E103-W02 User Manual

Serial wifi SMD small volume PCB antenna MQTT



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Module Introduction

1.1 Features Introduction



The E103-W02 is an ultra-low power serial to Wi-Fi module in a SMD small form factor package with PCB antenna, operating in the 2.4~2.484GHz band. The module can use serial port to send and receive data, lowering the threshold of wireless applications.
E103-W02 module is based on TI's CC3200 chip. The module integrates the pass-through function, ready to use, supports serial AT command set users can use the network access function through the serial port, widely used in we security, personal health care, smart home appliances, accessories and remote Internet and other fields.
The E103-W02 module supports standard IEEE802.11b/g/n protocol and complete
It supports STA/AP network roles, multiple network modes, SmartConfig, serial port pass-through, power-on pass-through, etc. After simple configuration, the network access function can be realized very conveniently, minimizing the developer's work and project development time.

No.	Features	Description
1	Ultra low power consumption	4 power consumption modes are freely configurable, and the standby power consumption is less than 5uA in the lowest power consumption mode.
2	High-speed transmissions	The module supports 3Mbit high-speed transmission.
3	Web configuration support	The module can be accessed via web page to read or configure the module parameters quickly.
4	Power-on pass-through	The module automatically connects to the WIFI network at power-on, and then connects to the target device through the protocol according to different network modes.
5	Automatic reconnection in case of network disconnection	In STATION mode, the module automatically reconnects to the target after the network connection is disconnected and restored.
6	Fast network matching	Support Airkiss/SmartConfig function for fast network pairing of the module.
7	Remote AT command	Support remote AT command, you can remotely use AT command to configure the module
8	Heartbeat package	When the module is a TCP client, it supports heartbeat Support serial heartbeat packets
9	Registration package	When the module is a TCP client, it supports the connection registration mechanism, and the user can customize the content of the registration packet
10	Cloud platform transmissions	The module can be configured with the relevant parameters to achieve multi-device cloud platform transmissions.
11	Multi-network working mode	Traditional TCP/UDP mode, multi-link TCP/UDP mode, MQTT client mode, HTTP client mode

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12	Pin status indication	According to different working states, with different pin level prompt
For more features, please see the related application documentation		

1.2 Basic usage

No.	Usage	Description
0	Module to Module Communication	Module No. 1 is set to AP mode and establishes a TCP or UDP server, Module No. 2 is set to STATION mode and connects to AP No. 1, and communicates with Module No. 1 through TCP or UDP Client mode. Communication with module 1 through TCP or UDP Client
1	Module to Server Communication	The Wi-Fi module is connected to the network through the wireless router and communicates with the server on the network (LAN or Internet) via TCP Client or UDP. If you need to connect to an Internet server, you need to configure the router with the appropriate port mapping.
2	Module-to-Client Communication	The Wi-Fi module connects to the network through the wireless router and establishes a TCP or UDP Server to listen for connection signals. The Client communicates with it through the Connection Module Server.
For more features, please see the related application documentation		

1.3 Electrical parameters

No.	Parameter Name	Parameter Value	Comments
1	RF Chips	CC3200	TI
2	Module Size	27 * 19 * 2.7mm	PCB antenna included
3	Average Weight	2.2g	PCB Antenna Included
4	PCB Process	4 layers	Impedance Debugging
5	Operating Frequency Band	2.4~2.484 GHz	
6	Production Process	Lead-free process, machine paste	Wireless products must be machine-mounted to ensure batch consistency and reliability
7	Interface Method	1.27mm	SMD
8	Power supply voltage	2.4 ~ 3.6V DC	Note: Voltage higher than 3.6V will cause permanent damage to the module
9	Communication level	Maximum 3.6	It is recommended that the difference with the supply voltage is less than 0.3V to reduce power consumption
10	Measured distance	About 150m	Clear and open, maximum power, height 2m
		About 500m	Clear and open, maximum power, height 2m
11	Transmitting power	20dBm	About 100mW
12	AT Support	Built-in intelligent processing	Configuration parameters can be set or read via AT commands

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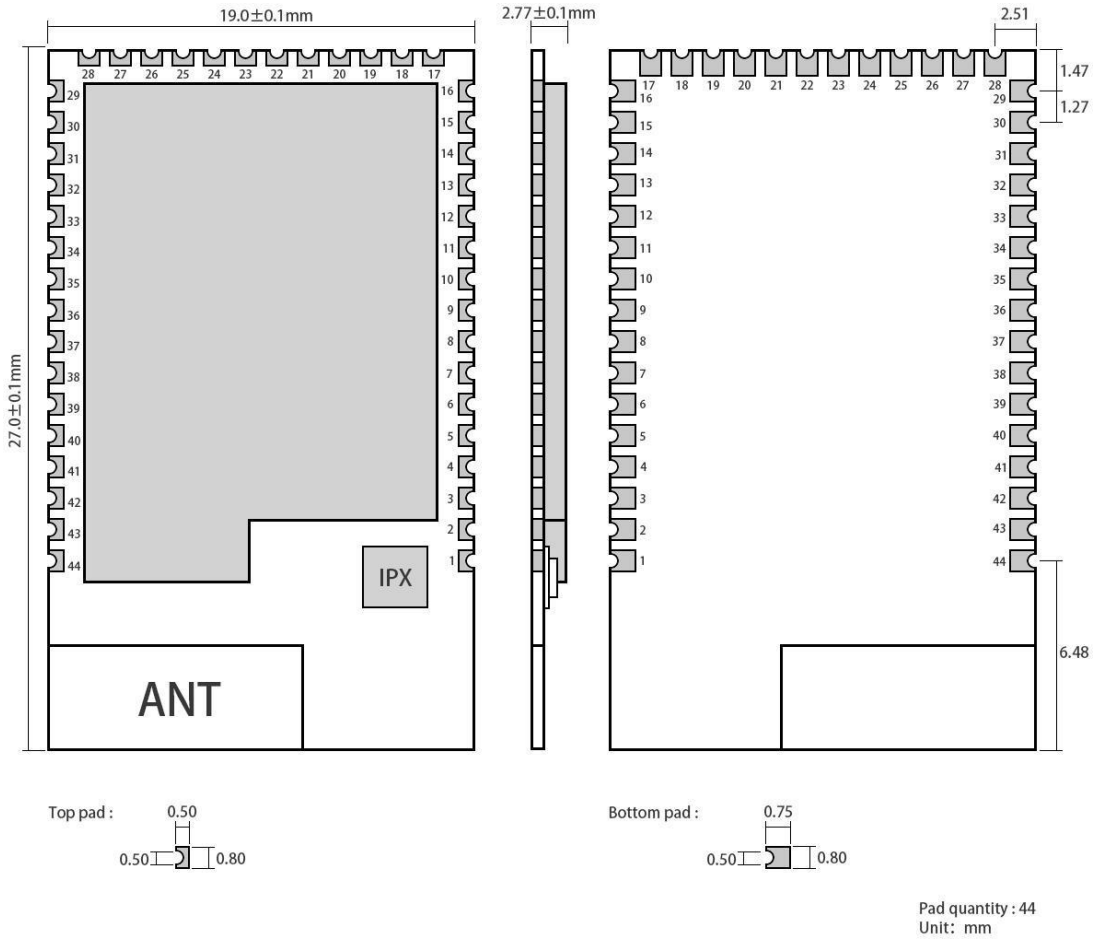
13	Wi-Fi version Version	802.11 b/g/n	
14	Communication Interface	UART Serial port	
15	Antenna Type	PCB On Board Antenna/IPX Block Sub	50Ω characteristic impedance, can be changed by yourself
16	Operating Temperature	-40 ~ +85℃	Industrial grade (chip range, please modify according to crystal parameters)
17	Working Humidity	10% ~ 90%	Relative humidity, non-condensing
18	Storage temperature	-40 ~ +85℃	Industrial grade

1.4 Electrical Features

Parameter		Condition	Min	Typical	Max	Unit
Storage temperature range			-40	room temperature	85	℃
Operating Voltage			2.4	3.3	3.6	V
At will IO	VIL/VIH		-0.5/0.65VDD	-	0.35VDD/VDD+0.5	V
	VOL/VOH		N/2.4	-	0.4/N	
	IMAX		-	-	3.5	mA

2. Brief description of functions

2.1 Pin Definition



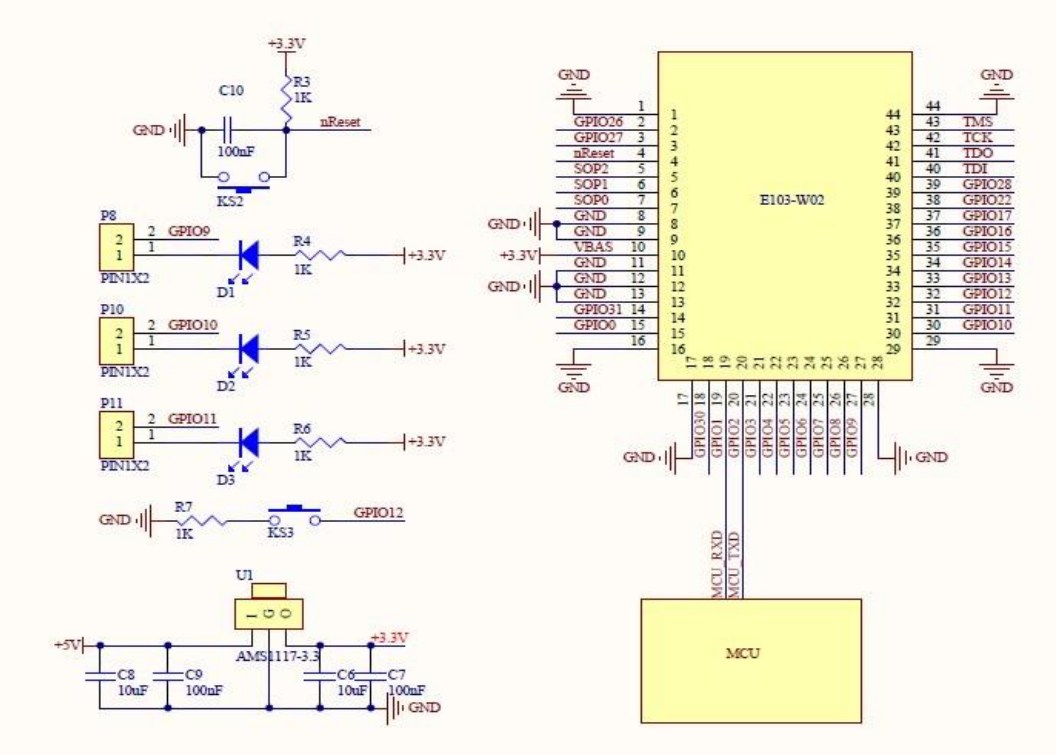
No.	Pin Definition	I/O	Functions and instructions for use
1、8、9、11、12、13、16、17、28、29、44	GND		Power ground
2	GPIO26	IO	General purpose IO port
3	GPIO27	IO	General purpose IO port
4	RST	I	Module reset pin, low reset
5	SOP2	I	Burn emulation mode selection
6	SOP1	I	Burn-in emulation mode selection
7	SOP0	I	Burn-in emulation mode selection
10	VCC		Device power supply VDC:2.4V~3.6V (300mA or more)
14	GPIO31	IO	General IO port
15	GPIO0	IO	General IO port

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18	GPIO30	IO	General IO port
19	GPIO1	O	UART serial output pins with AT command support
20	GPIO2	I	UART serial input pins, AT command support
21	GPIO3	IO	General IO port
22	GPIO4	IO	General IO port
23	GPIO5	IO	General IO port
24	GPIO6	IO	General IO port
25	GPIO7	IO	General IO port
26	GPIO8	IO	General IO port
27	GPIO9	O	Wifi connection status indicator, connected output low, not connected output high
30	GPIO10	O	Network connection status indicator, connected output low, unconnected output high
31	GPIO11	O	Smartconfig status indicator, low when in status, low when not in status High
32	GPIO12	I	Restore factory settings pin, set to low at startup, after the status indicator flashes three times alternately, the factory settings will be restored (1 to restore factory settings, you need to press the reset button)
33	GPIO13	IO	General IO port
34	GPIO14	IO	General IO port
35	GPIO15	IO	General IO port
36	GPIO16	IO	General IO port
37	GPIO17	IO	General IO port
38	GPIO22	IO	General IO port
39	GPIO28	IO	General IO port
40	TDI	I	JTAG Simulation foot
41	TDO	O	JTAG Simulation foot
42	TCK	I	JTAG Simulation foot
43	TMS	IO	JTAG Simulation foot

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2.2 Application schematics



Note: The power supply must be guaranteed at 2.4V~3.6V. To ensure that the module can work stably, it is recommended to choose an LDO with a current greater than 500mA externally.

3. Quick start

The E103-W02 module has the following 5 modes.

Mode	Description
NORMAL	In this mode, there is no difference with V2.0 version, that is, it supports 1-way TCP SERVER or 1-way TCP Client or 1-way UDP, and also supports remote AT command function.
MQTT	In this mode, the generic MQTT client function is supported, and it supports 1-way subscribe Topic and 1-way report Topic at the same time. Reporting Topic.
HTTP	In this mode, generic HTTP client is supported, supporting POST and GET request methods.
MULTIS	In this mode, multiple TCP links are supported, and the module as TCPSERVER can allow 4 TCPclient accesses.
MULTIC	In this mode, multiple TCP/UDP links are supported, and the module, as a TCP/UDP client, can access two servers at the same time. The module as a TCP/UDP client can access two servers at the same time.

The E103-W02 module is easy to use. In order to let the user get familiar with the module quickly, we will guide the user to use the module quickly for different modes, and guide the user to configure and communicate in various modes with simple settings.

The test process uses the AT command, and we have developed a web page HTTP for users to quickly configure in order to make a quick connection. This section of the test is operated by using the serial debugging assistant, and the module will display back the current command issued, so that the user can quickly understand the usage of the AT command.

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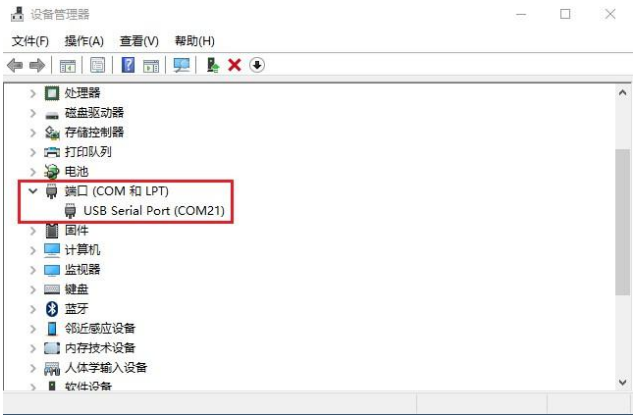
(Note: all AT instructions need to be followed by a line break, except for the "++++" instruction, i.e., only the "++++" instruction does not need to be followed by a line break)
In addition, users can use an external microcontroller (MCU) to communicate directly with the module UART for AT command without using the backplane, enabling secondary development.

