

Appendix A - Configuring the WiFi Module Option

Note: this version of the manual relates to the new WiFi module as shown below. Note that the antenna connector is located in the middle of the board and that the main chip is a square package with 48 pins. The back of the board has only a few resistors and capacitors.



By comparison, the older WiFi module had the antenna connector located in the corner of the board, the top of the board has an 8 pin chip and the back of the board has two high pin count chips. Please refer to the other manual if you have the older module.

The WiFi module as shipped is pre-configured with Soft-AP enabled and the baud rate set to 9600. This should allow anyone with a WiFi enabled computer or laptop and a web browser to configure the WiFi module for your network. The procedure to use for that is shown below.

Configuration is necessary to let the WiFi Module join your WiFi network. Before starting, you will need the following information:

- Your Access Point's SSID and passkey
- The encryption method used by the access point (WPA2PSK/AES is recommended)
- A method for obtaining an IP address to operate on your network.

The WiFi module offers two standard ways to obtain an IP address:

- 1) you can tell the WiFi module which IP address to use (called a "fixed or static IP address"). You would normally obtain an IP address (including subnet mask and gateway information) from your network administrator, or
- 2) you can tell the WiFi module to obtain an IP address automatically using the DHCP protocol.

Please note that the DHCP protocol does not guaranty that the WiFi Module will always get the same address, as this is dependent on your router. Using DHCP may be convenient to verify that the WiFi module is working, but for an operational system, a fixed IP address is recommended.

If something goes wrong during configuration, it is possible that the Soft-AP feature of the WiFi module may have been turned off, which would make it impossible to regain control via the web browser. In this case, the Thunderbolt Kit has a special function ("Reset WiFi") accessible via the menu that returns the WiFi module to its factory default settings, including enabling the Soft-AP feature. When that function is activated, a second procedure should be used to return the module to a state where it can be configured for your network. This second procedure is shown below the first procedure. Note that kits version 5 and above do not have that functionality.

Notes:

- 1) These steps have been tested with a computer running Windows 7 through 10. I believe it should work the same under other operating systems but I have not tried. I welcome feedback (positive or negative) with your experience in that regard.
- 2) The WiFi module's web page has a tab named Update FW. You should not try to update the firmware on the WiFi module for the following reason: the firmware update feature, when required, must only be done in concert with a Thunderbolt Monitor kit firmware upgrade, and only when advised to do so in the Thunderbolt Monitor kit firmware upgrade procedure. Failure to yield to this important point may result in the WiFi module becoming inoperative.

Configuration steps (with WiFi module pre-configured as received):

1) Using a WiFi equipped computer or tablet, open the Network and Sharing Center (or equivalent) and list the visible Access Points.

After a few seconds, you should see an access point named “TBMon-XXXX” where XXXX is a series of hexadecimal numbers. Connect to it (the access point is open.) Your computer may complain that there is no Internet access through this access point. This is normal.

2) Once your computer is connected to the “TBMon” access point, open your browser to "http://10.10.100.254/index_en.html". A login window similar to Figure 1 below will open, asking you for a login and password. As shipped, the login is “admin” and the password is “admin”. This can be changed later.

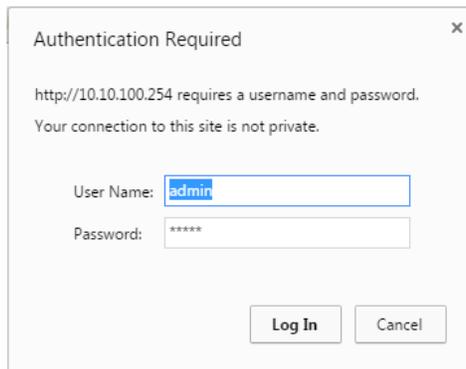


Figure 1: login page

3) Click “OK”. A page similar to Figure 2 will load.



系统状态	参数	帮助提示
WiFi参数	模块MAC: d8b04cb52180	固件版本: 当前模块工作的固件版本 WiFi模式: WiFi工作模式包含 AP、Station、APSTA
进阶参数	模块MID: USR-C215	
附加功能	固件版本: 2.2.3	
系统管理	WiFi模式: apsta	
固件升级	AP 模式IP: 10.10.100.254	
关于有人	AP SSID: TBMon-2180	
	AP 加密模式: NONE	
	STA SSID: USR-C215	
	STA IP: 10.10.10.254	
	STA 网关: 10.10.10.254	

Figure 2: Main setup page (Chinese)

4) Click on “English” at the top right of the page. The page will change to Figure 3

