

# High Flying Wi-Fi Module Operation Guide

This document is applicable to the following series of products. This article uses HF-LPT230 as an example to introduce the main software functions. The differences will be specified. For the hardware description of the product and some software functions, please refer to the user manual.

2.4GWi-Fi +5.0BLE		<b>HF-LPX70 Series:</b> HF-LPT270 HF-LPT170 HF-LPT271 HF-LPB170 HF-LPB175
2.4GWi-Fi		<b>HF-LPX30 Series:</b> HF-LPB130 HF-LPT230 HF-LPT130A HF-LPT130B HF-LPT330 HF-LPB135
2.4GWi-Fi +4.2BLE		<b>HF-LPC3XX Series:</b> HF-LPC300 HF-LPC330 HF-LPC305

2.4G+5G Wi-Fi	 <b>HF-LPD100</b>	 <b>HF-LPD130</b>	HF-LPD1XX Series: HF-LPD100 HF-LPD130
2.4G+5G Wi-Fi +BLE	 <b>HF-LPF100</b>		HF-LPF100

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# 1. HARDWARE INTRODUCTION

See user manual for detailed module information, High Flying provides the EVK development board for the corresponding module for functional testing and development.

Get EVK schematic from following link, user may refer to this for application hardware design.

Description Specification Downloads

User Guide

-  High Flying Wi-Fi Module Operation Guide\_20200814 [ Download Times: 568, Date Update: 2020-08-19 16:45:32 ]
-  HF-LPX70\_tuya\_20200911 [ Download Times: 161, Date Update: 2020-09-16 15:42:03 ]
-  HF-LPX70 Series WI\_FI\_BLE Module User Manual-V1.5(20201027) [ Download Times: 154, Date Update: 2020-10-28 14:47:41 ]

Application Notes

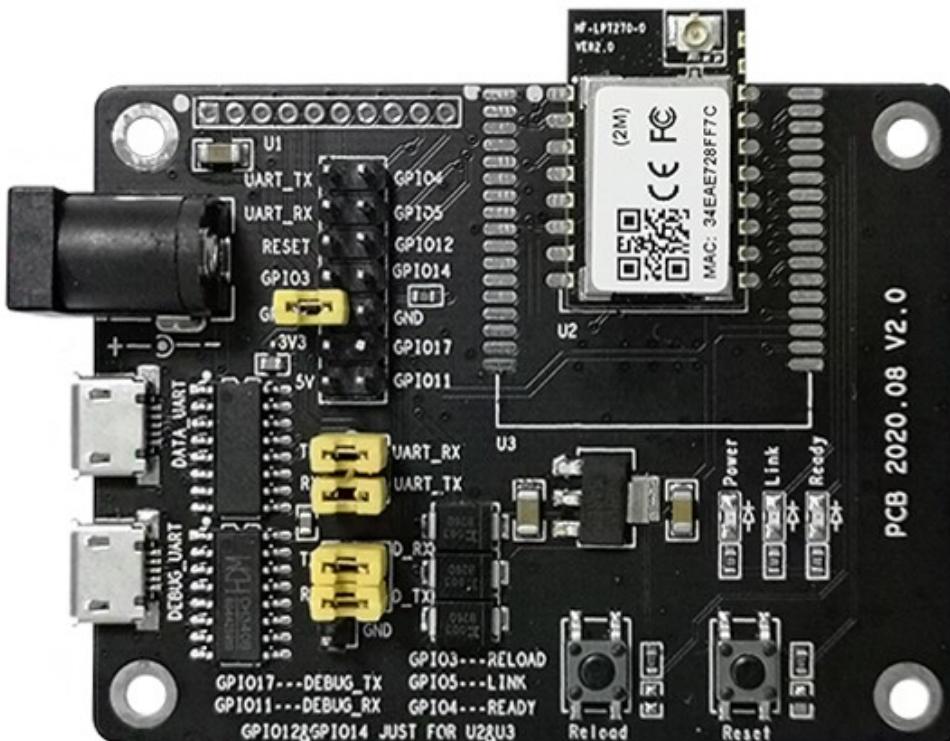
-  EVK Evaluation Board Design Data\_20200923 [ Download Times: 154, Date Update: 2020-09-24 09:42:15 ]

EVK has USB to TTL chip, so download the chip driver from following link.

<http://www.hi-flying.com/download-center-1/applications-1/download-item-usb-serial-drivers>

## 1.1. HF-LPX70 Series EVK

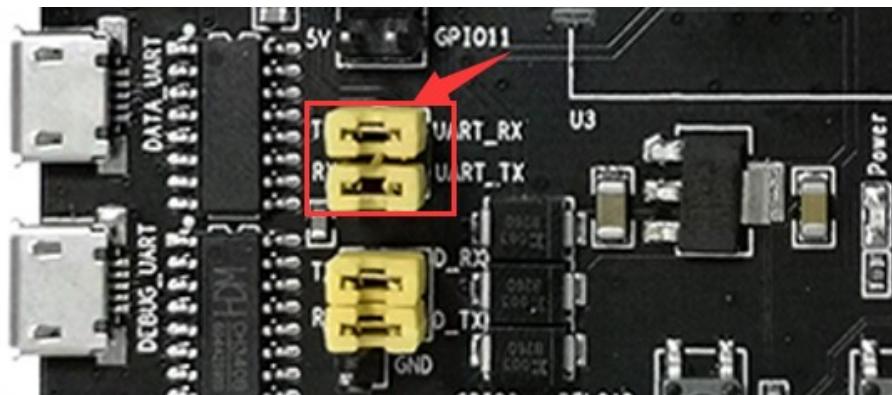
Use USB connect DATA\_UART to PC and install CH340B driver from above link. Then do following test.



Function	Name	Description
External Interface	DATA_UART	Power In and communication UART0 port.
	DEBUG_UART	Power In and debug UART1 port
	DC	DC jack for power in, 5V input. When USB power supply is not enough, may use external adapter.
LED	Power	Power LED
	Ready	nReady LED

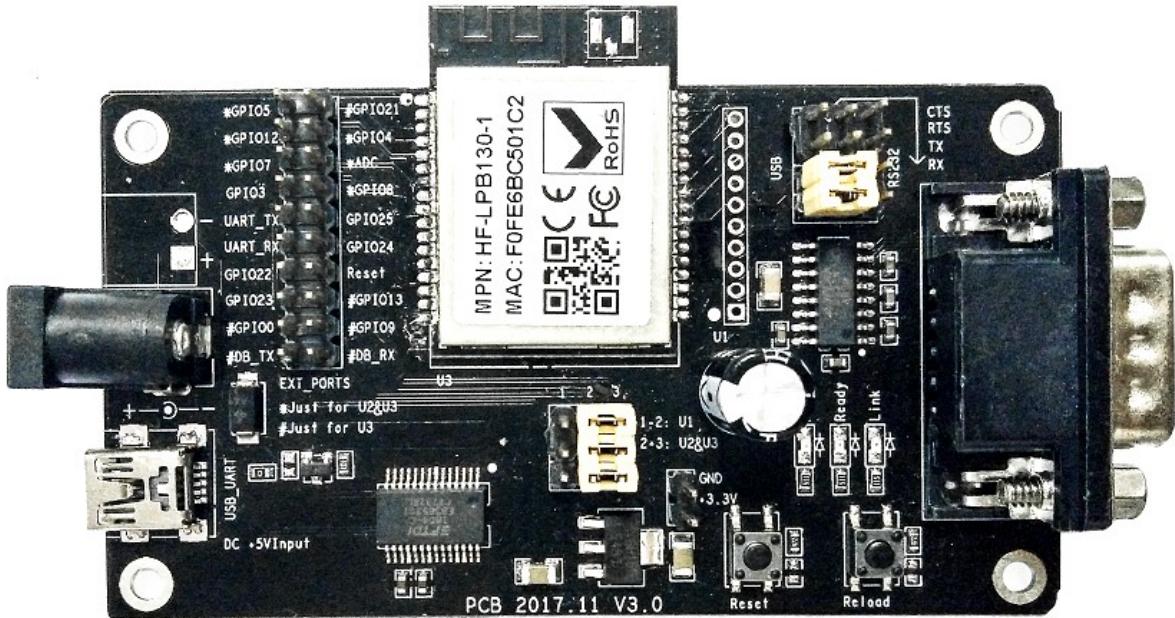
	Link	nLink LED
Button	Reload	Smart Config and Restore factory default configuration.
	Reset	Reboot module

