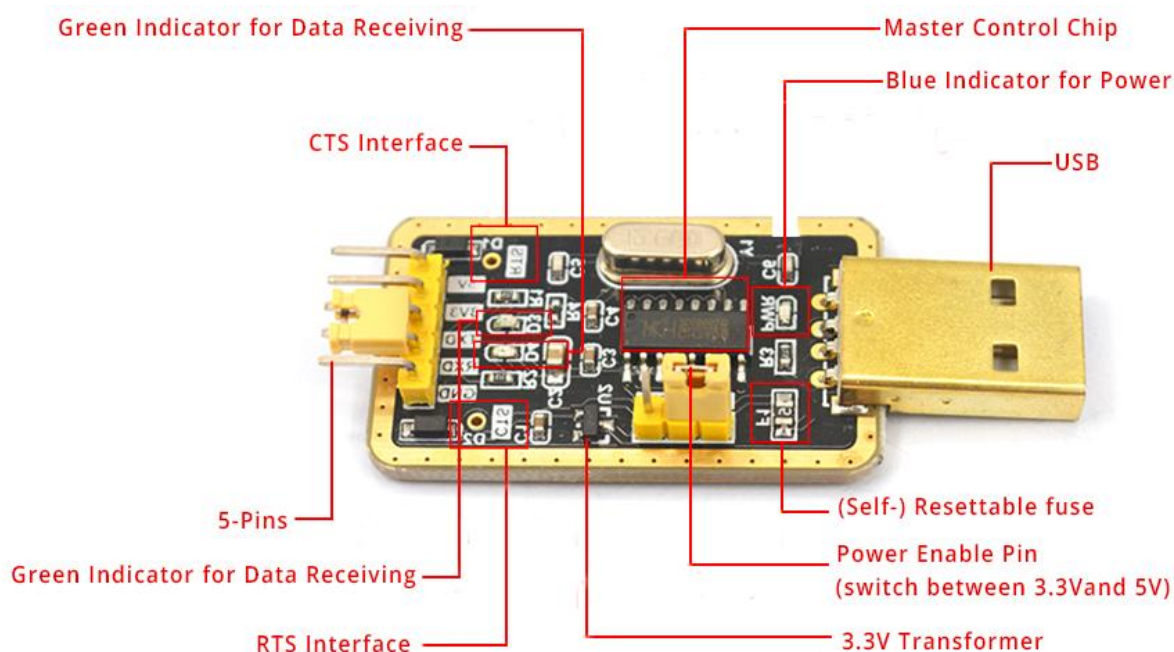
If there is a parity bit, it should be divided by 11 to get the number of bytes per second.

Baud rate 115200 = 115200 (bits/sec) = 10.27 (KB/sec)

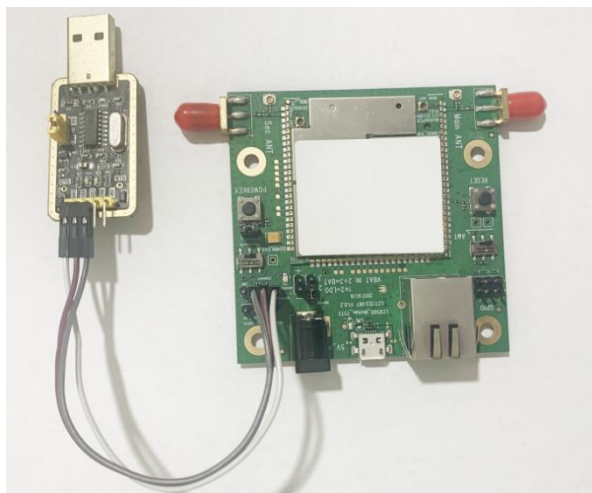
How to test if the COMUART works normally?

Item	Qty
Computer (with software sscom42 or other serial software such as putty, Serial Port Tester, CommMonitor3.0, Serial Interface, etc.)	1
FDM-6600	2
Antenna	4
TTL-USB Cable	2
Power Adapter(5V/2A)	2

TTL-USB Module



Connect TTL-USB cable with FDM-6600



FDM-6600	USB Module
RXD	TXD
TXD	RXD
GND	GND

Connect FDM-6600 with Computer

- Connect the antennas with FDM-6600
- Power the board using the adapter we supplied(DC5V/2A)
- Connect the board with your computer by TTL-USB Cable.