Hardware to be used.	
1	Model E103-W02 Wi-Fi Module 1 pc
2	Model E103-W02 Wi-Fi module test base 1 pc
3	1 PC with Wi-Fi function
4	Router 1 (can be replaced by Wi-Fi hotspot for cell phone)
Software that will be used (all can be downloaded from the official website)	
1	Serial port debugging assistant AccessPort/XCOM
2	TCP&UDP test tool
3	SmartConfig (one-click configuration) mobile app "Wi-Fi Starter"

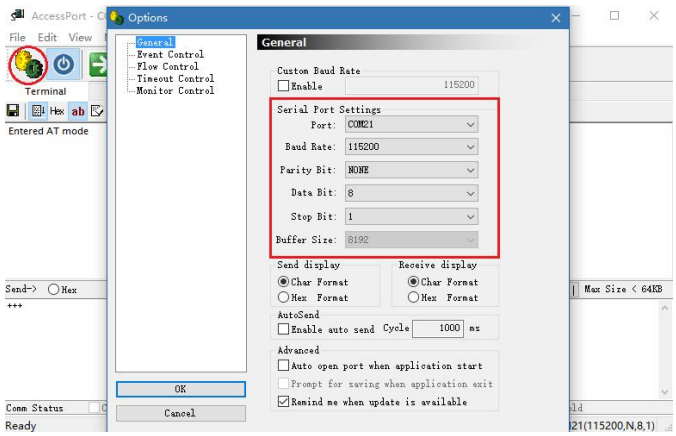
3.1 Traditional mode (NORMAL)

3.1.1 Link Preparation

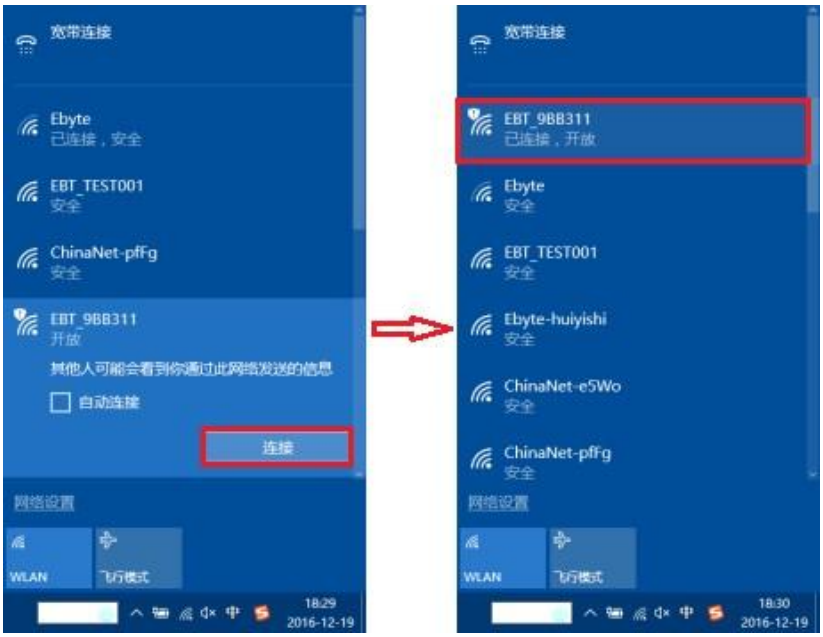
First of all, users need to know that the module is restored to factory settings or default state network role as AP, network mode as NORMAL mode, first, we need to connect the PC to the module to establish network connection.
①. Connect the factory E103-W02 base board to the PC via Micro USB cable.
②. Open the serial debugging assistant "AccessPort" and select the port number; if you don't know the port number, please check it in the device manager (see the figure below).



③. Set the serial port debugging parameters (Baud rate: 115200bps, data bit: 8bit, parity bit: no parity, stop bit: 1bit). (See the figure below)



④. We open the wireless network on the PC, find the wireless network with SSID starting with "EBT" (e.g. EBT_9BB311), and click "Next" to connect. (Here "9BB311" is the last 6 bits of the module MAC address, different modules have different MAC addresses, so different modules have different factory SSIDs) ⑤.



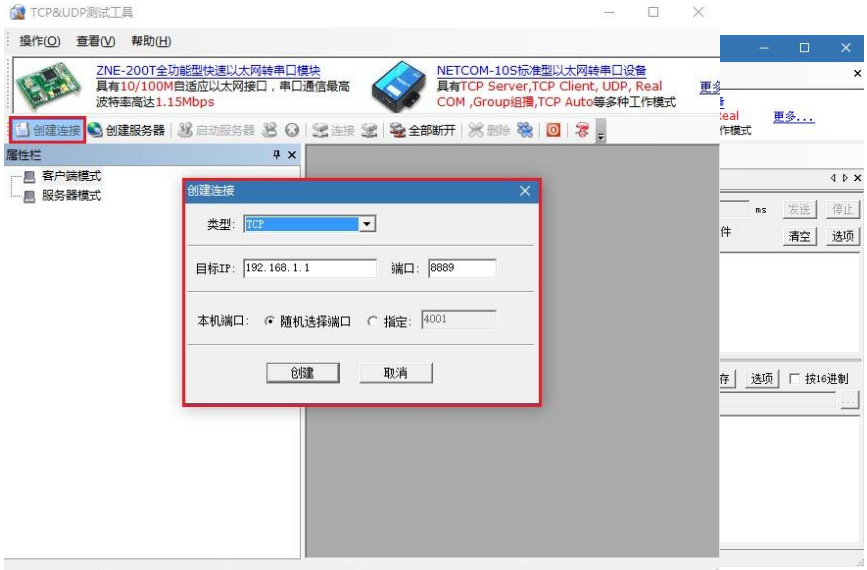
After successful connection, the LED1 on the module base board is always on (GPIO9 is pulled low) and the PC shows successful connection, otherwise, please operate the above steps again.



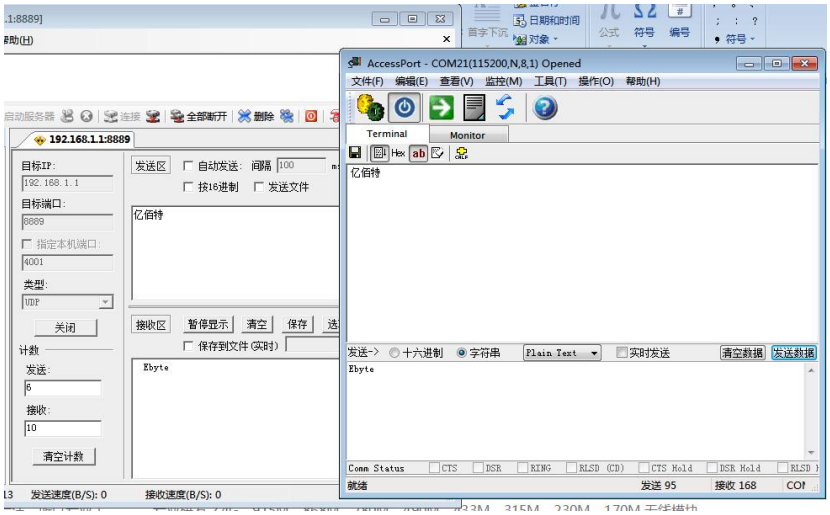
3.1.2 Module as AP to establish TCP SERVER wireless connection with PC

①. Open the TCP&UDP test tool, create the connection and set the parameters (see the figure below). (The parameter value can be queried by sending the corresponding AT command through the serial debugging assistant and then exit the AT command mode to realize the subsequent bi-directional communication between the PC and the module)

②. Click the "Create" button to complete the creation, and then click the "Connect" button.



③. The LED2 of the module base board is always on (GPIO10 is pulled low), which indicates that the connection is completed, and you can finish the bi-directional data transfer between PC and module (i.e. TCP&UDP test tool and serial debugging assistant communicate in both directions), otherwise, please operate the above steps again.



④. You can also transfer files (preferably TXT format files), so try it out.

3.1.3 Module as AP to establish UDP SERVER wireless connection with PC

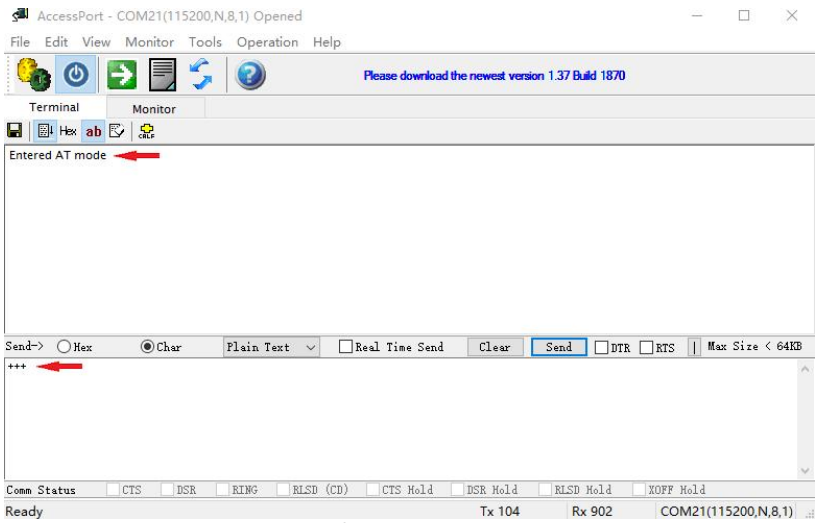
Let's establish the UDP communication, which requires us to do a simple configuration of the module.

①. Please make sure the link preparation work is completed successfully.

② Enter AT command mode for simple configuration. (Please be sure to complete the operation of serial number 1 first, because we are sending commands, please turn off the Real Time Send function of serial port for better debugging, if you use the serial debugging assistant without the Real Time Send function, please ignore this article)

a. Start serial debugging, enter the command "++++" in the send text box (please do not add line break), click Send to start sending commands.

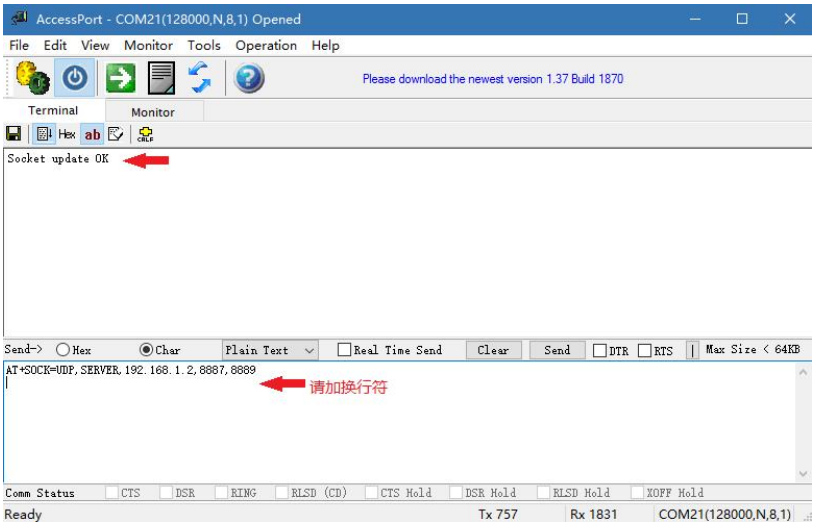
b. If the serial port returns "Entered AT mode" message, it indicates that it has entered AT command mode, otherwise, please operate the above steps again.



③. We have entered the AT command mode by step ②, and we will start to configure the socket protocol.

a. In the Send text box, enter the command "AT+SOCK=UDP,SERVER,192.168.1.2,8887,8889" (please add a newline character, that is, after entering the command "AT+SOCK=UDP,SERVER, 192.168.1.2,8887,8889" command followed by the Enter key), click Send to start sending commands.

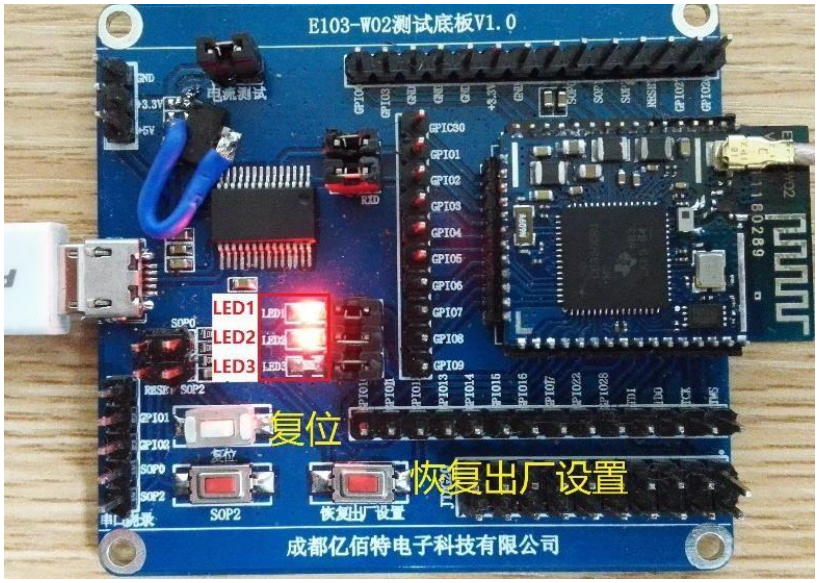
b. If the serial port returns "Socket update OK" message, it indicates that the command has set the protocol parameters successfully, otherwise, please operate the above steps again.



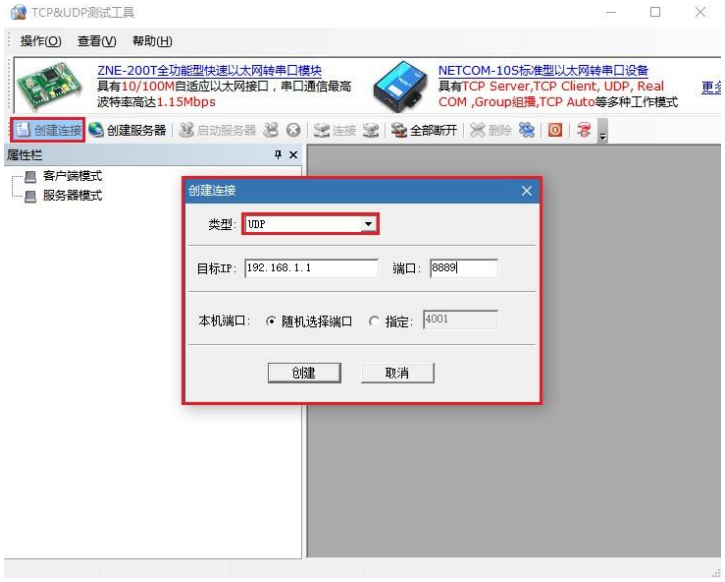
④. After setting the parameters, please reset or power down and reboot to take effect; if there are other parameters not set, please reset or power down and reboot after setting other parameters. Because we only configure the socket protocol here, so we reset or power down and restart directly.

(GPIO10 pulled low) light will be lit immediately, indicating that UDP protocol is enabled.

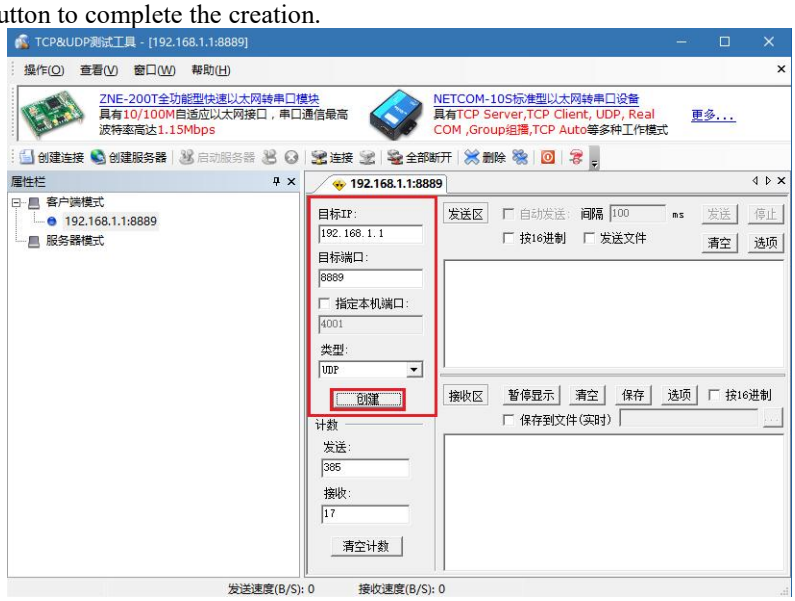
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⑤. Open the TCP&UDP test tool, create a connection, and set the parameters (see the figure below) .



6. Click the "Create" button to complete the creation.

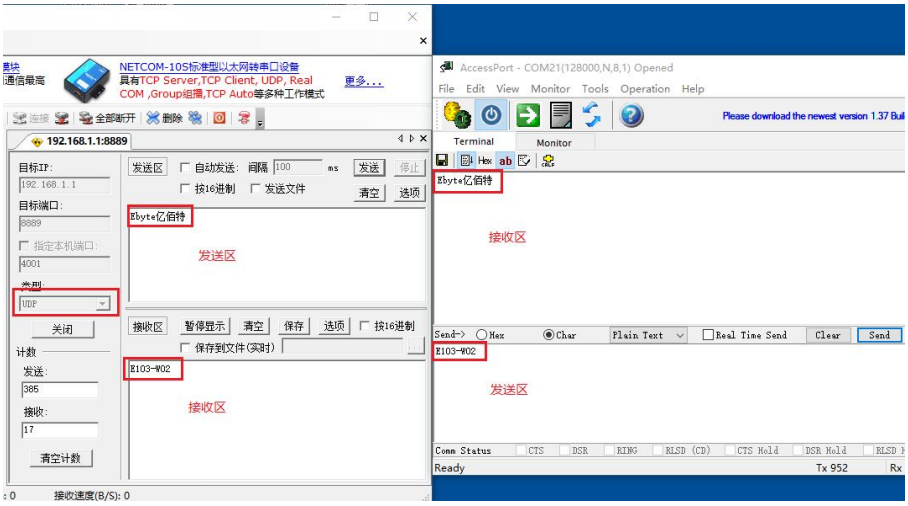


⑦. If the creation is successful, you can finish the bi-directional data transfer between PC and module (i.e. TCP&UDP test tool and serial debugging assistant). (i.e. TCP&UDP test tool and serial debugging assistant communicate in both

directions), otherwise, please operate the above steps again.

