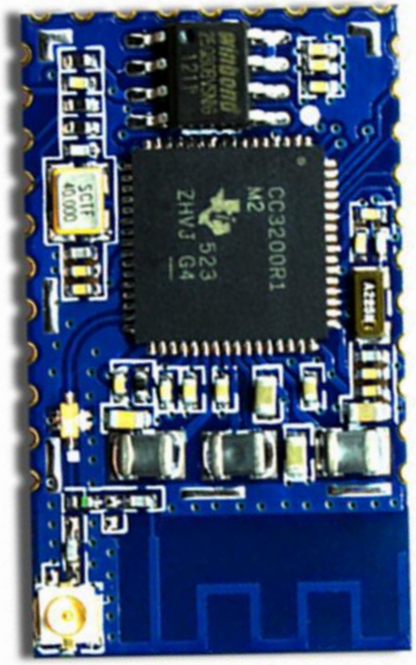
W-001 Wi-Fi Module Manual



H-2 Technik UG (haftungsbescgränkt)

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Version Information

Version	Date	Modified By	Introduction
1.1	03.2016	Kim	Release

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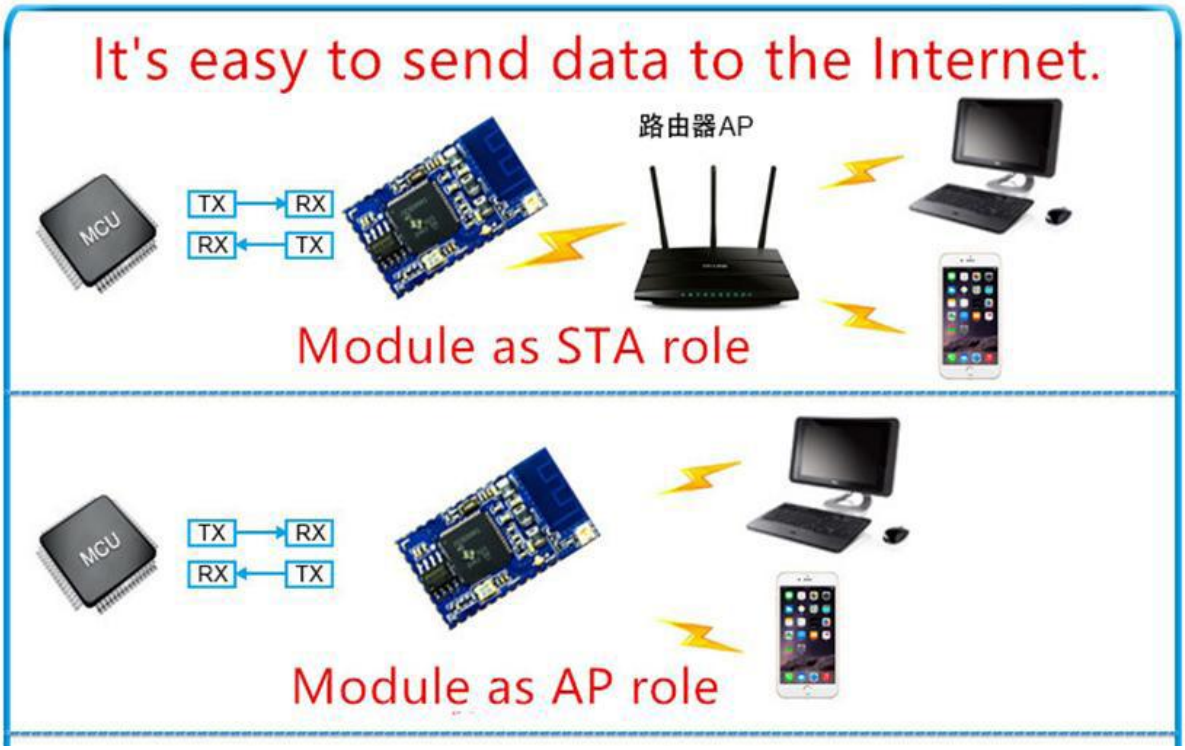
1. Overview

W-001 is a Serial Wifi Wireless Transceiver Networking Module ,it uses TI CC3200 Wi-Fi chip which is a highly integrated chip designed for the needs of IOT. TI CC3200 device is a wireless MCU that integrates a high-performance ARM Cortex-M4 core running at 80MHz, includes Embedded TCP/IP and TLS/SSL stacks, Http Server and multiple Internet protocols. So W-001 is a fully integrated single 2.4GHz band 802.11 b/g/n module, intended for portable and battery powered applications, where Wi-Fi connectivity is needed.