- After the driver is installed correctly, the computer will display the following COM port information



Sending and Receiving Serial data through the COMUART

Computer Settings:



Then you can send and receive serial data via both FDM-6600 COMUART

1.1.2. RJ45 Port

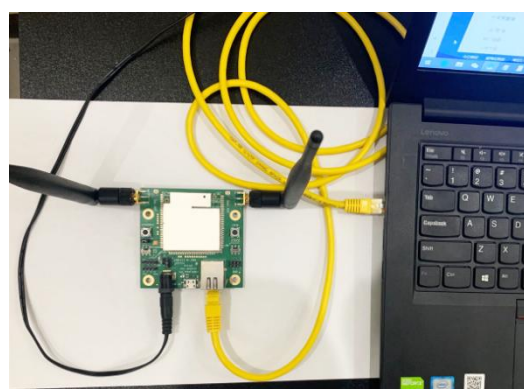
Item	Qty
Computer	1
IP Camera	1
FDM-6600	2
Antenna	4
RJ45 Cable	2
Power Adapter(5V/2A)	2

● Connect FDM-6600 with Computer and Camera

1. Set computer IP: 192.168.1.99/255.255.255.0
2. Set the IP Camera IP: 192.168.1.21
3. Conenct the antennas with FDM-6600
4. Power FDM-6600 via the adapter we supplied(DC5V/2A)
5. Connect one FDM-6600 with IP Camera
6. Connect the other FDM-6600 with computer



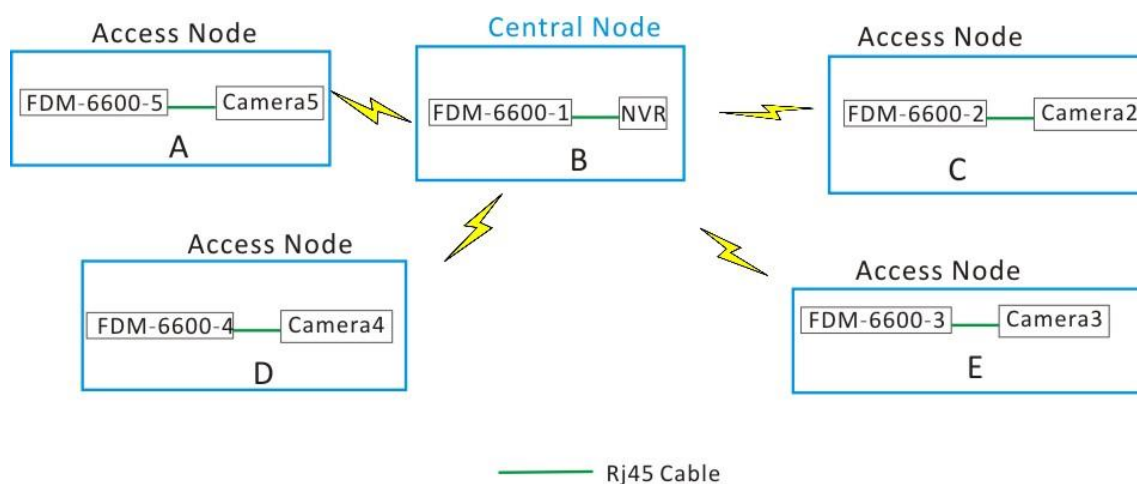
FDM-6600 Access Node Connect with Camera



FDM-6600 Central Node Connect with Computer

7. Using the computer visit <http://192.168.1.21>
8. Enter into IP Camera's user name and password, then you will get the IP Camera's video on the computer.