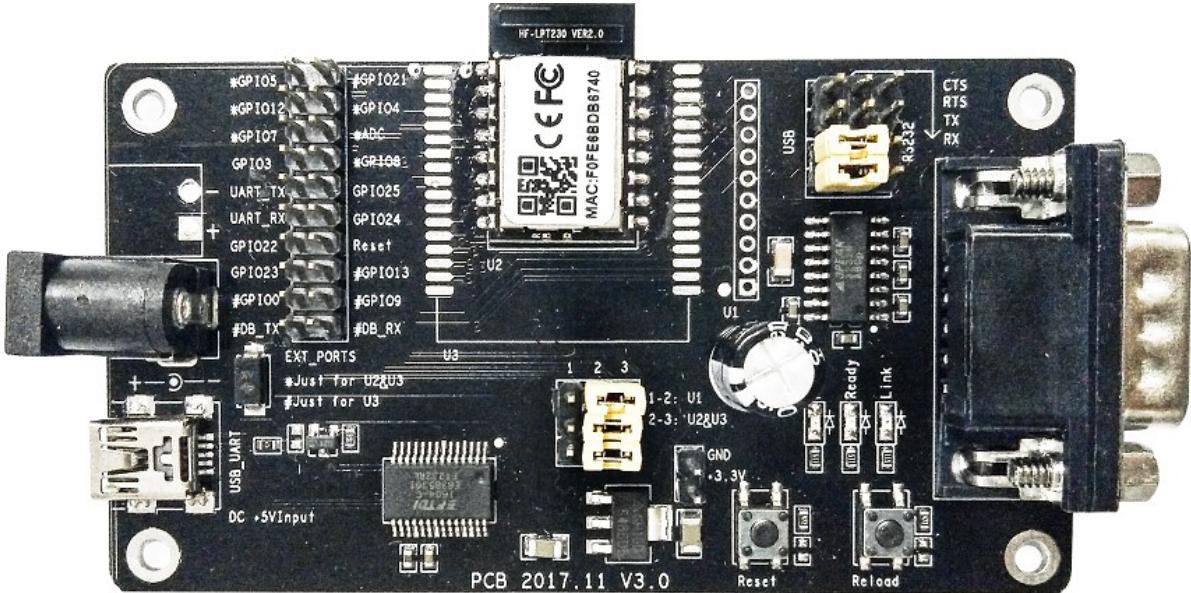
After test OK on EVK, may remove the following jumper(Break the module and CH340 UART), then connect UART\_RX and UART\_TX to user MCU board for products UART test.



## 1.2. HF-LPX30 Series and other modules EVK

Insert the USB cable to PC, and install the above FT232R USB driver to do the following test.





Function	Name	Description
External Interface	RS232	Main data/command RS-232 interface, <b>this interface maximum baud rate is 460800. Can not be used for debug UART log(It need 921600)</b>
	USB	USB to UART interface, can be used for debug UART log
	DC5V	DC jack for power in, 5V input.
LED	Power	Power LED
	Ready	nReady LED
	Link	nLink LED
Button	Reload	Smart config and Restore factory default configuration.
	Reset	Reset module

## 2. SERIAL PORT SETTINGS

### 2.1. SecureCRT Serial Port Tool SecureCRT

Download address:

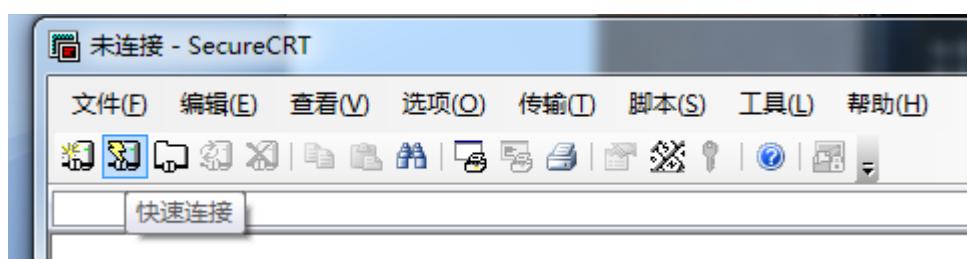
[http://www.hi-flying.com/index.php?route=download/category&path=1\\_4](http://www.hi-flying.com/index.php?route=download/category&path=1_4)

Unzip the folder, open to find the SecureCRT executable, and click Open.

Connect the development board to the computer with a micro USB cable and install the USB serial port driver:

<http://www.hi-flying.com/download-center-1/applications-1/driver-ft232r>

Click the Quick Connect button to create a connection.



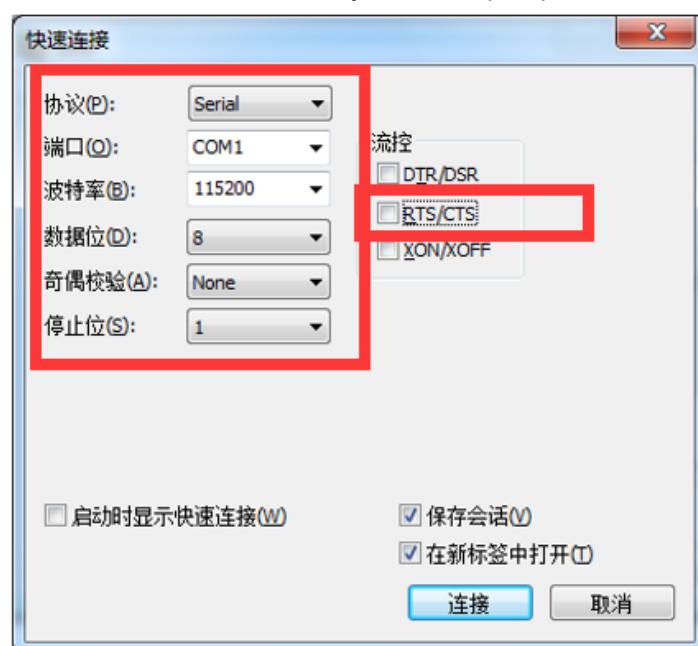
### 2.2. Setting Serial Port Parameters

Agreement: Serial

Port: The port to which the computer is actually connected (available via My Computer ->

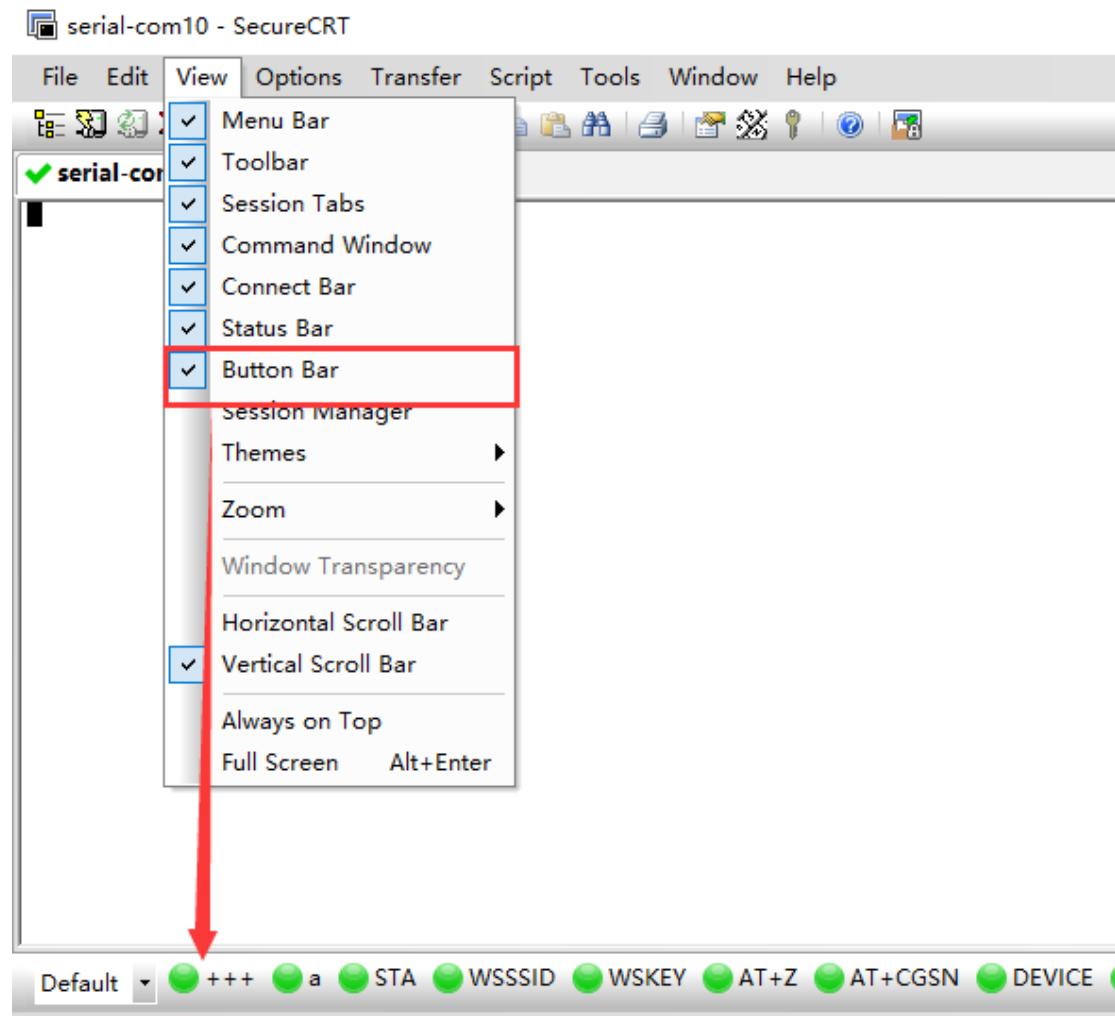
Device Manager -> Ports (COM and LPT) as shown.)