⑧. You can also transfer files (preferably TXT format files), so try it out.

In addition, customers can also set the socket link to TCP Client in AP mode, set the same way as above, here do not elaborate.



3.1.4 Module as STA (Station) to connect to other WiFi hotspots

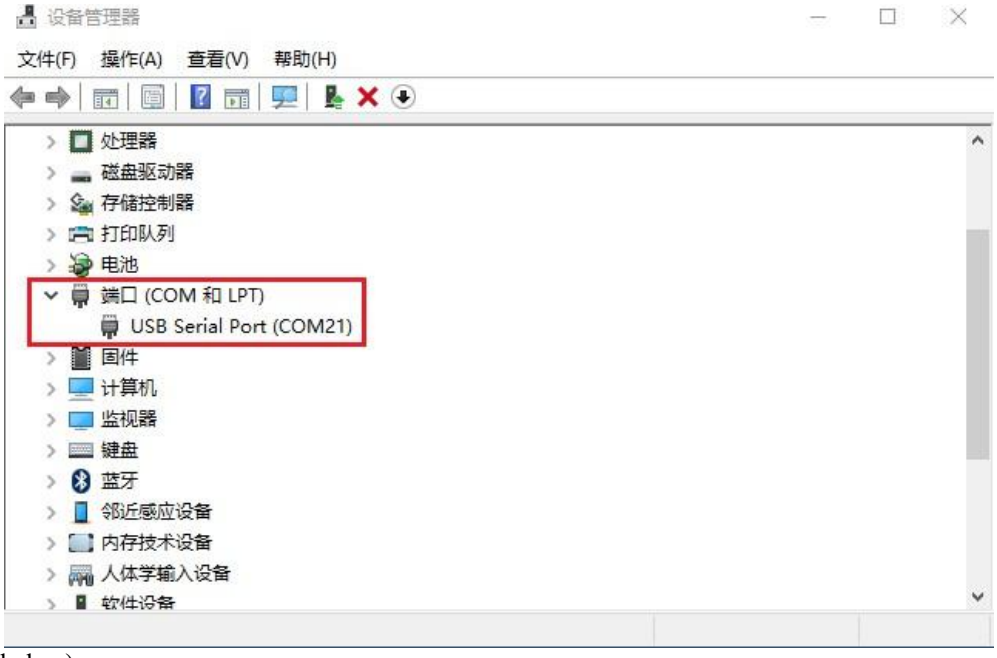
In order to facilitate users to use the module to access the network around the STA role in later sections, a section on how to access other WIFI nodes for users' reference.

Module as STA (Station) to connect to other WiFi hotspots

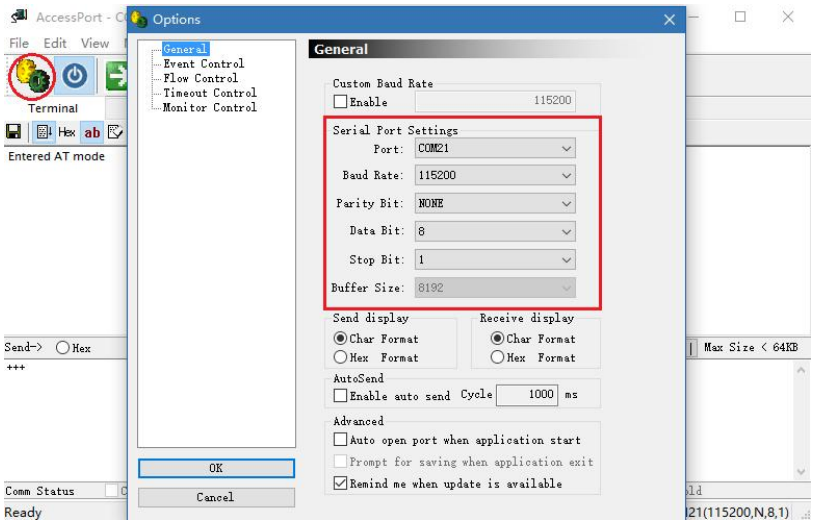
①. Connect the factory E103-W02 base board to the PC via Micro USB cable.

②. Open the serial debugging assistant "AccessPort" and select the port number; if you don't know the port number, please check it in the device manager (see the figure below).

③. Set the serial port debugging parameters (Baud rate: 115200bps, data bit: 8bit, parity bit: no parity, stop bit: 1bit).



(See the figure below)



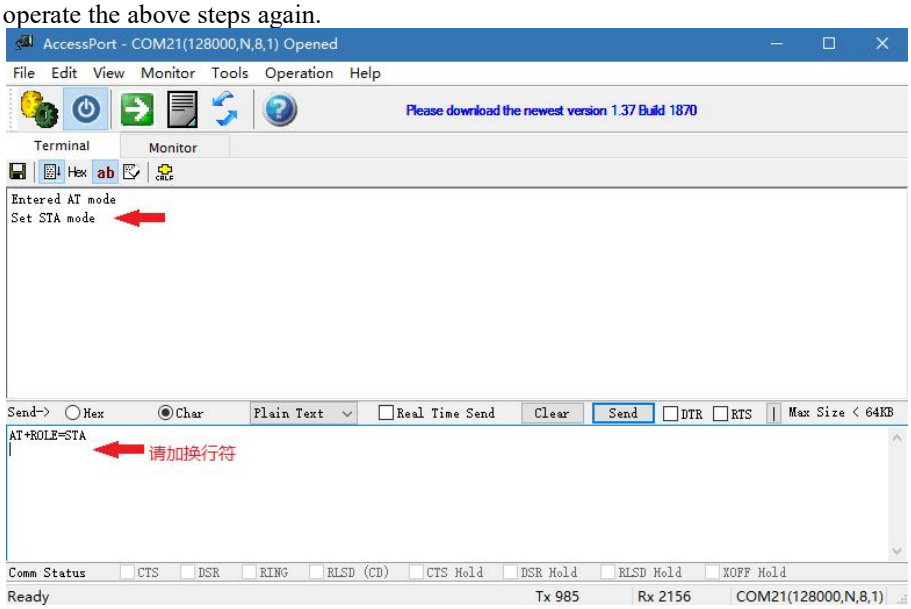
④. Next, we enter AT command mode for simple configuration. (Since we are sending commands, please turn off the Real Time Send function of serial port for better debugging; if the serial debugging assistant you use does not have Real Time Send function, please ignore this article)

a. Start serial debugging, enter the command "++++" in the send text box (please do not add line break), click Send to start sending commands. b. If the serial port returns the message "Entered AT mode", it indicates that it has entered AT command mode, otherwise, reset Otherwise, reset and retry the above steps. If not, reset and retry the above steps.

⑤. Now our module is used as STA mode to connect to other APs, so we need to set the mode to STA mode first.

a. Enter the AT command "AT+ROLE=STA" in the Send text box of the serial debug assistant (please add a line break, i.e. add the Enter key after entering the command "AT+ROLE=STA") and click Send to send the command.

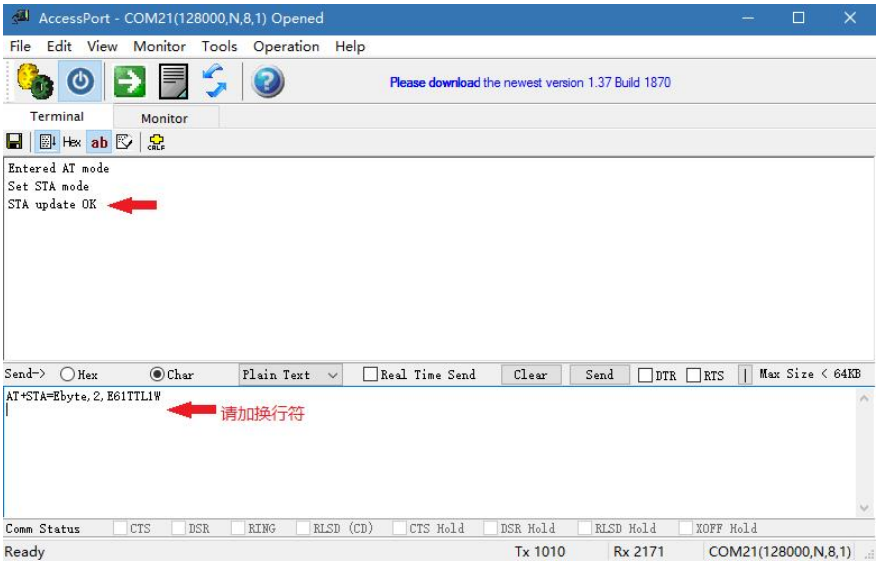
b. If the message "Set STA mode" is displayed on the serial port, it means that it has been set to STA mode successfully, otherwise, please operate the above steps again.



⑥. Next, you need to set the WiFi hotspot parameters (STA parameters) that we want to connect.

a. Enter the AT command "AT+STA=Ebyte,2,E61TTL1W" in the Send text box of the serial debug assistant (please add a line break, i.e. after entering "AT+STA=Ebyte,2,E61TTL1W" (please add a line break, i.e., after typing "AT+STA=Ebyte,2,E61TTL1W" and enter), click Send to send the command. (The "Ebyte" in the previous AT command is the SSID of the WiFi hotspot (i.e. WiFi name), '2' is the encryption method WPA2 (0 if no password), and "E61TTL1W" is the encryption method WPA2 (0 if no password). "E61TTL1W" is the WiFi password (if there is no password, the item is empty))

b. If "STA update OK" message is displayed on the serial port, it indicates that the STA parameters have been set successfully, otherwise, please operate the above steps again.



⑦. Reset or power down to restart the module, if the WiFi module is far away from the module, please connect the antenna.

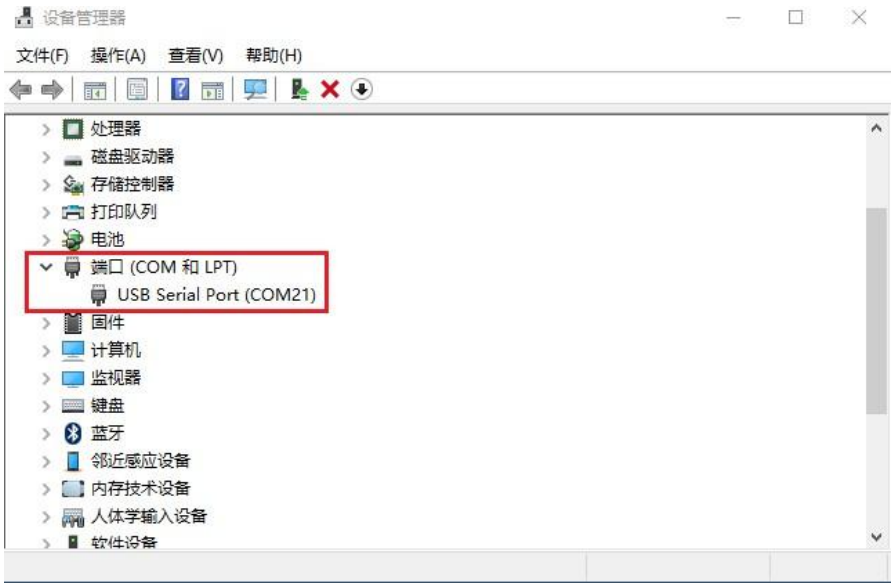
⑧. If LED1 is lit (GPIO9 pulled low), it indicates that the access to WiFi hotspot is successful.



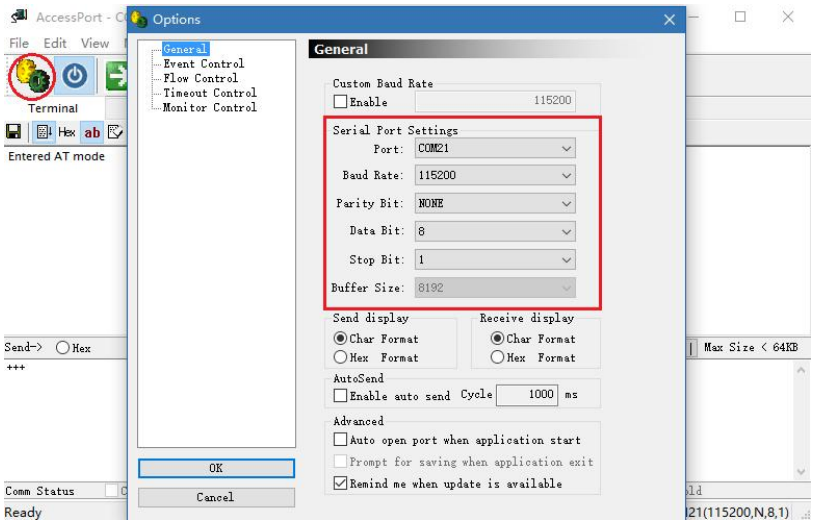
Module as STA (Station) to connect to other WiFi hotspots via SmartConfig (one-click configuration)

①. Connect the factory E103-W02 base board to the PC via Micro USB cable.

②. Open the serial debugging assistant "AccessPort" and select the port number; if you don't know the port number, please check it in the device manager (see the figure below).



③. Set the serial port debugging parameters (Baud rate: 115200bps, data bit: 8bit, parity bit: no parity, stop bit: 1bit). (See the figure below)



④. Next, we will enter AT command mode for simple configuration.

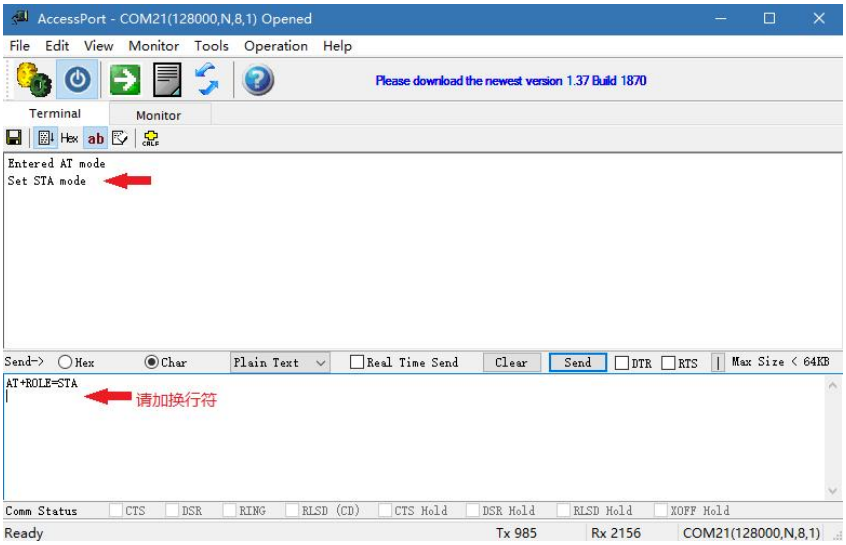
a. Start serial debugging, enter the command "++++" in the send text box (please don't add line break), click Send to start sending command.

b. If the serial port returns the message "Entered AT mode", it indicates that it has entered the AT command mode, otherwise reset and retry the above steps.

⑤. First, set the mode to STA mode.

a. Enter the AT command "AT+ROLE=STA" (please add a line break, i.e. add the Enter key after entering the command "AT+ROLE=STA") in the Send text box of the serial debug assistant, and click Send to send the command.

b. If the message "Set STA mode" is displayed on the serial port, it means that it has been set to STA mode successfully, otherwise, please operate the above steps again.

