

ComIoT 22

4G LTE Data Transmission Router Module

Product Specifications

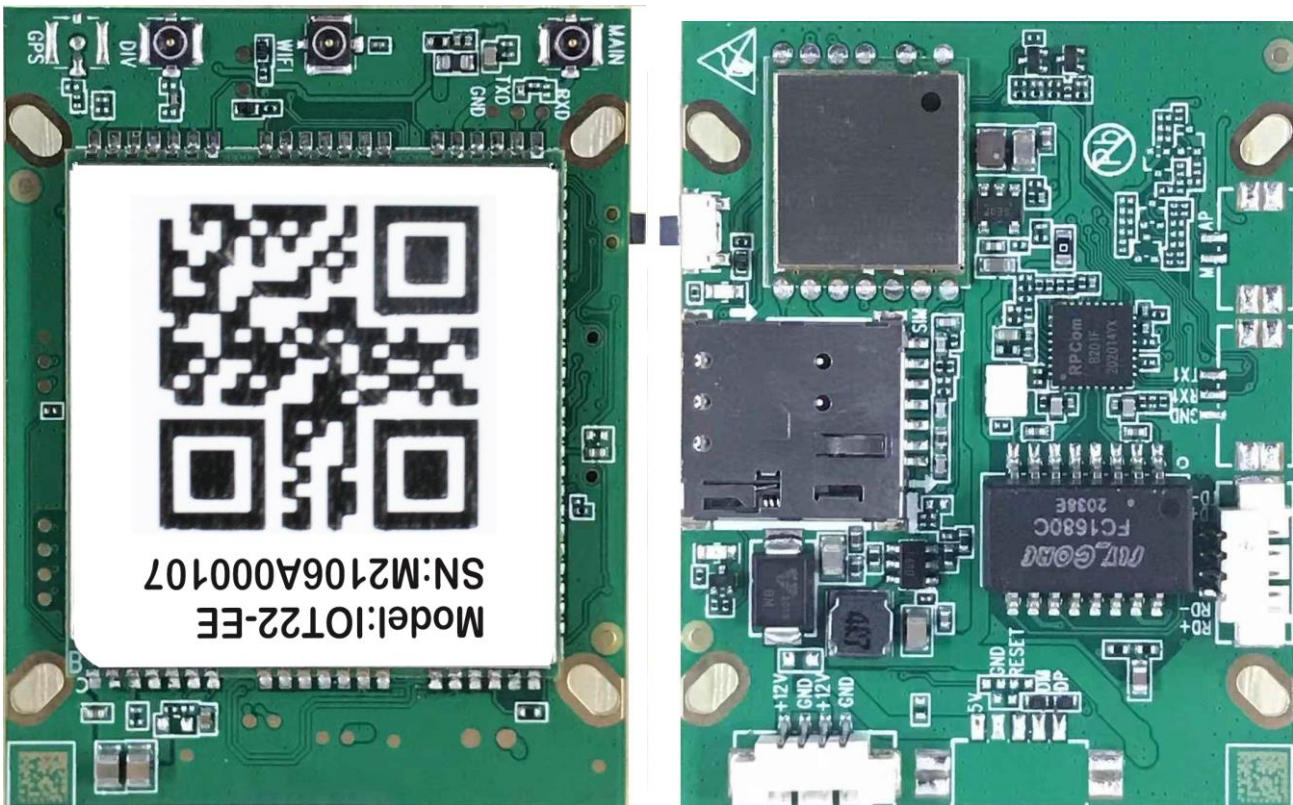


- Wide Voltage Power Input
- Plug and Play Auto Internet Dial Up Access
- Plug and Play Standard Ethernet Port
- High Reliability Performance, Low Cost, Low Power Consumption
- Standard 38mm x 38mm Positioning Security Hole, Easy to Assemble

