



E103-W06 User Manual

CC3235SF 2.4G/5.8G Dual Frequency WiFi Serial Port Module



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1. Overview

1.1 Introduction

E103-W06 is a high-performance, high-reliability dual-band WIFI module launched by Chengdu Ebyte based on TI's third-generation WIFI chip CC3235S. It has a built-in high-performance ARM Cortex-M4 processor, and the maximum wireless transmit power can reach +18dBm. The hardware package is compatible with the original CC3235MODS and CC3235MODSF, and the company's modules can be interchanged with them.

Functionally, the module supports IEEE802.11 a/b/g/n standard, can work in 2.4G and 5G frequency bands, the module supports AP, STA, WIFI Direct (only 2.4G frequency band support) mode, supports TCP/UDP /HTTP/MQTT multiple network transmission protocols, embedded mDNS, DNS-SD, DHCP service package, support personal WPA2 encryption, can meet a variety of high-standard and high-reliability wireless communication scenarios, at the same time with boot transparent transmission, Smartconfig convenient Sexual distribution network function. E103-W06 is an industrial-grade WIFI module that truly combines ease of use with high reliability and high performance.



1.2 Features

- ◆ Support IEEE802.11 a/b/g/n standard;
- ◆ Dual-band WIFI: can work in 2.4GHz & 5GHz two frequency bands;
- ◆ Support AP, STA, WIFI Direct 3 working modes;
- ◆ Support WEP/WPA/WPA2 multiple WIFI security authentication methods;
- ◆ Support TCP/UDP/HTTP/MQTT multiple network communication protocols;
- ◆ Support TLS/SSL secure transmission mode;
- ◆ Support up to 4 socket connections;
- ◆ AP access point supports 4-way STA device connection;
- ◆ Support mDNS, DNS-SD, DHCP network service package;
- ◆ Support WEB page parameter configuration;
- ◆ Support NTP network time acquisition (under the premise of Internet access);
- ◆ Support disconnection and automatic reconnection;
- ◆ Support high-speed continuous transmission, up to serial port 3M baud rate continuous transmission;
- ◆ Support multiple power mode switching;
- ◆ Support WIFI idle connection (LDPS);
- ◆ Support MQTT network protocol (Alibaba Cloud, Baidu Cloud, OneNet);
- ◆ Support WebSocket connections;
- ◆ Support HTTP Client;

- ◆ Support TCP SERVER/TCP CLIENT, UDP communication;
- ◆ Support custom registration package, custom heartbeat package function;
- ◆ Support socket distribution protocol;
- ◆ AT command configuration;
- ◆ Support remote command configuration;
- ◆ Support Smartconfig quick network configuration;
- ◆ Support transparent transmission multiplex protocol transmission and broadcast transmission;
- ◆ Support pin to restore default parameters;
- ◆ Support modbus protocol conversion (RTU and TCP);
- ◆ Support static IP address assignment;
- ◆ Support scanning nearby AP information.

1.3 Application

-Medical and Healthcare

- Multiparameter Patient Monitor
- ECG
- Hospital electronic bed and bed control system
- telemedicine system

-Building and Home Automation:

- HVAC systems and thermostats
- Video Surveillance, Video Doorbells, and Low-Power Cameras
- Building security systems and electronic locks

-smart appliances

-smart wear

-Asset tracking

-factory automation

-grid infrastructure

2. Parameter

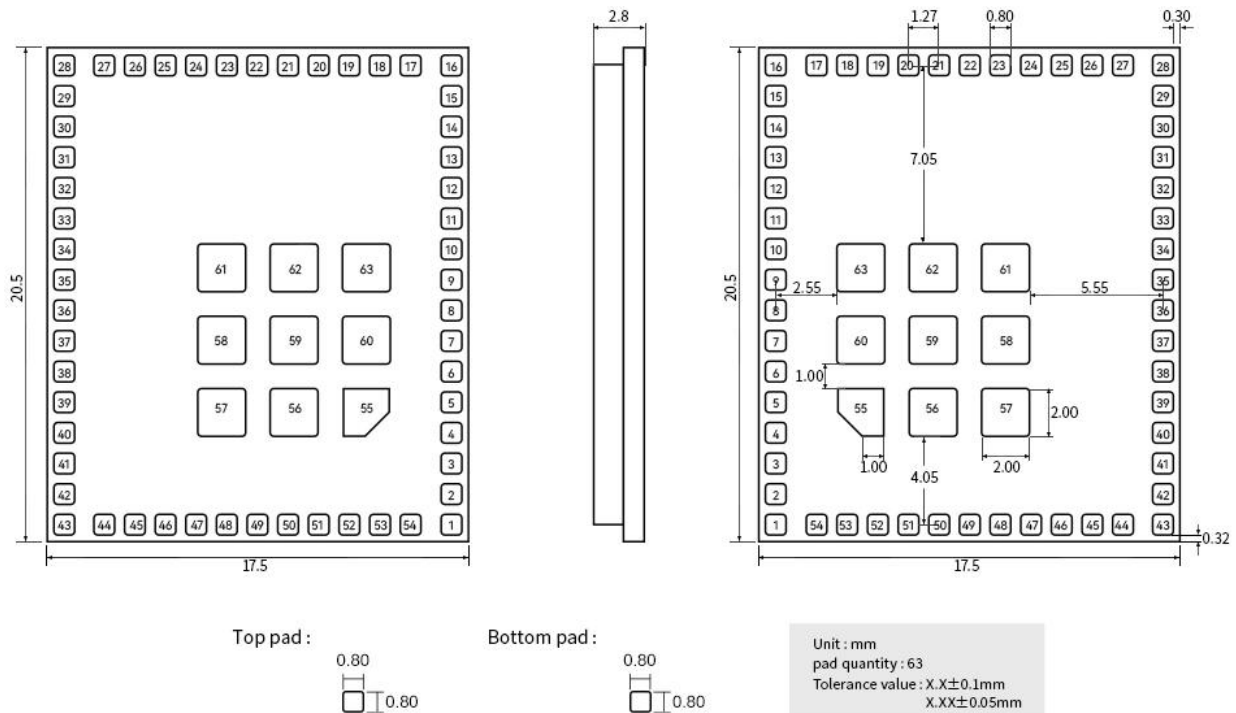
2.1 Limit parameter

Main parameter	Performance		Remark
	Min.	Max.	
voltage (V)	0	3.6	Exceeding 3.6V will permanently burn the module
blocking power (dBm)	-	10	The probability of burning at close range is small
Operating temperature (°C)	-40	+85	Industrial grade

2.2 Working parameter

Main parameter		Performance			Remark
		Min.	Type	Max.	
Operating voltage (V)		2.3	3.3	3.6	Recommended 3.3V power supply
Communication level (V)			3.3		-
Operating temperature (°C)		-40	-	+85	Industrial grade design
Working frequency (Hz)		2.412G	2.442G	2.472G	Support 2.4G frequency band
		5.180G	5.550G	5.825G	Support 5G frequency band
Power consumption	Maximum transmit power (dBm)	16	18	18.5	Test 2.412GHz
		16	18	18.5	Test 5.18GHz
	Emission current (mA)	-	276mA	-	Instantaneous power consumption (2.412GHz), DSSS 1Mbps
		-	183mA	-	Instantaneous power consumption(5.18GHz), OFDM 6Mbps
	receive current (mA)	-	78mA	-	Average power consumption received (2.412GHz)
		-	83mA	-	Average power consumption received(5.18GHz)
	sleep current (μA)	-	18uA	-	hibernate
		-	18uA	-	Low power deep sleep (LPDS)
	WiFi version	-	802.11	-	a/b/g/n
	RF interface	-	pad	-	Pad size 0.81mm*0.81mm, 50Ω characteristic impedance

3. Size and Pin Definition

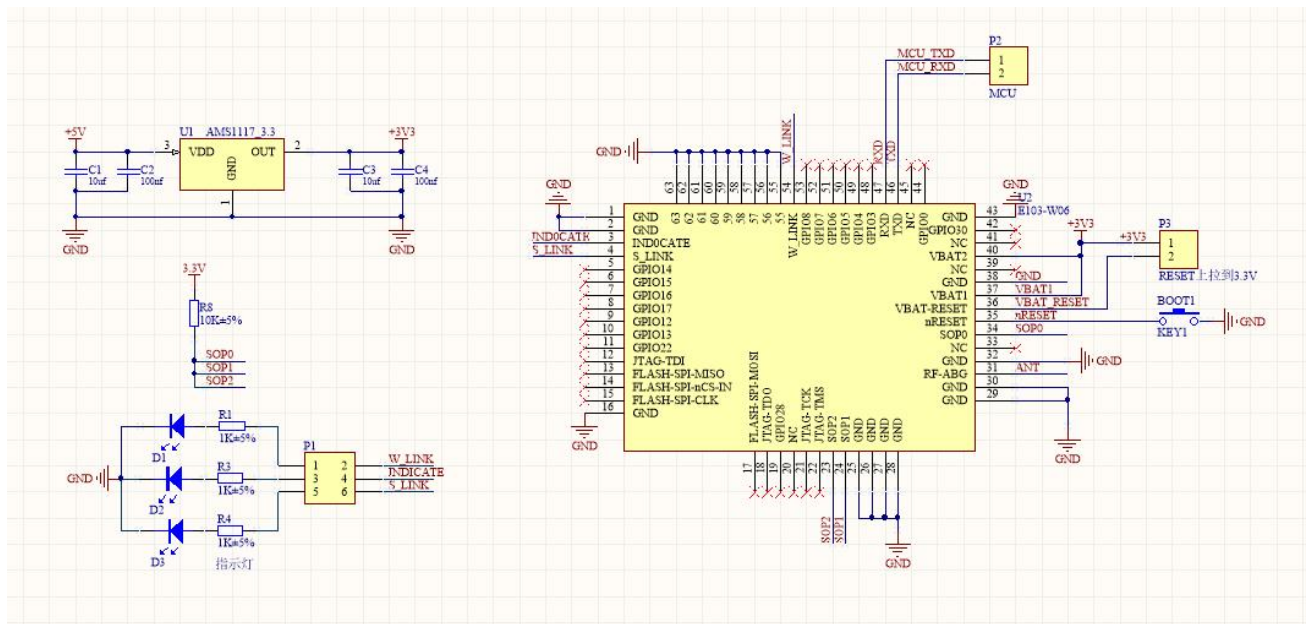


Pin No.	Pin name	Pin type	Pin No. Corresponding to CC3235S	Pin application
1	GND	-	-	Ground wire, connected to the power reference ground
2	GND	-	-	Ground wire, connected to the power reference ground
3	INDICATE	-	1	Abnormal indication, Abnormal: High, Normal: Low. (GPIO10 of CC3235)
4	S_LINK	-	2	socket connection indication, connect: high, disconnect: low. (GPIO11 of CC3235)
5	GPIO14	I/O	5	Factory reset pin, active low. When powered on, keep the low level for about 3 seconds. No need to reboot again.
6	GPIO15	I/O	6	General IO port
7	GPIO16	I/O	7	General IO port
8	GPIO17	I/O	8	General IO port
9	GPIO12	I/O	3	General IO port
10	GPIO13	I/O	4	WAKEUP wakeup pin
11	GPIO22	I/O	15	General IO port
12	JTAG_TDI	I/O	16	JTAG emulation pin, JTAG TDI input; not connected if not used
13	FLASH_SPI_	I	-	External serial FLASH programming interface: SPI data input