The default factory serial port parameters are as shown in the figure below. If necessary, the AT+UART command can be used to modify the serial port parameters of the device.

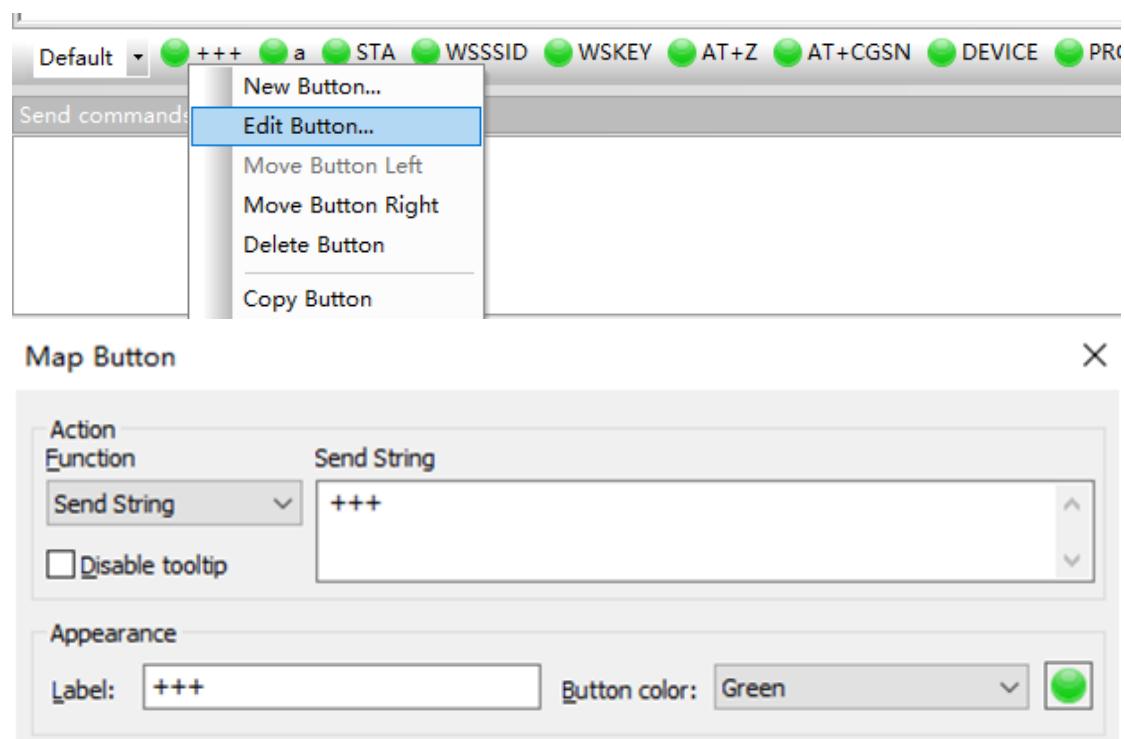


### 2.3. SecureCRT Software Usage

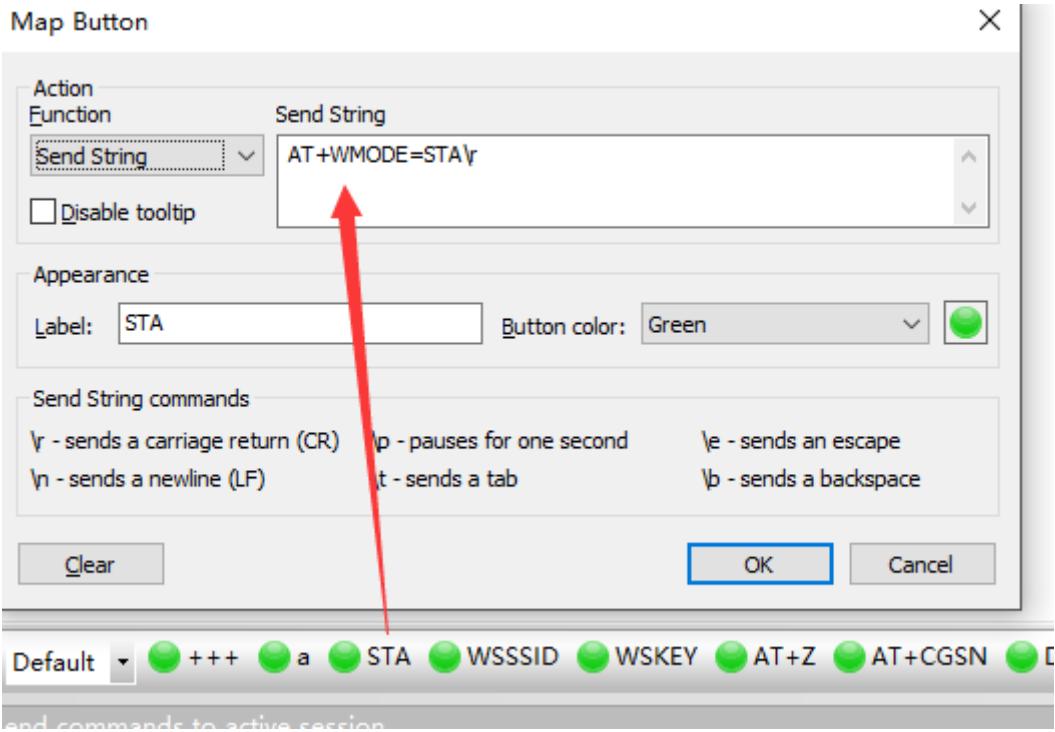
Open the tool Button Bar function.



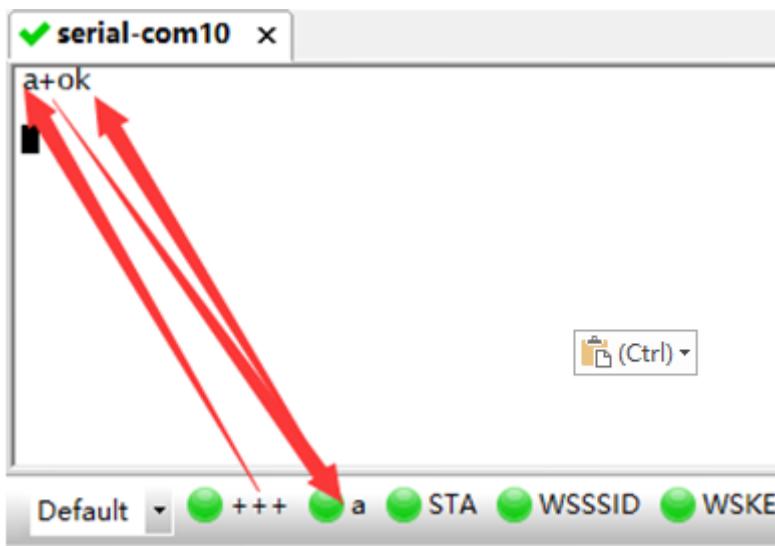
Right-click the Edit button function to open the tool button function, you can add the commonly used send data, here add the "+++" and "a" required to enter the command mode.