How to use NVR to get the camera's video



Connect IP Camera with FDM-6600 as to below settings:

	IP	Subnet Mask	Gateway
Camera 2	170.218.2.21	255.0.0.0	170.18.15.6 (IP address of NVR)
Camera 3	170.218.2.22	255.0.0.0	170.18.15.6 (IP address of NVR)
Camera 4	170.218.2.23	255.0.0.0	170.18.15.6 (IP address of NVR)
Camera 5	170.218.2.24	255.0.0.0	170.18.15.6 (IP address of NVR)
NVR	170.18.15.6	255.0.0.0	170.18.15.1

Note: Since NVR can automatically send ARP packets, so it can be set with different subnet network with FDM-6600

2. Software

2.1. WebUI Login

- WebUI interface operation is mainly to manually select the corresponding parameters or input relevant parameters, configure the nodes, and return the configuration status displayed on the UI interface.
- The initial IP address is: <http://192.168.1.12>
- The initial user name and password are

- User name: **admin123**
- Password: **admin123**
- Administrator login user name and password(password and user name changing is not supported)
- Administrator username: **admin123**
- Administrator password: **admin123**
- After registering and changing the password, it will automatically log in and jump to the index page.
- Registration function: directly enter the user name and password, the original account will be overwritten.
- After the factory settings are restored, the account and password are restored to their initial values.
- "Login", "Registration", "Modify Password" need to configure the IE browser, tools-options-Internet options-security settings-enable ActiveX controls and plug-ins.
- **Note: Administrator login does not require the above steps.**
- Add the local and remote IP addresses of WebUI as trusted sites.
- The user name is 6-20 characters composed of letters and numbers, and the first character must be a letter.
The password is also 6-20characters

2.2.Home Page Debugging Switch

Modem switch setting: open/close

WebUI Management Tool

Switch Open/Close Device Restart Device Key Setting Master-Slave Setting Wireless Setting Network Parameter Setting VCOM Function Debug Interface Equipment Information	Modem Open/Close Debug Switch: Current Statu:[Open] Select OK
---	--

Modem Restart Setting

WebUI Management Tool

Switch Open/Close Device Restart Device Key Setting Master-Slave Setting Wireless Setting Network Parameter Setting VCOM Function Debug Interface Equipment Information	Modem Restart Restart Device: Current Statu:[Open] Restart
---	--

2.3.Key Setting

Before networking, each node need to enter into the key

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Key Setting Management

Note:Auto restart Modem when setup is complete

Key Setting(Must be even in HexNumber, 0~9, A~F or a~f, No more than 32 bytes):

Now Key:[FF]

New Key:

2.4.Master-slave Setting

In the same network, only one central node is allowed, and the others are all access nodes.

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Setting Up Master-Slave Configuration

Note:Auto restart Modem when setup is complete

Master-Slave Configuration:

Now Type:[Auto]Work Type:[Central Node]

2.5. Wireless Setting

Set the frequency band

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Frequency Band
Frequency Hopping
Bandwidth
Building Chain
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Frequency Band Management

Note:Auto restart Modem when setup is complete

Setting Frequency Band:

Now Configuration:{800M Frequency Band;1.4G Frequency Band;2.4G Frequency Band;}

Value: ☒ 800M Band ☒ 1.4G Band ☒ 2.4G Band

Frequency Hopping Management

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Frequency Band
Frequency Hopping
Bandwidth
Building Chain
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Frequency Hopping Management

Frequency Hopping Switch:

State:[Open]

Bandwidth

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Frequency Band
Frequency Hopping
Bandwidth
Building Chain
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Bandwidth Management

Bandwidth Setting:

Value:[20M]

Building Chain Management: Input the frequency point and bandwidth.

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Frequency Band
Frequency Hopping
Bandwidth
Building Chain
Network Parameter Setting
VCOM Function
Debug Interface
Equipment Information

Building Chain Management

Building Chain Setting:

Bandwidth Setting:

Value:[20M]

Frequency Point Setting(24015-24814,[8060-8259](#),14279-14478):

Value:

2.6.Network Parameter Setting

Set IP address of the node. The initial IP address is <http://192.168.1.12>

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Network Parameter Setting
IP Setting
VCOM Function
Debug Interface
Equipment Information

IP Address Change Management

IP Setting:
 Now IP Address:[192.168.1.12]
 New IP Address: . . .