	MISO			
14	FLASH_SPI_nCS_IN	I	-	External serial FLASH programming interface: SPI chip select (active low)
15	FLASH_SPI_CLK	I	-	External serial FLASH programming interface: SPI clock
16	GND	-	-	Ground wire, connected to the power reference ground
17	FLASH_SPI_MOSI	O	-	External serial FLASH programming interface: SPI data output
18	JTAG_TDO	I/O	17	JTAG emulation pin, JTAG TDO output; can not be connected if not used
19	GPIO28	I/O	18	General IO port
20	NC	I/O	-	Do not connect pins, users don't need to care
21	JTAG_TCK	I/O	19	JTAG emulation pin, JTAG TCK input; if not used, it can not be connected; the module has a built-in 100K pull-down resistor.
22	JTAG_TMS	I/O	20	JTAG emulation pin, JTAG TMS input; not connected if not used.
23	SOP2	-	21	The SOP2 pin has a built-in 100K pull-down resistor; when using, an external pull-up resistor 10K is required to pull the pin level high.
24	SOP1	-	34	The SOP1 pin has a built-in 100K pull-down resistor; when using, an external pull-up resistor 10K is required to pull the pin level high.
25	GND	-	-	Ground wire, connected to the power reference ground
26	GND	-	-	Ground wire, connected to the power reference ground
27	GND	-	-	Ground wire, connected to the power reference ground
28	GND	-	-	Ground wire, connected to the power reference ground
29	GND	-	-	Ground wire, connected to the power reference ground
30	GND	-	-	Ground wire, connected to the power reference ground
31	RF_ABG	I/O	31	2.4G/5G RF input and output
32	GND	-	-	Ground wire, connected to the power reference ground
33	NC	-	-	Do not connect pins, users don't need to care
34	SOP0	-	35	The SOP0 pin has a built-in 100K pull-down resistor; when using it, an external pull-up resistor of 10K is required to pull the pin level high.
35	nRESET	I	32	The nRESET pin has a built-in 100K pull-up resistor to the VBAT_RESET pin. Note: VBAT_RESET is not connected to VBAT1 or VBAT2 inside the module. The following connection methods are recommended: 1. Connect nRESET to a switch, external controller, or host only if nRESET will be in a defined state under all operating conditions. Leave VBAT_RESET unconnected at this time to save power. 2. If nRESET cannot be in a defined state under all operating conditions, connect VBAT RESET to the module mains (VBAT1 and VBAT2). The leakage current is expected to be (3.3 V/ 100 kΩ) mA due to the internal pull-up resistors.
36	VBAT_RESET	-	-	
37	VBAT1	Power	37, 39	Module power positive reference, voltage range 2.3 V to 3.6 V. Note:

				The module is not connected to VBAT2, it needs to be short-circuited with Pin 40 VBAT2 when using it; see the recommended connection diagram in Chapter 4 for details.
38	GND	-	-	Ground wire, connected to the power reference ground
39	NC	-	-	Do not connect pins, users don't need to care
40	VBAT2	Power	10, 44, 54	Module power positive reference, voltage range 2.3 V to 3.6 V. Note: The module is not connected to VBAT1, and it needs to be shorted to Pin 37 VBAT1 when using it; see the recommended connection diagram in Chapter 4 for details.
41	NC	-	-	Do not connect pins, users don't need to care
42	GPIO30	I/O	53	General IO port
43	GND	-	-	Ground wire, connected to the power reference ground
44	GPIO0	I/O	50	General IO port
45	NC	-	-	Do not connect pins, users don't need to care
46	TXD	-	55	TTL serial output, connect to external RXD input pin (GPIO1 of CC3235)
47	RXD	-	57	TTL serial input, connect to external TXD output pin (GPIO2 of CC3235)
48	GPIO3	I/O	58	General IO port
49	GPIO4	I/O	59	General IO port
50	GPIO5	I/O	60	General IO port
51	GPIO6	I/O	61	General IO port
52	GPIO7	I/O	62	General IO port
53	GPIO8	I/O	63	General IO port
54	W_LINK	-	64	wifi connection indication, connect: high, disconnect: low. (GPIO9 of CC3235)
55	GND	-	-	Ground wire, connected to the power reference ground
56	GND	-	-	Ground wire, connected to the power reference ground
57	GND	-	-	Ground wire, connected to the power reference ground
58	GND	-	-	Ground wire, connected to the power reference ground
59	GND	-	-	Ground wire, connected to the power reference ground
60	GND	-	-	Ground wire, connected to the power reference ground
61	GND	-	-	Ground wire, connected to the power reference ground
62	GND	-	-	Ground wire, connected to the power reference ground
63	GND	-	-	Ground wire, connected to the power reference ground

4 Recommended Wiring Diagram



Notice:

- 1、 The power supply must be guaranteed to be 2.3V~3.6V. In order to ensure the stable operation of the module, it is recommended to select an external LDO with a power supply capacity greater than 500mA.
- 2、 Pin 40 VBAT2 and Pin 37 VBAT1 inside the module are not connected, and need to be short-circuited with Pin 37 VBAT1 when using.
- 3、 RXD/TXD of E103-W06 are connected to MCU_TXD/MCU_RXD of external MCU respectively.
- 4、 nRESET pin has built-in 100K pull-up resistor to VBAT_RESET pin. Note: VBAT_RESET is not connected to VBAT1 or VBAT2 inside the module. When the module is working, it is necessary to connect VBAT_RESET to VBAT1 or VBAT2, otherwise it will not work properly. If you need lower overall power consumption during low power consumption, you can disconnect VBAT_RESET and connect it to NBAT1 or VBAT2 when working.
- 5、 If you need to use the data transmission function of this module, you need to connect the SOP1 pin to a 10K pull-up resistor when powering on, and SOP0 and SOP2 to connect to a pull-down resistor. . Otherwise it won't work.
- 6、 If secondary development is required, please refer to the relevant development manual of CC3235SF for the connection method of SOP0, SOP1 and SOP2 pins, and select the mode by yourself.

5. Function Description

The working mode of this module is divided into three levels: working role; transmission mode; service category. From the role of the WiFi layer, it can be divided into Access Point, commonly known as AP access point, Station, commonly known as site, WiFi-Direct, also known as P2P or WiFi direct connection; in terms of transmission mode, it is divided into single Modular transparent transmission and protocol transmission; from the service category, it is divided into TCP Server, TCP Client, UDP, MQTT, HTTP client.

5.1 Job role

Job roles are defined from the perspective of the WiFi physical layer.

5.1.1 Access Point(AP model)

Access Point is referred to as AP mode, which is similar to a router, allowing wireless devices to connect and establish TCP/IP-based server, client, and UDP communications. In this mode, 4 stations can be connected, and a maximum of 4 TCP socket transmissions are supported. Command `AT+MODE=1,x,x` set the first bit as: 1, to configure the module to work in the AP role.

5.1.2 Station(STA model)

Station mode is abbreviated as STA. In this role, the module does not provide connection and can only connect to an Access Point or a router. This module supports TCP server, TCP client, and UDP in the Station role, and supports a maximum of 4 sockets. Also supports MQTT, WebSocket, HTTP client. The command `AT+MODE=2,x,x` sets the first bit as: 2, to configure the module to work in the STA role.

5.1.3 WiFi Direct(P2P model)

WiFi Direct mode is a way to directly establish a point-to-point connection without routing, also known as P2P, which is similar to Bluetooth but the transmission rate is significantly higher than that of Bluetooth. Command `AT+MODE=3,x,x` set the first bit as: 3, to configure the module to work in WiFi Direct mode.

There are two roles in P2P mode: Client; GroupOwner.

5.2 Transfer mode

To be precise, the transmission mode refers to the number of sockets supported by the module under the TCP/IP protocol. When only one socket is supported, we define it as single-mode transparent transmission, and when it supports multiple channels, we define it as protocol transmission. It should be noted that the transmission mode parameter does not take effect on WiFi-Direct.

5.2.1 Transparent transmission

Transparent transmission means that when only one socket is supported, data from either the serial port or the network is sent directly without any format. Command `AT+MODE=x,1,x` set the second bit to 1 to configure the module to work in transparent transmission mode.

5.2.2 Protocol transmission

When supporting multiple sockets, in order to distinguish the source and destination of data, we define it as a protocol transmission, which includes specified sending and broadcast sending.

5.2.2.1 Designated to send

Specifying to send means that the data packet input to the serial port contains a unique socketed ID label, and the module transmits the data to the corresponding socket connection according to this ID number.

fixed head	Socket ID	data
3 Byte	1Byte	N Byte

fixed head: 0xAA 0xFE 0x55

Socket ID:

0x00,Represents the discovery of a Socket 0 link

0x01,Delegate discovers Socket 1 link

0x02,Represents the discovery of a Socket 2 link

0x03,Represents discovery of Socket 3 link

data: Application Payload

E.g: AA FE 55 00 AA BB CC In protocol transmission mode, send AA BB CC to Socket 0 through serial port

5.2.2.2 Broadcast send

When the Socket ID is 0xff, it means broadcasting. If a 4-way connection is established, the data will be sent to the 4-way socket at the same time, otherwise the data will be sent to the established connection.

5.2.2.3 Protocol reception

fixed head	Socket ID	length	data
3 Byte	1Byte	2Byte	N Byte

fixed head:

0xAA 0xFE 0x55

Socket ID:

0x00,Represents the discovery of a Socket 0 link

0x01,Delegate discovers Socket 1 link

0x02,Represents the discovery of a Socket 2 link

0x03,Represents discovery of Socket 3 link

length:

The actual length of the application data, range: 0~1000

data:

Application Payload

E.g: AA FE 55 00 00 03 11 22 33 In protocol mode, the 3-byte data received from Socket0, the content is: 0x11 0x22 0x33

Use the command AT+MODE=x,2,x to set the second bit to configure the module to work in the protocol transmission mode.

5.3 Service mode

The service mode refers to the network protocol supported by the module and the role of the module under the network protocol, that is, the server (server) and client (client) that are often referred to. Here, UDP, MQTT, HTTP client, WebSocket, etc. are all classified into in this mode. Note that the service mode has no effect on the WiFi-Direct (P2P) role. The service model includes the following.

5.3.1 TCP server

Make the module work as a TCP server. Use the command: AT+MODE=x,x,1 to set the third bit to configure the module to work in TCP server mode.

5.3.2 TCP client

Make the module work as a TCP client. Use the command: AT+MODE=x,x,2 to set the third bit to configure the module to work in TCP client mode.

5.3.3 UDP

In UDP mode, there is no distinction between server and client. Use the command: AT+MODE=x,x,3 to set the third bit to configure the module to work in UDP mode. In addition, there is no concept of connection in UDP mode, so the S_LINK pin will not be operated in the status indication.

5.3.4 MQTT

The module supports Alibaba Cloud, Baidu Cloud, OneNet and other IoT platforms in MQTT mode. Enter the service parameters created on the platform into the module to communicate.

5.3.4.1 Ali Cloud

For network communication based on Alibaba Cloud platform, you need to log in to Alibaba Cloud to obtain relevant parameters, which mainly include product secret key, device name, client ID and other information. For details, see Chapter 7 Alibaba Cloud Configuration Tutorial.

5.3.4.2 Baidu cloud

For network communication based on Baidu cloud platform, you need to log in to Baidu cloud to obtain relevant parameters, mainly including device name, user name, password and other confidence. For details, please refer to Chapter 7 Baidu Cloud Configuration Tutorial.

5.3.4.3 Onenet

For network communication based on the OneNet cloud platform, you need to log in to OneNet to obtain relevant parameters, including device ID, product ID, authentication information, etc. For details, see Chapter 7 OneNet Configuration Tutorial.

5.3.5 HTTP Client

When using this function, you only need to configure the corresponding server resource identifier URL, and start a trigger request to get the resources responded by the server. You don't need to care about the complex HTTP protocol layer. For details, see Chapter 7 HTTP Client Configuration Tutorial.

5.3.6 WebSocket

The traditional HTTP transmission protocol is based on access and response. In this way, the server is always passive and cannot be used for applications where the web client and the web server frequently interact. The application of the WebSocket function allows the E103-W06 module to pass the serial port. Real-time interaction with the web page saves the GET and POST request process initiated by the HTTP client during multiple interactions, improves the response speed, and the module side can actively push data to the web page. For details, see Chapter 7 WebSocket Configuration Tutorial.

5.4 Parameter configuration

There are 3 ways to configure parameters: serial port-based AT command configuration, UDP-based remote AT configuration, and browser-based web page configuration. For detailed operations, see Chapter 6 AT Command Description and Chapter 7 Tutorial.

5.4.1 Serial AT configuration

When you need to use serial AT commands to configure parameters, first send "+++" to enter the AT mode, and then operate according to the AT commands in Chapter 6. After the configuration is completed, some commands will take effect immediately, and some commands will take effect after restarting, according to the AT command chapter. prevail. To exit the AT mode, send the command: AT+EXAT. Anytime sending "+++" command will enter AT mode. But AT+EXAT can only be used in AT mode, otherwise it is used as transmission data.

For specific AT commands, please refer to "E103-W06 AT Command Manual".

5.4.2 UDP Remote configuration

UDP remote configuration is a parameter configuration performed by using a network debugging tool under the same network, which can also be called over-the-air configuration. There are two ways to enter into the remote configuration: when the module is in AP mode, the PC is connected to the module; when the module is in STA mode, the PC and the module are connected to the same router. The module will always listen to a fixed UDP port 8009. When the module and the terminal are in the same network, the parameters can be configured by setting the corresponding IP and port. The remote configuration must be in AP mode or STA mode and can only be performed after a network connection has been established. P2P mode does not support this function.