W-001 provides a low cost and simple Wi-Fi solution for devices that run an operating system and a TCP/IP stack on-board, but still offers the benefits of a module – small form factor, easy integration and certifications.W-001 integrates AT command， Web Configuration， and support smartconfig, serial transparent transmission, it makes that easy to send the data to the internet and implement the remote control.



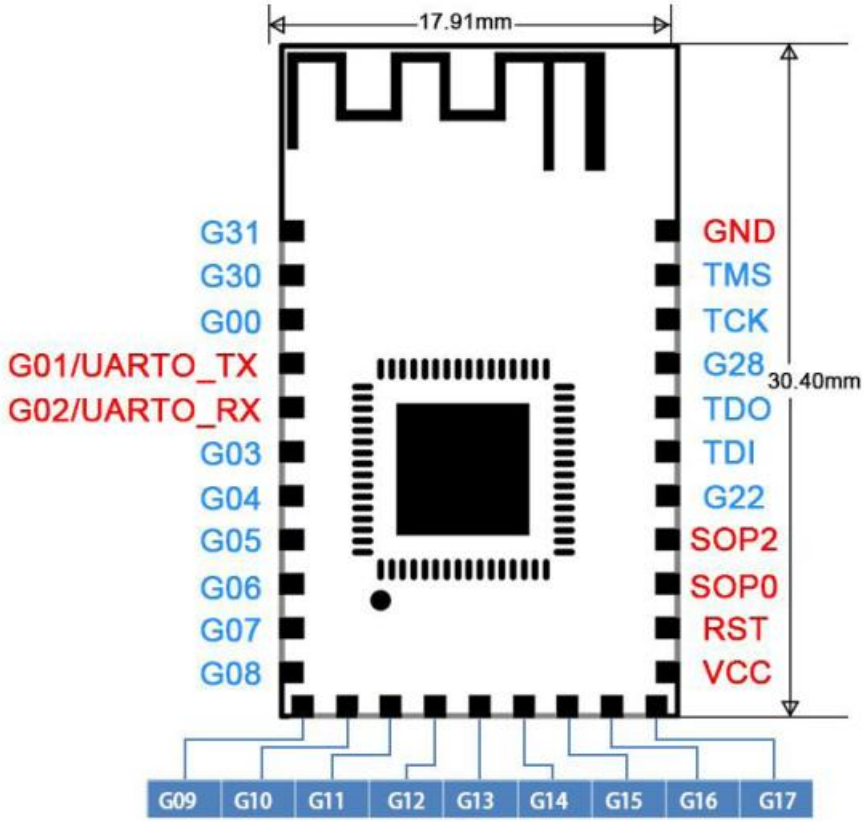
2. The detailed parameters of Module

2.1 The parameters of module

W-001 WiFi module's parameters in detail in the following table:

WeBee W-001 WiFi Module parameters:	
PCB parameters	1. Layers : 4
	1. Size : 30.4*17.9mm
	3. Interface : 2mm interval
	4. Material : RF special materials
The characteristics of the module	1. Input DC voltage : 2.1V-3.6V（3.3V is recommend）
	2. Operating temperature : -40℃— 80℃
	3. Antenna： PCB on board(also supports an IPEX antenna)
	4. Transmission distance: 80 m(open environment)
	5. WiFi version : 802.11.4 b/g/n
	6. Transmission power : 18dBm @1 DSSS， 14.5dBm @54OFDM
	7. CC3200 All IO ports expansion,including debug ports
The module software features	1. All parameters would be saved after power-down
	2. Support AP and STA role
	3. Integrate AT command and web Configuration
	4. Support TI's smartconfig smart link protocol
	5. Support "OPEN"， "WAP"， "WAP2"
	6. Support DHCP to automatically obtain IP
	7. Support TCP Server， TCP Client， UDP

2.2 The description about module-pin



please refer to datasheet for detail I/O Mapping

If the customer use W-001 WiFi module transparent transmission module， you only need to focus on the function and use of the following Pin, it can directly interact with external MCU,to implement transmit data to Internet and remote control.

Single Name	I/O	Description
VCC	I	Power supply:2.0 ~3.6V(3.3V is recommend)
GND	--	GND
SOP0	I	It needs to pull low level for booting.
SOP2	I	It needs to pull low level for booting.
RST	I	an external reset signal , low level effective
G01	I	**The Rx pin of Module**

G02	O	**The Tx Pin of Module**
G09	O	This pin will outputs three pulses， if module boot success
		Indicating the WiFi state High level: the WiFi connects to the router Low level: the disconnect to the router
G10	O	When the UDP creation is successful, the pin outputs "0", otherwise outputs "1"
		When used as TCP Server, there came the TCP Client connection pin outputs "0", otherwise outputs "1"
		When used as TCP Client, when successful connect to the TCP Server, this pin outputs "0", otherwise outputs "1"
G11	I	Deep-Sleep Wakeup pin ,Enter smartconfig mode outputs "0", otherwise outputs "1"
TDI	JTAG	JTAG→ data input
TDO		JTAG→ data output
TCK		JTAG→ clk
TMS		JTAG→ mode