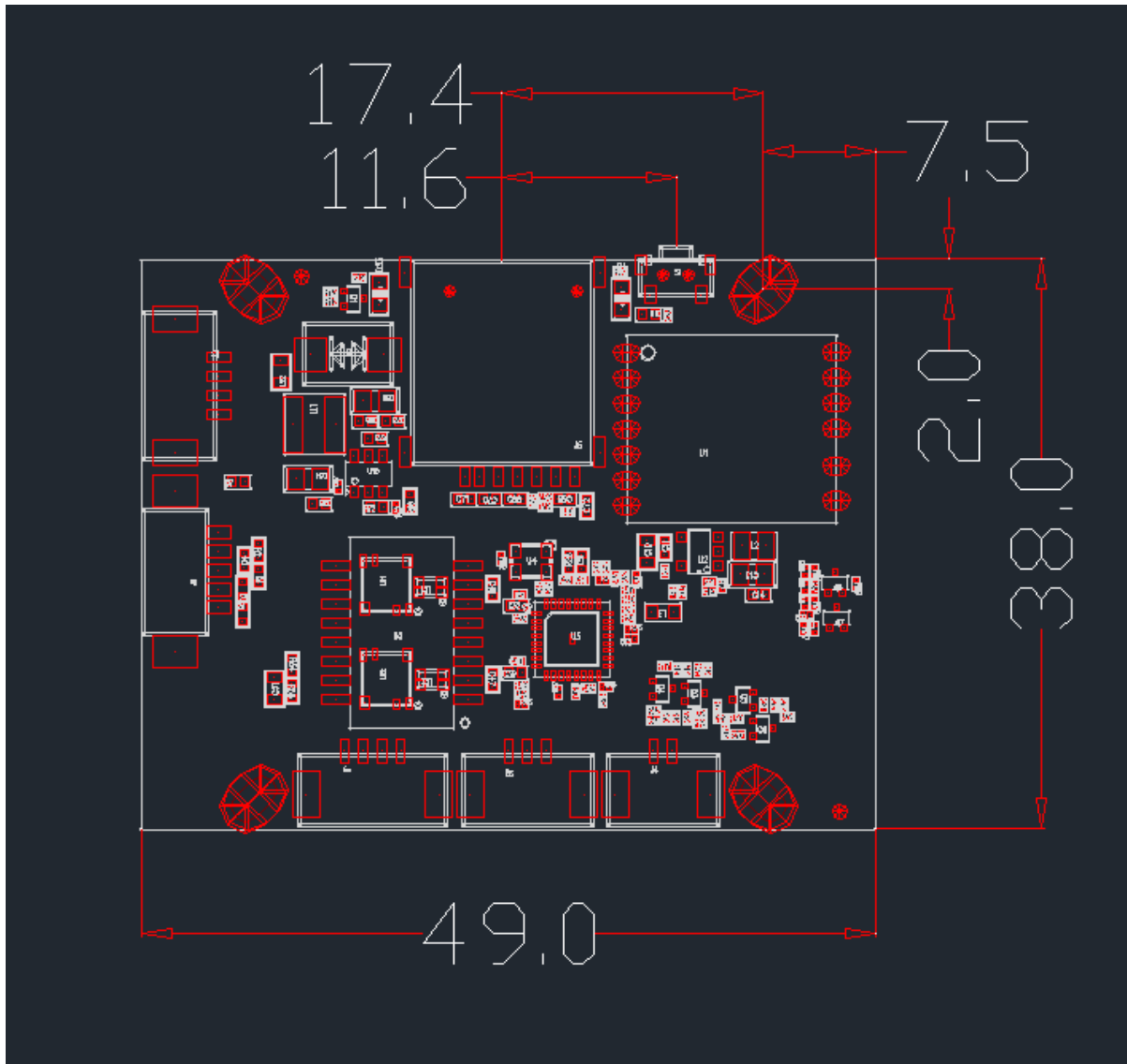
Product Description

The IoT22 is a wireless surveillance core board based on a ZXW 4G cellular and WIFI communication technology platform. It supports a wide range of wireless communication components such as FDD-LTE, TDD-LTE and WLAN and is designed for plug and play wireless surveillance applications. In addition, IoT22 can also be widely used in a variety of Internet of Things (IoT) front end data capture and collection. It can also be used in a medium and high speed data transmission unit (DTU). It has standardized interfaces that can do direct docking and rapid alignment to a control board to achieve application solutions. The IoT22 provides main interfaces such as power interface, USB interface, SIM card holder interface, Soft reset button, UART interface, Sleep Wake Up interface, RF interface, and 10M/100M network interface.