5.4.3 Browser-based web configuration

The web configuration must ensure that the PC and the module are in the same local area network. There are two ways to enter the web configuration: the module is in AP mode, and the PC is connected to the module; the module is in STA mode, and the PC and the module are connected to a router. The PC accesses the IP address of the module through a browser, and accesses a static web page for parameter configuration.

For versions after 7270-0-13, you can switch to the English configuration interface in the upper right corner.

5.5 Status indication

Status indication is to display the working status of the module through serial port printing or pin output level status.

Serial port instruction: print "enter AT mode" when entering the AT command, print "break AT mode" when exiting the AT command, print "ERR=x" when the AT command is wrong, return the set value if the AT command is correct.

The pin indication includes WiFi connection status indication, socket connection status indication and module abnormal indication. When the WiFi connection is established, the W_LINK pin outputs a high level, and if the connection is disconnected, the W_LINK pin outputs a low level. When the socket connection is established, S_LINK outputs a high level, and if the connection is disconnected, S_LINK outputs a low level.

The INDICATE pin remains low when the module is working normally. If the module has an abnormal INDICATE pin outputting a high level, the module needs to be restarted at this time.

5.6 Low power consumption

The low power consumption of the module enables the module to enter the sleep state through command operation. After entering the sleep state, it can be woken up through the pin. The wake-up method is to recommend a rising edge of more than 200ms to WAKEUP (ie GPIO_13), Or the serial port receives data.

5.7 3M high-speed transmission

Regarding high-speed continuous transmission, the following issues need to be paid attention to:

- 1、 The serial port chip must be a model that can support 3M baud rate. The company's test baseboard uses CP2102 series
- 2、 The serial port assistant software must be able to support 3M baud rate, the company's test software is XCOM2.6
- 3、 The connection between the module and the PC should not go through the USB converter, but directly connect to the USB3.0 port of the PC, otherwise it is easy to lose packets

5.8 Heartbeat package, registration package

Heartbeat package registration package is a function only in TCP client mode. This module supports custom heartbeat package data and registration package data content.

5.9 Modbus protocol

This module supports Modbus protocol and can realize free conversion between RTU and TCP. When in use, you only need to pass in the data from the serial port, the module will automatically identify and convert it into data that conforms to the Modbus specification and upload it to the network. Or convert the received network data into data that conforms to the Modbus specification and output from the serial port.

requires attention:

- 1、 The Modbus supported by this module is only for data conversion and does not support actual functional operations. If you need to use this part of the function, please cooperate with the actual PLC equipment.
- 2、 If the Modbus function is enabled, the protocol transmission is invalid, that is, the protocol transmission is no longer data with a fixed format, and will be converted into data that conforms to the modbus protocol standard.
- 3、 Only the TCP server, TCP client, UDP, MQTT, WebSocket and P2P modes support the Modbus protocol, but the HTTP client does not. The reason is that because the HTTP client is a short-connection communication method, the server cannot actively initiate data exchange.

5.10 Static IP

In STA mode, it can support setting static IP, which is convenient to realize the communication of fixed IP. It should be noted that the static IP address must be in the same network segment as the target router or target AP, otherwise the IP address cannot be assigned and it cannot work properly. For example, the target AP address is 10.123.45.1, then the static IP address must be set to 10.123.45.x. Otherwise, the IP address cannot be assigned normally, and the module cannot work. Static IP related parameters can only be set or queried in STA mode, other modes do not support corresponding AT commands.

5.11 Pin reset to factory parameters

This module will only actively detect the level state of the GPIO14 pin within 3 seconds when it is powered on. If it is low, it will restore the parameters to the factory default parameters. There is no need to restart when using, and the GPIO14 pin will be set to low level after the parameters are restored successfully.

5.12 Scan nearby AP information

When the module works in STA mode, you can use AT commands to scan the AP information nearby, if there is, the AP information will be printed out through the serial port, the format is as follows:

Fixed head	SSID	MAC(BSSID)	Channel	Rssi
+scan:	up to 32 bytes	17 bytes	max 3 bytes	max 3 bytes
+scan:	TEST_ZW	14:AD:CA:AA:91:D6	4	-69

- 1、 Scanning for nearby APs only takes effect in STA mode, the connection mode is manual connection, and the wifi connection is not established, otherwise it will return ERR=-5, indicating that this operation is not supported in this state.
- 2、 Each parameter is separated by a comma ',' and terminated by a carriage return line feed (\r\n). The MAC addresses (BSSID) are separated by semicolon ';'. The difference between 5G and 2.4G is in the channel, the channel of 2.4G is [1, 13], and the channels greater than 13 are all 5G channels.
- 3、 APs that scan the 5G band need to enable 5G, otherwise the module can only scan AP information in the 2.4G band.
- 4、 A single time can scan a maximum of 30 AP information.

5.13 Default parameters

Parameter category	Parameter name	Parameter value	Related instructions
serial port	baud rate	115200	AT+UART
	digit	8	
	stop bit	1	
	parity	none	
	serial port timeout	40 (ms)	
	Serial frame length	1000	
RF parameters	working frequency	2.4G	AT+RADIO
	channel	1	
	transmit power level	0	
	CountryCode	CN	
AP role SSID parameter	SSID	E103-W06-V1.0	AT+SSID
	Whether to hide SSID	0 (no)	
	encryption type	2 (WPA2)	
	password	12345678	
Operating mode	job role	1	AT+MODE
	transfer mode	1	
	service mode	1	
network IP address	IP address	10.145.45.1	AT+NETIP
	subnet mask	255.255.255.0	
	gateway address	10.145.45.1	
	server address	10.145.45.1	

P2P connection parameters	P2P Scanning Gap		20	AT+P2PDEVINFO
	P2P role		0 (client)	
	P2P local name		E103-W06WiFiDirectClient	
	P2P target name		E103-W06WiFiDirectGo	
P2P socket	P2P port		4001	AT+P2PSOCKET
	P2P address		10.145.45.1	
STA connection parameters	target SSID		E103-W06	AT+STACON
	encryption type		2	
	password		ebytw06	
	Connection Type		1	AT+CONTYPE
local socket parameters	local port		4001	AT+SVRPORTIP
	local IP		10.145.45.1	
Remote socket parameters	Socket1	port	4001	AT+SOCKET
		IP	10.145.45.2	
	Socket2	port	4002	
		IP	10.145.45.2	
	Socket3	port	4003	
		IP	10.145.45.2	
	Socket4	port	4004	
		IP	10.145.45.2	
Heartbeat parameters	4 sockets are the same	heartbeat type	0 (closure)	AT+HEARTBT
		heartbeat timeout	5 (Unit: second)	
		Heartbeat data type	1 (string)	
		Heartbeat data	CDEBYTE-E103-W06-ST RHT	
Registration package parameters	4 sockets are the same	Registration package type	0 (closure)	AT+REGISTER
		Registration package data type	1 (string)	
		Registration package data	CDEBYTE-REGISTER-PACK-STR	
NTP time	NTP timezone offset		480 (unit: minutes) Beijing time	AT+NTPTIME
Modbus	Modbus enabled		0 (close Modbus)	AT+MODBUS
static IP	IP address		10.145.45.2	AT+IPSTATIC
	subnet mask		255.255.255.0	
	gateway address		10.145.45.1	
	server address		10.145.45.1	

6. Use Tutorial

This module has many functions, you need to configure relevant parameters before using it, and then it can work normally.

In the following tutorials, the operations added with * are the operations that must be performed. Please set them according to your own needs when using other modes. For specific AT command description, please refer to Chapter 6.

6.1 Basic TCP/UDP data transfer

Why is it called basic TCP/UDP data transmission, because this data transmission is based on the transport layer under the TCP/IP protocol, which is the most basic data transmission layer. The data at this layer is not carried out by protocols such as MQTT and HTTP. complex network packets. Learn more about this piece by yourself.

Both the AP role and the STA role support data transmission, provided that the required selection ensures that the module and the target are in the same local area network. There are only some differences between AP mode and STA mode. For example, AP mode supports multi-connection protocol transmission. In AP mode, it is not necessary to set the remote IP address in advance. This tutorial is based on the AT command of the serial port. The operations with * in each step are necessary operations, and those without * are unnecessary operations that can be omitted. Operation after opening the serial port debugging assistant.

Data transmission is further divided into: data transmission with PC, data transmission with module.

6.1.1 Communication with PC

6.1.1.1 Communication with the PC's TCP server in the AP role

This is just an example. The other two communications in TCP mode also refer to this example (TCP server, UDP). You can set different modes through the AT+MODE command.

1、Set the module role: AP, transmission mode: transparent transmission, service mode: TCP server;

AT+MODE=1,1,1

2、Configure SSID related parameters (SSID is commonly known as WiFi name):

AT+SSID=0,E103-W06-TEST,2,12345678.

3、Set working frequency:

AT+RADIO=1,36,0,0,CN

4、Set IP address:

AT+NETIP=192.168.1.111,255.255.255.0,192.168.1.31,192.168.1.31

5、set port number:

AT+SVRPORTIP=4001



6、*After configuring the parameters, restart the module, find the WiFi with the SSID (WiFi hotspot name) set in the second step called E103-W06-TEST on the PC side, and enter the secret connection



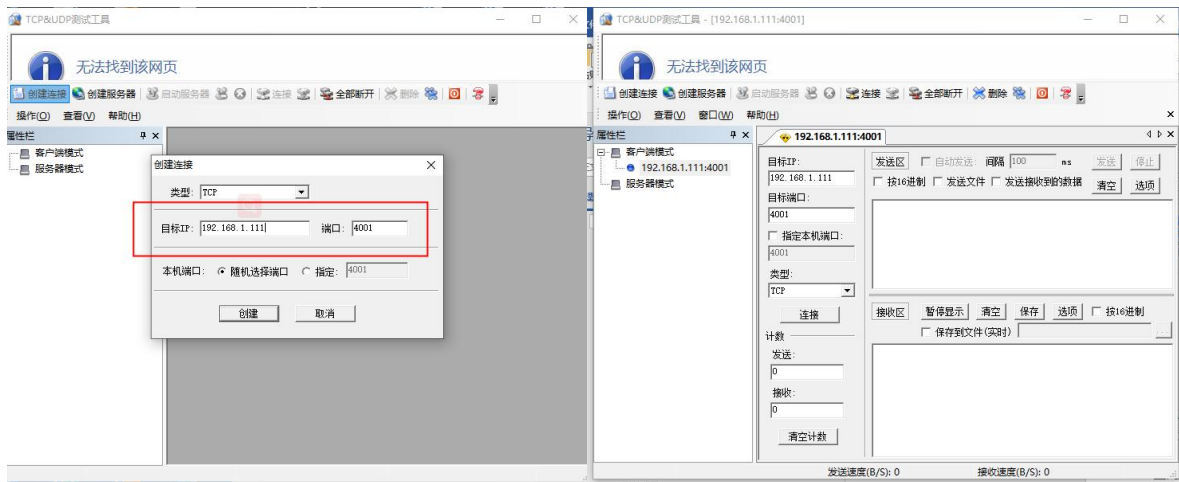
7、*After the connection is successful, query the local IP and local port:

AT+ SVRPORTIP?

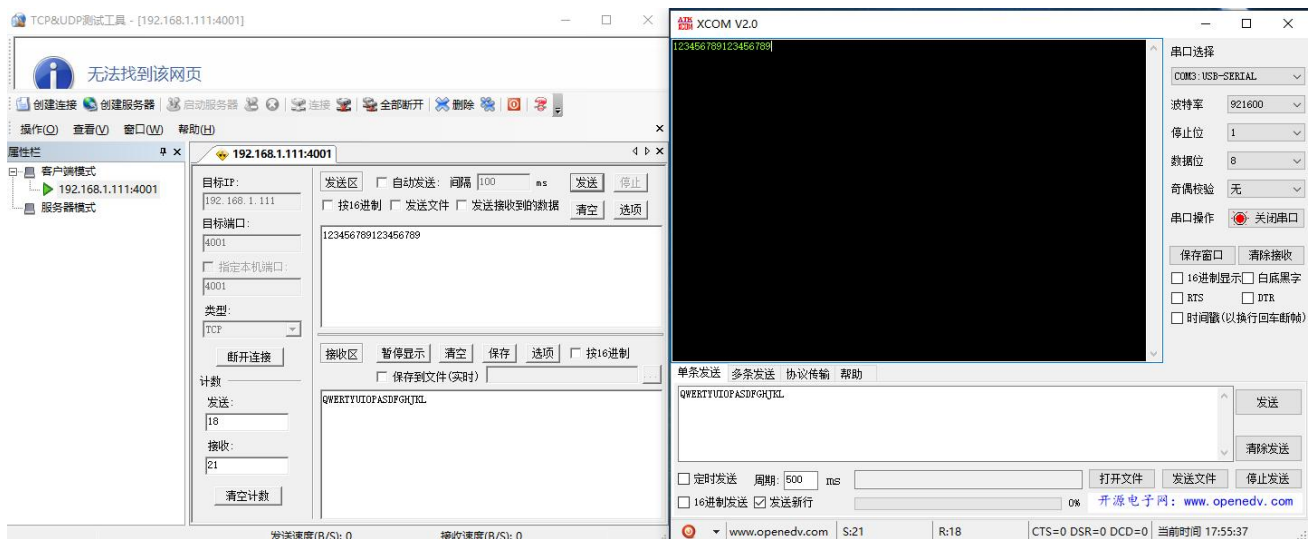
get returned as follows: AT+SVRPORTIP=4001,192.168.1.111



8、*Open the TCP debugging assistant, because the module is a server, so create a client here, and enter the corresponding IP and port information in step 7, as shown in the figure:



9、*Communication, you need to pay attention before communication if the module is in AT mode, you need to exit the AT command, AT+EXAT.