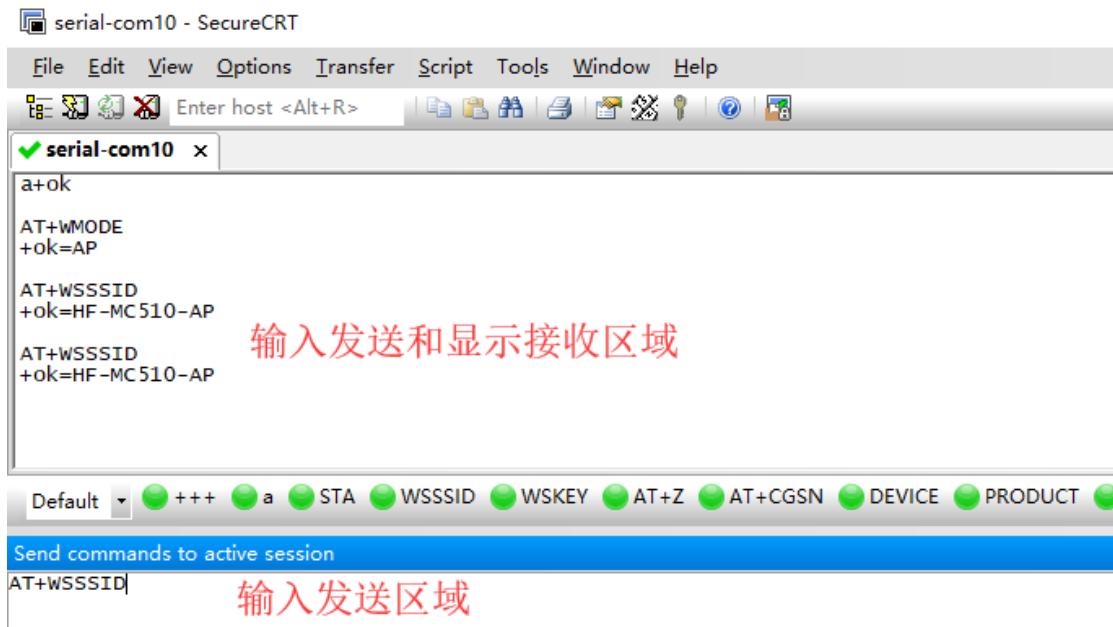
Can also edit and add commonly used AT commands with '\r' as the terminator.



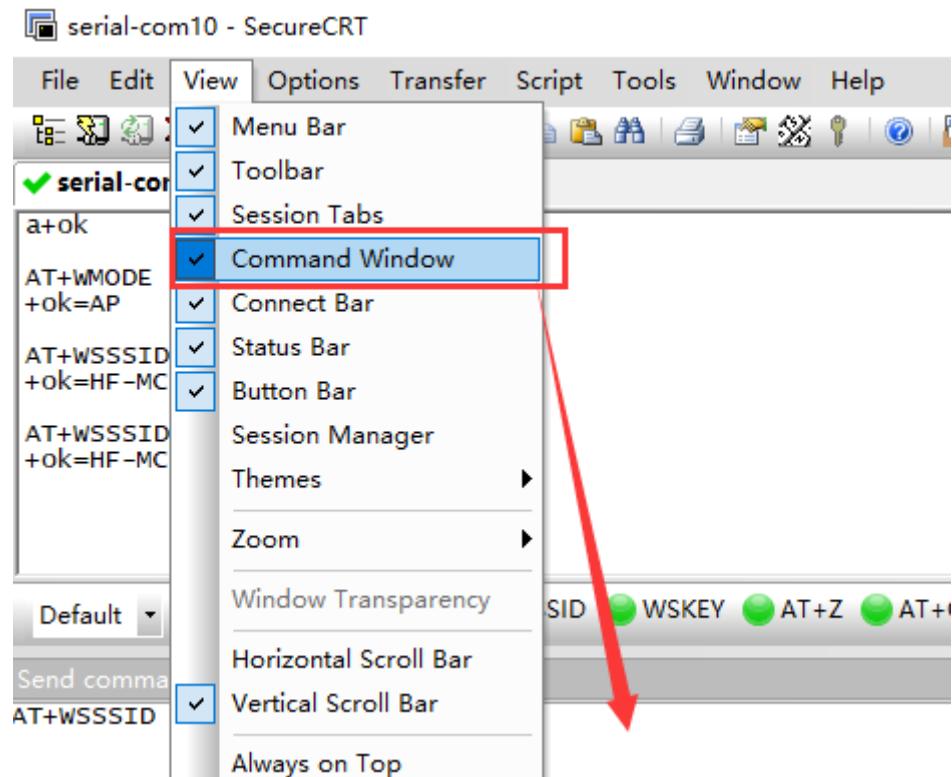
Click the corresponding button to send "+++", the module responds with "a" and then clicks to send "a". After the module returns "+ok", it enters the command mode.



After entering the command mode, the module can send commands, and the data input by the main interface will be sent out immediately. The displayed data is echoed. The data in the lower command bar will be sent only after pressing the Enter key (It needs to be displayed after the tool is enabled.) **The data sent in the command bar is marked with a carriage return, so there is no need to add "\r" as the button bar.**



The Command Window is displayed.



#### Notes:

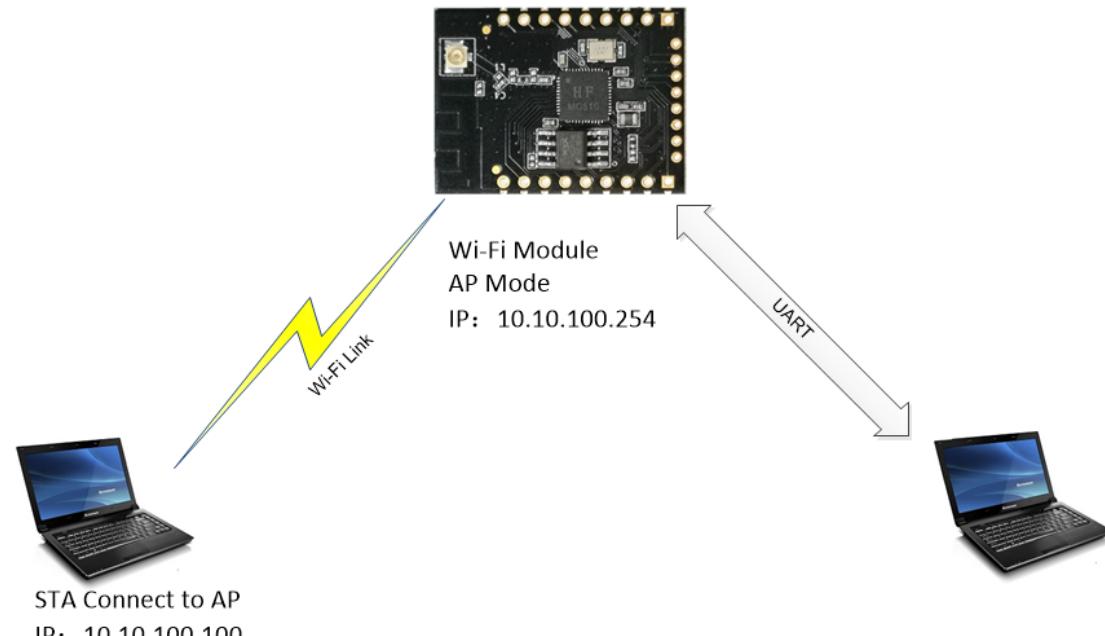
1. Switching the transparent transmission mode to the command mode For detailed procedures, refer to the user manual.
2. It is also possible to directly send the AT command in the transparent transmission mode, and use the AT+CMDPW command to enable this function. See the chip manual for details.
3. In the batch stage, High Flying can support the module that burns the customized parameters, so the default parameters do not need to be configured by the MCU.

### 3. TEST CASE

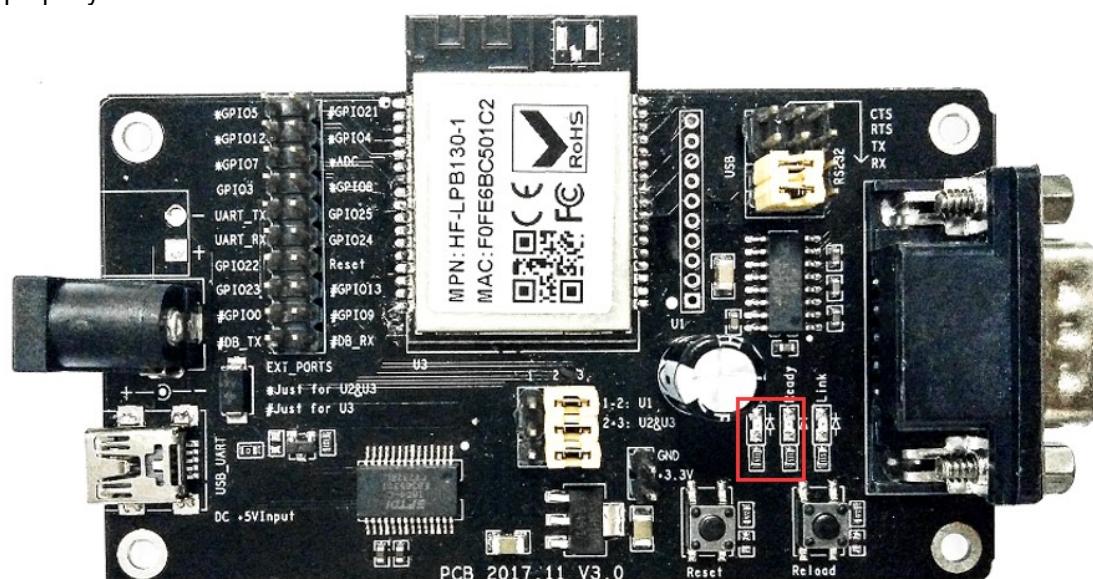
The software used in this article can be obtained from the High Flying website.  
[http://www.hi-flying.com/index.php?route=download/category&path=1\\_4](http://www.hi-flying.com/index.php?route=download/category&path=1_4)