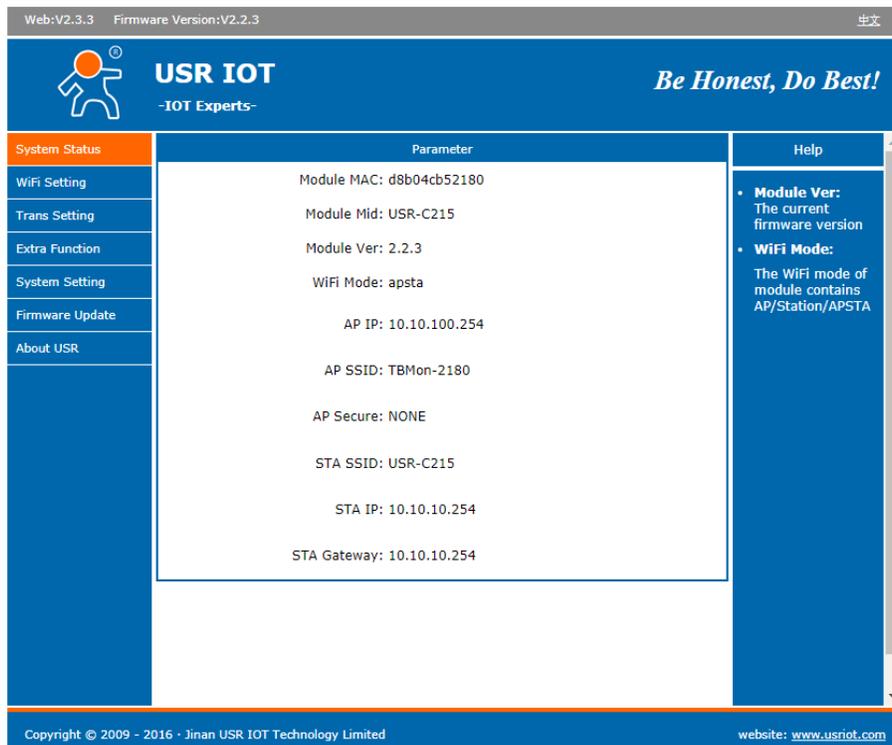


Figure 3: Main setup page (English)

5) Click on “WiFi Setting”, the page will change to Figure 4:

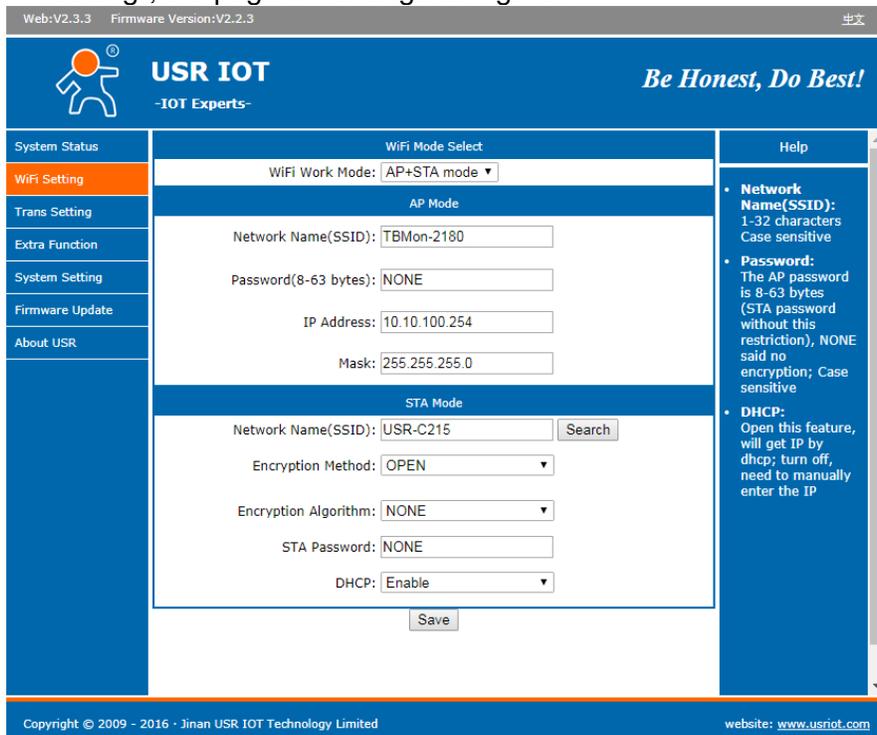


Figure 4: WiFi Setting

Change the WiFi Work Mode selection to “AP+STA mode”, enter your router’s SSID in the Network Name (SSID) box, select an Encryption Method (“WPA2PSK recommended, supported by all recent routers) and Encryption Algorithm and enter your router’s password as shown in Figure 4. Typically, you will also leave DHCP enabled, at least initially. Leave other fields untouched.