2.7.Uplink and Downlink Setting

Four uplink and downlink modes:

config0(2D3U)

config1(3D2U)

config2(4D1U)

config3(1D4U)

D=DOWN, U=UP

Note: Only the central node can modify the uplink and downlink settings, and the device needs to be restarted to take effect after the setting is successful.

WebUI Management Tool

Switch
Key Setting
Master-Slave Setting
Wireless Setting
Network Parameter Setting
UP-DOWN Setting
UP-DOWN Setting
VCOM Function
Debug Interface
Equipment Information

UP-DOWN Setting Management(Work Type:[Central Node])

Note:Auto restart Modem when setup is complete

Note:Central Pattern, config0(2D3U) config1(3D2U) config2(4D1U) config3(1D4U)
 Value:[config0(2D3U)]

- There is no need to manually change the access node's configuration. Because the access node will automatically change its configuration according to the central node and obtain the new configuration after it access to the network.
- When the master node is configured with different bandwidths and different subframes, the actual downlink bandwidth is as follows(The data is laboratory test data)

Bandwith(MHz)	D/U	Data Rate(Mbps)			
		0	1	2	3
1.4	UL	1.675586	1.092773	0.546386	2.294824
	DL	0.752198	1.385009	2.053467	0.236768
3	UL	4.775196	3.114257	1.557129	6.539941
	DL	2.70205	4.487988	6.385547	1.45332
5	UL	8.571094	5.589844	2.794922	11.73867
	DL	4.85376	7.94751	11.23462	2.608594

10	UL	17.80254	11.61035	5.805176	24.38174
	DL	10.83633	17.02852	23.60772	5.418164
20	UL	27.47871	17.9209	8.96045	37.63389
	DL	16.72617	26.28398	36.43916	8.363086

2.8.VCOM

WebUI Management Tool

Switch

Key Setting

Master-Slave Setting

Wireless Setting

Network Parameter Setting

VCOM Function

VCOM Function

Debug Interface

Equipment Information

VCOM Function Management

Note:Auto restart Modem when setup is complete

Now Status:[Close] Select OK

2.9.Debug Interface

Actively report information such as IP address, signal strength, RSRP, etc.

WebUI Management Tool

Switch

Key Setting

Master-Slave Setting

Wireless Setting

Network Parameter Setting

VCOM Function

Debug Interface

[Active Escalation Check](#)
[DRPR Interface](#)
[Shell Debug Interface](#)
[AT Debug Interface](#)

Equipment Information

Active Escalation Check

Open Close

Active Escalation Check:

DRPR Report

WebUI Management Tool

- Switch
- Key Setting
- Master-Slave Setting
- Wireless Setting
- Network Parameter Setting
- VCOM Function
- Debug Interface
- [Active Escalation Check](#)
- [DRPR Interface](#)
- [Shell Debug Interface](#)
- [AT Debug Interface](#)
- Equipment Information

DRPR Report Status

RSRP < -124	SNR < 0
RSRP -124 ~ -104	SNR 0 ~ 6
RSRP -103 ~ -85	SNR 7 ~ 12
RSRP -84 ~ -65	SNR 13 ~ 18
RSRP > -64	SNR > 19

IP	EARFCN	RSRP	SNR	DISTANCE
----	--------	------	-----	----------

Shell debugging interface, which can execute the shell commands.

WebUI Management Tool

- Switch
- Key Setting
- Master-Slave Setting
- Wireless Setting
- Network Parameter Setting
- VCOM Function
- Debug Interface
- [Active Escalation Check](#)
- [DRPR Interface](#)
- [Shell Debug Interface](#)
- [AT Debug Interface](#)
- Equipment Information

Shell Cmd Debug

Please enter Shell Cmd:

Result:



AT debug interface

WebUI Management Tool

- Switch
- Key Setting
- Master-Slave Setting
- Wireless Setting
- Network Parameter Setting
- VCOM Function
- Debug Interface
- [Active Escalation Check](#)
- [DRPR Interface](#)
- [Shell Debug Interface](#)
- [AT Debug Interface](#)
- Equipment Information

AT Cmd Debug

Please enter AT Cmd:

Result:



2.10. Device Information

Show the version information of the device

WebUI Management Tool

- Switch
- Key Setting
- Master-Slave Setting
- Wireless Setting
- Network Parameter Setting
- UP-DOWN Setting
- VCOM Function
- Debug Interface
- Equipment Information

[Equipment Information](#)

Equipment Information

AllSystemVersion:
CX6602N_1.00.00.R11_20200421

HLSysVersion:
484C535F534F4E4D5F56322E31302E30305F5235305F32303230303430370000000000000000
< >

PHYSysVersion:
0D504C5F534F4E4D5F56322E31302E30305F5235345F3230323030343130000A0A0A0A0A0A0
< >

3. AT Commands Supported by WebUI

3.1.Command Set Supported by AT Debug Interface

WebUI supports the following AP side AT commands

"AT+CFUN"
 "AT^LCMFUN"
 "AT^DTSET"
 "AT^NETIFCFG"
 "AT^DGMR"
 "AT^DFGMR"
 "AT^RCVR"
 "AT^DAMR"
 "AT^POWERCTL"
 "AT^CAMERATL"
 "AT^RMTCTL"
 "AT^ELFUN"
 "AT^ELCH"
 "AT^ELCFGUL"
 "AT^RECOVSET"
 "AT^APLFUN"
 "AT^VCOMFUN"
 "AT^DHCPSET"
 "AT^DHDRSET"

3.2.Explanation of AT Command in WebUI

Explanation of AT Command in WebUI

Menu	Commands	X Value		Remark	Prompt
------	----------	---------	--	--------	--------

Debug Switch	at+cfun=	0 or 1	Single Selection		Success or Failure
Key Setting	at+cfun=0 at^dapi="X" at+cfun=1 Rule: For commands that can only be issued in the shutdown state, the combined command mode must be used	"must be even number"	Must be hexadecimal, i.e. 0~9, A~F or A~F, and must not exceed 64 characters, i.e. 32 bytes. It has to be even. Add auxiliary instructions and set limits	It can only be set after soft shutdown	Success or Failure
Master-Slave Setting	at+cfun=0 at^ddtc=X at+cfun=1 Rule: for the instruction which can only be sent in the shutdown state, the combined instruction mode must be adopted	1 or 2 or 0 can only be displayed (1 is the main, 2 is the slave)	The single setting can only be 1/2, but it can display 0 (X can also be 0 to indicate that the boot is of automatic type).	It can only be set after soft shutdown	Success or Failure
Frequency band setting	at^daocndi=X at+cfun=0 at+cfun=1 Prompt needs to be issued after a soft restart	01 or 04 or 08	multiple choice	It can take effect only after soft switch	Success or Failure
IP address Setting	at^netifcfg=2,"X.X.X.X"	Comply with IP address regulations	X is a space to manually enter any number		Success or Failure
Bandwidth settings	at^drps=X,	0 or 1 or 2 or 3 or 5	Single Selection	Local settings	Success or Failure
Bandwidth settings	at^drpc=X,	0 or 1 or 2 or 3 or 5	Single Selection	Chain group settings	Success or Failure
Power setting	at^drpc=,"X"	-40 to +40	Manually input values in the range	Chain group settings	Success or Failure
Frequency setting	at^drpc=X,,	Frequency point (bandwidth value range, 24015~24814, 8060~8259, 14279~14478)	Manually input the frequency point number	Chain group settings	Success or Failure

Query version	AT^DGMR?		Query the whole system		Displays the whole system version
---------------	----------	--	------------------------	--	-----------------------------------

			m version number		ion number
	AT^DCMR=17		Query the physical layer version number		Displays the physical layer version number
	AT^DCMR=18		Query the high-level version number		Displays the high-level version number
VCOM	at^vcomfun=X	0 or 1	Single Selection 1: vcom open 0: vcom close		Success or failure prompt to power off and restart to take effect
Frequency hopping setting (master end setting)	AT^DFHC=X at+cfun=0 a+cfun=1 Prompt needs to be issued after a soft restart	0 or 1 (0: close, 1: on)	Single Selection		Success or Failure