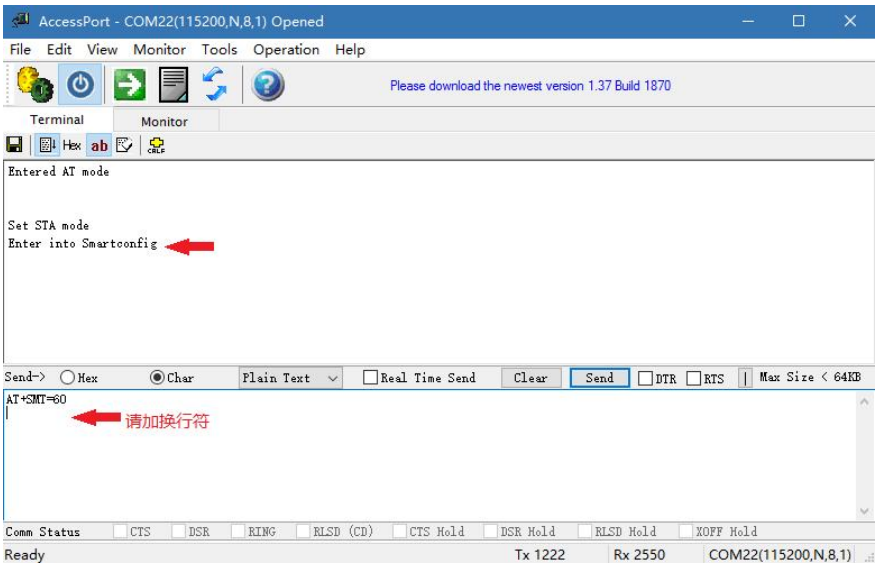


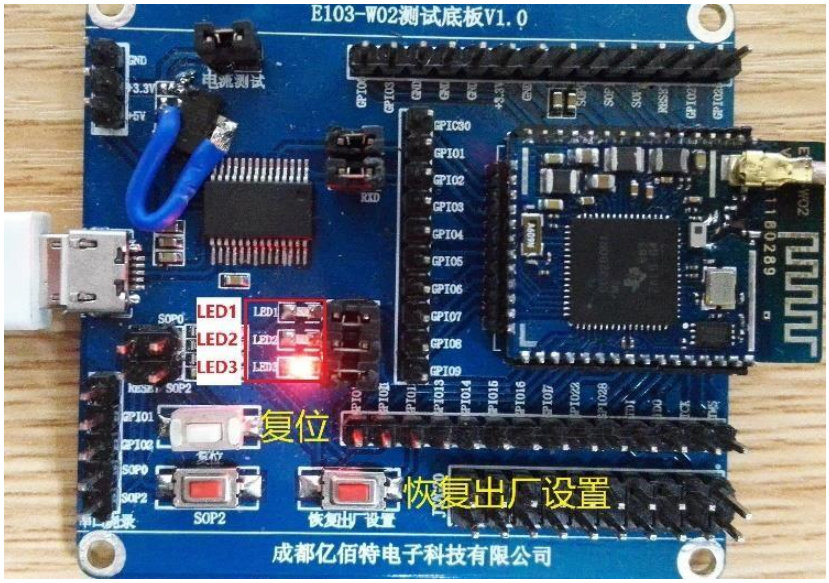
⑥. Reset or power-down restart the module and repeat step

⑦. Next, we need to enter SmartConfig mode.

a. Enter the AT command "AT+SMT=60" in the Send text box of the serial debug assistant (please add a line break, i.e. add the Enter key after entering the command "AT+SMT=60") and click Send to send the command. (The 60 in the AT command here means that the WiFi hotspot is not connected after 60S, and will time out of SmartConfig mode) (During this 60S period, the module waits to accept the command sent by the phone, and lights up LED1 (GPIO9 is pulled low) if it is accepted successfully)

If the serial port shows "Enter into Smartconfig" message and LED3 (GPIO11 pull low) is lit, it indicates that it has entered SmartConfig mode, otherwise, please retry the above steps.





⑧. Turn on your phone wifi and connect to a hotspot.

⑨. Install and open the mobile APP software "Wi-Fi Starter", enter the WiFi hotspot password, and click "Start". (Network Name is the name of the WiFI hotspot that the phone is connected to, the software will automatically recognize it, no need to input)



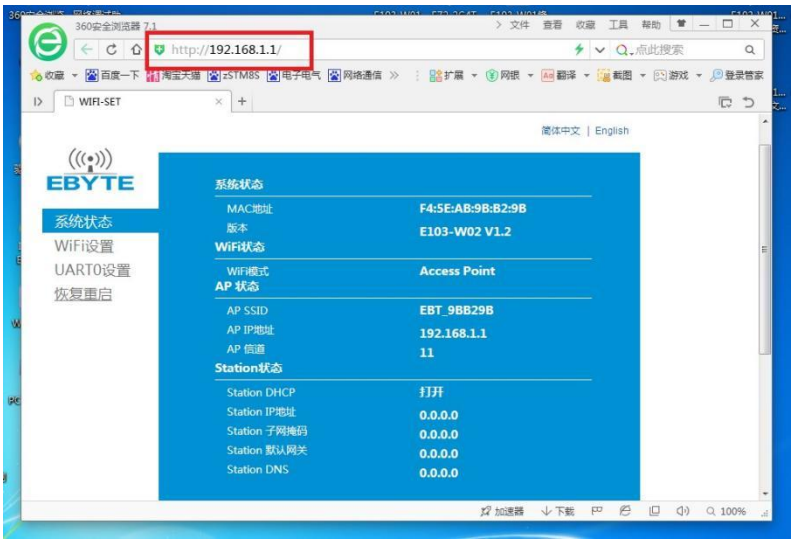
⑩. If the WiFi module is far away from the module, please connect the antenna. The LED1 light on the base board is lit (GPIO9 pulled low), which indicates a successful connection to the WiFi hotspot, otherwise, please retry the above steps. (After successful connection, the module will remember the WiFi hotspot (including password) connected this time, and will connect automatically next time when you reset or reboot the module)



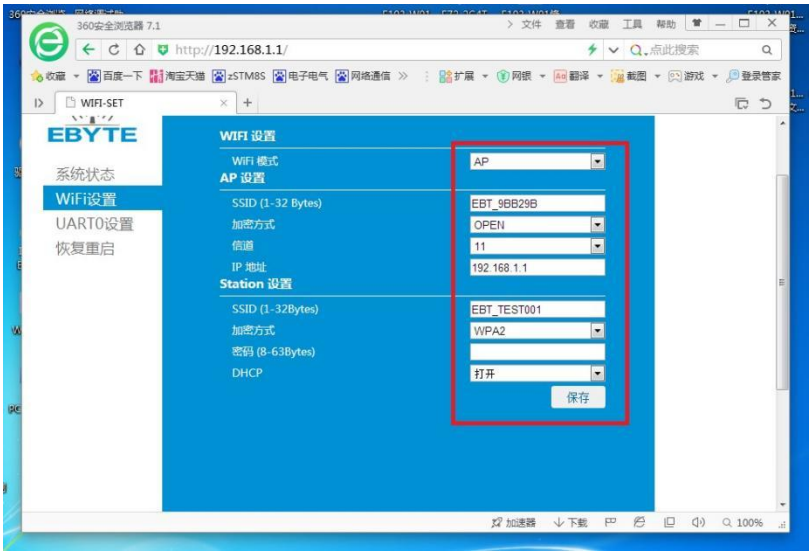
Here, users can also use the AT+AIRKISS command to implement the AIRKISS method of configuration.

3.1.5 Web Configuration

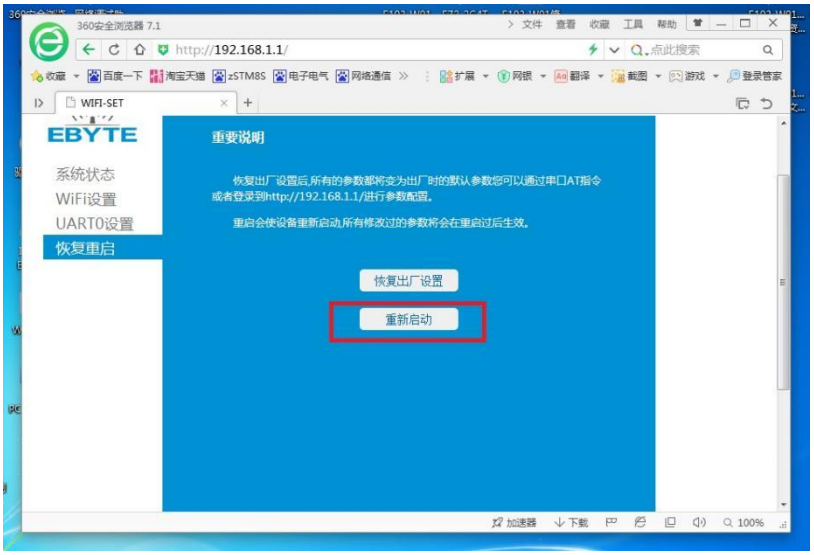
The E103-W02 can be reconfigured by using the web page, before this operation, the module should be connected to the PC for wireless network.
After the PC shows successful connection, open the browser and input the IP address of the module (if you don't know the IP address of the module, you can use the serial AT command "AT+APIP=?).



Then enter the module parameters configuration page, where several parameters of the module can be reset.



After the parameters have been reconfigured, the module needs to be restarted for the configuration parameters to take effect.



3.1.6 Remote AT Commands

The NORMAL mode of the E103-W02 allows you to use the remote AT command to send AT commands to the module's 12476 port using the UDP communication protocol.
command to the module 12476 port using the UDP communication protocol. When using the remote AT command, it is not necessary to use "+++" to switch modes. Remote commands are only allowed in the NORMAL mode of the module and will not be used when switching to other modes (e.g. MQTT, HTTP).



3.2 MQTT Client Mode (MQTT)

In the NORMAL mode chapter, we introduced in detail about the module setup process and the use of AT commands, in this chapter and other modes of introduction, we only do some simple introduction and use of AT commands for the function.

The MQTT protocol is lightweight, simple, open and easy to implement, which makes it suitable for a wide range of applications. In many situations, including restricted environments, such as: machine-to-machine (M2M) communication and the Internet of Things (IoT). It has been widely used in, for example, communication sensors via satellite links, occasional dial-up medical devices, smart homes, and some miniaturized devices

3.2.1 Setup process

When the module is working in MQTT mode, some sub-functions of other modes will not be enabled at this time (e.g. NORMAL's remote AT command will not

When using MQTT mode, if the user wants to access the public network, realize long-distance transmission or access the cloud server, he needs to know that the network role of the module should be set to STA mode. In the following, ONENET is used as an example to introduce the access method and communication.

1. Enter AT mode, so that the current network role is in STA mode

+++ AT+ROLE=STA

2. Connect the destination WIFI (AP), access the network AT+STA=EBYTE,2,JSZXE880

3. switch mode, set the working mode to MQTT mode AT+MODE=MQTT

4. set the MQTT connection information, connect to ONENET's MQTT server (provided that the user has created the relevant MQTT device) AT+MADDR=183.230.40.39,6002 (the address can be either an IP or a URL)

5. Set the MQTT access information (the specific information is filled in according to the user's actual parameters) AT+MUSER="ClientID", "Username", "Userpassword " (the parameters here must be quoted differently)

6. AT+MSUB=Topic,Qos

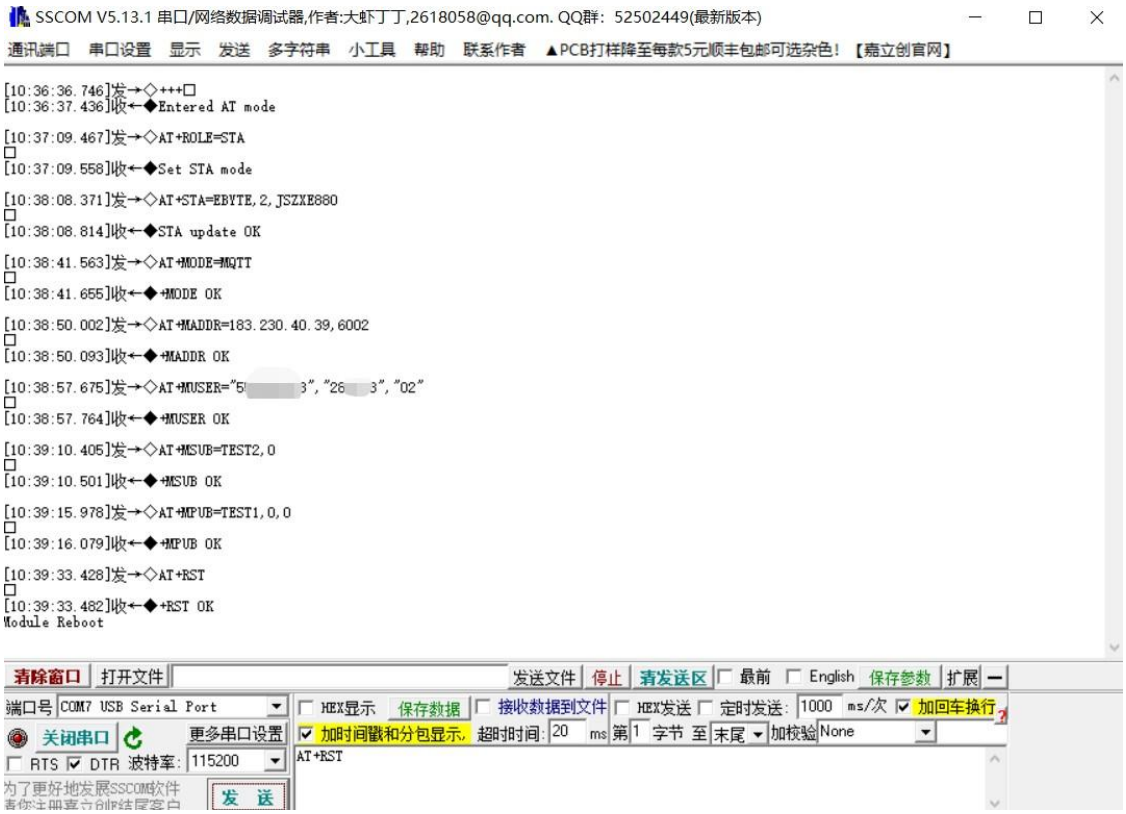
7. set the MQTT upload information AT+MPUB= Topic,Qos,Retain

8,restart to take effect command AT+RST

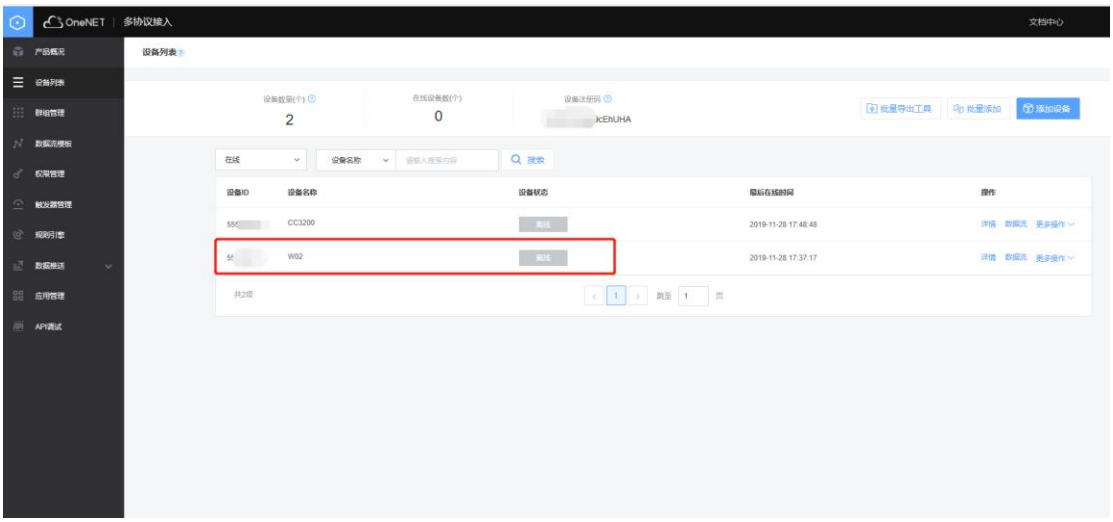
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3.2.2 Device Access Demonstration

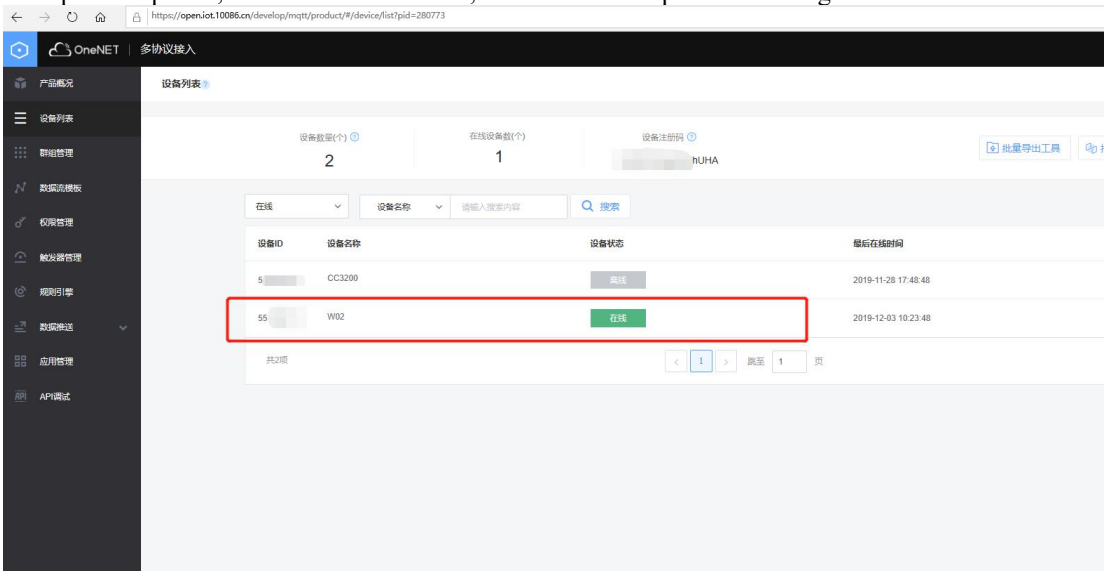
A complete set of MQTT AT commands operates as shown in the following figure.