SOP pins's state control the module can be run or download status：

SOP0	SOP1(pull down defualt)	SOP2	用途
0	0	0	JTAG/Run
1	0	0	SWD
0	0	1	Using serial download

2.3 Factory settings

Item	Default parameters
port	9001
Encryption	OPEN
Wireless networking mode	AP mode
IP address of module	192.168.1.1
Network parameters	TCP Server
Operating mode	serial transparent transmission
Module Baud Rate	9600bps，Data filed 8bit，stop bit 1bit，No odd-even check

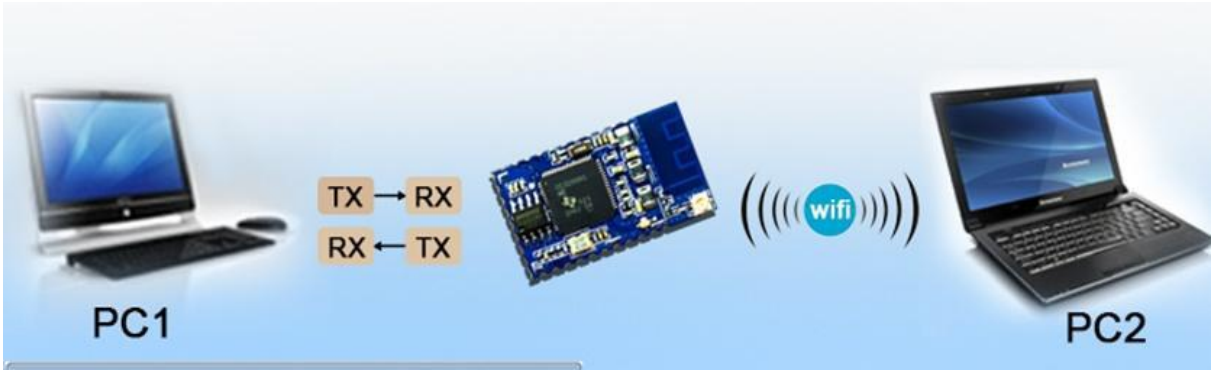
3. Testing W-001 module

This section will introduce the Instructions about W-001 module Simply to allow users to quickly know how to use the module, so you can have a comprehensive understanding about our modules quickly. It can be tested network easily that the module is an AP (router) in default when the power on, PC as a client role connected to the module.

① Hardware connection

There are two methods about testing the module. The first is the module as AP (router), PC as a client connected to the module for testing network; the second is that all modules and PC as a client, they are connected to a network router test; here using the first method for testing.

The W-001 module is connected to the PC1 through the serial port and the pins is 3.3V TTL level (PC1 and PC2 can be the same one).



②PC2 and module connect each other via wireless.

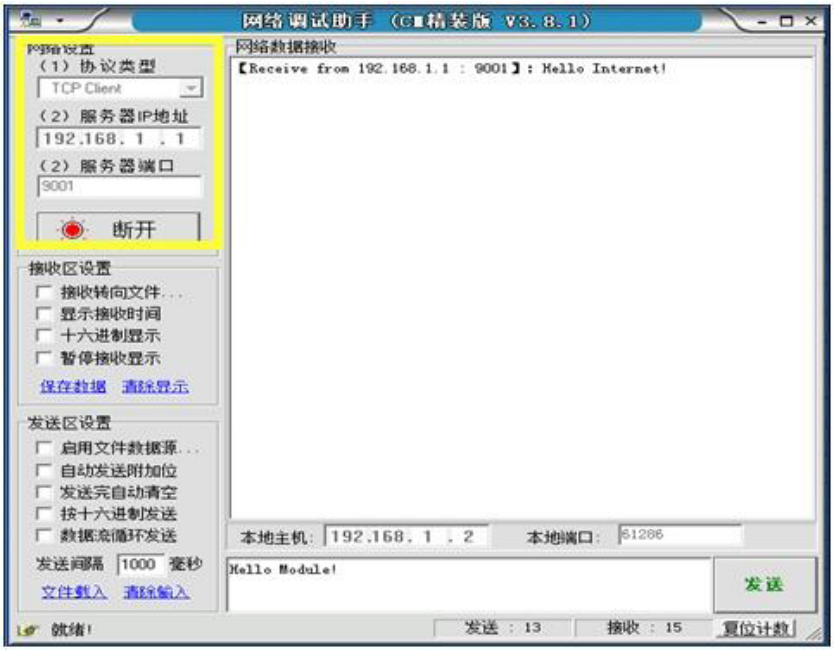
The module of factory setting is an AP(router) role， just open your phone or PC's wireless network, you can find the SSID which name is WEBEE_XXXXXX (XXXXXX is the part of MAC address，for example: if the module's MAC address is —1A-FE-34-EE-34-B6 ， then SSID is—W-001_EE34B6). The wireless network is no password in default.