#### 3.1. Transparent Transmission of UART and Wi-Fi Module in AP Mode

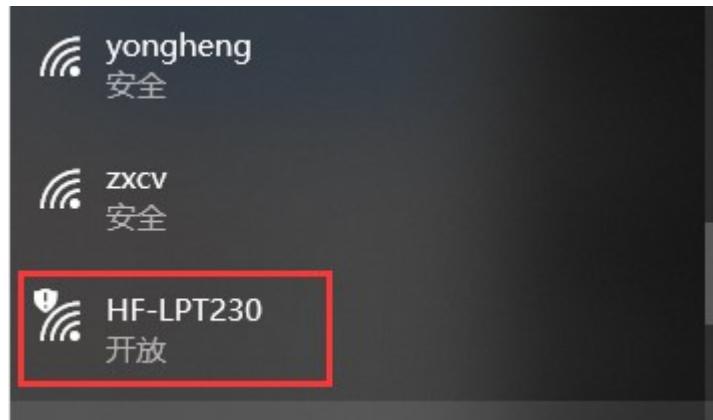
The test topology is as follows:



After power-on, the Power light is on, the Ready light is on, and the module is working properly.

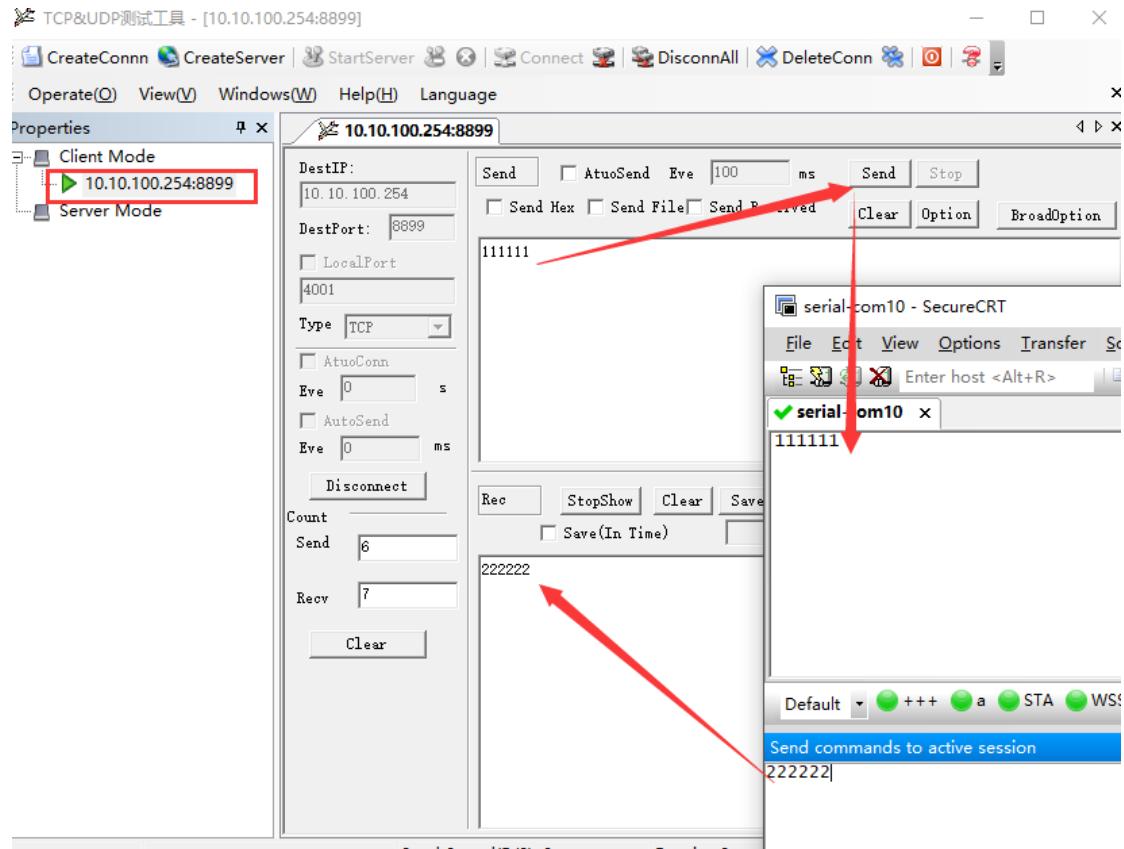


After the computer Wi-Fi searches for the AP hot spot of this device, it connects.



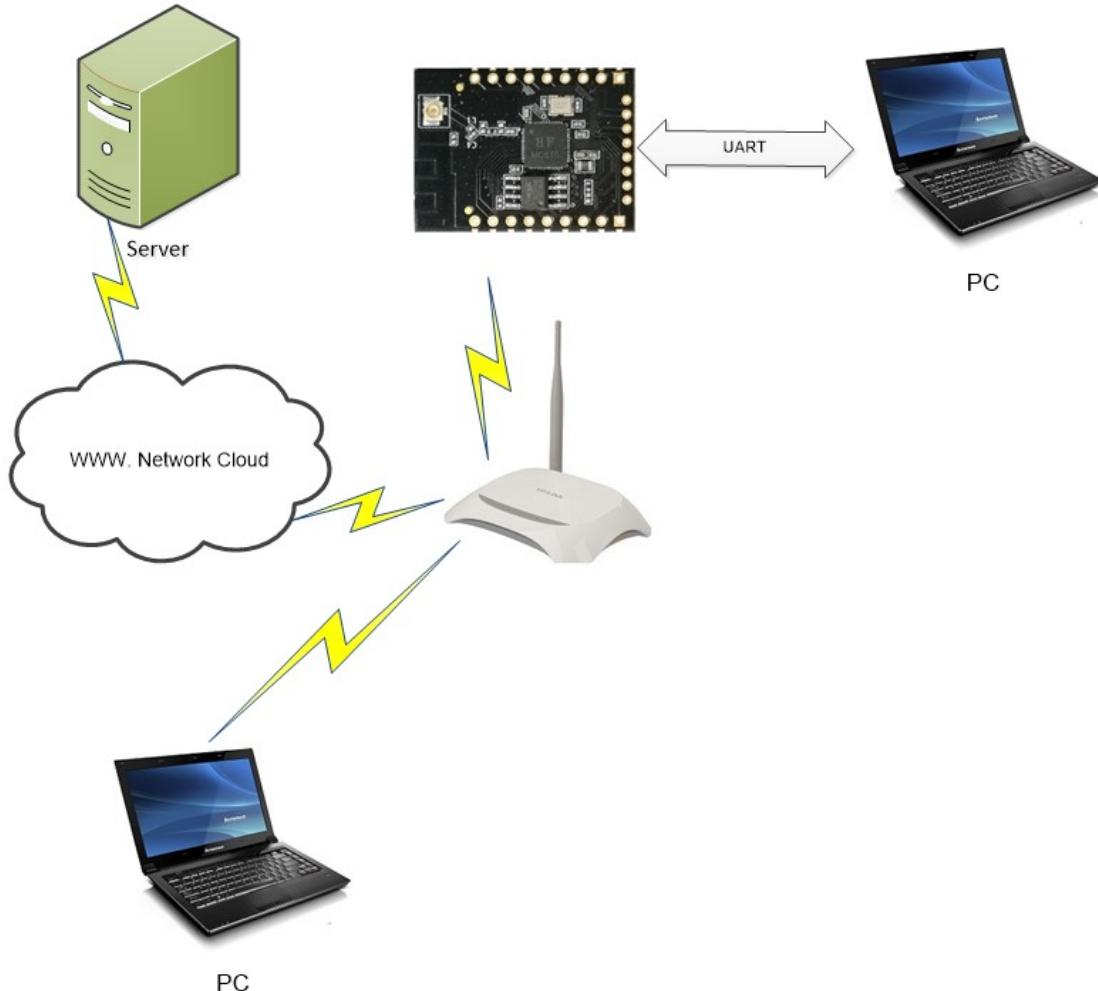
Open the TCP & UDP Debug software, create a TCP client, fill in the module's IP address and TCP information (default AP IP: 10.10.100.254, TCP Server, 8899 port, available AT+LANN, AT+NETP command to modify the default information), click **【Connect】** establish connection.

The two-way transmission and reception of data is completed as shown below.