So far, the data transmission based on AP mode is completed.

Other transmission modes and service modes are set by themselves based on this.

6.1.1.2 The STA role communicates with the PC's TCP client

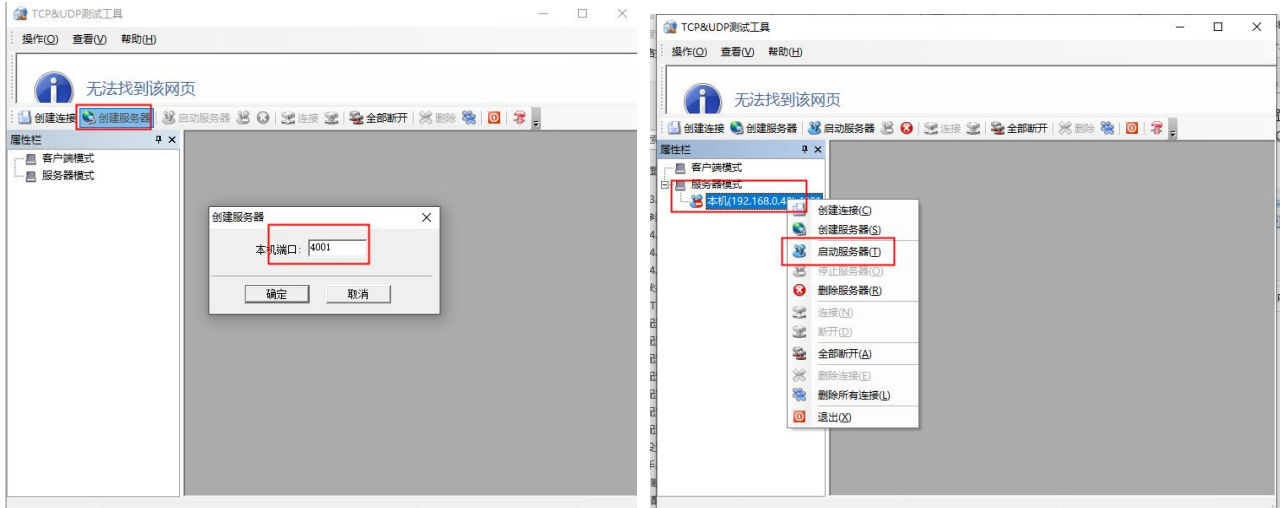
In order for the module to communicate with the PC in the role of STA, it is necessary to ensure that the PC and the MO block are in the same local area network. Here, the method of mobile phone hotspot is used as a tutorial, and a router can also be used. The other two TCP servers and UDP of STA also refer to this process, and you can set different modes through the AT+MODE command.

1、*Turn on the mobile phone hotspot, connect the PC to the hotspot, and find the IP address assigned to the PC by the hotspot. This step is very important. If the IP address is incorrect, communication will not be possible. (can also be connected to a router).

IP地址

192.168.43.64

2、*Open the TCP debugging assistant, create a TCP Server server, enter the port number set in the second step, and start the server:



3、*Set the communication port, IP address (this step is very important, if the IP address is incorrect, communication will not be possible), refer to the instruction: configure, read SOCKET port, IP address:

AT+SOCKET=0,4001,192.168.43.64

4、*Set the module role: STA, transmission mode: transparent transmission, service mode: client client

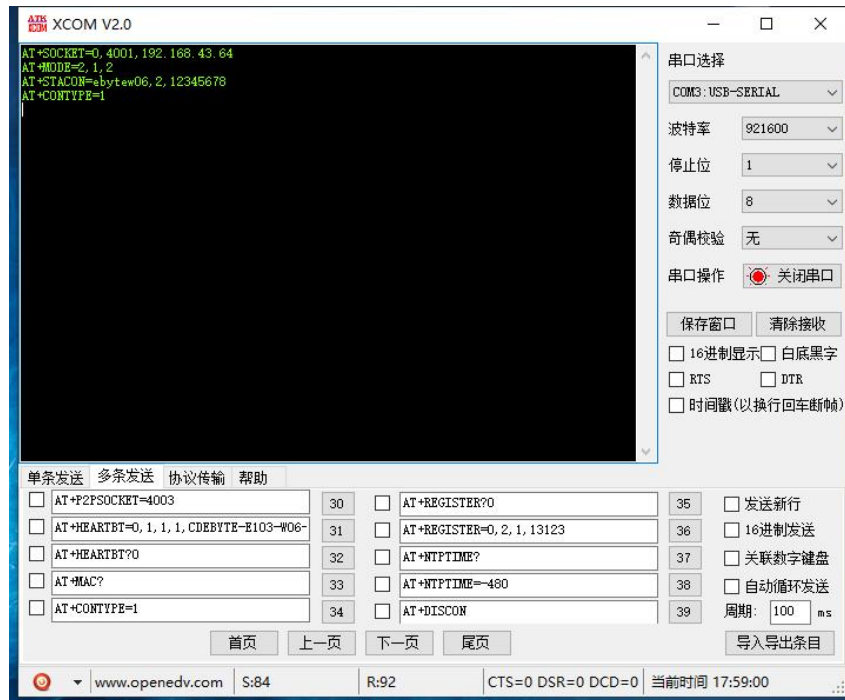
AT+MODE=2,1,2

5、*Set the connection target parameters, the parameters here are the hotspot name, password and encryption method set in the first step:

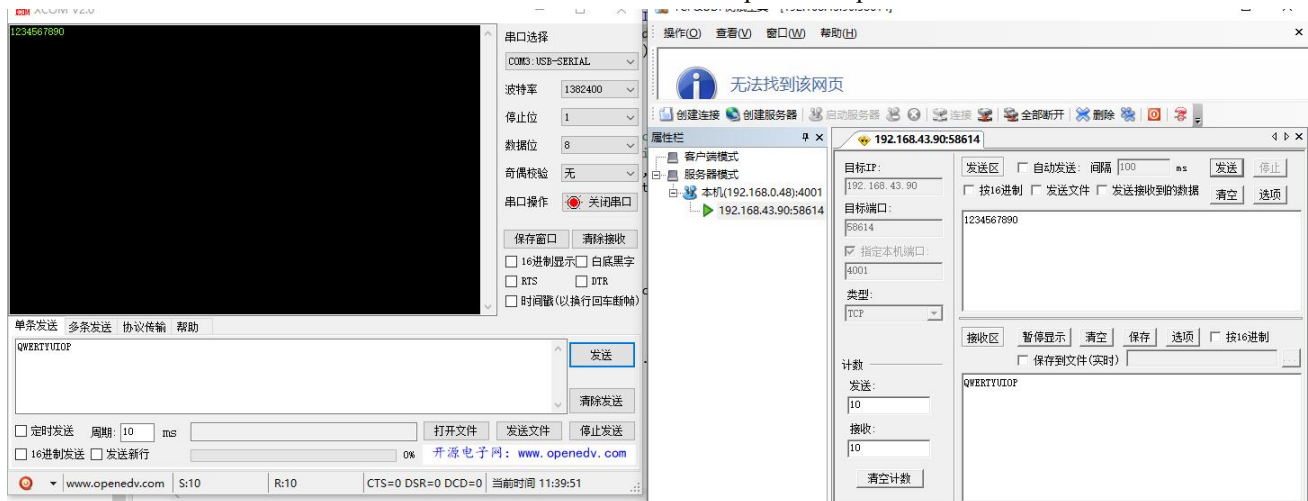
AT+STACON=ebytew06,2,12345678

6、*Set the connection method (connection is divided into manual, automatic, smartconfig), here select automatic connection:

AT+CONTYPE=1



7、Restart the module and wait for the module to connect to the hotspot and Tcp Server for data transmission



So far, the communication with the PC under the STA role has been established.

Note: Some mobile phones may not have data forwarding function due to their own technical reasons, so you need to pay attention.

6.1.1.3 UDP protocol transmission in AP role

This example will demonstrate protocol transmission in AP mode.

1、* Set Role: AP, Transmission Mode: Protocol Transmission, Service Type: UDP

AT+MODE=1,2,3

2、* Set the local port number

AT+SVRPORTIP=4001

3、*Set UDP communication list, this step is to distinguish UDP data source, you can set 4 groups.