The detail of network information :module as the AP's IP address is 192.168.4.1, and the PC is connected to its IP address is 192.168.4.2; Check you PC's wireless network status, you can see information about the following figure illustrate successful PC connection module, so be sure to ask the user to confirm this, to ensure the success of the test.

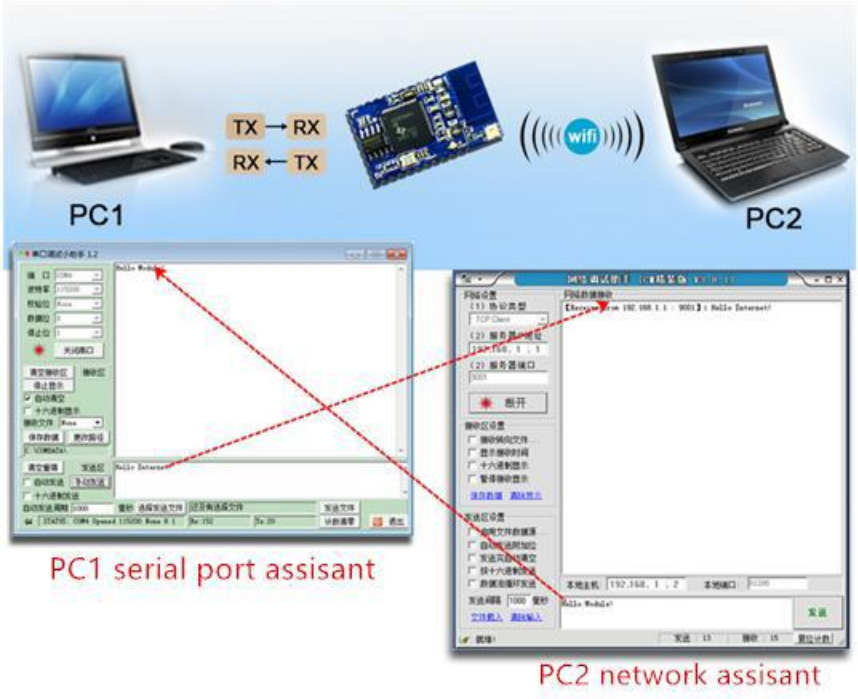
③Data transmission test between module and PC2

Open the serial assistant control W-001 serial port settings as shown on the PC1:

Opening Network assistant on PC2, setting as follows:



After configuration is complete, click the network connection assistant, then y you can transmit the data.



4 The network parameters of module setting instructions

4.1 Networking mode

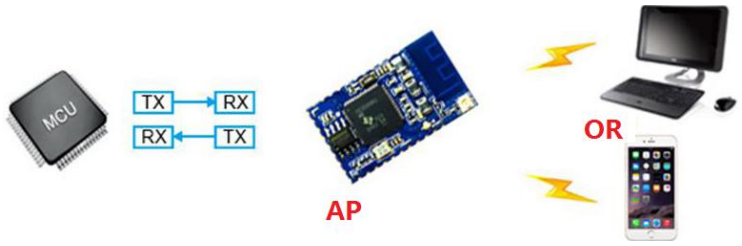
4.1.1 STA working mode

STA(Station) mode is a wireless network terminal, such as laptops, mobile phones and so on, W-001 module connect to a router as a base station (STA). All STA are in AP as a wireless network hub, they can communicate with each other, so you can realize network access module, users can communicate through mobile phones, computers and modules, as shown by it shows:

4.1.2 AP working mode

AP(Access Point) mode is a central node of the network, when W-001 module as a wireless access point (AP), allowing other devices connected to it as STA.

Note: W-001 module can connect only one STA device， when it's an AP role.



4.2 Setting parameter of network

W-001 module supports Socket roles including TCP Server, TCP Client and UDP Server, UDP Client. Network parameters user device configuration is written in Flash, without having to configure again after power off.

4.2.1 Module as TCP Server role

When the device is used as TCP Server, user need only to configure the listening port. Once configured, TCP Client can send and receive data with server using this port. The current version of TCP Server will only accept **one** TCP Client connection.

4.2.2 Module as UDP server role

When the device is to be set as UDP Server, user need only to configure the listening port. Once configured, UDP Client can send and receive data using this port. The difference between UDP and TCP Server is that, TCP Server keeps connected to all of the data communication from/to TCP Client, UDP Server communicates only with the last client.