Note: if you want later to set your Thunderbolt Monitor to a fixed (static) IP address, you will need to go back to this page and select “Disable” in the DHCP box and fill the other fields as desired.

6) Once you have verified that all the fields are as desired, click the “Save” button. The page will change to Figure 5.



Figure 5: STA Settings changed

Click the “Restart” button, wait a few seconds and recycle power to the Thunderbolt Monitor kit to ensure a clean reboot.

As the kit reboots, the WiFi module will attempt to connect to your router and should, after a few seconds obtain an IP address. The very first time, it may fail. This is not unusual as the first time a new WiFi device is connected to a router, there is a fair amount of interaction taking place and the connection may time out before the setup completes. If so, simply recycle power again and the second time it should connect. If it does not, redo the steps from the beginning and verify all the information you enter.

Connecting the Thunderbolt Monitor kit to a WiFi access point:

The WiFi LED on the kit's main board should turn on when the WiFi module is associated with your router. If you are using DHCP, you will need to get into your router's admin page to see what IP address the kit was assigned. The kit will likely be identified at TBMon or USR-IOT. All routers are different so I can't give you a useful example. Refer to your router's manual. Make a note of the IP address.

Connecting the Thunderbolt Monitor kit to LadyHeather:

Please note that the WiFi module listens to TCP port 8899 for connections. This is the port number you will have to use with Lady Heather.

A typical shortcut to start LadyHeather as a TCP client is:

```
"C:\Program Files\Heather\heather.exe" /ip=192.168.1.24:8899"
```

Simply replace the IP address as needed.

When the kit is being accessed by a Lady Heather client via WiFi, the DATA LED will blink as messages are sent to the WiFi module. The messages are short, so the LED will blink very briefly.

Also note that the kit supports up to 3 connections from clients at a time. This is limited by the WiFi module itself.

The details of operation of the Lady Heather software is beyond the scope of this manual.

Resetting the WiFi module:

In case of persistent problem, the WiFi module may need to be reset to factory settings using the kit's menu ("Reset WiFi") , then re-initialized using the steps described in the second part of this document.

Configuration steps (with WiFi module factory reset):

After a WiFi Reset command, you need to redo steps 1 through 6 above with the following changes and additions:

Once the module has rebooted, reconnect to it and now go to the “Trans Setting” page and change the Baud Rate to 9600 per Figure 6

Web:V2.3.3 Firmware Version:V2.2.3 中文

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System Status

WiFi Setting

Trans Setting

Extra Function

System Setting

Firmware Update

About USR

Serial Port Set

Baud Rate (1200-460800 bps): 9600 bps

Data Bit: 8 bit

Check Bit: None

Stop Bit: 1 bit

CTSRTS/485: NFC

Network set

Mode: Transparent

SocketA Connect Set

Protocol: TCP-Server

Port: 8899

Server IP Address: 10.10.100.254

SocketB Connect Set

Protocol: OFF

Port: 8899

Server IP Address: 10.10.100.254

Save

Help

- **Baud Rate:**
1200~460800bps
- **CTSRTS/485:**
Default is NFC
- **Port:**
1~65535
- **Server IP Address:**
When the module is Client, the remote server address to be connected; When it's TCP server, the parameter is invalid; The parameter can be IP or domain name

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Figure 6: Transmission Settings

Click Save

When the web page changes, change to the “WiFi Setting” page.

In the "WiFi Mode Select" box, make sure that “AP+STA” is selected.
In the “AP Mode” box, change “Network Name” to “TBMon”

Click Save

Recycle power to the TboltMon kit. After a few seconds, the Associated LED should be lit and the LCD display will display the IP address assigned to the WiFi module. That is the information you will need to setup the Lady Heather software.

Notes:

- 1) When the WiFi module is powered up the first time after configuration, it may take 30 seconds or more before the Associated LED turns ON. This is a function of the WiFi router.
- 2) As shipped, the WiFi module's SSID in AP mode is set to TBMon-XXXX where XXXX is replaced with the last 4 digits of the MAC address (you can see the MAC address of the module on the System Status page). It is not necessary to include these digits but it will be convenient if you have more than one TBMon+WiFi running. If they all have the same SSID, it may be difficult to know which one you are connecting to.

Manual versions

V4.2.2 (August 27, 2017): Fix issue with GPS Week rollover and issue with WiFi module