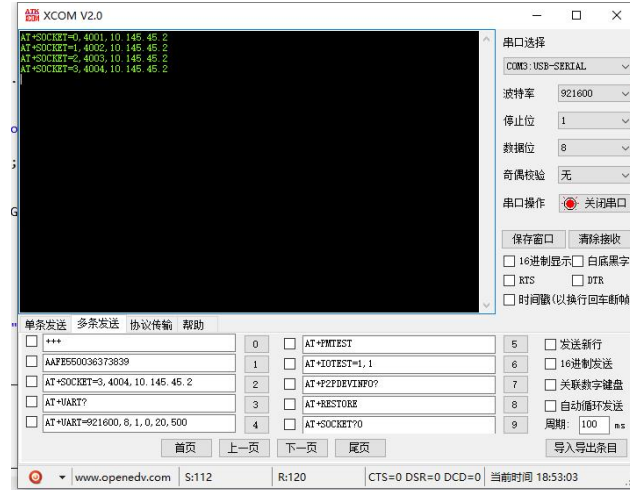
AT+SOCKET=0,4001,10.145.45.2

AT+SOCKET=1,4002,10.145.45.2

AT+SOCKET=2,4003,10.145.45.2

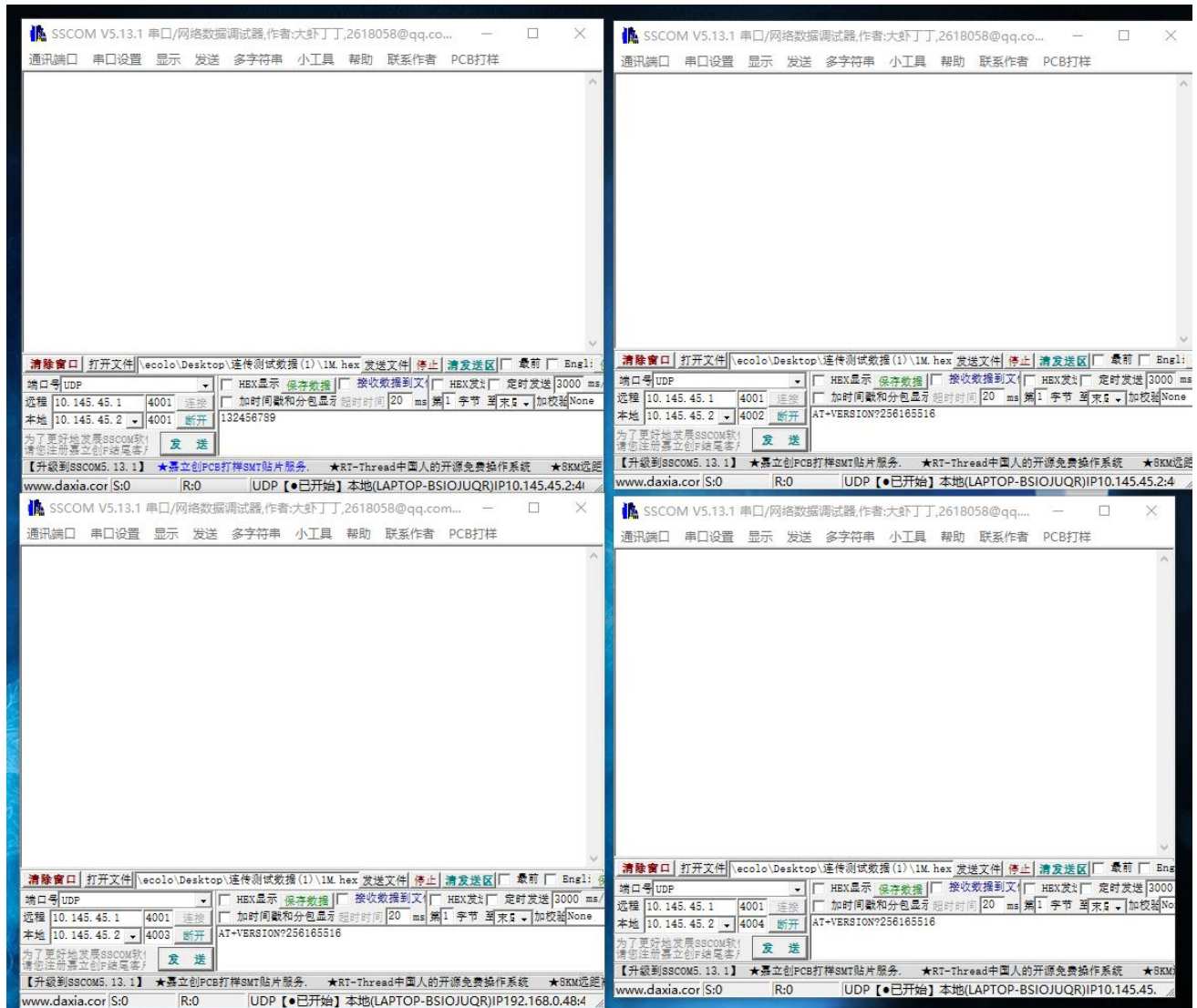
AT+SOCKET=3,4004,10.145.45.2

This is just for demonstration, the actual value can be set by itself as needed.



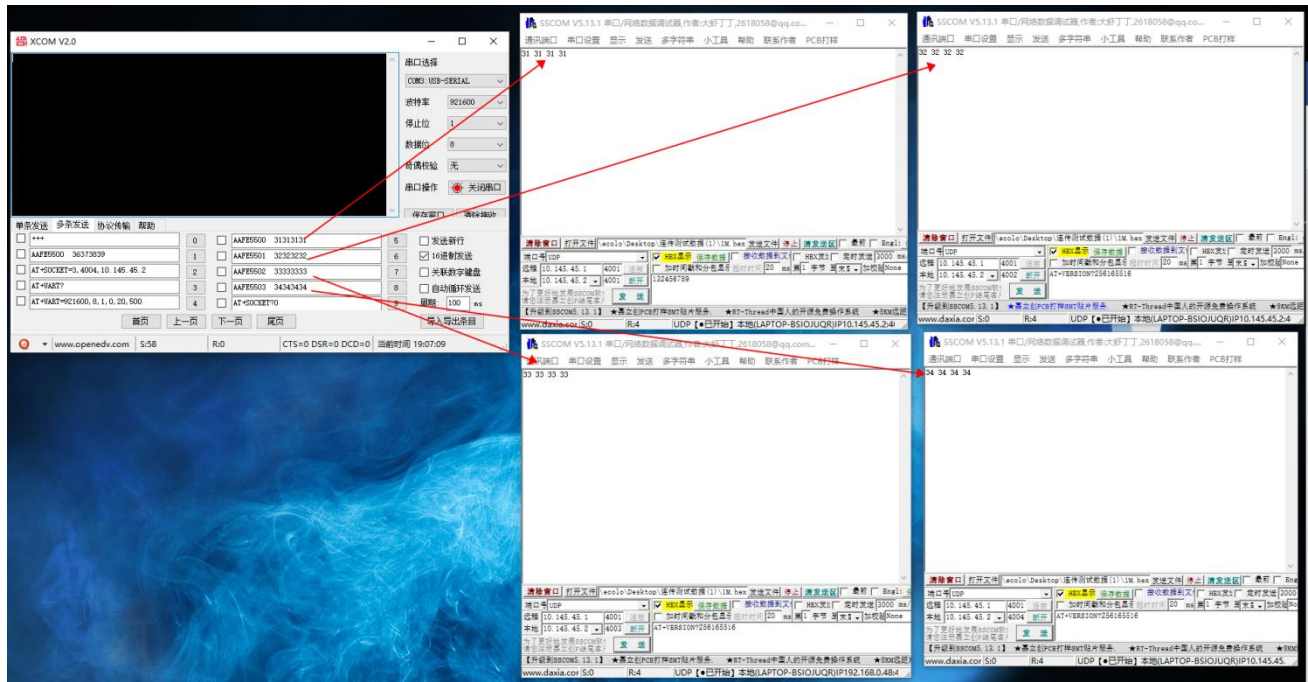
4、* Reboot the module, use a PC to connect to the module

5、* Open UDP Assistant to establish UDP communication

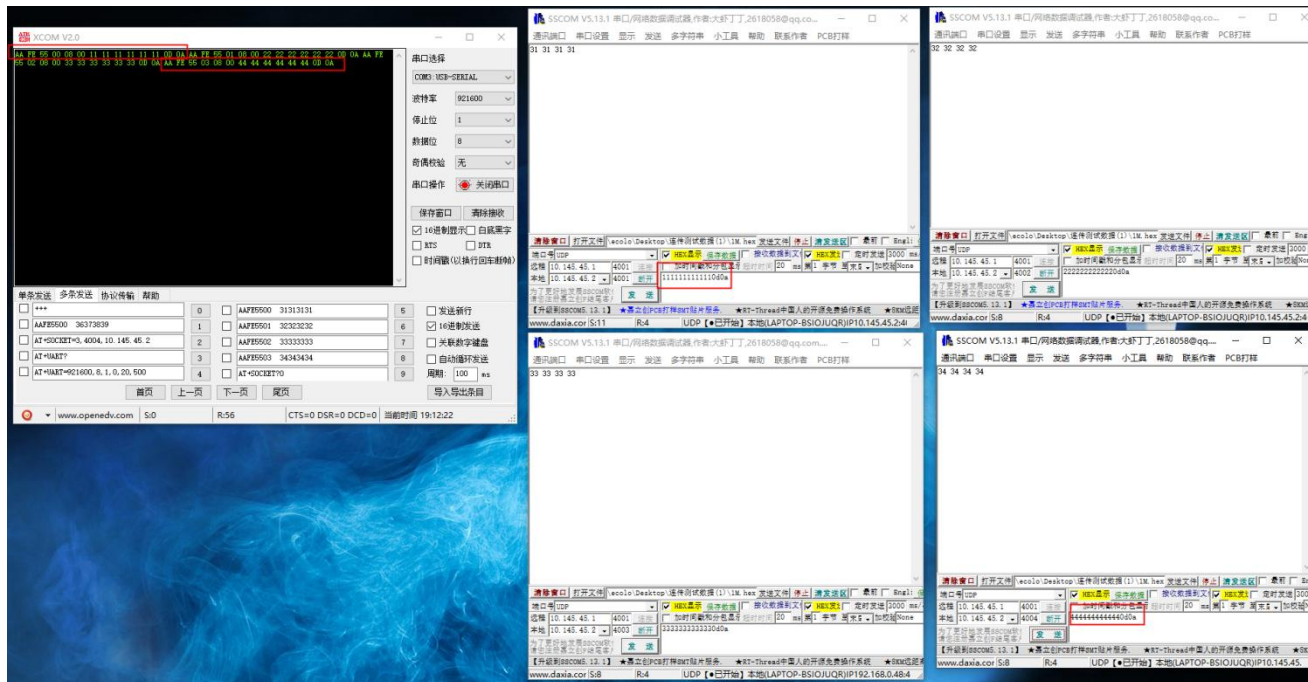


5、*Communication, because it is a protocol transmission, the data needs to be input according to the protocol transmission format when sending data on the module side, see Protocol Transmission for details. The PC side does not need to be formatted, but the module will print out the data according to the protocol format after receiving the data from the PC side.

module send:

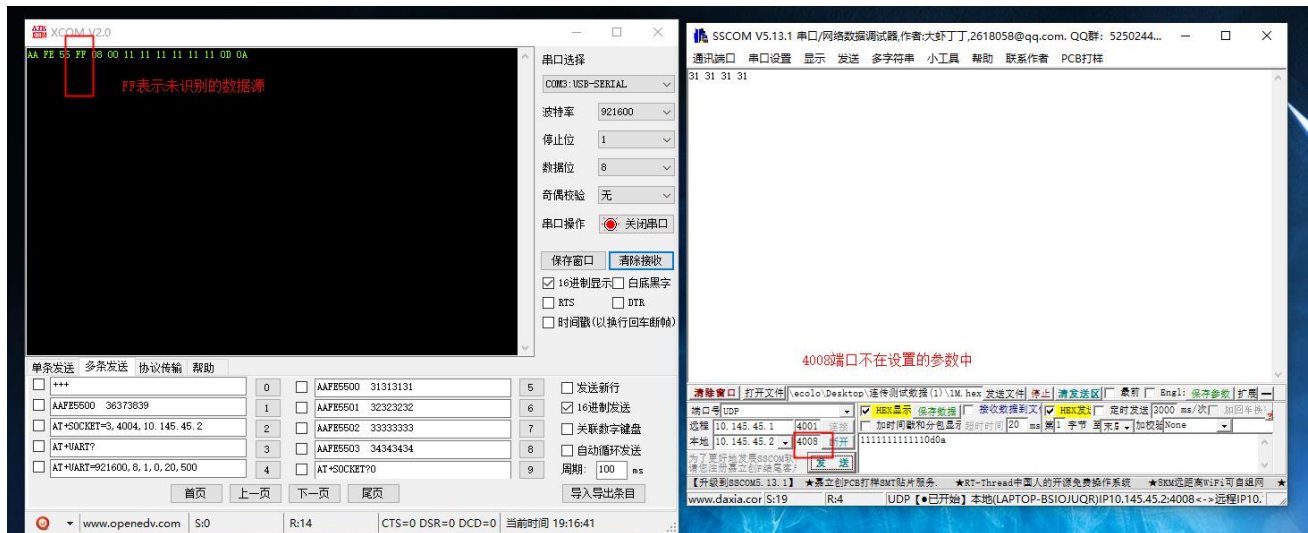


module receive:



So far, the communication between the module and the PC is completed. Both AP and STA roles support TCP server, TCP Client, and UDP. The specific combination can be used in conjunction with these three tutorials.

It should be noted that if the source address and port of the received data are not in the parameters set in the third step, the serial number spit out is 0xff, indicating an unidentified data source.



6.1.2 Communication between modules

There are three modes of communication between modules of this product: AP-STA-based communication; STA-STA communication; these two communication modes are one module as TCP server and the other as TCP client, the only difference is STA -STA way requires two modules to be connected to an external router.

Communication in P2P Mode Based on WiFi-Direct.

6.1.2.1 AP-STA TCP communication between modules

- 1、*Set the working mode, set module A as AP role and module B as STA role. It should be noted that in the TCP mode, the service mode of the module cannot be set to the same, that is to say, one of the two modules is a TCP Server and the other must be a TCP Client, otherwise the connection and communication cannot be established normally. Regarding the channel and frequency settings, because the module is dual-band 2.4G and 5.8G, it is also necessary to ensure that the frequencies of the two modules are consistent.

AP configuration:

model: AT+MODE=1,1,1

SSID: AT+SSID=0,E103-W06,2,12345678

Get the local IP: AT+SVRPORTIP? (Be sure to do this here, and then pass the parameters into the STA, otherwise it will not be able to communicate).

The return value is shown in the figure.



STA configuration:

model: AT+MODE=2,1,2

Target: AT+STACON=E103-W06,2,12345678

Set the remote IP and port. Here, the local IP obtained in the AP configuration is passed in as the remote IP of the STA.:

AT+SOCKET=0,4001,101.145.45.1

After the configuration is complete, restart the module, wait for the connection to complete, and then send data.

It should be noted that the IP address of the AP connected to the STA must be passed in before starting the STA. Otherwise, a normal network connection cannot be established.

If the AP opens the protocol transmission mode at this time, it can support connecting 4 STAs, and the configuration of the remaining STAs is the same as this.

For STA-STA communication, two modules need to be connected to the same router. Here, the SSID of the target AP is E103-W06 for demonstration.