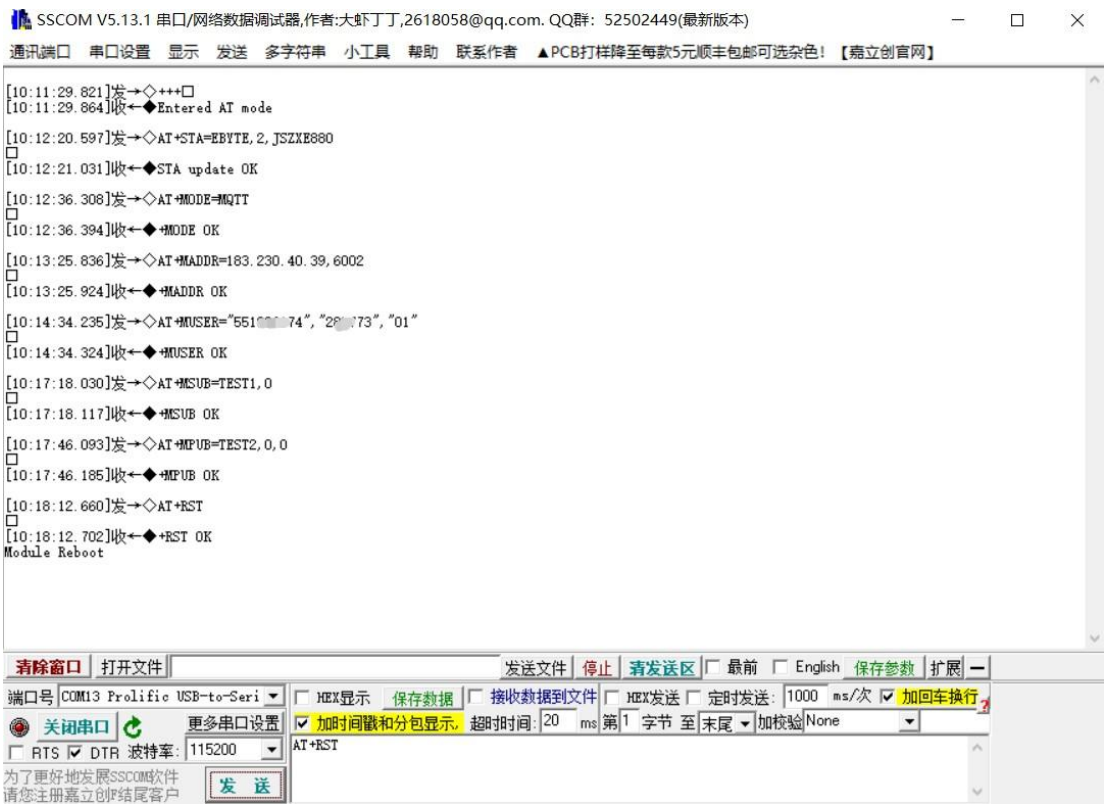
Logging into our ONENET MQTT device management platform shows an offline status when there is no access, as shown in the following figure



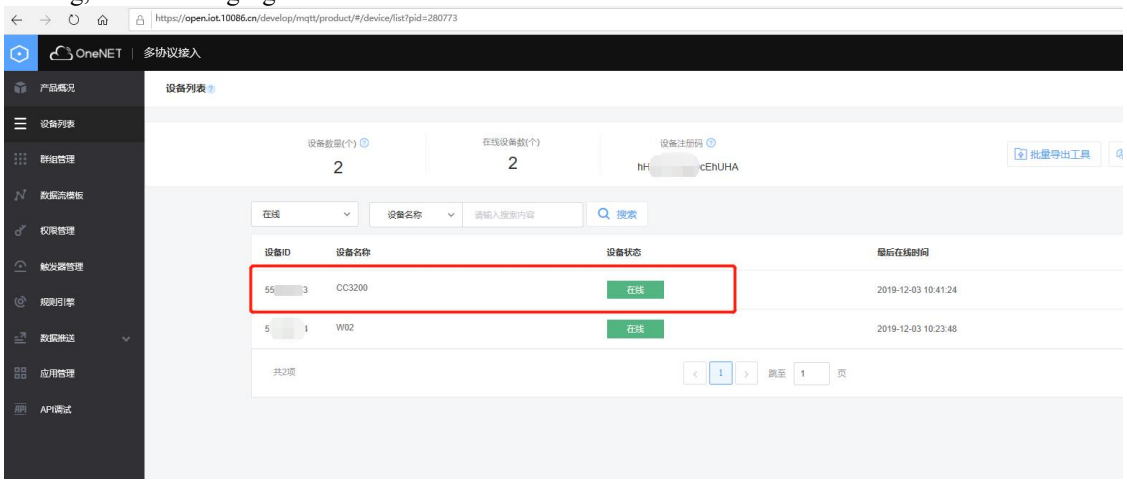
When the setup is completed, after successful access, ONENET cloud platform management shows the status of online



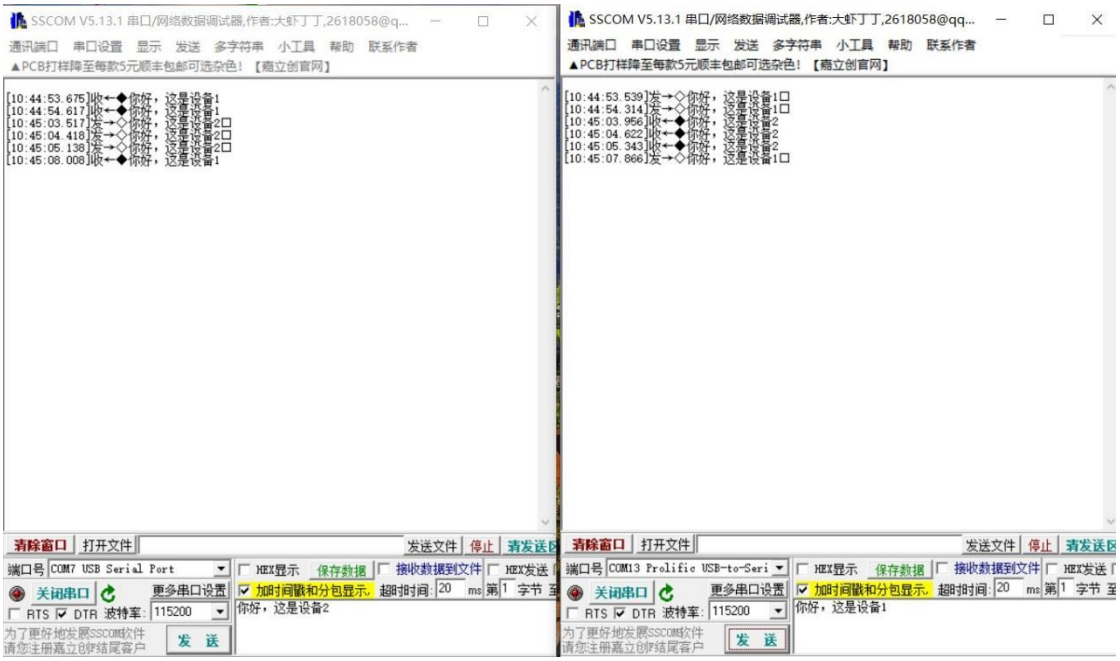
At this point, when the ONENET is successfully accessed, the GPIO10 pin is pulled low to characterize the successful access status, and pulled high when it is dropped. In order to visually demonstrate the transmission process of the device data, we use another W02 to follow the above steps (note that the subscription and upload paths need to be exchanged) As shown in the figure below.



After accessing, the following figure shows.



Now, MQTT communication between 2 devices is possible.



3.2.3MQTT Notes

In the above usage examples, ONENET is used as a use case, but this feature is used as a general MQTT feature to support different MQTT In the process of use, especially when MQTT is connected to the servers of MQTT service providers (e.g. AliCloud, BaiduCloud, ONENET), customers need to derive the corresponding MQTT triples according to their rules.

3.3 HTTP Client mode (HTTP)

3.3.1 Setup Process

When the module is working in HTTP Client mode, some sub-functions in other modes or modes will not be enabled at this time, in HTTP Client
mode, the module is connected to the user's destination HTTP server as an HTTP client. If the user wants to access Ethernet data in this way when using HTTP mode, he/she needs to know that the network role of the module should be set to STA mode. In the following, the access method and communication will be described.

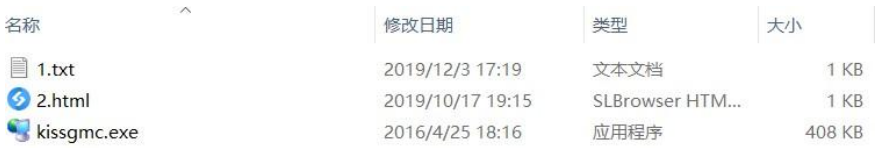
1. Enter AT mode so that the current network role is in STA mode
+++

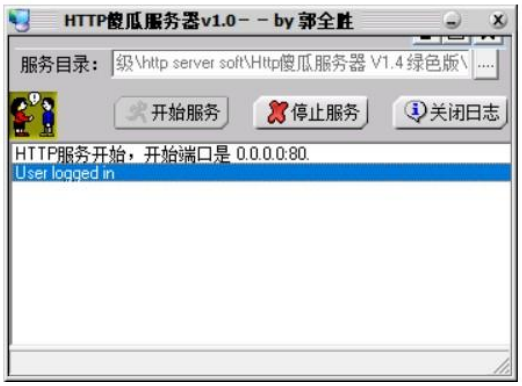
AT+ROLE=STA
2. Connect the destination WIFI (AP), access the network AT+STA=EBYTE,2,JSZXE880
3. Switch the mode, set the working mode to HTTP mode AT+MODE=HTTP
4. Set the HTTP connection information, the destination IP of the HTTP server and the listening port AT+HCADDR=192.168.0.136,80 (the HTTP server address of the local LAN) 5.
AT+HCMODE=/1.txt, POST
7. Set HTTP client's request header options (up to 180 bytes) AT+HCHEAD=, (parameter send "," means don't set header information) 8,restart to take effect command
AT+RST

3.3.2 Use of theOST request method

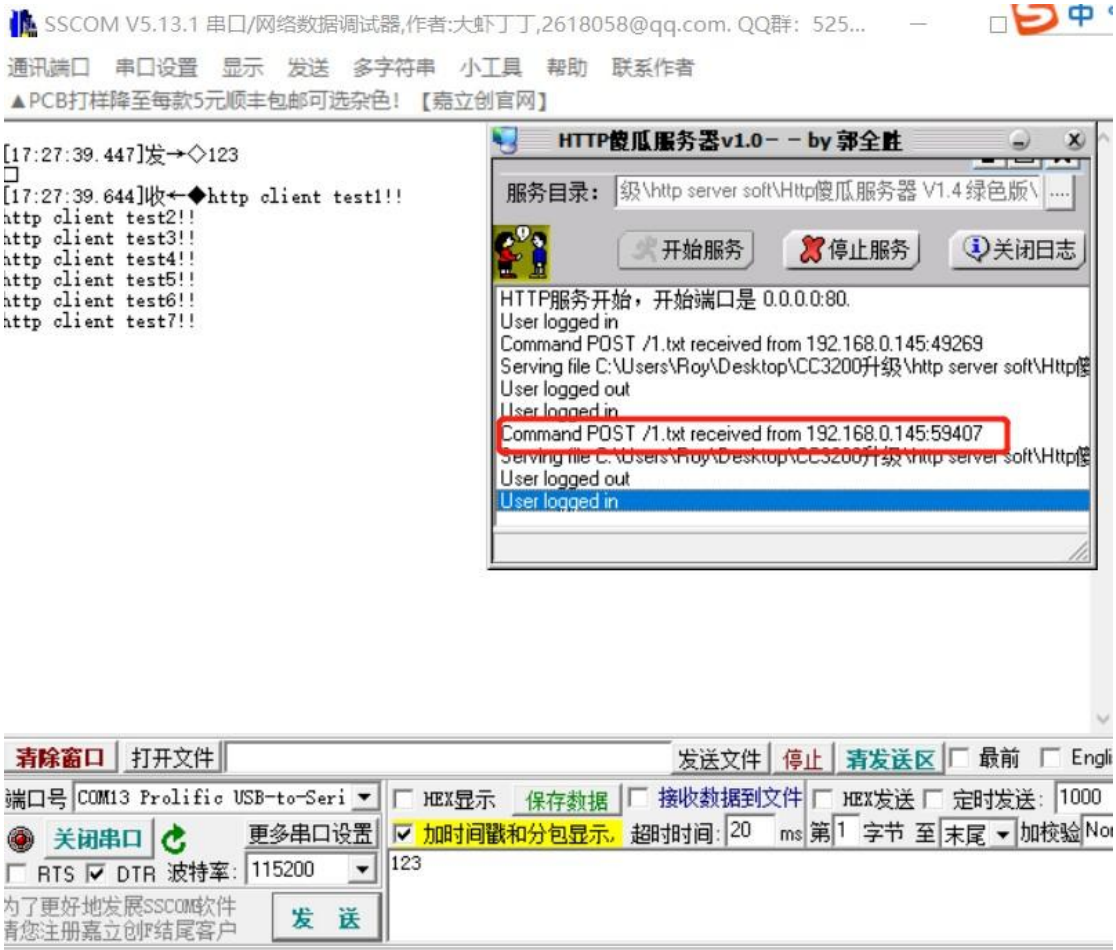
The AT command AT+HCMODE=URL, POST allows the module to request data in the form of a POST, with the URL being the specified access path.
For demonstration purposes, we open a server software on a PC under the same LAN as the module and create a 1.txt file in the same directory of the software, and write a number of data in the txt file, as shown in the following figure.
In the serial port, each time the data is sent, it will trigger the HTTP client's request data, and the corresponding data

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entered in the serial port is reported to the server data, in the serial port to send data: 123, the module will request data from the server according to the request path and request method set, the server will then return the file value to the serial port, as shown in the following figure: the red box in the figure is the request information of the module as an HTTP client.

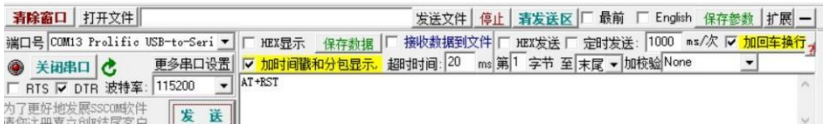


The POST method is generally recommended for clients to use when uploading larger data to the server, if you are just requesting data from the server, you can choose the GET method..