### 3.2. Transparent Transmission of UART and Wi-Fi Module in STA Mode

The test topology is as follows:



First, you need to configure the module to connect to the router. The module supports multiple ways to configure the connection router. The detailed options are as follows.

**Method 1: SmarBLELink config mode, the operation mode is detailed in the following link data, it is recommended that these HF-LPX70, HF-LPC3XX series support BLE function combo modules use this method.**

<http://www.hi-flying.com/download-center-1/applications-1/download-item-smartblelink>

**Method 2: SmartAPLink config mode. For details, please refer to the following link. It is recommended to use this method.**

<http://www.hi-flying.com/download-center-1/applications-1/download-item-smartaplink>

**If you use the WeChat mini program, you can use it to distribute the network.**

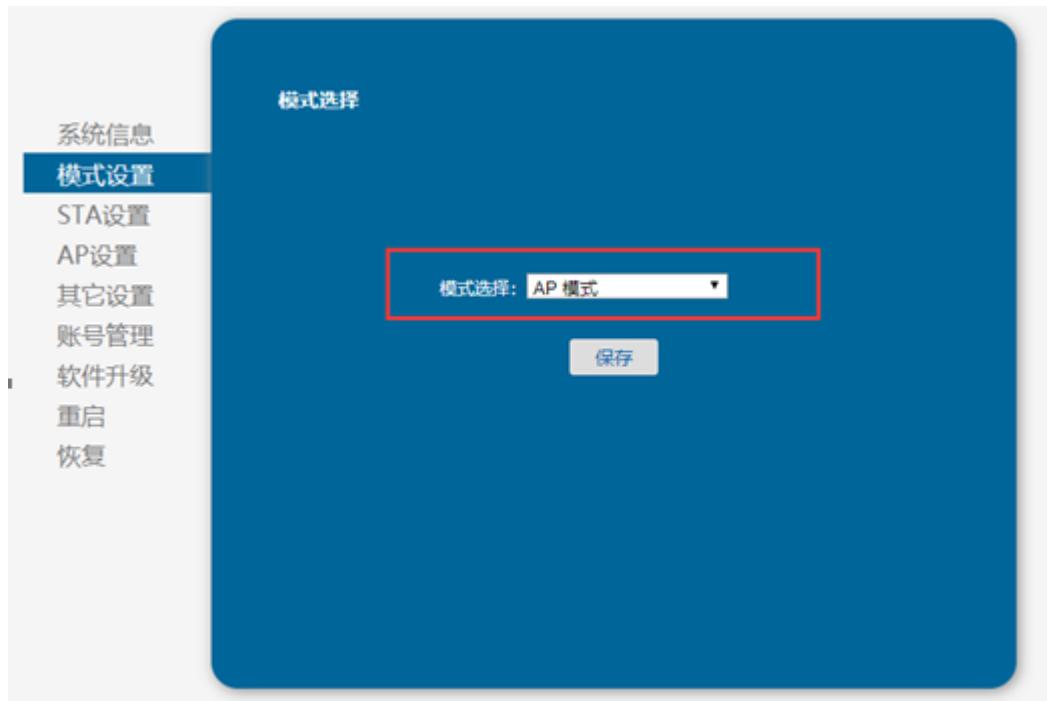
<http://www.hi-flying.com/download-center-1/applications-1/download-item-wechat-miniap-p-config>

**Method 3: SmartLink capture mode distribution network, packet capture mode distribution network, the current mainstream distribution network, but the success rate is not 100%, no AP distribution network is good.**

<http://www.hi-flying.com/download-center-1/applications-1/download-item-smartlink-v8>

**Method 4: Web page configuration.**

- PC Wi-Fi Direct Module AP hot spot, enter 10.10.100.254 to log in to the management page, enter the username admin and password admin, change the mode selection to STA, and fill in the information of the AP. After the setting is completed, the restart takes effect.



After searching for the surrounding AP and selecting it, fill in the password.

[中文](#) | [English](#)

#### Note:

- The HF-LPX70 series 2MB Flash support the webpage function. No webpage for 1MB Flash
- The HF-LPX30 series has 1MB and 2MB Flash difference, and the external webpage content is different. See the user manual for details.

#### Method 5: Serial AT command mode.

- Send the AT command as shown below, configure the connection to the router, and send the AT+Z restart after the configuration is complete.

```

AT+WMODE=STA
+ok

AT+WSSSID=UPGRADE-AP_aaaa
+ok

AT+WSKEY=wpa2psk,aes,12345678
+ok

AT+Z
+ok

```

- Check the connection status of the router.

```

AT+WANN
+ok=DHCP,192.168.83.108,255.255.255.0,192.168.83.1

AT+WSLQ
+ok=Good, 100%

AT+WSLK
+ok=UPGRADE-AP_aaaa(00:00:00:00:00:00)

```

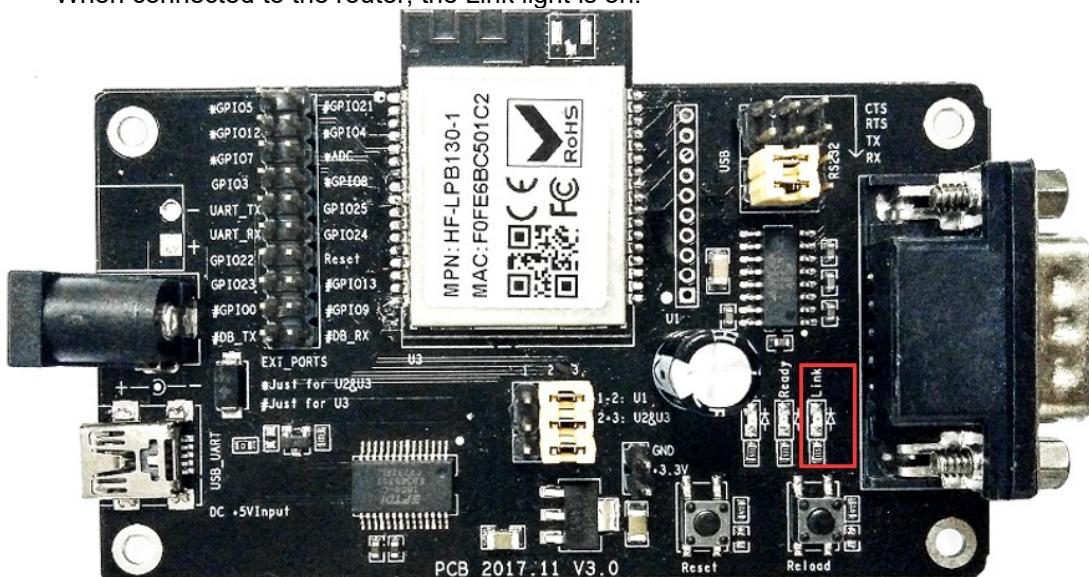
- You can scan and obtain information about neighboring APs.

```

AT+WSCAN
+ok=
Ch,SSID,BSSID,Security,Indicator
1,HF-Demo-Specia,00:0E:E8:B6:49:B0,WPAPSKWPA2PSK/AES,72
1,zx2,24:69:68:7F:68:6E,WPAPSKWPA2PSK/AES,100
1,HF2211_A04C,F0:FE:6B:5D:A0:4C,OPEN/NONE,100
1,HF_MC510_AP_h,D8:15:0D:D7:E5:44,WPAPSKWPA2PSK/AES,54
1,OULUN_TEST,7C:B5:40:4F:B2:CD,OPEN/NONE,100
1,TP-LINK_2.4G_6B13,74:05:A5:83:6B:13,WPAPSKWPA2PSK/TKIPAES,61
4,SHN48,14:75:90:0B:C6:96,WPA2PSK/AES,78
6,UPGRADE-AP_aaaa,C8:3A:35:54:B3:70,OPEN/NONE,74
1,2211sd,F0:FE:6B:5D:A0:B0,WPA2PSK/AES,54
1,TP-LINK_DuanTiYong,14:75:90:0B:C6:8A,OPEN/NONE,59
4,HKKHK,F4:FE:22:22:88:88,OPEN/NONE,47
1,TEST,36:96:72:19:4C:6F,WPAPSKWPA2PSK/AES,64
2,Tenda_Kevin,C8:3A:35:17:5A:C0,WPAPSKWPA2PSK/AES,61
6,DLINK_JIEHUI,28:3B:82:C6:F1:7A,WPAPSKWPA2PSK/TKIPAES,72
6,,98:9C:57:C0:8C:21,WPA2PSK/AES,61
6,ChinaNet-xuanyin,78:44:FD:AB:73:76,WPAPSKWPA2PSK/AES,100
6, HF office AP 08:98:48:FF:89,WPAPSKWPA2PSK/AES,49

```

When connected to the router, the Link light is on.