Product Appearance



Product Size

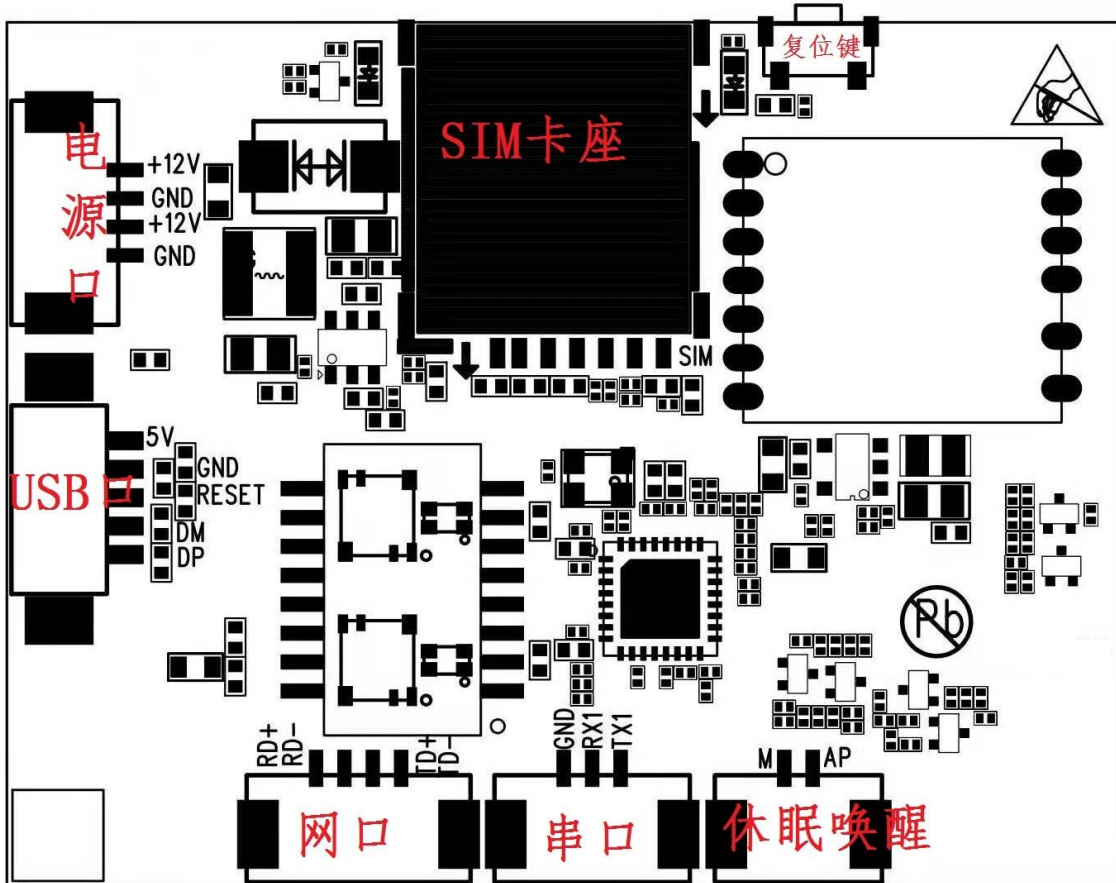


Size and Dimension (Unit: MM)

Device Interfaces

Item	Description
Power Interface	Input: 5V-16V, Typical: 12V, Output Follow Input Voltage
USB Interface	USB 2.0 Interface x 1
USIM Interface	1.8V/3.0V Nano USIM/SIM Card Slot, 4FF

Ethernet Interface	4PIN Socket x 1, 10/100 Auto Adaptive, LAN/WAN Configurable
UART Interface	UART Interface x 1
Sleep/Wake Up Interface	One signal for the main control to wake up the module, and one for the module to wake up the main control signal
Reset Button	Press and hold 3sec above to reset to factory default setting
RF Interface	4G MAIN Antenna Interface x 1 4G Auxiliary Antenna Interface x 1 WIFI Antenna Interface x 1
LED Indicators	Power On / WIFI Status x 1, Cellular Connection Status x 1
Power Consumption	Working: 100~120mA Idle: 30~40mA Sleeping: 5mA



1.1 Power Interface

1. DC-12V power input interface: use the J3 connector of the IoT22 board to give the +12V power supply (Note: it is recommended to use J3 interface for +12V power supply).



2. USB +5V Power Input: use the J2 connector of the IoT22 board to give +5V power supply.

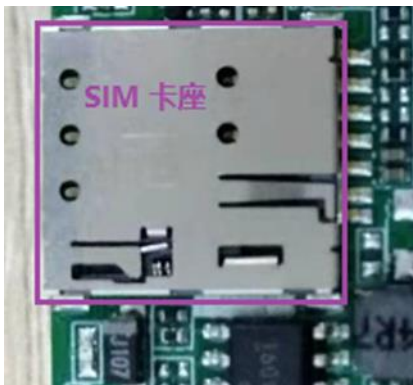


1.2 USB Interface

The IoT22's power supply can be powered by USB +5V, while the J2 interface also has a USB signal for the Net100 module, which can enumerate a set of COM ports including AT, LOG, and so on after connecting the PC with a USB cable, the module is switched on normally and the PC has the device driver loaded. Using the common serial debug tool, select the corresponding AT port, you can send AT commands through the USB port.

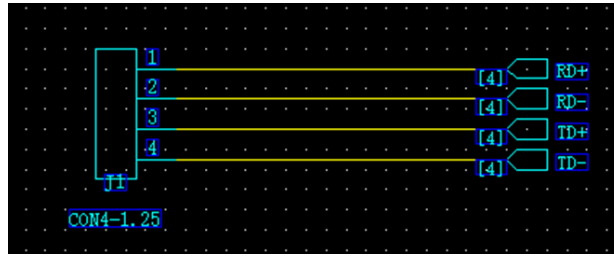
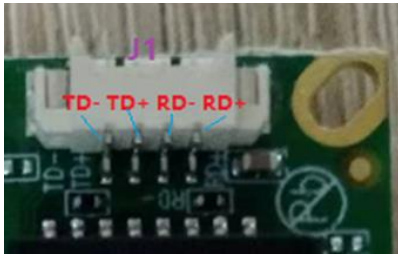
1.3 USIM Interface

The IoT22 provides a USIM interface that uses a Nano card (the smallest card size). While inserting the card, the chip surface of the SIM card is facing to the board and the notch side is inward. When plugging in your SIM card, be sure to turn off the power supply first.