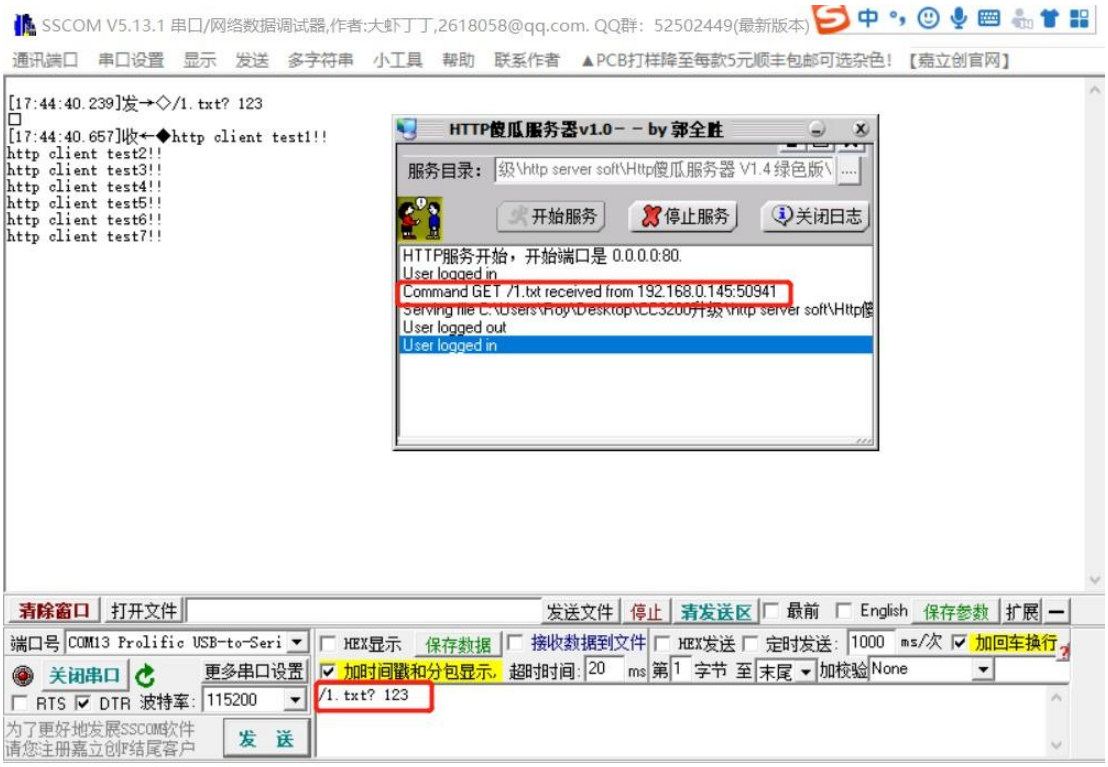
3.3.3 Use of 3GET request method

The AT command AT+HCMODE=URL, GET allows the module to request data as GET with URL being the specified access path.
URL is the specified access path and is only valid when the access data is POST, GET access path needs to be specified in the serial data. On the basis of POST, the request method is reset as follows.





When you need to request data, you need to specify the access path of the HTTP Client before sending the serial data as shown in the following figure



In the above figure, you can see the request method and path parsed by the server, and when using the GET method, you need to specify the access path in the serial data (remember to add "?") and spaces)

The GET method is more flexible and suitable for small data uploads, but the request path often becomes a situation.

3.3.4 HTTP Client Precautions

The access path set by the AT command is only valid for the POST request method, and the GET method requires the data header in the serial data to specify the access path.

The GET method requires the data header in the serial data to specify the access path.

The default request header attributes of the HTTP client are

Host: xxx.xxx.xxx.xxx

Accept: */* Content-Length: xx

This ensures that the client can request data without setting the packet header.

The customer can set the header information by using the data format AT+HCHEAD=XX:XX,XXX:XXX. If the customer wants to add the default request header followed by

Connection: keep-alive

Content-Type: application/json

then the following AT format should be used, with a total length of no more than 180 bytes.

AT+HCHEAD= Connection: keep-alive, Content-Type: application/json

3.4 Multi-link mode for servers (MULTIS)

When the module works in MULTIS mode, other modes or sub-functions will not be used, MULTIS i.e. the module as a server can support multiple client connection mode, currently the mode supports simultaneous 4-way client connection, the following, will show the module in the role of AP to achieve multi-client communication.

3.4.1 Setting process

1. Enter AT mode, so that the current network role is in AP mode

+++ AT+ROLE=AP

2. Switch the mode and set the working mode to MULTIS mode AT+MODE=MULTIS

3. set the local listening port number of MULTIS (default 5001) AT+MULTISP=5002

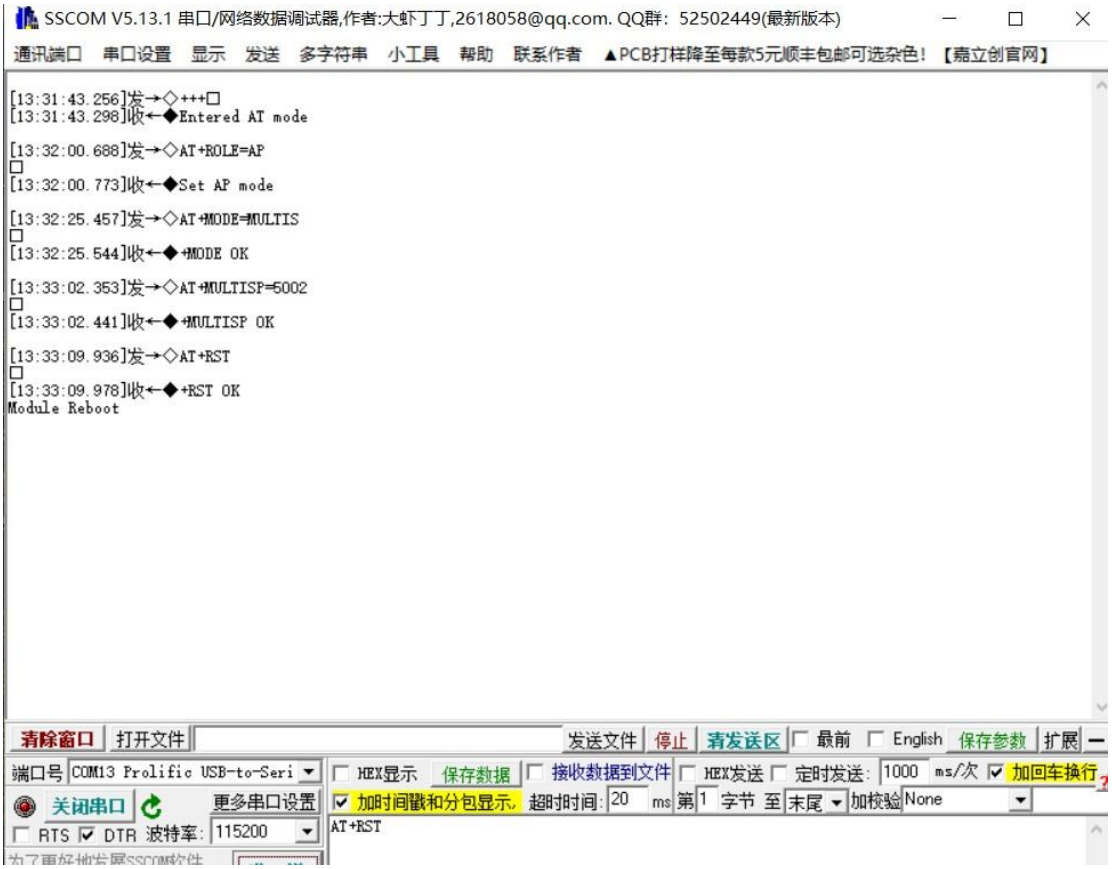
4,reboot to take effect command AT+RST

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3.4.2 Multi-client access demo

The operation of a complete set of AT commands in MULTIS mode is shown in the following diagram.

After reboot, at this point, the module works in MULTIS mode, which has been established after the server is powered

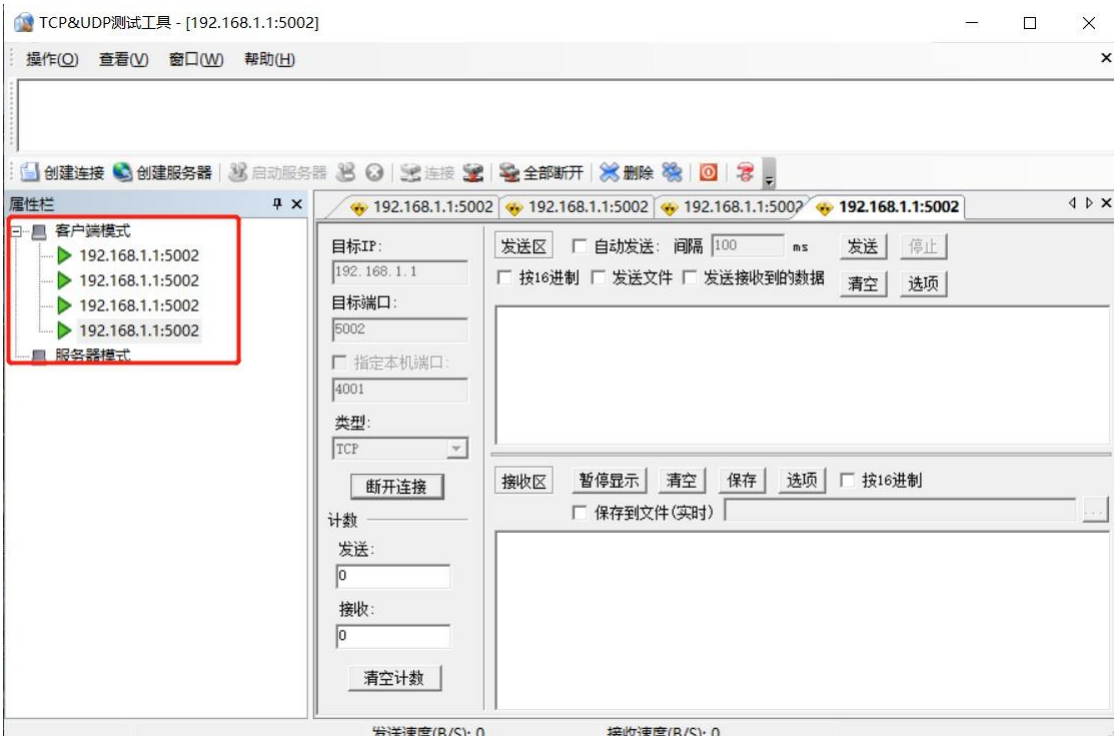


on, and the port number and local IP are set by the user. When the computer is successfully connected to the module, the GPIO9 pin is pulled low.

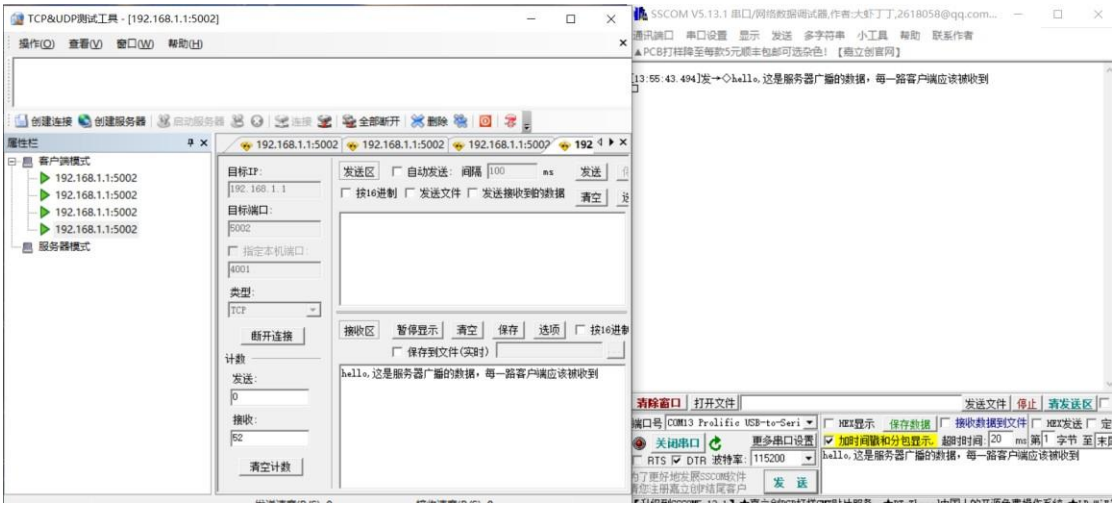
When successfully connected, we create 4 clients on the computer side, fill in the IP and port of the module server (here, the IP of our module: 192.168.1.1 port number 5002)

As shown in the figure below.

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The data received by the module's serial port will be broadcast to each of its client connections.



3.4.3MULTIS Caution

When there is one client connection, the GPIO10 pin will be pulled low to indicate client access, when there is no client connection in the module server link, GPIO10 will be pulled high to indicate no client access.

When there is no client connection in the module server link, GPIO10 will be pulled high to indicate that there is no access from any of the clients.

Messages from any TCP client will be printed out by the module's serial port, and messages entered by the module's serial port will be broadcast by the server to each of its client links.

Each client can choose to go offline at any time without restarting the configuration server.

When the server already has a link to 4 clients, the server will automatically kick off the earliest client link to the server when there is another access.

3.5 Multi-link mode for clients (MULTIC)

When the module works in MULTIC mode, other modes or sub-functions will not be used, MULTIC means that the module can support multiple server connection mode as a client, currently this mode supports access to two server links at the same time, A B two for common TCP/UDP links; in this example, the module will be made to work in the

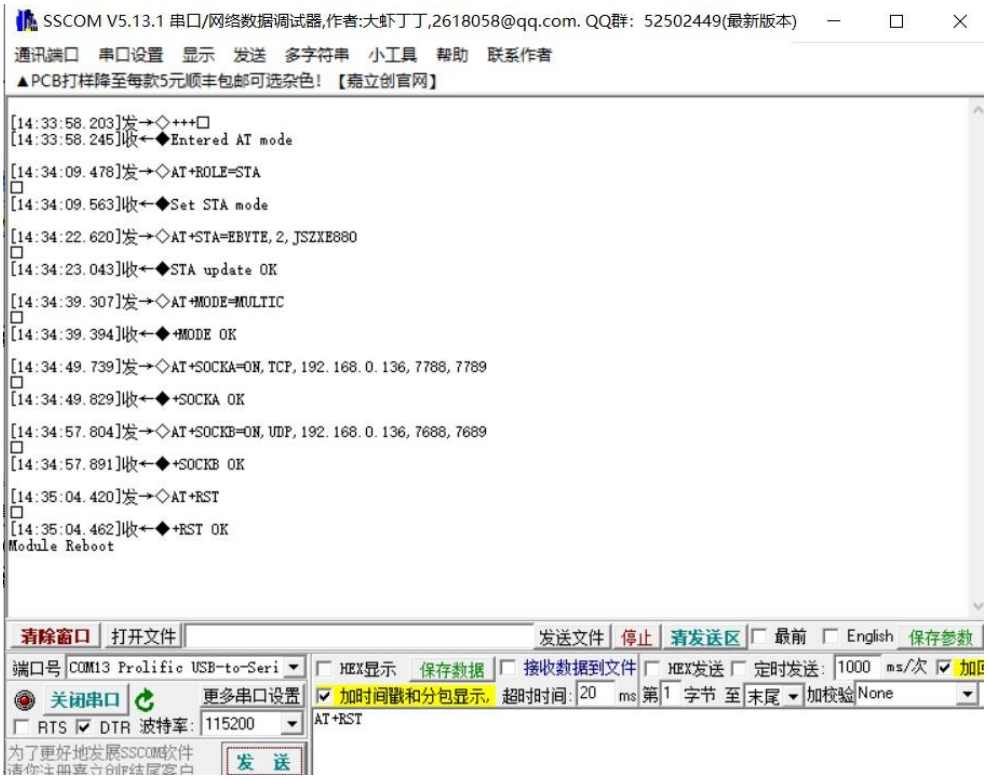
network role of STA, demonstrating the setup process and the use of A B 2.

3.5.1 Setting Process

1. Enter AT mode, so that the current network role is in STA mode
+++ AT+ROLE=STA
2. Connect the destination WIFI (AP), access the network AT+STA=EBYTE,2,JSZXE880
3. Switch the mode, set the working mode to MULTIC mode AT+MODE=MULTIC
4. Set the connection information of SOCKET A, connect to the destination server, the connection type is TCP AT+SOCKA=ON,TCP,192.168.0.136,7788,7789
5. Set the connection information of SOCKET B, connect to the destination server, the connection type is UDP AT+SOCKB=ON,UDP,192.168.0.136,7688,7689
6,Reboot to take effect command AT+RST

3.5.2A B Generic Client Access Server Demonstration

The operation of a complete set of AT commands in MULTIC mode is shown in the following diagram.