STA1 configuration process

model: AT+MODE=2,1,1

Target: AT+STACON=E103-W06,2,12345678

Configure local port: AT+SVRPORTIP=4001

Get IP address: AT+SVRPORTIP? Get return: AT+SVRPORTIP=4001,192.168.0.189

STA2 configuration process:

model: AT+MODE=2,1,2

Target: AT+STACON=E103-W06,2,12345678

Set the remote IP and port, here the IP and port obtained by STA1 are passed in:

AT+SOCKET=0,4001,192.168.0.189

Restart the module and wait for the connection to complete before communicating.

6.1.2.2 UDP communication between modules

UDP is a communication that does not establish a connection, the core is IP address and port. This way to communicate one as AP and the other as STA.

1、 Configure the AP module:

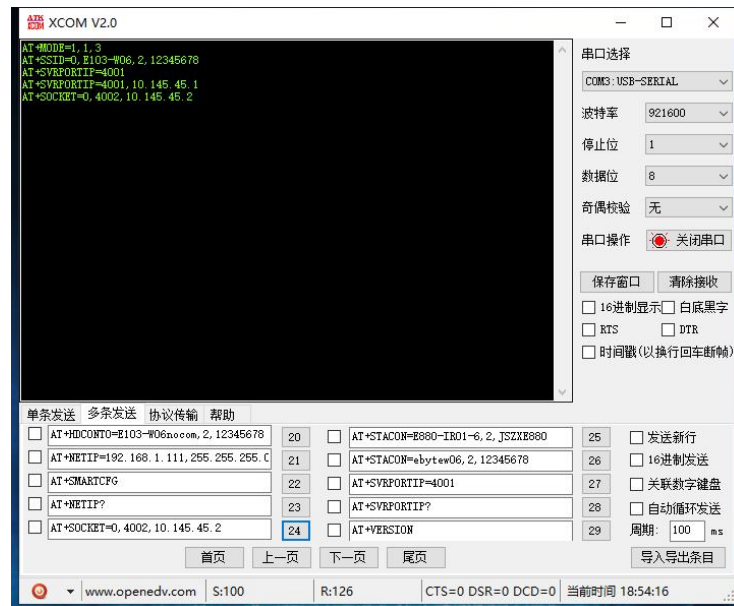
set mode: AT+MODE=1,1,3

set SSID: AT+SSID=0,E103-W06,2,12345678

set local port: AT+SVRPORTIP=4001

Get the local port local IP: AT+SVRPORTIP?. Get the return: AT+SVRPORTIP=4001,10.145.45.1

set remote port set remote ip: AT+SOCKET=0,4002,10.145.45.2



2、 Configure the STA module:

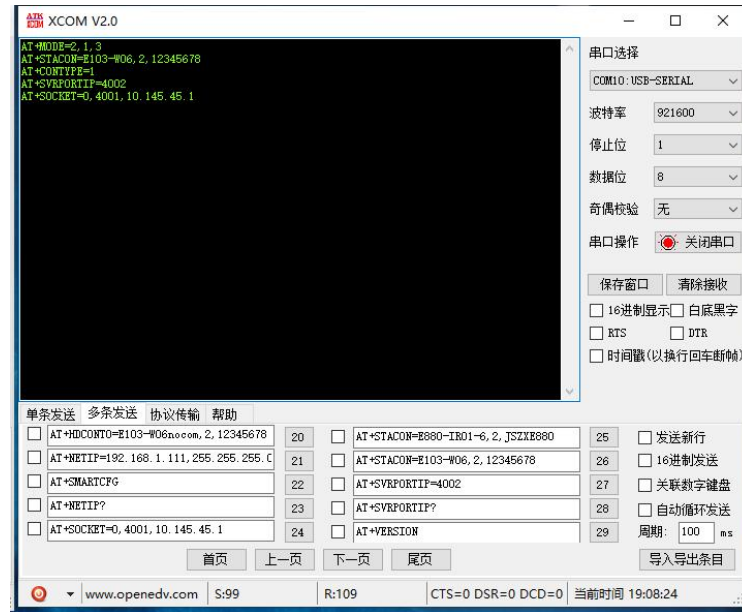
set mode: AT+MODE=2,1,3

Set target SSID: AT+STACON=E103-W06,2,12345678

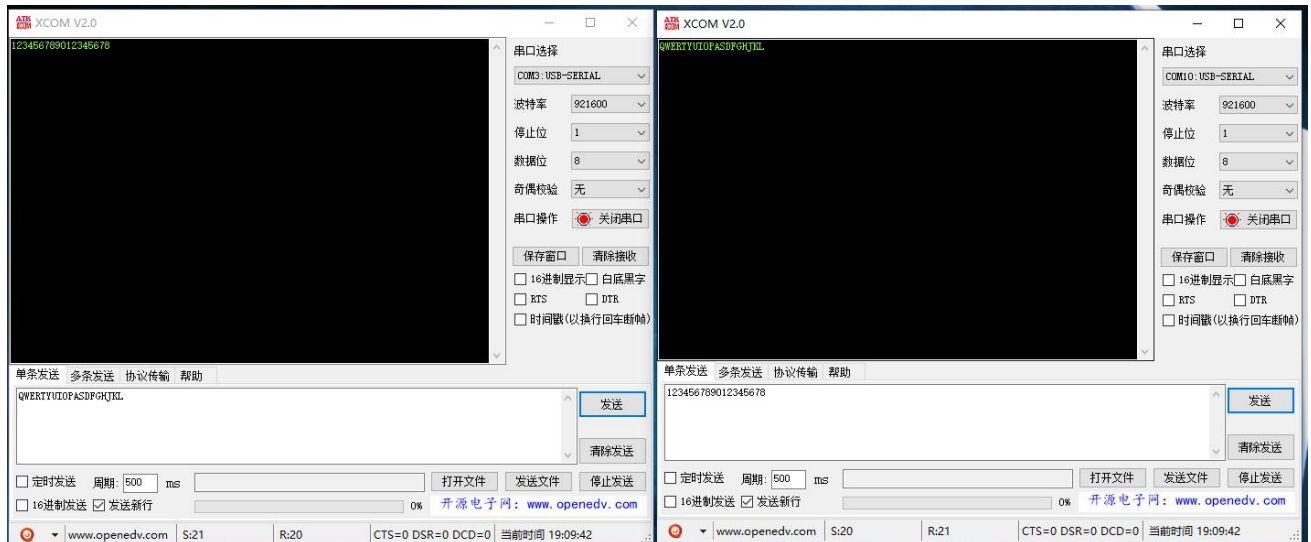
Set the connection method: AT+CONTYPE=1

Set the local port: AT+SVRPORTIP=4002 (note that the local port here is the remote port in the previous step).

Set the remote port remote IP: AT+SOCKET=0,4001,10.145.45.1 (the remote port IP here is the local port IP in the previous step).



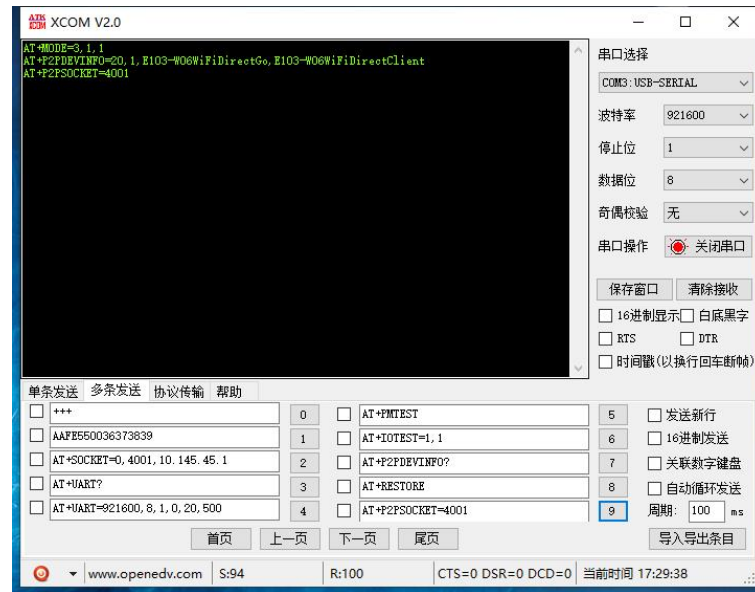
3、* Restart the module, wait for connection, communicate.



6.1.2.3 P2P communication with WiFi-Direct

WiFi-Direct is a point-to-point connection, and the configuration process is as follows when using it.

- 1、* First configure to P2P mode, two modules send AT commands at the same time: AT+MODE=3,1,1
- 2、*Then select one of the modules and configure it as GroupOwner, and send commands to set connection parameters (see Configuration, Read WiFi-Direct (P2P) connection parameters for instruction descriptions):
AT+P2PDEVINFO=20,1,E103-W06WiFiDirectGo,E103-W06WiFiDirectClient
- 3、Query the socket local port and IP address (or):
AT+P2PSOCKET?

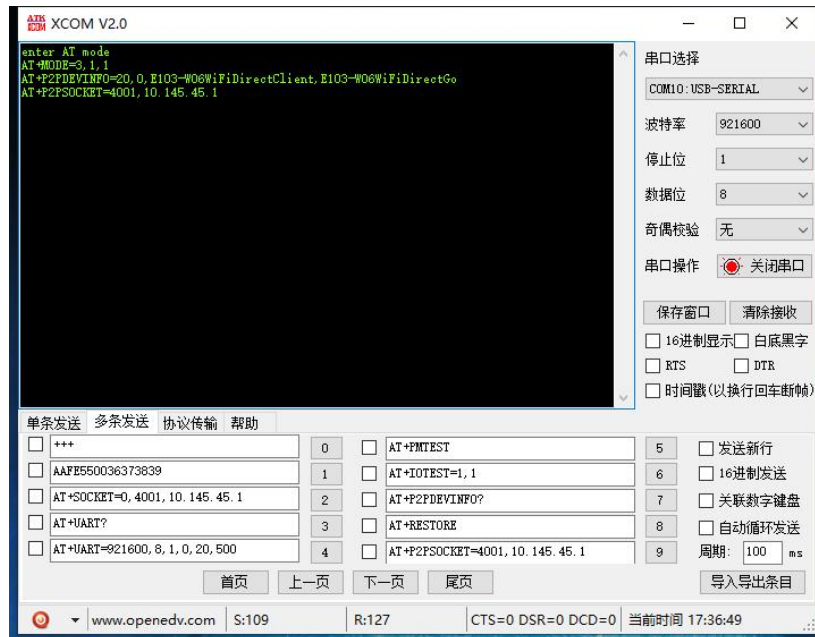


4、*Finally configure another module as Client, send commands to set connection parameters:

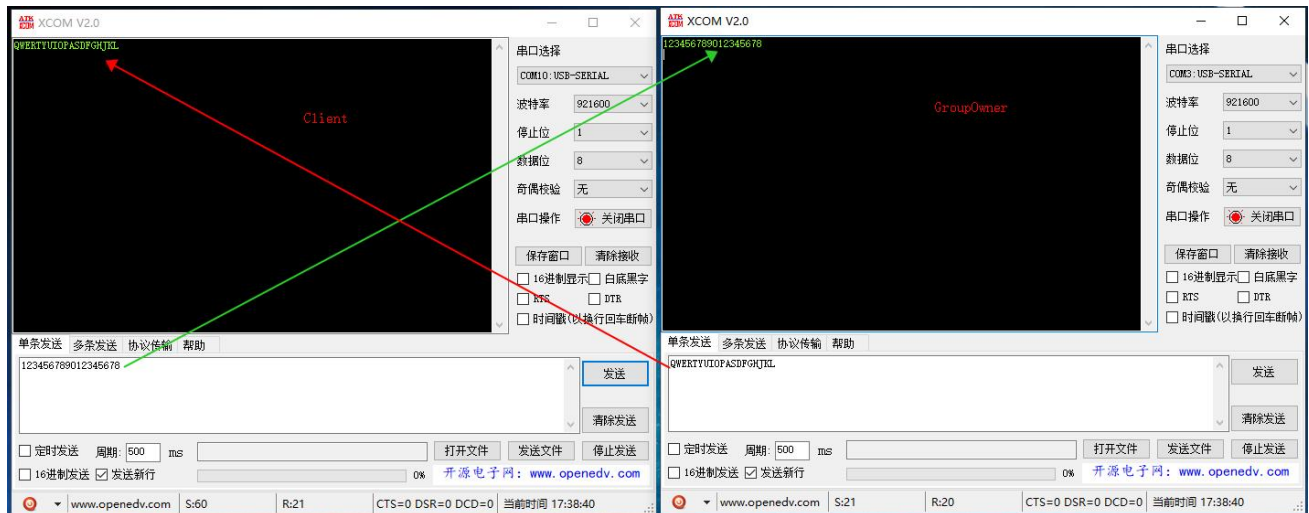
AT+P2PDEVINFO=30,0,E103-W06WiFiDirectClient,E103-W06WiFiDirectGo

5、*Configure the remote port and address, and set the IP address and port of the GroupOwner queried in the previous step to the Client (the IP address and port of this part must be obtained after querying the GroupOwner, otherwise communication cannot be established)

AT+SVRPORTIP=4001,10.145.45.1



6、*Restart and wait for the connection to be established to communicate



6.2 Telecommunication

Network communication is based on the STA role, with various cloud platforms, including MQTT-based Alibaba Cloud, Baidu Cloud, OneNet; HTTP server and WebSocket.