4.2.3 Module as TCP Client role

When the device is used as TCP Client, user needs to configure the network parameters of the device, including the IP address of the remote server and remote TCP server listening port. As an option, user can perform self-port configuration of the device, to do so, please fill 0, the module will be randomly assigned to a port (Note: This is a port of the device itself, not the server listening port).

4.2.4 Module as UDP client role

When the device is used as UDP Client, user needs to configure the network parameters of the device, including the IP address of the remote server and remote UDP server listening port. As an option, user can perform self-port configuration of the device, to do so, please fill 0, the module will be randomly assigned to a port (Note: This is a port of the device itself, not the server listening port).

4.3 Serial Communication parameters

The parameters of module's serial port, can be configured according to customer specific transmission rate, including the baud rate, parity, data bits and stop bit length.

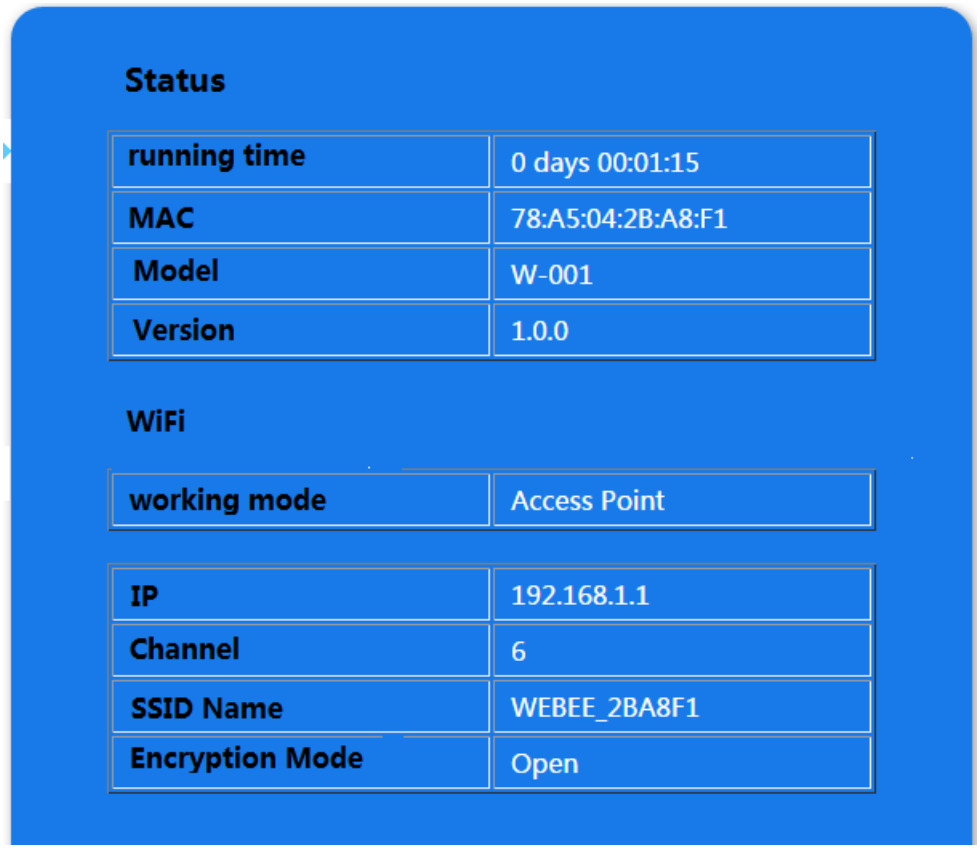
The partameters of moduel's serial that can be set	
Baud rates	9600 bps
	19200 bps
	38400 bps
	57600 bps
	74800 bps
	115200 bps
	230400 bps
	256000 bps
	460800 bps
	921600 bps
parity	NONE
	ODD ： Odd parity
	EVEN ： EVEN parity
Bits of data	5 bits
	6 bits
	7 bits
	8 bits
Bit of stop	1 bit
	2 bits