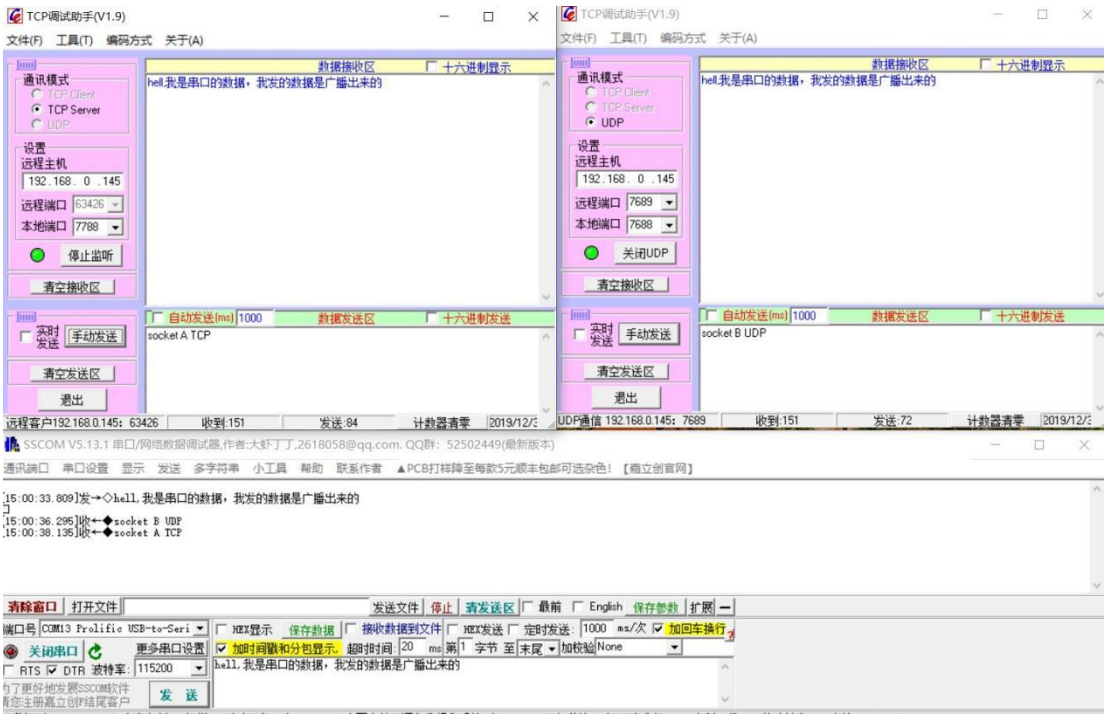


If more than 2 links are established and the links are of TCP type, it is necessary to ensure that the server (TCP) is established before the module is restarted, for the reasons explained in the notes later.

as shown in the following figure.

When the serial port sends data, it is sent as a broadcast to each server connected to the module client, and the data sent

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by each server is printed to the module serial port.

3.5.3MULTIC Precautions

MULTIC mode supports 2 connections of clients to the server, 2 common socket links, 2 links can be used at the same time, or one or more of them, with no restrictions.

When the module starts up, it will try to connect to the server pointed by the client for the first time, and when none of the clients of the module connects to the specified server correctly, the module will re-establish the connection. If one of the clients fails to connect to the server, it will not be used in future work.

When a client accesses a server that actively kicks off the client, it will not be used in future work if 2 or more clients are currently enabled.

When one or more clients have successfully accessed the server, GPIO10 is pulled low to indicate the status of at least one successfully accessed server, and when none of the clients have successfully accessed the server, GPIO10 is pulled high to indicate that no server is currently connected.

3.6 Modify serial port baud rate

No.	Remarks
1	The E103-W02 Wi-Fi module supports any serial port baud rate from 300-3000000.
2	The user can modify the corresponding parameters of the serial port by sending AT+UART command. For example: AT+UART=115200,8,0,1
3	Please refer to the AT command set for the specific commands.
Baud rate support	300-3000000bps（Default 115200）
Calibration bit support	NONE, no parity bit（Default）
	EVEN，Even Check
	ODD，Odd calibration
Data bits	5 positions
	5 positions
	5 positions
	5 positions
Stop Bits	5 positions

3.7 Low Power Configuration Description

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The E103-W02 has 4 power consumption modes: Active, Sleep, LPDS, and Hibernate, which can be changed to the corresponding low-power mode by sending the AT+PM command. For example: AT+PM=1,5

√(Active)/×(OFF)	MCU					NET	WAKEUP		REF CURRENT	
	RTC	RAM	UART	GPIO	CPU		NET	RXD	AP	STATION
Active	√	√	√	√	√	√	-	-	71mA	18mA
Sleep	√	√	√	√	×	√	√	√	68mA	16mA
Lpds	√	√	×	×	×	√	√	√	63mA	2.5mA
Hibernate	√	×	×	×	×	×	×	√	4.6uA	4.5uA

Mode 0: Active mode

All peripherals of the module are operating normally. This is the normal operating mode, where the module has the best performance and the fastest response time. Mode 1: sleep mode

The module can be woken up by serial port or network packet, the gpio port keeps output, and the module continues to run from sleep after waking up. Wake-up mode: serial RXD, network

Mode 2: Lpds mode

The module enters lpds mode, the network part remains running, and the module gpio port output is high resistance. The module can be woken up by serial or network packets, and the wake-up packets are transmitted normally. To send packets at this time, you need to send a serial short data to wake up the module first, and then you can send data normally after the module wakes up. When there is received network data, the data will be output directly through the serial port. Wake-up mode: serial RXD, network

Mode 3: Hibernate mode

When the module enters hibernate mode, both the network and MCU enter hibernate mode, and the gpio port outputs high resistance state, so it can only be woken up by serial data. After waking up, the module restarts and runs. The power consumption can reach below 5uA. Wake-up mode: serial RXD

Tips.

1, AP mode is set to low-power mode, the module will not enter low-power mode immediately after starting, and will only enter low-power mode after connecting to the network (as AP mode, there are devices connected to the module).

2、Receiving network data and serial data will refresh the delay time to enter the low-power mode. For example, in hibernate mode, after the user sends serial data to wake up the module and waits to connect to the server, it can continuously send data for a long time without worrying that the module will re-enter hibernate mode. When the serial port or network data reception is complete, the delay into low-power mode timing starts immediately, and the module re-enter hibernate mode after reaching the delay time.

3, low-power mode all IO are in high resistance state, so the status indicator is disabled, will not reflect the current actual connection status.

*** Translated with www.DeepL.com/Translator (free version) ***

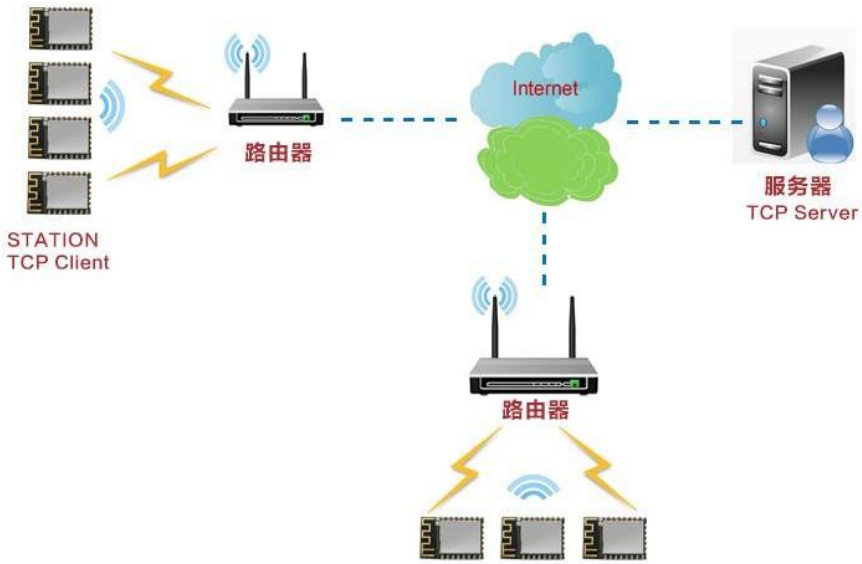
4. Network description

4.1 Networking Roles

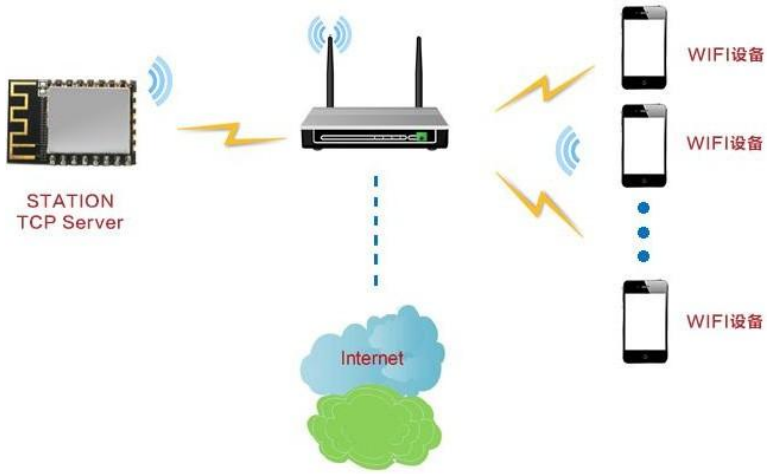
No.	Remark
1	The E103-W02 module supports AP mode (equivalent to a router), STATION mode (equivalent to a Wi-Fi device) as a physical connection role. The E103-W02 module supports AP mode (equivalent to a router), STATION mode (equivalent to a Wi-Fi device), and up to 1 Wi-Fi device in AP mode.
2	The E103-W02 module includes TCP Server, TCP Client and UDP in the socket role. TCP-based connection mechanism, please note that TCP heartbeat packets should be used if you need to be connected for a long time.

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4.2 Networking Model

Module establishes TCP Client communication with remote server connection in STATION mode (typical application)
The networking model can meet the applications of home IOT, intelligent meter reading, real-time monitoring, etc. The module can exchange data with the web server in real time. Users can perform various operations on the module side in real time by interacting with the web server.

Module establishes TCP Server communication with Wi-Fi device connection in STATION mode

This networking model is similar to the first one, except that the module establishes a TCP Server instead of a TCP Client in STATION mode.
This model can support up to 4 remote device connections under networking conditions.



One module establishes TCP Server in AP mode and other modules establish TCP Client in STATION mode to communicate with each other

This networking model can be referred to as intra-module networking, where a module in AP mode can be connected to at most one STATION, and the TCP Server can be established on any module under the completion of intra-module networking, and the remaining module can use TCP Client to communicate with it.

5. AT command

No.	Command	Test method. (Remember to add a carriage return line, the query command is AT+XXX=? The following is only an introduction to the The following is only to introduce the use of methods)	Function Description	Test Example	Example AT command response
0	+++	Parameter Description: No parameter Response. Entered AT mode			Entered AT mode

1	AT+ALLSTATE	AT+ALLSTATE Parameter description: No parameter Response: All parameter information	Execute all query commands such as AT+AP=? AT+MAC=?	AT+ALLSTATE	Returns the result of the executed query command
2	AT+AIRKISS	AT+AIRKISS Parameter Description: No parameter Response. Enter into AirKiss	Enter AIRKISS mode mode, wait for access to the AP	AT+AIRKISS	Enter into AirKiss
3	AT+APIP	AT+APIP=<APIP>,<Mask>,<Gateway>,<DNS> Parameter Description. APIP: IP address in AP mode Mask: subnet mask Gateway: gateway address DNS: DNS server address Response. APIP Update OK	Set/query AP IP related parameters	AT+APIP=?	APIP:192.168.1.1 Mask:255.255.255.0 Gateway:192.168.1.1 DNS:192.168.1.1
			Set the parameters related to the AP IP	AT+APIP=192.168.1.2,255.255.255.0,192.168.1.1,192168.1.1	APIP update OK
4	AT+AP	AT+AP=<SSID>,<SecType>,< Password> Description of parameters: SSID: Service Set Identifier <1~32Byte> SecType: encryption type (0: no password, 1: WEP encryption, 2: WPA2 encryption) Password: password <8~63Byte> Response. AP Update OK	Inquiry AP	AT+AP=?	SSID:EBT_65C60F SecType:0 Password:
			Settings AP	AT+AP=EBYTE,2, 12345678	AP update OK
5	AT+CHAN	AT+CHAN=<Channel> Description of parameters: Channel:Number of channels (1~11) Response.	Inquiry AP Access Road	AT+CHAN=?	AP Channel:11
			Settings AP Access Road	AT+CHAN=1	AP channel update OK
				AT+CHAN	AP channel update OK

		AP Channel Update OK			
6	AT+DEVSN	AT+DEVSN=? Parameter Description: No parameter Response. +DEVSN OK	Inquiry SN code	AT+DEVSN=?	+DEVSN SN: 191126173603FF1D
7	AT+EXIT	AT+EXIT Parameter Description: No parameter Response. Exited AT Command mode	Exit AT mode	AT+EXIT	Exited AT mode
8	AT+HELP	AT+HELP Parameter Description: No parameter Response. Functional description of all commands	View the help command for each AT command	AT+HELP	Show usage of all AT commands
9	AT+HTTP	AT+HTTP=<Switch> Parameter Description: Switch: 0 (off) or 1 (on) Response. Http status set OK	Inquiry HTTP SERVER's Enablement	AT+HTTP=?	Http status: 1
			Settings HTTP SERVER Enablement	AT+HTTP=1	Http status set OK
10	AT+HCADDR	AT+HCADDR=<Server Addr>,<Server Port> Parameter description. Server Addr： HTTP Server IP Server Port: HTTP Server Port Response. +HCADDR OK	Inquiry HTTP CLIENT's address-related parameters number	AT+HCADDR=?	+HCADDR State:OFF,Addr:192.168.1.1,Port:80
			Settings HTTP CLIENT's address-related parameters	AT+HCADDR=192. 168.1.1,80	+HCADDR OK
11	AT+HCMODE	AT+HCMODE=<URL>,<Request> Parameter Description. URL: path to request server (1~64 bytes) Request: method of request GET/POST (1~10 bytes) Response. +HCMODE OK	Inquiry HTTP CLIENT's	AT+HCMODE=?	+HCMODE URL:/post,Request:POST
			schema-related parameters Parameters	AT+HCMODE=/k.t xt,POST	+HCMODE OK

12	AT+HCHEAD	AT+HCMODE=<head1>,<head2>,...<headn> Parameter Description: head1~headn: packet header information, broken by "," no more than 128 bytes Response +HCHEAD OK	Inquiry HTTP CLIENT's Packet header information	AT+HCHEAD=?	+HCHEAD Header:Accept: */*
			Settings HTTP CLIENT's Packet header information	AT+HCHEAD=,	+HCHEAD OK
13	AT+KEEPALIVE	AT+KEEPALIVE=<ON/OFF>,<Period>,<len><Info> Parameter description. <ON/OFF>:ON(open) OFF (OFF) If OFF, the following parameters are invalid (factory default is OFF) < Period >:Heartbeat period in seconds (1~300) <Len>:heartbeat packet length of Settings (1~31) <Info>:Heartbeat packet content (length less than 32 hexadecimal digits) Response. Keepalive set OK	Inquiry Heartbeat Package Related Parameters	AT+KEEPALIVE=?	Keepalive status: OFF Period:50 Len:5 InfoPkt:0102030405
			Settings heartbeat packet related parameters	AT+KEEPALIVE=ON,10,5,0102030405	Keepalive set OK
14	AT+MULTISP	AT+MULTISP=<Port Parameter description. <Port>: Server port number of multi-client (1~65536) Response. +MULTISP OK	Inquiry server port number	AT+MULTISP=?	+MULTISP Port:5001
			Settings server port number	AT+MULTISP=5002	+MULTISP OK
15	AT+MADDR	AT+MADDR=<Server IP/URL >,<Port> Parameter Description: Server IP/URL. MQTT server address URL or ip Port:MQTT server port Response: +MADDR +MADDR OK	Check the MQTT address-related parameters	AT+MADDR=?	+MADDR State:OFF,Addr:www.ebyte.com,Port:1883
			Set the address-related parameters for MQTT	AT+MADDR=183.2 30.40.39,6002	+MADDR OK