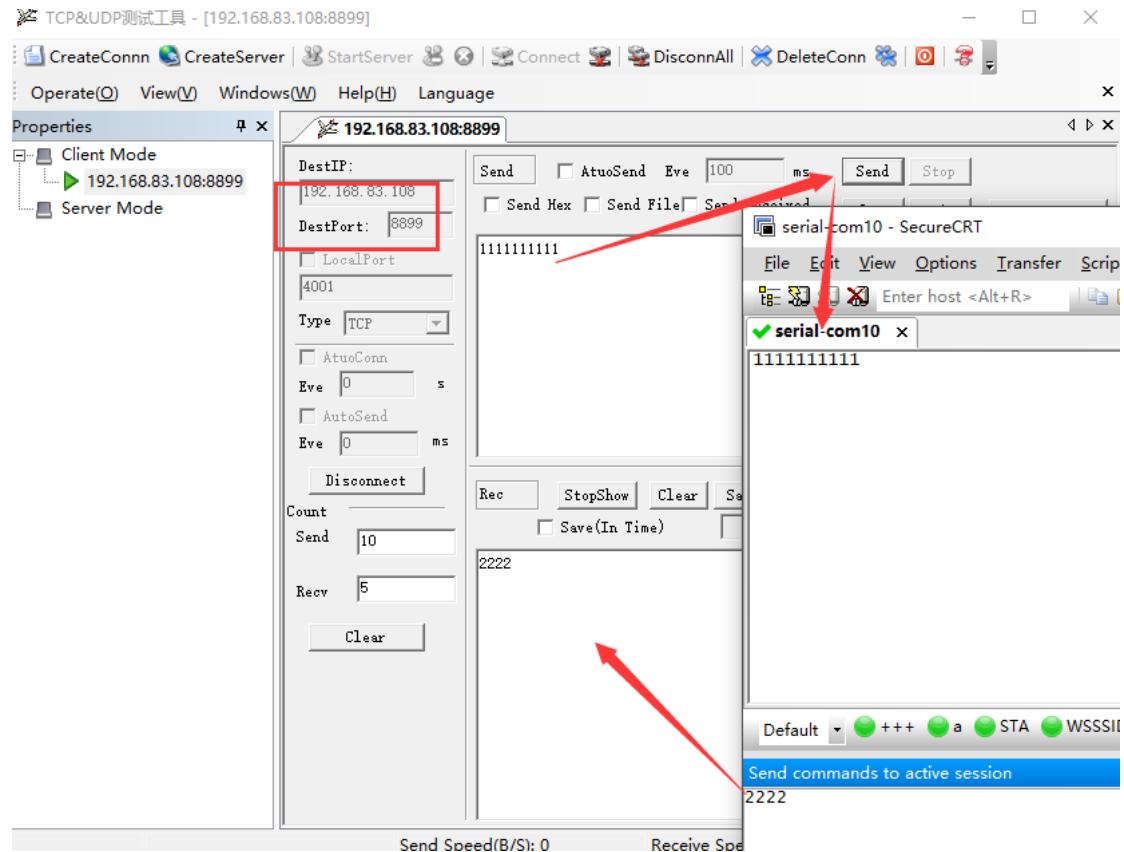


- ◆ The module TCP Server data is transmitted as follows.

The IP address of the communication test fills in the IP obtained from the router (AT+WANN command query, SmartAPLink return network information, router DHCP client

search or UDP broadcast packet to scan for IP information, this broadcast scan See the Wi-Fi Config tool data link below for details.

<http://www.hi-flying.com/download-center-1/applications-1/download-item-wifi-config-tools-v1-0>



◆ The module TCP Client data transfer sample is as follows.  
Modify AT+NETP as a TCP client, perform client test, and test using High Flying test server. After the setting is completed, AT+ENTM switches to transparent transmission mode.

```
AT+NETP=tcp,client,40432,test.server.iotworkshop.com
+ok

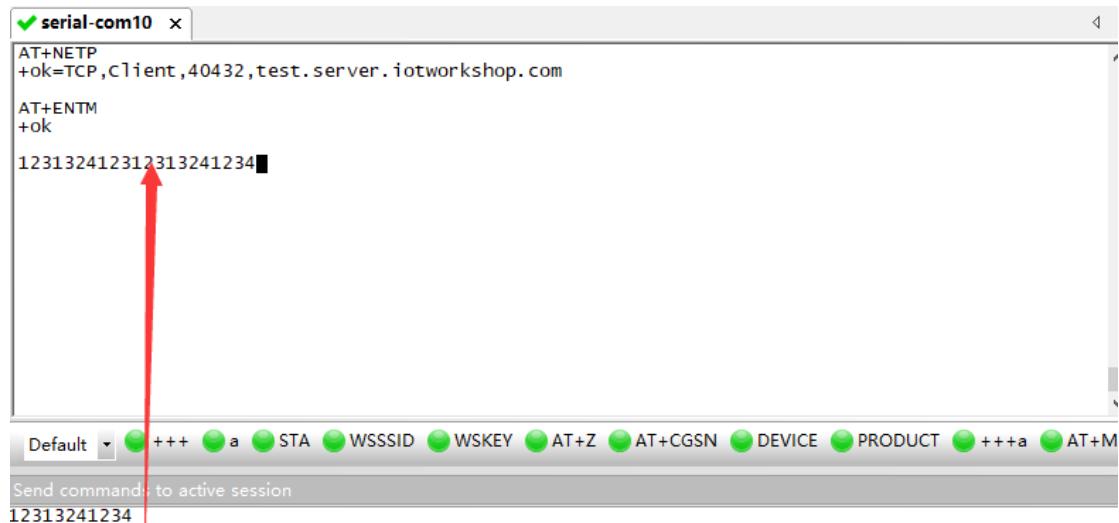
AT+NETP
+ok=TCP,client,40432,test.server.iotworkshop.com

AT+ENTM
+ok
```

High Flying test server address: test.server.iotworkshop.com, the server will send back the received data.

TCP Port: 40432  
UDP Port: 40431

The data sent from the serial input field can be seen in the receiving area to receive the same data.



```
serial-com10 x
AT+NETP
+ok=TCP,client,40432,test.server.iotworkshop.com

AT+ENTM
+ok

123132412312313241234■

Default +++ a STA WSSID WSKEY AT+Z AT+CGSN DEVICE PRODUCT +++a AT+M
Send command: to active session
12313241234
```

### 3.3. MQTT Transmission in STA Mode

The configuration module is connected to the router, and the MQTT server, the theme, and the like are configured. This function is supported in 4.13.24 and later versions. The High Flying MQTT test server: 112.124.43.15, port 1883.