5 Setting module's parameters via Web-Page

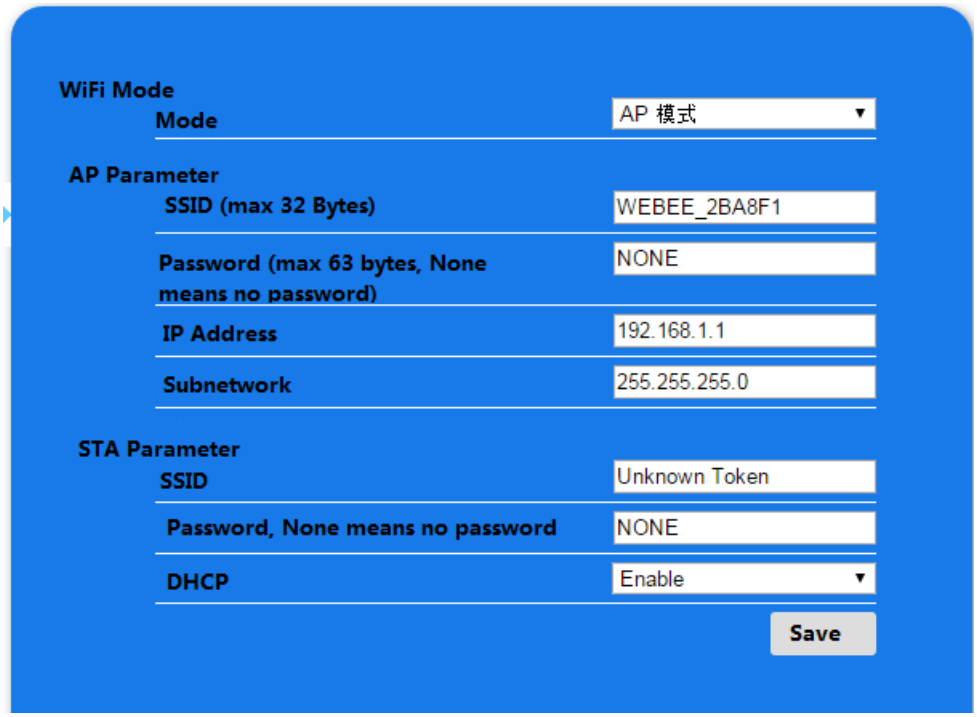
The web Page language is only Chinese available. The English version is coming soon.

W-001 modules can be easily configured via Web pages, including system configuration status, WiFi parameters, UART0 parameters and recovery. Setting W-001 module as the AP, user needs to connect PC to the module via WiFi , opening web-browser, type 192.168.1.1 to enter the Web configuration page; Setting W-001 module as the STA, user needs to connect PC and modules through the router, and get the IP address of the module, opening the browser, enter the IP address of the module to step into web configuration pages.

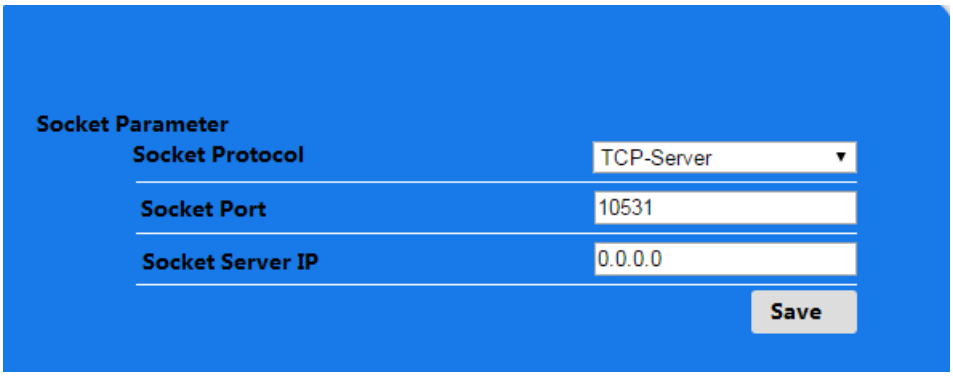
Status of system→The system status and WiFi status about module



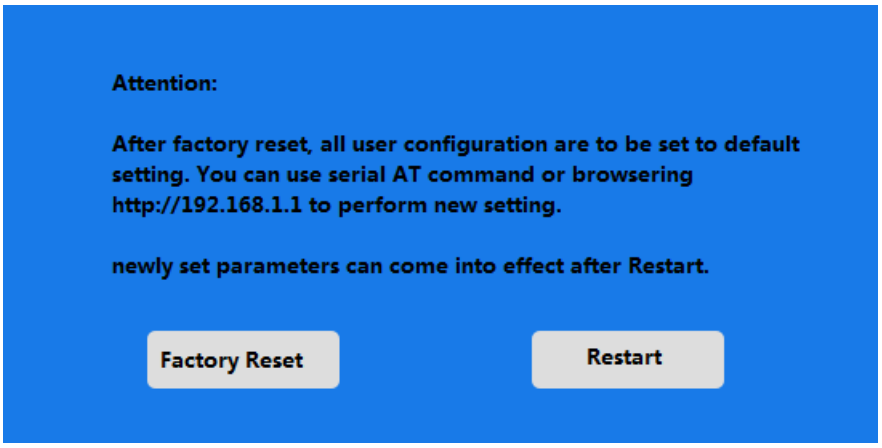
WiFi parameters → Including WiFi mode selection, AP and STA parameter setting as shown below, the user simply fill in the information they want to set, click Save.