1.4 Ethernet Interface

The IoT22 provides a four-wire Ethernet network interface that supports 10M/100M. It is defined in the diagram below:

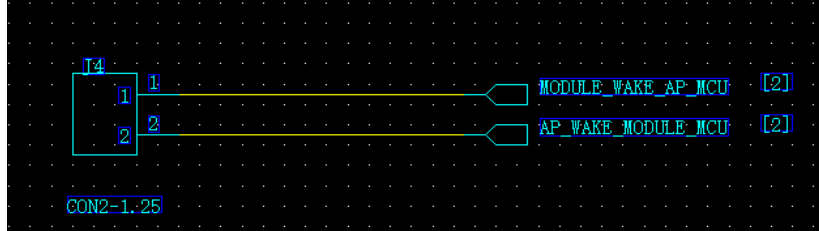
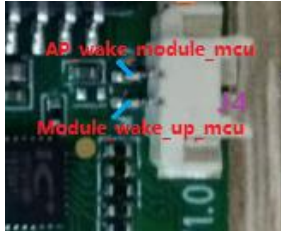


1.5 UART Interface

The UART interface of the Net100 module is 1.8V, the IoT22 board is designed to convert to the 3.3V UART interface that is required on the AP side, OR it can bypass the voltage conversion circuit to provide a 1.8V UART interface directly. The IoT22 provides a direct connection to the Net100 module's serial port, and the UART interface can be used to communicate directly with other AP chips.



1.6 SLEEP/WAKE UP Interface



GPIO Interrupt of SLEEP / WAKE UP is defined as follows:

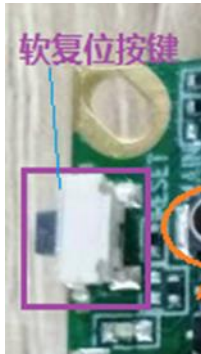
The Name of the Pin	Signal Description	Attribute	Remark
AP_WAKE_MODULE	The AP wakes up the module signal	DI	Pin2
MODULE_WAKE_AP	The module wakes up the AP signal	DO	Pin1

AP_WAKE_MODULE signal: The module needs to be kept low when it is required to hibernate. When you need to wake up the module, set the signal high. If you do not use the signal, hover the signal or leave it high.

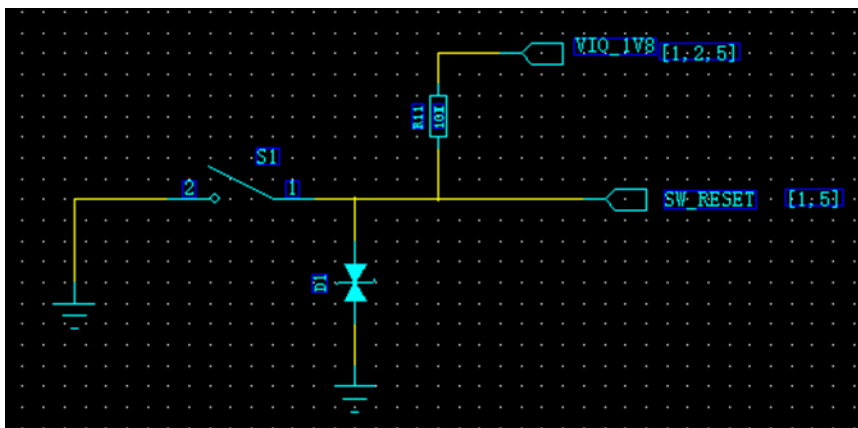
MODULE_WAKE_AP signal: This signal is used for the module to wake up an external device, with a default low level. In certain states such as text messages, incoming calls, and so on, the pin generates a high-level pulse to wake up the external device.

1.7 Reset Interface

1. The reset key function: press and hold for more than 3 seconds to restore factory settings. The position of the reset key is shown below:



2. SW_RESET the GPIO of the Net100 module



1.8 RF Interface

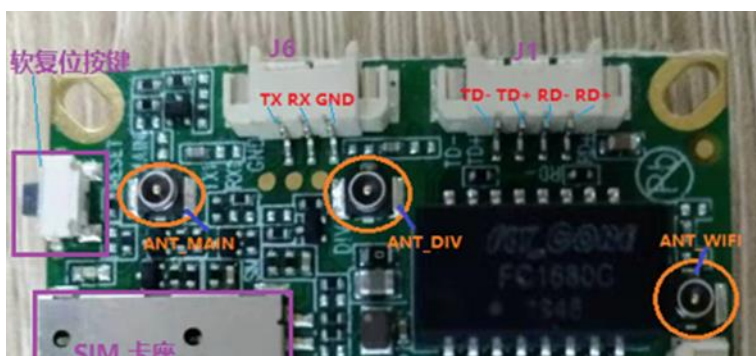
4G main antenna interface:

1 x Main antenna interface (ANT_MAIN in the diagram)

1 x Auxiliary antenna interface: one (ANT_DIV in the diagram);

WiFi antenna interface:

1 x WiFi antenna interface (ANT_WIFI in the diagram)



4G/3G/2G Technical Specifications

Item	Description
Cellular Technology	LTE FDD, LTE-TDD, WCDMA, TD-SCDMA, EDGE, GPRS, GSM
Data Rate	LTE-FDD: Max 150Mbps DL / Max 50Mbps UL
	LTE-TDD: Max 130Mbps DL / Max 35Mbps UL
	WCDMA: Max 21Mbps DL / Max 5.76Mbps UL
	TD-SCDMA: Max 4.2Mbps DL / Max 2.2Mbps UL
	EDGE: Max 236.8Kbps DL / Max 118Kbps UL
	GPRS: Max 85.6Kbps DL / Max 85.6Kbps UL
	GSM: Max 9.6Kbps DL / Max 2.7Kbps UL
Rx Sensitivity	Compliance with 3GPP Release 9 Standard
Tx Output Power (Max)	LTE-FDD: 23dBm±2dB
	LTE-TDD: 23dBm±2dB
	WCDMA: 24dBm±1dB/-3dB
	TD-SCDMA: 24dBm±1dB/-3dB
	GSM: B5/B8: +33±2dB (Power Class 4)
	GSM: B2/B3: +30±2dB (Power Class 1)
Antenna Type	External Antenna
Antenna Gain	5dBi

Cellular Band/Frequency (Europe version)

Standards	Bands
4G LTE-FDD	B1, B2, B3, B5, B7, B8, B20
4G LTE-TDD	B38, B39, B40, B41
TD-SCDMA	B34, B39
WCDMA	B1, B2, B5, B8
GSM	850, 900, 1800, 1900 (Quad-Band)

Cellular Band/Frequency (Pacific version)

Standards	Bands
4G LTE-FDD	B1, B2, B3, B5, B7, B8, B28(A+B)
4G LTE-TDD	B38, B39, B40, B41
TD-SCDMA	B34, B39
WCDMA	B1, B2, B5, B8
GSM	850, 900, 1800, 1900 (Quad-Band)

Cellular Band/Frequency (China version)

Standards	Bands
4G LTE-FDD	B1, B3, B5, B8
4G LTE-TDD	B38, B39, B40, B41
TD-SCDMA	B34, B39
WCDMA	B1, B8
GSM	900, 1800

Software Access Information

Item	Default Value
Default IP Address	192.168.150.1
Default Login ID	admin
Default Login Password	admin (can be modified)
Default WIFI Password	12345678

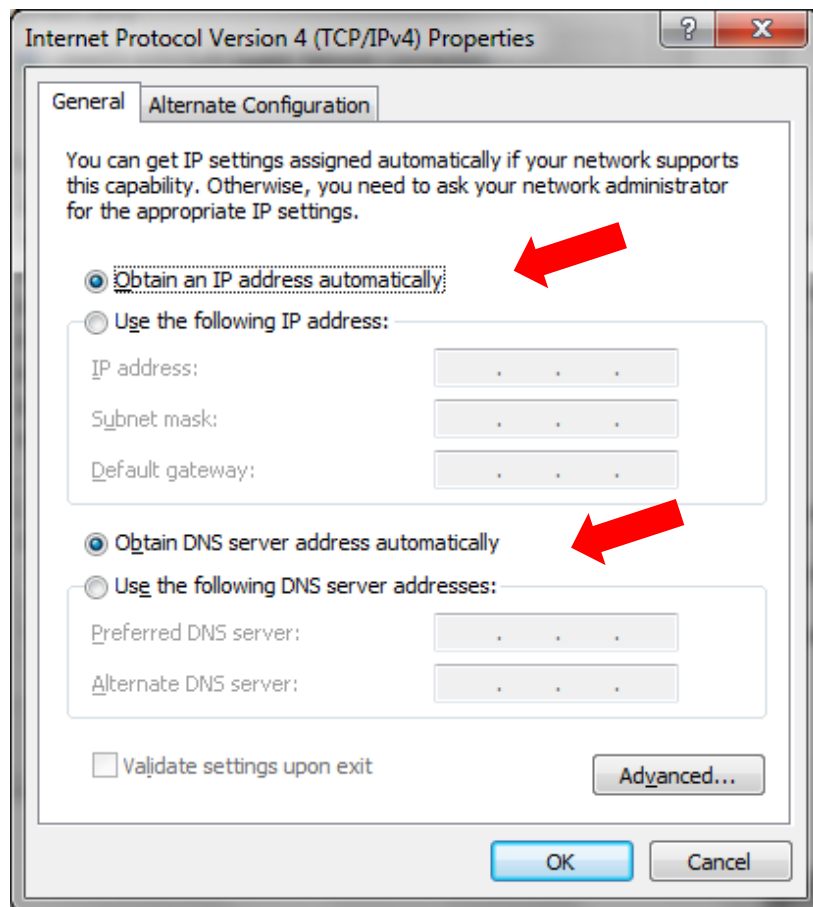
Note: Login ID and password can be modified in the device setting.