6.2.1 MQTT

Support three transmissions under MQTT, Alibaba Cloud, Baidu Cloud, OneNet.

The configuration process is as follows, according to the platform you use, go to register to get the relevant parameters, and finally add it in the web page window, you can also use AT commands to configure.

Special note: For users of self-built mqtt server, use this module to access, you can choose Baidu cloud or onenet, and fill in the corresponding parameters.

When the self-built mqtt server uses Baidu Cloud, the device name is both the Client ID, and the username and password correspond. When using onenet, the device ID is both the client ID, the product ID is the user name, and the authentication information is the password.

6.2.1.1 Ali Cloud

- 1、 Log in to the web page, in the mode setting menu, select Station as the job role, MQTT as the service mode, and save the settings.
- 2、 In the parameter setting menu, select Alibaba Cloud.
- 3、 Product key: In the Alibaba Cloud IoT platform console, create products and devices to obtain product keys. Such as: A1Ve0iJW6z1
- 4、 Device Name: The device name entered when adding the device. Note: Only numeric English can be input, and the input length cannot exceed 10 bytes
- 5、 Client ID: User-defined input. Note: Only numeric English can be input, and the input length cannot exceed 12 bytes

- 6、 Device key: On the Alibaba Cloud IoT platform console, create a product and device to obtain a device key. Such as: AHlmNjuaMCGJ1bFOjC4EZMZmHSUhZSEQ
- 7、 address: Domain name for accessing Ali IoT: such as: A1Ve0iJW6z1.iot-as-mqtt.cn-shanghai.aliyuncs.com
- 8、 port: Ali IoT port。 such as: 1883
- 9、 Subscribe to topics: such as: /A1Ve0iJW6z1/MQTT_TEST/user/get
- 10、 Post topic: such as: /A1Ve0iJW6z1/MQTT_TEST/user/update
- 11、 Subscribe to publish message level: Qos:0 、 Qos:1 、 Qos:2

The left screenshot shows the 'Mode Settings' (模式设置) tab. The 'Job Role' (工作角色) is set to 'Station'. The 'Service Mode' (服务模式) is set to 'MQTT'. The 'Target SSID' (目标SSID) is 'E103-W06'. The 'Local IP' (本机IP) is '10.145.45.1'. The 'Gateway Address' (网关地址) is '10.145.45.1'. The 'DNS Server' (DNS 服务器) is '0.0.0.0'. The 'Save Settings' (保存设置) button is visible.

The right screenshot shows the 'Parameter Settings' (参数设置) tab. The 'Stop Position' (停止位) is '1 bit'. The 'Baud Rate' (串口波特率) is '40'. The 'Data Length' (数据帧长度) is '1000'. The 'Socket' section is expanded, showing 'IoT Cloud' (阿里云) as the platform. The 'Product Key' (产品密钥) is 'a1Va0iJW6z2'. The 'Device Name' (设备名称) is 'E103'. The 'Client ID' (客户端ID) is '3C970E441007'. The 'Device Key' (设备密钥) is 'qHlmNjuaMCGJ1bFOar4EZMZmHSUhZSE1'. The 'Address' (地址) is 'a1Ve0iJW6z1.iot-as-mqtt.cn-shanghai.a'. The 'Port' (端口) is '1883'. The 'Subscribe Topic' (订阅Topic) is '/ebyte/E103/user/get'. The 'Publish Topic' (发布Topic) is '/ebyte/E103/user/update'. The 'Subscribe Message Level' (订阅消息等级) is 'QOS_0'. The 'Publish Message Level' (发布消息等级) is 'QOS_0'. The 'Save Settings' (保存设置) button is visible.

6.2.1.2 Baidu cloud

- 1、 Log in to the web page, in the mode setting menu, select Station as the job role, MQTT as the service mode, and save the settings.
- 2、 In the parameter setting menu, select Baidu Cloud.
- 3、 Device Name: The name entered when creating a shadow. Note: Only numeric English can be input, and the input length cannot exceed 15 bytes
- 4、 Username: The name in the shadow connection configuration. Such as: Un2d6cs/E810MQTT
- 5、 key: the key in the shadow connection configuration. Such as: s9mMzByp4Mpryphq
- 6、 Address: Domain name connected to Baidu Internet of Things. Such as: Un2d6cs.mqtt.iot.gz.baidubce.com
- 7、 port: Baidu IoT Port。 Such as: 1883
- 8、 Subscribe to topics: Such as: \$baidu/iot/general/get
- 9、 Post topic: Such as: \$baidu/iot/general/update
- 10、 Subscribe to publish message level: Qos:0 、 Qos:1 、 Qos:2

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当前状态

模式设置

参数设置

模块管理

1

工作角色: Station

工作频率: 2.4G 信道: 1 发射功率: 0dBm

服务模式: MQTT

目标SSID: E103-W06 (1~32) 连接方式: 自动

目标密码: ebyte (1~32) 加密类型: WPA2

本机IP: 10.145.45.1

网关地址: 10.145.45.1

DNS 服务器: 0.0.0.0

保存设置 不保存设置

本机IP地址:

在Station模式下,

本机IP、网关地址、

DNS相关参数不需

要设置

网关地址:

访问外网的必经之路

参数

帮助提示

当前状态

模式设置

参数设置

模块管理

停止位: 1 bit

串口超时: 40 (1~65535)ms

数据帧长度: 1000 (20~1000)

Socket

2 物联网平台: 百度云

3 设备ID: E103

4 用户名: ebyte/E103

5 密码: Z9RHzByp7MpyrLhg

6 地址: a1Ve91JW6r9-iot-as-mqtt.cn-shanghai.a

7 端口: 1883

8 订阅Topic: /ebyte/E810/user/get

订阅消息等级: QOS_0

9 发布Topic: /ebyte/E810/user/update

发布消息等级: QOS_0

10

保存设置 不保存设置

帮助提示

物联网平台参数

远程端口

服务模式在TCP

Client下, 远程端口

参数有效

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6.2.1.3 OneNet

- Log in to the web page, in the mode setting menu, select Station as the job role, MQTT as the service mode, and save the settings.
- Log in to the web page again, and select ONENET in the parameter setting menu. Note: Onenet creates products to select multi-protocol access.
- Device ID: such as: 511986588
- Product ID: such as: 286258
- Authentication information: custom input when creating a device. Such as: ebyte
- Address: The domain name for accessing the ONENET Internet of Things. Such as: mqtt.heclouds.com
- Port: ONENET IoT port. Such as: 6002
- .Subscription topic: such as: iot/general/get
- Publish the subject: such as: iot/general/update
- Subscription publish message level: Qos:0 , Qos:1 , Qos:2

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当前状态

模式设置

参数设置

模块管理

1

工作角色: Station

工作频率: 2.4G 信道: 1 发射功率: 0dBm

服务模式: MQTT

目标SSID: E103-W06 (1~32) 连接方式: 自动

目标密码: ebyte (1~32) 加密类型: WPA2

本机IP: 10.145.45.1

网关地址: 10.145.45.1

DNS 服务器: 0.0.0.0

保存设置 不保存设置

本机IP地址:

在Station模式下,

本机IP、网关地址、

DNS相关参数不需

要设置

网关地址:

访问外网的必经之路

参数

帮助提示

当前状态

模式设置

参数设置

模块管理

停止位: 1 bit

串口超时: 40 (1~65535)ms

数据帧长度: 1000 (20~1000)

Socket

2 物联网平台: ONENET

3 设备ID: 561566512

4 产品ID: 286258

5 校验信息: ebyte

6 地址: a1Ve91JW6r9-iot-as-mqtt.cn-shanghai.a

7 端口: 1883

8 订阅Topic: /ebyte/E810/user/get

订阅消息等级: QOS_0

9 发布Topic: /ebyte/E810/user/update

发布消息等级: QOS_0

10

保存设置 不保存设置

帮助提示

物联网平台参数

远程端口

服务模式在TCP

Client下, 远程端口

参数有效

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6.2.2 HTTP Client

1. Log in to the web page, in the mode setting menu, select Station as the job role, HTTP Client as the service mode, and save the settings.
2. Log in to the web page again, and fill in the HTTP server address in the parameter setting menu.
3. Enter the HTTP server port number.
4. The request method can choose post or get.
5. Select all output as the output method. All the content returned by the server is output through the serial port. If valid output is selected, the serial port only outputs valid data.
6. Enter the header URL path.
7. User-defined input protocol header, multiple items need to be added directly\r\nThe last one is not added.



If the user passes parameters through GET, the following describes the GET usage method in detail. as follows:

GET /request/login.do?name=test&userpwd=123456 HTTP/1.1

Host: 192.168.4.10:8080

Where /request/login.do? is the content set in the URL of the header path (note that ? should be added after the URL), and name=test&userpwd=123456 is the data received by the module serial port. 192.168.4.10:8080 is the HTTP server address and port.

Custom protocol header: The default is Connection: keep-alive, the user can modify, if you need more than one, add \r\n between commands, the last one is not added.

If the user passes parameters through POST, the following describes the POST usage method in detail. as follows:

POST /request/login.do HTTP/1.1

Host: 192.168.4.10:8080

(This place is a blank line and cannot be deleted. Finally, the content of the brackets should be deleted, and the blank line should be reserved).

username=test&userpwd=123456

Where /request/login.do is the content set in the header path URL, and name=test&userpwd=123456 is the data received by the module serial port. 192.168.4.10:8080 is the HTTP server address and port.

Custom protocol header: The default is Connection: keep-alive, the user can modify, if you need more than one, add \r\n between commands, the last one is not added.

6.2.3 WebSocket

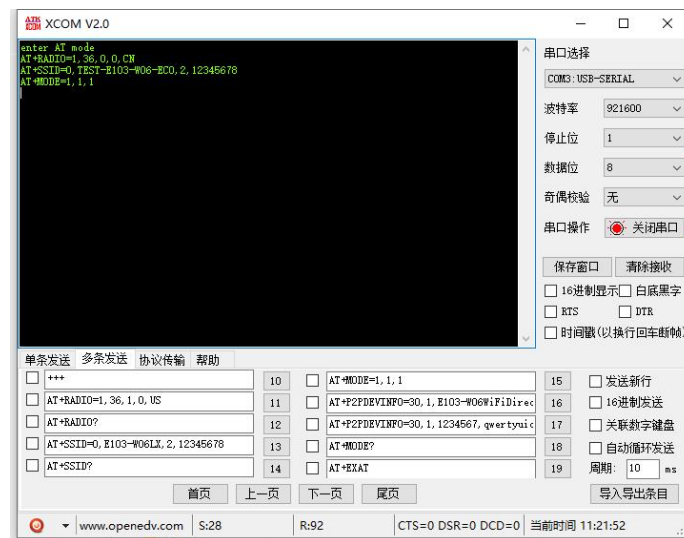
- 1、 Log in to the web page, in the mode setting menu, select the work role as Station, the service mode as websocket, and save the settings.
- 2、 In the parameter setting menu, configure the required parameters.



6.3 Parameter configuration

6.3.1 Serial AT command configuration

Serial AT command configuration, directly open the serial debugging assistant, set the corresponding baud rate, data bits, etc.