UART0 parameters → Including serial-port configuration parameters and Socket parameter configuration.



Reboot & recovery → Including the restoration of the factory settings and restart the module, as shown below:



6 AT command

Besides web configuration, W-001 supports also AT commands to configuration, user needs to connect W-001 to PC serial port, sending AT command to perform configuration.

6.1 Enter AT command mode

Command: +++	Param description:
	Response: **Switch AT Command Mode!**
	Example: +++
Note: Effective immediately	

6.2 Exit AT command mode for transparent transmission

Command: **AT+QUIT**	Param description:
	Response: **Switch To Data Mode.**
	Example: **AT+QUIT**
Note: Effective immediately	

6.3 Setting/Querying WiFi role

Command: **AT+ROLE=role** Note: Effect after reboot	Param description: **role: AP** **STA**
	Response: **Change WiFi Role = AP/STA**
	Example: **AT+ROLE=AP** **AT+ROLE=STA**
Command: **AT+ROLE=?**	Param description:
	Response: **WiFi Role = AP/STA**
	Example: **AT+ROLE=?**

6.4 Setting/Querying the parameters of WiFi

Settting Command: **AT+AP=[ssid],** **[sectype],[key]** Note: Effect after reboot	Param description: **ssid: the name of AP(1~32bit,not allow ",")** **sectype: Security Type:OPEN, WEP, WPA2** **key: AP key(length: 8~32)**
	Response: **Change AP Para=Webee_W-001,WPA2,0123456789**
	Example: **AT+AP=Webee_W-001,WPA2,0123456789**
Querying command: **AT+AP=?**	Param description:
	Response: **AP Para=webee,WPA2,12345678**
	Example: **AT+AP=?**

6.5 Setting/Querying the AP signal channel

Setting command: **AT+CHAN=[ch]** Note：Effect after reboot	Param description: **ch: signal channel(1~13)**
	Response: **Change Channel=13**
	Example： **AT+CHAN=6**
Querying command: **AT+CHAN=?**	Param description:
	Response: **Channel=13**
	Example： **AT+CHAN=?**

6.6 Querying the MAC address of module

command: **AT+MAC**	Param description:
	Response: **Chip MAC=0x78A5042BA8F1**
	Example: **AT+MAC**

6.7 Setting/Querying the parameters of AP and IP

Setting command: **AT+APIP=[ip],** **[mask],** **[gateway],[dns]** Note: Effect after reboot	Param description: **ip: IP address, 0-AP, 1-STA** **mask: Subnet Mask, 0-AP, 1-STA** **gateway: Gateway Address, 0-AP, 1-STA** **dns: dns address, 0-AP, 1-STA**
	Response: **AP IP Config.**
	Example: **AT+APIP=192.168.1.1,255.255.255.0,192.168.1.1,** **192.168.1.1**
Querying command: **AT+APIP=?**	Param description:
	Response: **APIP=192.168.1.1,MASK=255.255.255.0,** **GW=192.168.1.1,DNS=192.168.1.1**
	Example: **AT+APIP=?**

6.8 Setting/Querying/Deleting the parameters of STA-WiFi

Setting command: **AT+STA=[ssid],** **[sectype],[key]** Note: Effect after reboot	Param description: **ssid: AP, length: 1~32 (not allow", ")** **sectype: Security Type: OPEN, WEP, WPA2** **key: AP key, length: 8~32**
	Response: **Add STA Profile,index = [idex]**
	Example: **AT+STA=webee,wpa2, 0123456789**
Querying command: **AT+STA=?**	Param description:
	Response: **Profile 0: webee,WPA2** **Profile 1: webee1,WPA2** **Profile 2: webee2,WPA2** **Profile 3: None** **Profile 4: None** **Profile 5: None** **Profile 6: None**
	Example: **AT+STA=?**
Deleteing command: **AT+STA=[idex]**	Param description: **idex: profile,the larger the number, the higher the priority**
	Response: **Del STA Profile[idex]**
	Example: **AT+STA=2AT+STA=ff (remove all profile)**

6.9 Setting/Querying the parameters of STA and IP

Setting command: **AT+IP=[mode],[ip],** **[mask],[gateway],** **[dns]** Note：Effect after reboot	**Param description:** **mode: dhcp or static** **ip: ip address，0-AP，1-STA** **mask: Subnet Mask，0-AP，1-STA** **gateway: gateway-address，0-AP，1-STA** **dns: dns-address，0-AP，1-STA**
	Response: **DHCP:Set STA IP=DHCP** **STATIC(static):STA IP Config**
	Example： **AT+IP=STATIC,192.168.1.1,255.255.255.0,192.168.1.1,** **192.168.1.1** **AT+IP=DHCP**
Querying command: **AT+IP=?**	Param description:
	Response: **STA IP=[mode],192.168.1.1,MASK=255.255.255.0,** **GW=192.168.1.1,DNS=192.168.1.1**
	Example： **AT+IP=STATIC,192.168.1.1,255.255.255.0,192.168.1.1,** **192.168.1.1** **AT+IP=DHCP**