Access and operate the software function of the device can be done via a web browser. There are two methods can do it: 1. Wired connection and 2. Wireless WI-Fi.

1. First time to use

Before proceeding to the device login interface, connect the device to a power source. For wired connection as an example:

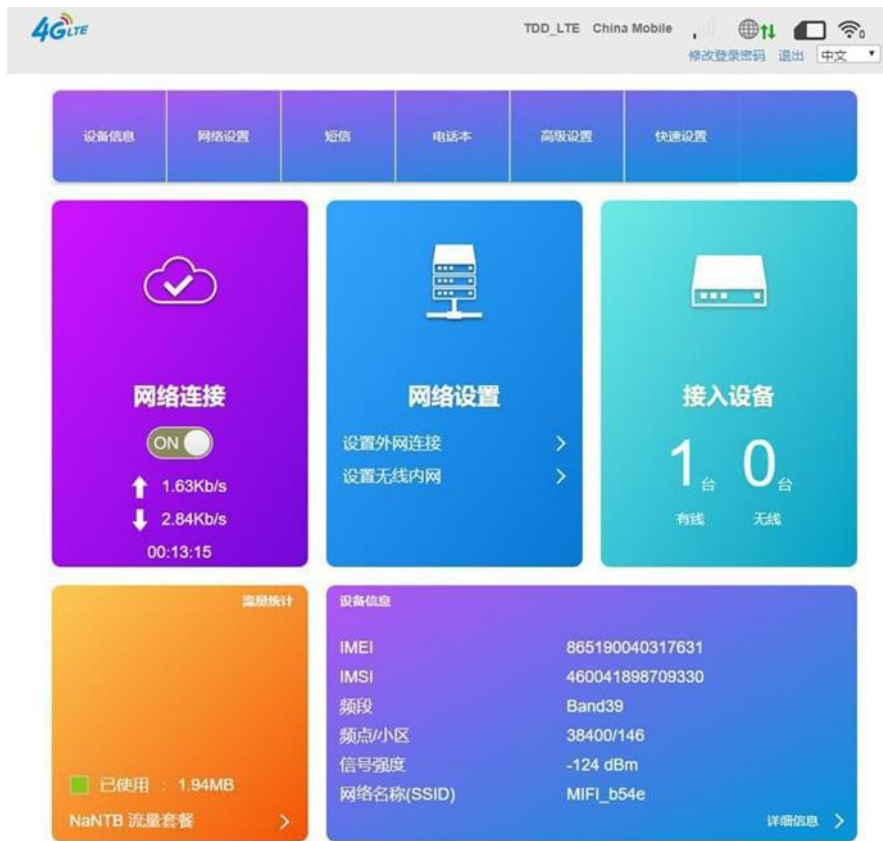
- a. Use a network cable to connect the network port RJ45 interface of the device to the network port interface of the PC
- b. On the PC, the computer network port is generally set to automatic mode, as follows:



- c. Once the connection of the device and the PC connected successfully. Open a web browser and enter the IP address: 192.168.150.1 and enter. The web browser should display the login page as below:



- d. In the username and password field key in the default username and password: **admin** and then press enter to login to the device. Once login successfully, a web dashboard interface in be display as below:



2. Software Functions

In the device information page, the device information can be found such as firmware version, operation time, IMEI, IMSI, ICCID and other information. The device information page is like below:

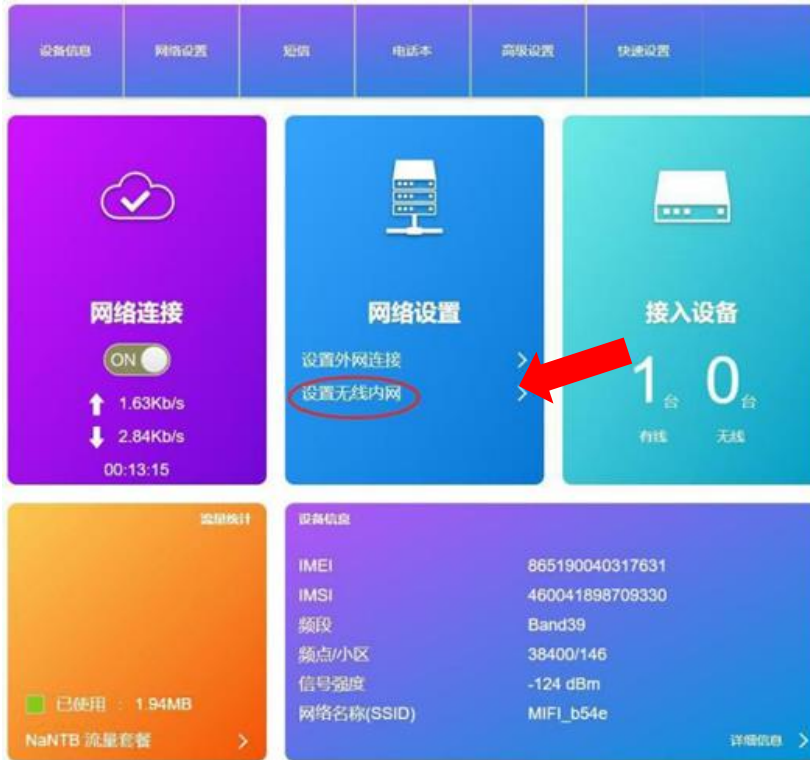


The screenshot shows a mobile application interface for device information. At the top, there is a status bar with '4G LTE', 'TDD_LTE', 'China Mobile', and various system icons. Below the status bar is a navigation bar with a back arrow and the title '设备信息'. On the left side, there is a sidebar menu with three items: '设备信息' (selected), '系统状态', and '网络参数'. The main content area displays a list of device information items:

设备信息	
软件版本	ML7820+B_B16_1XCT0X_T3_44002
硬件版本	ML7820+B_V1.0
运行时间	00 Day : 00 Hour : 01 Min : 20 Sec
设备型号	ML7820+B
IMEI	865190045470237
SIM卡ICCID	898604051918C1452165
SIM卡IMSI	460042570703865

a. Modify WI-Fi SSId and Password

In the dashboard page, click the “Wireless setting”



In the Wi-Fi setting page, SSID and password can be modify here. After that, click the apply button to save and apply the new settings.

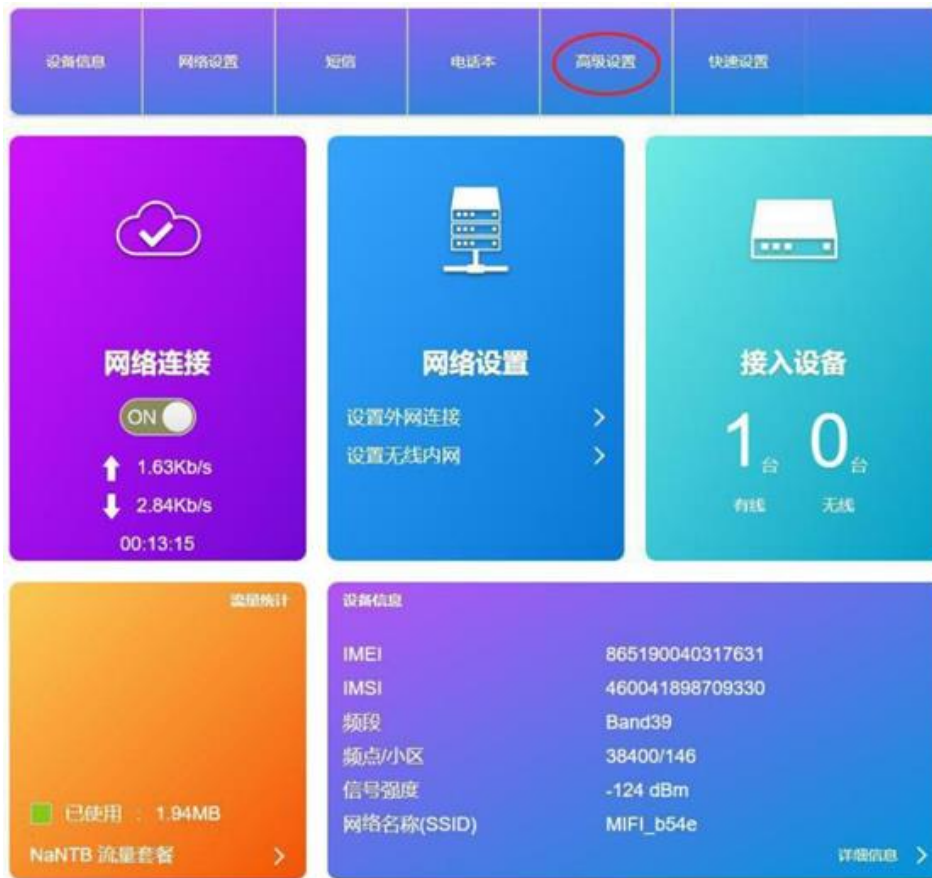


b. Modify Gateway setting

In practical applications, if a terminal device or IP camera to be connected is not in the same network

segment as the ComFi IX220. The gateway of the ComFi IX220 can be modified in order to make it and the terminal device or IP camera connected in the same network segment.