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		AT+MUSER=<"ClientID">,<"UserName">,<"UserPWD"> Note that the parameters need to be quoted here Description of parameters: ClientID: Client ID (up to 64 bytes) UserName: User name (up to 64 bytes) UserPWD: user secret (up to 64 bytes) Response: +MUSER OK +MUSER OK	Parameters related to querying MQTT's user information	AT+MUSER=?	+MUSER ClientID:Roy,UserName:ebyte,UserPwd:123456
16	AT+MUSER		Set the parameters related to user information for MQTT	AT+MUSER="5556 56353","280773","02"	+MUSER OK
		AT+MSUB=<Topic>,<Qos> Parameter Description: Topic:The path of the Topic to which Settings subscribes (up to 64 bytes) Qos:Settings subscribed Qos message level 0,1,2 Response. +MSUB OK	Inquiry MQTT Sub topic related parameters	AT+MSUB=?	+MSUB Topic:subtopic,Qos:0
17	AT+MSUB		Set the relevant parameters for the MQTT Sub topic	AT+MSUB=subtopic,0	+MSUB OK
		AT+MPUB=<Topic>,<Qos>,<retain> Parameter description. Topic:The path of Topic reported by Settings (up to 64 bytes) Qos:Qos message level reported by Settings 0,1,2 retain:Probate parameter reported by Settings 0,1 Response. +MSUB OK	Inquiry MQTT Pub topic related parameters	AT+MPUB=?	+MPUB Topic:pubtopic,Qos:0,Retatin:0
18	AT+MPUB		Set the parameters related to the MQTT Pub topic	AT+MPUB=pubtopic,0,0	+MPUB OK
		AT+MODE=<RunMode> Parameter Description. <RunMode>: The mode in which the	Inquiry Current Communications Communication Mode	AT+MODE=?	+MODE Run Mode:NORMAL
19	AT+MODE				

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		module is running, with the following values: NORMAL: traditional mode, original functional mode MQTT: MQTT mode HTTP: HTTP CLIENT	Settings Current communication mode	AT+MODE=MQTT	+MODE OK

		Modes MULTIS: Multi-client access mode MULTIC: Multi-server connection mode Response +MODE OK			
20	AT+MAC	AT+MAC=? Parameter Description: No parameter Response. MAC address	Inquiry mac address	AT+MAC=?	1893D7429AA7
21	AT+ONENETIPPORT	AT+ONENETIPPORT=<RemoteIP >,<Remote Port > Description of parameters： RemoteIP: IP address RemotePort: Communication server port Response：OneNET RemoteIpPort set OK	Checking ONENET IP and port-related related parameters	AT+ONENETIPPOR T=?	OneNET RemoteIP:183.230.40.33 RemotePort:80
			Set the ONENET IP and port-related parameters	AT+ONENETIPPOR T=183.230.40.33,80	OneNET RemoteIpPort set OK
22	AT+ONENETUNI	AT+ONENETUNI=<ON/OFF>,P_ID,A_Info,S_name Parameter Description: ON/OFF: ON(open) OFF(close) If OFF, the following parameter is invalid (default is OFF) (considered as OFF) P_ID: OneNET product ID A_Info: OneNET device authentication information S_name: OneNET product script file name Response. OneNET Uni Set OK	Inquiry ONENET's User Related Parameters	AT+ONENETUNI=?	OneNET status:OFF P_ID:95205 AU_Info:ebyte1 S_Name:Smart
			Settings ONENET's user-related parameters	AT+ONENETUNI=ON,278656,02 ,EbyteScr	OneNET Uni Set OK

23	AT+ONENETADD	AT+ONENETADD=<inde x>,<deviceID>,<Api key> Parameter Description: Index: Add the device to the group index number (less than 20) deviceID: OneNET device ID of the receiving device Apikey: OneNET APIkey of the receiving device Response: Add Success Add Success	Add ONENET device Device ID	AT+ONENETADD=1 ,548806592,K0ITQw7RcARCHdou2 2fjSEz3sQU=	Add Success
24	AT+ONENETDEL	AT+ONENETDEL=<inde x> Parameter Description: Index: Adds the device to the group index number (less than 20) Response: Delete Success Delete Success	Delete ONENET device Device ID	AT+ONENETDEL	Delete Success
25	AT+ONENETSEL	AT+ONENETSEL=<inde x> Description of parameters: Index: Adds the device to the group index number (less than 20) Response: Deviece ID: 17502768 APIKey: pyZVOnnBGhT=7X0Bl6 oqoaEdh2 (device present) or Deviece ID: - APIKey: - (no information at this index)	Select ONENET device Device	AT+ONENETSEL=1	Deviece ID: 548806592 APIKey: BFizARKT6LyQClPaT7QefXOK UrE=
26	AT+STATUS=?	AT+STATUS=? Parameter Description: No parameter Response. WiFi Status: IP=192.168.1.1 , Gateway=0.0.0.0	View link status	AT+STATUS=?	WiFi Status: IP=192.168.0.161 , Gateway=192.168.0.1

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27	AT+PM	AT+PM=<Power Mode>,<Delay> Parameter description. Power Mode: Power consumption mode Mode: (can be 0,1,2,3) Delay: the delay time to enter the low-power state after waking up Delay: the delay time to enter the low-power state after waking up Delay: the delay time to enter the low-power state after wake-up (2~240S) Response.	Inquiry Power Management-related Parameters Inquiry Power Settings power management related parameters	AT+PM=? AT+PM=0,240	Power Mode:0 Set Delay:5 Power mode set OK
28	AT+RESTORE	AT+RESTORE Parameter Description. No parameter Response. Restore OK	Restore factory Settings operation	AT+RESTORE	Restore OK
29	AT+REGPKT	AT+REGPKT=<ON/OFF> ,<len>,<Info> Parameter description. <ON/OFF>:ON(open) OFF (off) If it is OFF, then the following parameters is not Effective (factory default is OFF) <len>:Registration package of Settings Length (1~31) <Info>:Registration package content	Inquiry registration package related parameters Settings registration package related parameters	AT+REGPKT=? AT+REGPKT=ON,10,010203040506 0708090A	RegPkt status: OFF Len:5 RegPkt:0A0B0C0D0E RegPkt info set OK

		(length less than 32 16			
30	AT+ROLE	AT+ROLE=<mode> Parameter description. mode: Settings for AP indicates Access Point, which provides wireless access service Settings is STA for Station, similar to Wireless Terminal. Wire Terminal Response.	Inquiry Module for Web Roles Settings module for web roles Settings module for web roles	AT+ROLE=? AT+ROLE=STA	Role=AP Set STA mode

31	AT+RST	AT+RST Parameter Description: No parameter Response. Module rebooting	Reboot	AT+RST	+RST OK
32	AT+STAIP	AT+STAIP=<IPMode>, <STAIP>,<Mask>,<Gateway>,<DNS> Parameter description. IPMode: IP mode (DHCP or STATIC) STAIP: The IP address in STA mode IP address of Mask: subnet mask Gateway: Gateway address DNS: DNS server address address Response.	Inquiry STA IP-related Information Inquiry STA	AT+STAIP=?	STAIP:192.168.0.161 Mask:255.255.255.0 Gateway:192.168.0.1 DNS:192.168.0.1 IPMode:DHCP
			Information about setting up STA IP	AT+STAIP=DHCP, 192.168.0.161, 255.255.255.0, 192.168.0.1,192.168.0.1	STAIP update OK
33	AT+SOCKA	AT+SOCKA=<ON/OFF>, <Protocol>,<RemoteIP>,<RemotePort>,<LocalPort > Note: SOCKA SOCKB is the secondary SOCK Only support client Parameter description. <ON/OFF>: Enable on OFF, default is OFF, OFF is followed by the parameter Settings without Effect Protocol.	Inquiry Vice socket A Road-related parameters number	AT+SOCKA=?	+SOCKA State:OFF,Proto:TCP,RIP:192.168.1.1,RPort:7789,LPort:7788
			Settings Sub socket A Related parameters of the path number	AT+SOCKA=ON,TCP,183.221.116.120,8886,8889	+SOCKA OK

		UDP/TCP: the communication protocol used. Protocol RemoteIP: Remote IP RemotePort: Remote port LocalPort LocalPort: Local port LocalPort Response. +SOCKA OK AT+SOCKA=<ON/OFF>,			

		AT+SOCKB=<ON/OFF>,	Inquiry Parameters related to the subsocketB path	AT+SOCKB=?	+SOCKB State:OFF,Proto:TCP,RIP:192.168.1.1,RPort:7689,LPort:7688
34	AT+SOCKB	<Protocol>,<RemoteIP>,<RemotePort>,<LocalPort > Note: SOCKA SOCKB is the secondary SOCK Only client side is supported Parameter description. <ON/OFF>: Enable on OFF, default is OFF, OFF is followed by the parameter Settings without Effect Protocol. UDP/TCP: the communication protocol used. Protocol RemoteIP: Remote IP RemotePort: Remote port LocalPort LocalPort: Local port LocalPort Response. +SOCKB OK	Settings Related parameters of the subsocketB path	AT+SOCKB=ON,TCP,183.221.116.120,8886,8889	+SOCKB OK
35	AT+SOCKEBT	AT+SOCKEBT=<ON/OFF > Parameter description. <ON/OFF>: Enables on OFF, default is OFF, OFF is followed by the parameter Settings without effect	Inquiry EBYTE's access status	AT+SOCKEBT=?	+SOCKEBT State:OFF

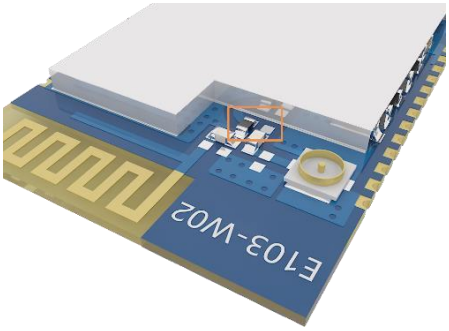
		Response: +SOCKEBT +SOCKEBT OK AT+SOCKEBT=<ON/OFF >	Settings EBYTE's access status	AT+SOCKEBT=ON	+SOCKEBT
36	AT+SOCK	AT+SOCK=<Protocol> ,<CS>,<RemoteIP>,< RemotePort>,< LocalPort >	Inquiry main socket related parameters	AT+SOCK=?	Protocol:TCP CS:CLIENT RemoteIP:183.230.40.40 RemotePort:1811 LocalPort:8887
			Settings master socket's related parameters	AT+SOCK=TCP,CLIENT ,183.230.	Socket update OK

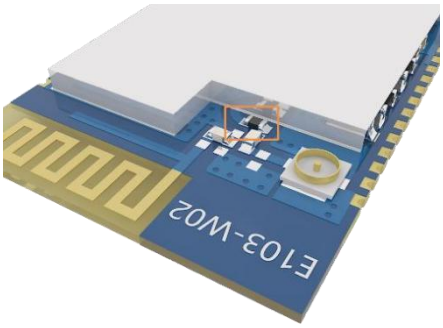
		CS: (CLIENT or SERVER) RemoteIP: Remote IP address RemotePort: Remote port number LocalPort: Local port number Response. Socket Update OK		40.40,1811,8887	
37	AT+SMT	AT+SMT=<Timeout> Parameter Description: Timeout: Timeout to exit the mode (can be 0~255; 0: never exit, 1~255: exit after 1~255 seconds) Response. Enter into Smartconfig	Enter Smart Config mode	AT+SMT=60	Enter into Smartconfig
38	AT+STA	AT+STA=<SSID>,<Sec Type>,<Password> Description of parameters: SSID: Service Set Identifier <1~32Byte> SecType: encryption type Password: password <8~63Byte> Response. STA Update OK	Inquiry STA's related parameters	AT+STA=?	SSID:E880-IR01 TYPE:2
			Settings STA related parameters	AT+STA=E880-IR01,2,JSZXE880	STA update OK
39	AT+UBEAT	AT+UBEAT=<ON/OFF>,<heard words>,<Type>,<period> Parameter description. <ON/OFF>: whether the heartbeat function is enabled or not, not enabled by default heard words: heartbeat content (up to 64 bytes) Type: heartbeat type: 0:ascll 1:HEX period: heartbeat period	Inquiry serial heartbeat packet related Parameters	AT+UBEAT=?	+UBEAT State:OFF,Heart words:hello,Type:Asc,Peri:5
			Settings serial heartbeat packet related parameters	AT+UBEAT=ON,EB YTE,0,5	+UBEAT OK

		（0~255） Response: +UBEAT OK			
40	AT+UART	AT+UART=<Baud>,<Da tabit>,<Parbit>,<S topbit> Parameter description. Baud: Baud rate (desirable 300-3000000bps) Databit: data bit Parbit: Parity bit Stopbit: Stop bit	Inquiry serial port of related parameters	AT+UART=?	Baud:115200 Databit:8 Parbit:0 Stopbit:1
			Settings serial port related parameters	AT+UART=115200 ,8,0,1	Uart update OK
41	AT+VER=?	Parameter Description. No parameter Response.	Inquiry Version Information	AT+VER=?	E103-W02 V3.0

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6. Antenna Selection





The default factory 0R resistor is soldered as shown above (left), and the antenna interface is PCB; if you need to change the antenna interface to IPEX, please change the 0R resistor as shown above (right).

7. Customized cooperation

If you want to customize your products, please contact our company.
EBYTE has reached deep cooperation with many famous enterprises.

8. Welding work instruction

8.1 Reflow temperature

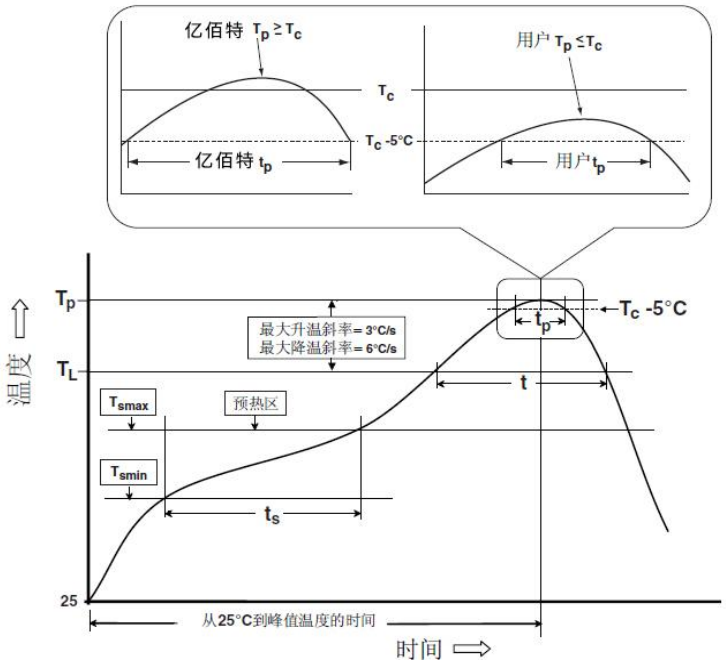
Reflow profile characteristics		Leaded process assembly	Lead-free process assembly
Preheat/hold	Minimum temperature (Tsmin)	100℃	150℃
	Maximum temperature (Tsmax)	150℃	200℃
	Time (Tsmin~Tsmin)	60-120 s	60-120 s
Temperature rise slope (TL~Tp)		3℃/sec, max.	3℃/sec, max.
Liquid phase temperature (TL)		183℃	217℃
Holding time above TL		60~90 seconds	60~90 seconds

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Peak temperature of the package Tp	The user cannot exceed the temperature marked on the "Moisture Sensitivity" label of the product.	The user must not exceed the temperature marked on the "Moisture Sensitivity" label of the product.
The time (Tp) within 5°C of the specified grading temperature (Tc), see the figure below	20 seconds	30 seconds
Cooling slope (Tp~TL)	6℃/sec, max	6℃/sec, max
Time from room temperature to peak temperature	6min, max	8min, max
*The peak temperature (Tp) tolerance of the temperature profile is defined as the upper limit for the user		

8.2 Reflow Profile



9. Revision history

Version	Revision Date	Revision Notes	Maintaining people
1.0	2017-10-16	Initial Version	huaa
1.1	2018-5-23	Content Addition	huaa
1.2	2018-9-18	Manual splitting	huaa

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1.3	2019-2-17	Bug fix	Ray
1.4	2019-8-9	Content addition	All
3.0	2019-12-18	Version upgrade	Blue
3.1	2020-2-25	Content modification	Blue
3.2	2022-9-16	Content modification	Hao
3.3	2022-12-12	New welding guide	Hao

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