6.10 Setting module restore factory-setting

command : **AT+RESET**	Param description:
	Response: **Reset All Config!** **Device Restart...**
	Example： **AT+RESET**

6.11 Reboot the module

command : **AT+RST**	Param description:
	Response: **Device Restart...**
	Example： **AT+RST**

6.12 Querying the firmware version of module

command : **AT+VER**	Param description: Response: **Device FW Ver: x.x.x** Example: **AT+VER**

6.13 Querying the ID of module

command : **AT+ID**	Param description: Response: **Device ID: W-001** Example: **AT+ID**

6.14 Querying the status of STA

command : **AT+STATUS**	Param description: Response: **STA STATUS: DISCONNECTED** **STA STATUS: CONNECTED,SSID,BSSID** Example: **AT+ STATUS**

6.15 Setting/Querying the parameters of UART0

Setting command: **AT+UART=** **[buad],** **[databit],** **[stopbit],** **[parbit]** Note: Effect after reboot	Param description: **baud: baud rate (300~3000000bit/s)** **databit: 8-8 bit, 7-7 bit, 6-6 bit, 5-5 bit** **stopbit: 1-1bit, 2-2bit** **parbit:none,odd,even,mark,space** Response: **Set UART CFG: 115200,8,1,none** Example: **AT+UART=115200,8,1,none**
Querying command: **AT+UART=?**	Param description: Response: **UART CFG: 115200,8,1,none** Example: **AT+UART=?**

6.16 Setting/Querying the parameters of socket

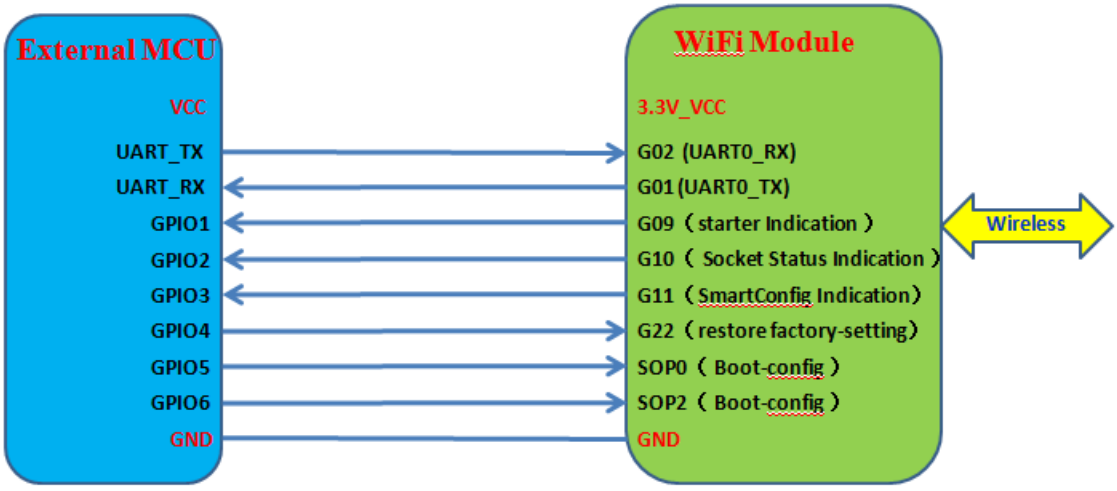
Setting command: **AT+SOCK=** **[mode],[lport],** **[ip],[port]** Note：Effect after reboot	Param description: **mode: TCPS,TCPC,UDPS,UDPC** **lport:** the local port（**invalid set: 0** ） **ip:** Remote server IP address or domain name **port:** The remote server port
	Response: **Set Socket CFG: tcps,8001,192.168.1.110,9001**
	Example： **AT+SOCK=TCPS,8001,192.168.1.110,9001**
Querying command: **AT+SOCK=?**	Param description:
	Response: **Socket CFG: TCPS,8001,192.168.1.110,9001**
	Example： **AT+SOCK=?**

6.17 Setting the module enter hibernate mode

Setting command: **AT+HIB**	Param description:
	Response: **HIB: Entering HIBernate**
	Example： **AT+HIB**

7 The typical application circuit of W-001 module

The W-001 modules are factory programmed firmware, user can use it as an ordinary common serial device. It can transmit data with a simple circuit transparently.



WiFi Typical application circuit