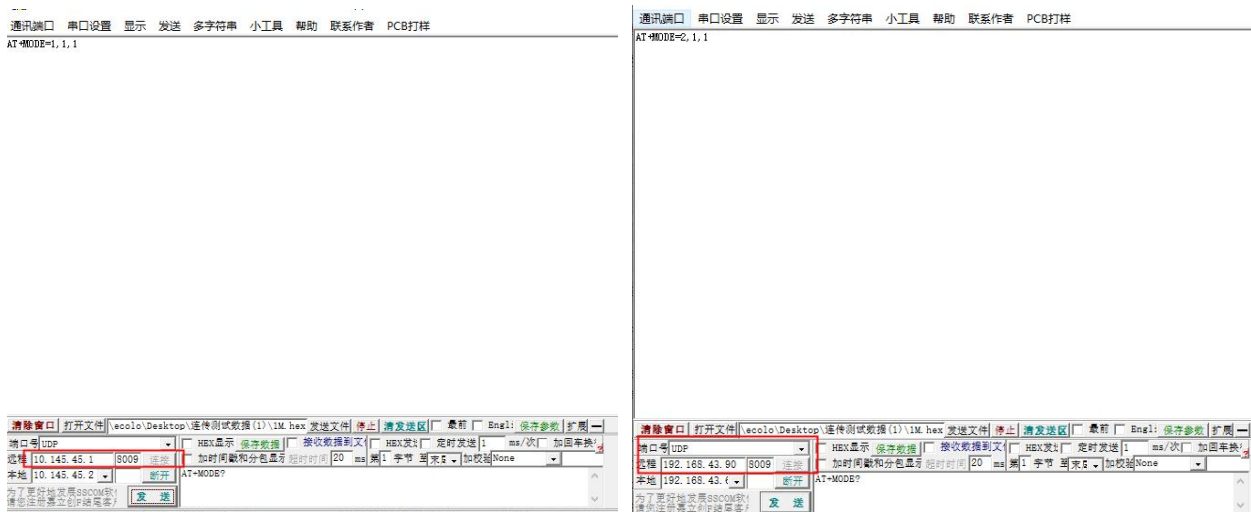


Configure according to the AT command in Chapter 6. It should be noted that the command must follow the

specification.

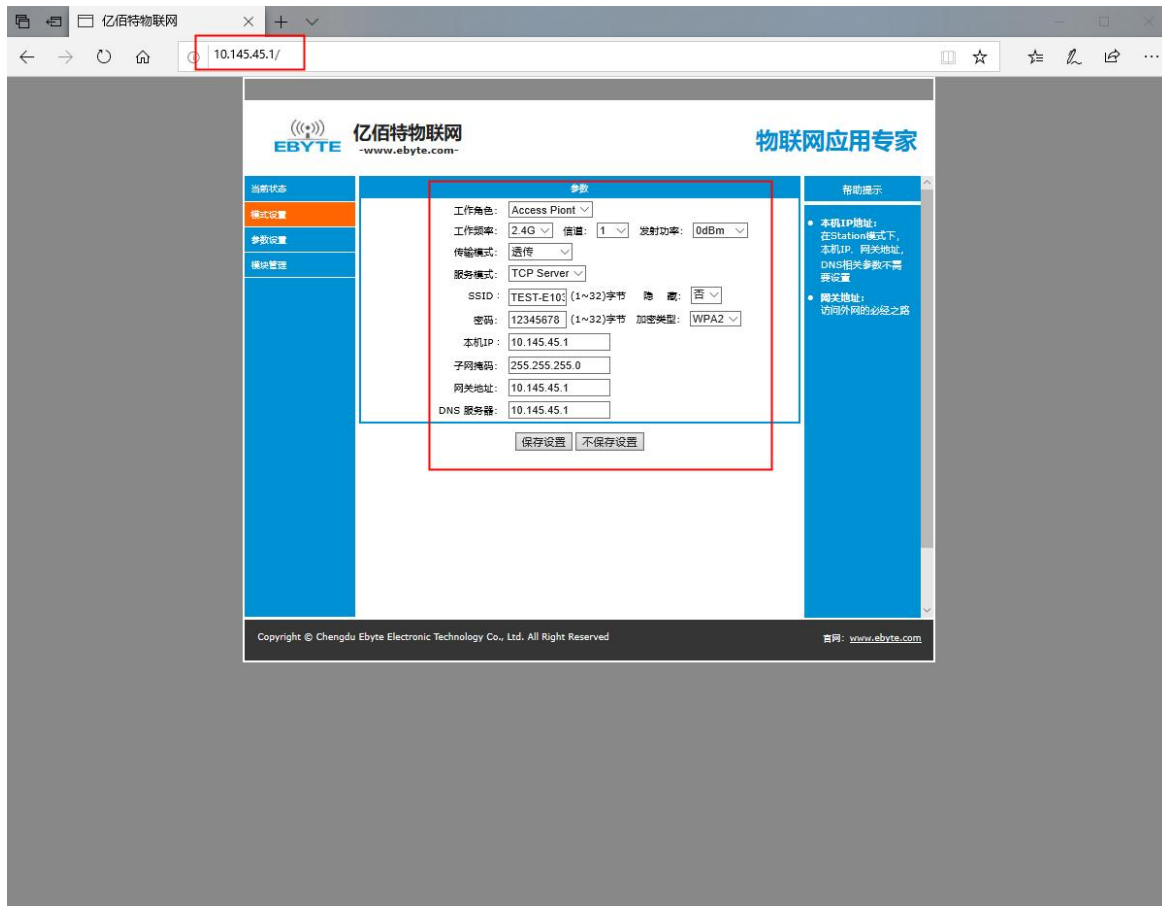
6.3.2 UDP remote configuration

During remote configuration, it is necessary to ensure that the module and the PC are in the same local area network. For the configuration method, see the communication with the PC (either make the module in AP mode, the PC is connected to the module, or the module is in STA mode and the PC is connected to the same router) to obtain IP. After the address, directly enter the IP address and UDP port number 8009 (this port number is a fixed value and cannot be changed). In essence, remote configuration is also an AT command operation. For specific commands, see AT commands. The following figure shows the remote configuration based on AP mode and STA mode respectively.



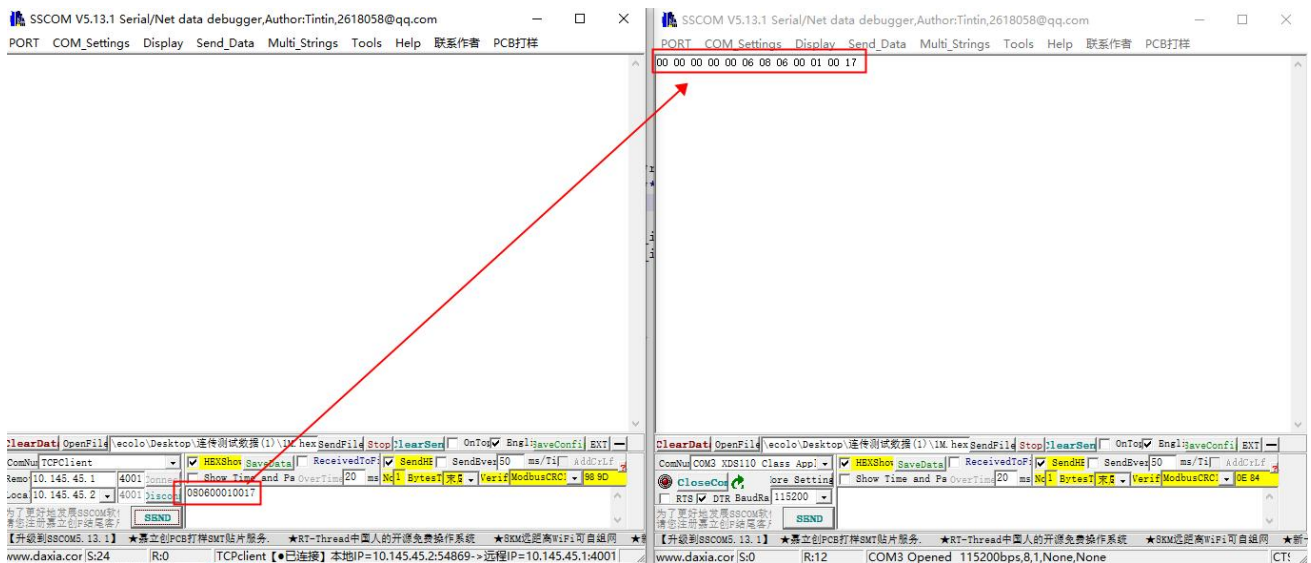
6.3.3 Web page configuration

When configuring the webpage, it is also necessary to ensure that the module and the PC are in the same local area network. Find the IP address corresponding to the module and enter the IP address on the browser. The 10.145.45.1 here is only the IP address used for demonstration. Use the command: AT+SVRPORTIP? to query and enter the correct IP to enter the configuration interface. The IP address is set according to the module feedback results, and other parameters are set according to their own needs.



6.4 Modbus usage

After setting the working parameters according to the above chapters, enter the AT command and open the modbus protocol: AT+MODBUS=1. Communicate after connection is established



The Modbus protocol of this module only supports data conversion and transmission. If necessary, please operate with the actual controls.

6.5 Static IP usage

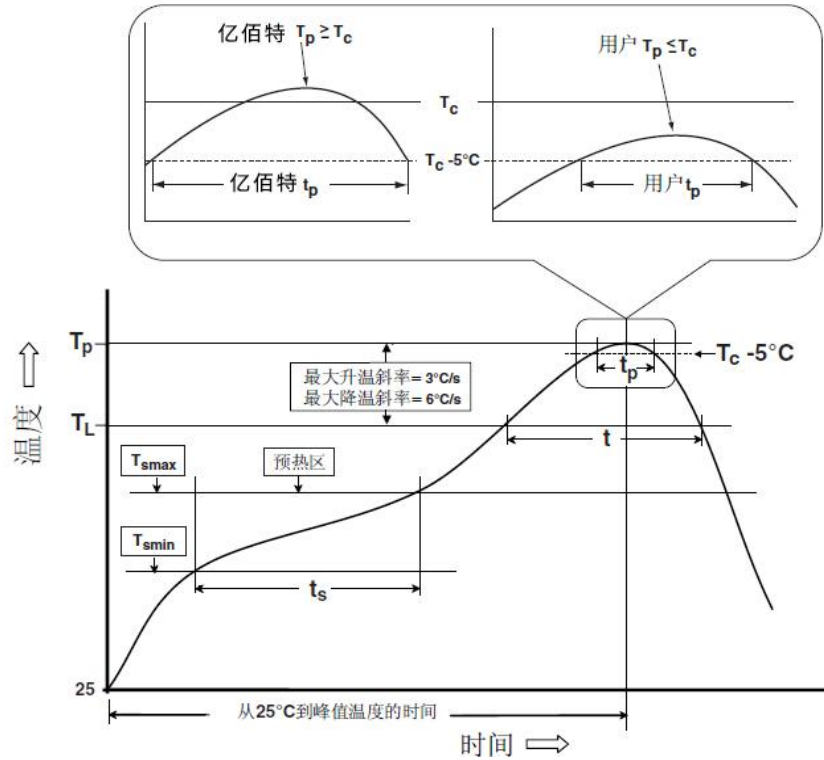
- 1、 Set the module to STA client mode. AT+MODE=2,1,2
- 2、 Set static IP related parameters. AT+IPSTATIC=1,10.145.45.9,255.255.255.0,10.145.45.1,10.145.45.1
- 3、 Set the target AP, socket port and address as shown in Section 6.1.2.1. Restart the module to establish a connection for communication.

7. Welding Operation Guidance

7.1 Reflow temperature

Profile Feature		Sn-Pb Assembly	Pb-Free Assembly
Preheat/ heat preservation	Min preheating temp. (T _{smin})	100°C	150°C
	Max preheating temp. (T _{smax})	150°C	200°C
	Preheating time (T _{smin} ~T _{smin})	60-120 sec	60-120 sec
Average ramp-up rate (T _L ~T _p)		3°C/second max	3°C/second max
Liquidous Temperature (T _L)		183°C	217°C
Time Maintained Above T _L		60~90 sec	60~90 sec
Peak temperature T _p		Do not exceed the temperature stated on the "damp sensitivity" label.	Do not exceed the temperature stated on the "damp sensitivity" label.
See the figure below for time (T _p) within 5°C of the specified grading temperature (T _c)		20 sec	30 秒 sec
Average ramp-down rate (T _p ~T _L)		6°C/second max	6°C/second max
Time 25°C to peak temperature		6 minutes max	8 minutes max
※ The peak temperature (T _p) tolerance definition of the temperature profile is the upper limit			

7.2 Reflow profile



8 Revise History

Version	Date	Description	Issued By
1.0	2020.10.14	initial version	luo
1.2	2020.12.03	Content changes	Ren
1.3	2021.04.09	product upgrade	Ren
1.4	2022.09.04	1. Added English web page configuration interface. 2. Added the serial port wake-up function after hibernation.	M.T.
1.5	2023.4.10	Add the welding operation instruction	Hao
1.6	2024.3.7	product upgrade	Hao

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