Click Advanced Settings on the dashboard as the picture below:



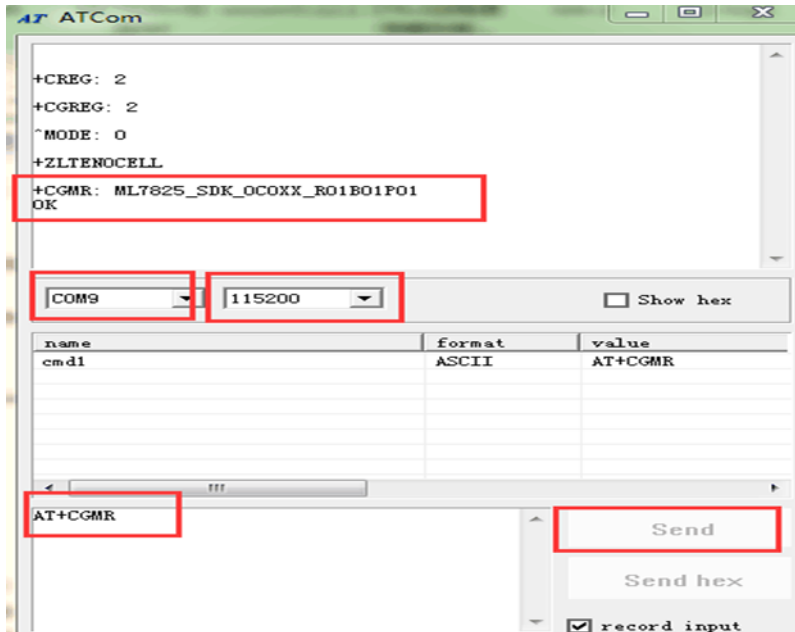
In the router section, modify the IP address will change the network segment. Also, in the DHCP IP Pool should also set to the corresponding network segment IP range. After click the Apply button, the system will automatically update and restart. After restart, it will have the new gateway connection. If you use a computer or mobile phone to connect this time, you need to enter the modified gateway IP address in the web browser to log in to the router.



3. Debugging and Testing

3.1 How to communicate with USB under MS Windows

- First the IoT22 module is connected to the PC with a USB cable.
 - When the module is powered on,
 - The AT port is enumerated normally.
 - Then use a serial debugging tool such as ATcom to do AT interactive commands for debug
- (Noted: when the module is initialized, the AT command input is "ECHO OFF" by default. In order to visually see what is entered, key in command ATE1 to enable and turn to ECHO ON mode)



3.2 How to communicate with USB under Linux

- a) Connect the IoT22 module to the PC with a USB cable.
- b) Power on the IoT22 module
- c) After a normal boot, enter “1susb” to query, add the 19d2:0532 chars

```
haojie@haojie-Lenovo:~/aura/7520SDKV1.0.0B07P09-V3_AP/project/zx297520v3/prj_md1/build$ lsusb
Bus 002 Device 002: ID 8087:0024 Intel Corp. Integrated Rate Matching Hub
Bus 002 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 003: ID 192f:0916 Avago Technologies, Pte.
Bus 001 Device 004: ID 19d2:0532 ZTE WCDMA Technologies MSM
Bus 001 Device 002: ID 8087:0024 Intel Corp. Integrated Rate Matching Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

- d) Load the usb driver using the command “mod probe usbserial vendor=0x19d2 product=0x0532” and then query the device in the dev directory. (ttyUSB0: AT port, ttyUSB1: Modem port, ttyUSB2: Log port).

```
haojie@haojie-Lenovo:~/aura/7520SDKV1.0.0B07P09-V3_AP/project/zx297520v3/prj_md1/build$ ll /dev/ttyUSB*
crw-rw---- 1 root dialout 188, 0 4月 20 17:22 /dev/ttyUSB0
crw-rw---- 1 root dialout 188, 1 4月 20 17:22 /dev/ttyUSB1
crw-rw---- 1 root dialout 188, 2 4月 20 17:22 /dev/ttyUSB2
crw-rw---- 1 root dialout 188, 3 4月 20 17:22 /dev/ttyUSB3
crw-rw---- 1 root dialout 188, 4 4月 20 17:22 /dev/ttyUSB4
```

- e) Use the minicom tool in the Ubuntu OS for AT commands for debugging


```
haojie@haojie-Lenovo:~/aura/7520SDKV1.0.0B07P09-V3_AP/project/zx297520v3/prj_md1/build$ sudo minicom
Welcome to minicom 2.7

OPTIONS: I18n
Compiled on Jan  1 2014, 17:13:19.
Port /dev/ttyUSB0, 17:25:00

Press CTRL-A Z for help on special keys

+ZMSRI
+ZICCID: 89860021191607349722
+CREG: 2
+CGREG: 2
+CEREG: 2
+ZLTENOCCELL
OK
at^sysinfo
^SYSINFO: 0,0,0,0,1
OK
```

Noted: when the module is initialized, the AT command input is "ECHO OFF" by default. In order to visually see what is entered, key in command ATE1 to enable and turn to ECHO ON mode)

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