AT+NETP=MQTT, 1883, 112.124.43.15, first set the MQTT server information and then set other topics, etc. The default parameters are as shown below. After the configuration is completed, AT+Z or reset restarts the module.

```
AT+NETP=MQTT,1883,112.124.43.15
+ok

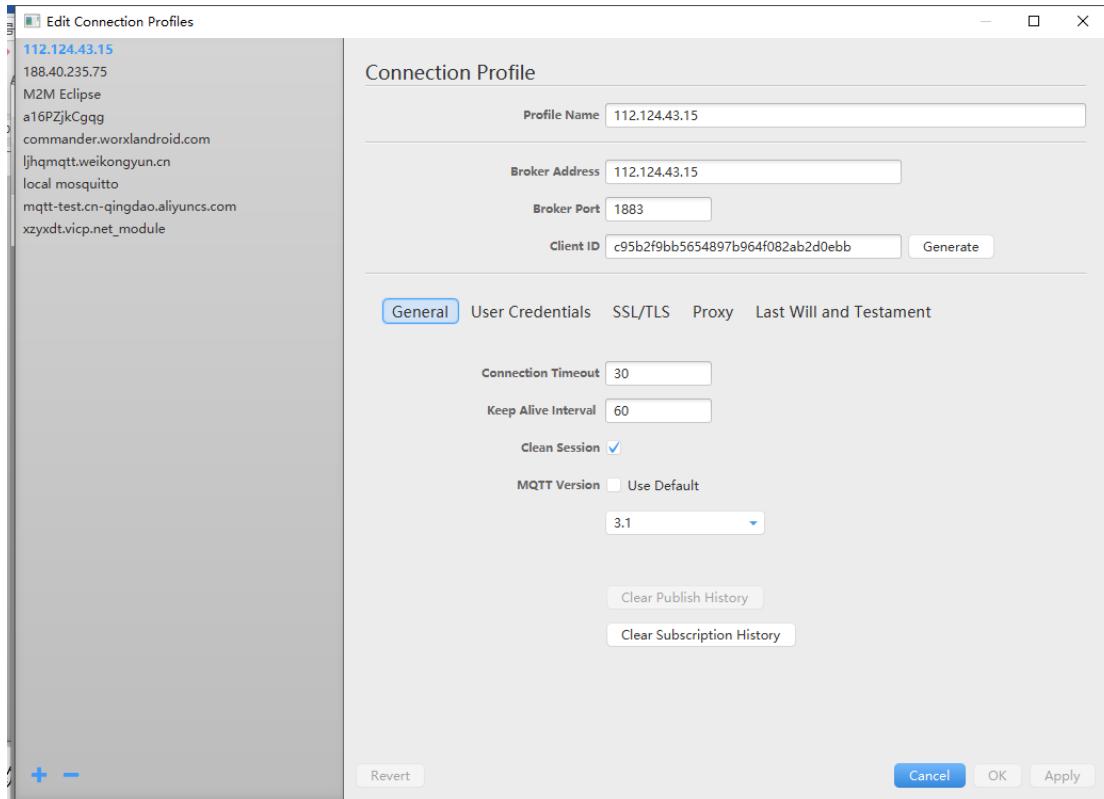
AT+NETP
+ok=MQTT,1883,112.124.43.15

AT+MQTOPIC
+ok=%MAC/up,%MAC/down

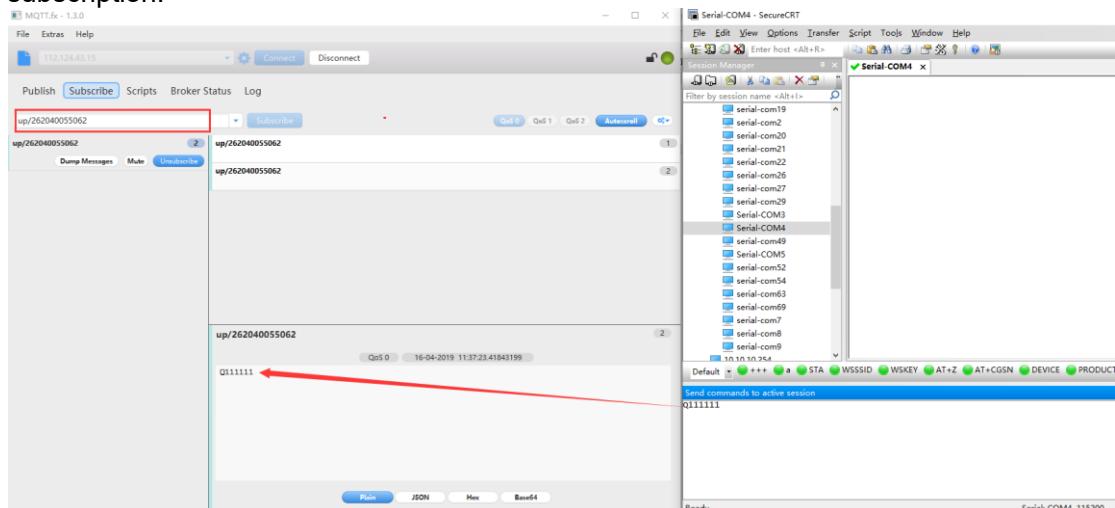
AT+MQLOGIN
+ok=admin,public

AT+MQID
+ok=F0FE6BEF8700
```

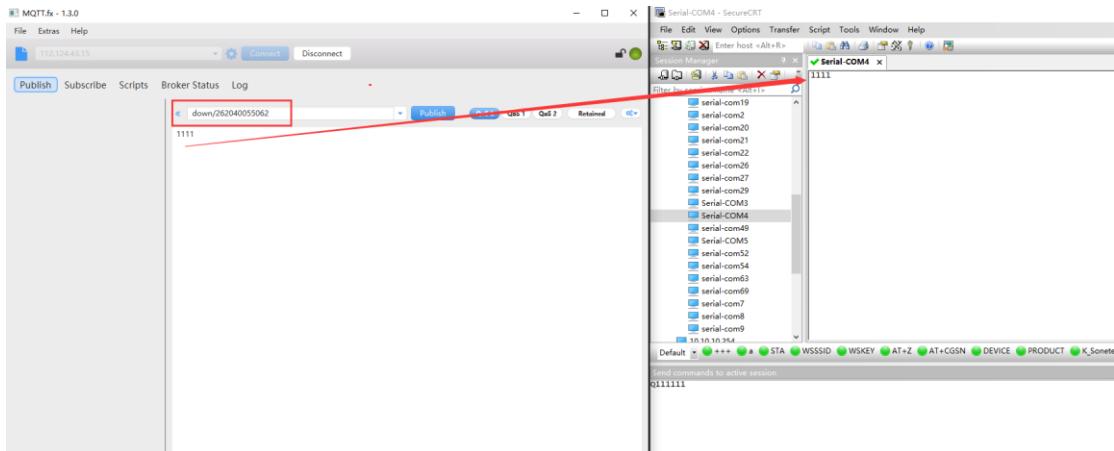
Open the MQTTfx tool and fill in the server address information as well.



- Fill in the **subscription topic** in the MQTTFX software, and keep the same theme as the device-side **publishing topic**. Open the serial port tool (SecureCRT or other serial port tools are available), send data, and see the data packets sent from the device in the tool subscription.



- The tool fills in the corresponding publishing topic (consistent with the subscription topic filled in by the device), and the sent data can be output through the serial port of the device.



### 3.4. HTTP Transmissio in STA Mode

The browser accesses <http://115.29.164.59:8432/iot?msg=123456788>, page effect:



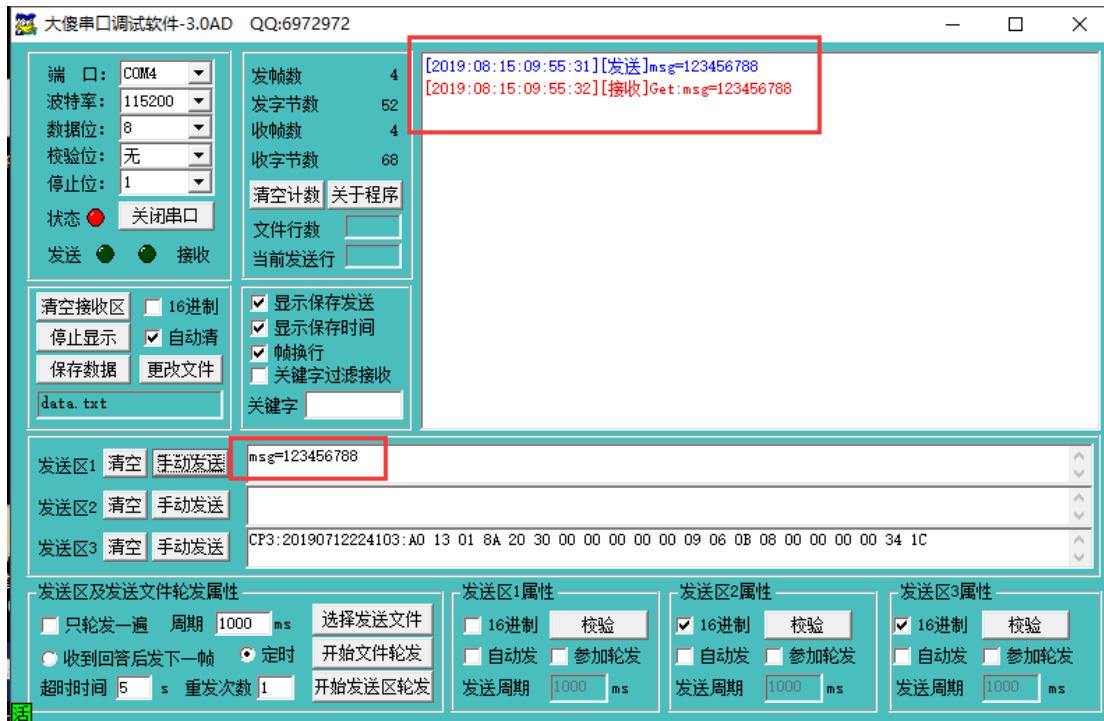
Fill in the HTTP server parameters as follows:

- AT+NETP=HTTP,8432,115.29.164.59
- AT+HTPTP=GET
- AT+HTPURL=/iot,1.1
- AT+HTPHEAD=Host:115.29.164.59106:8432<CRLF><CRLF>  
AT+NETP=HTTP ,8432 ,115 .29 .164 .59  
+ok
- AT+HTPTP=GET  
+ok
- AT+HTPURL=/iot ,1.1  
+ok
- AT+HTPHEAD=Host :115 .29 .164 .59106 :8432<CRLF><CRLF>  
+ok

After the setting is completed, restart, wait for the serial port output SOCKA status to indicate the connection is successful (requires AT+EVENT=on to enable this prompt information function).

**+EVENT=SOCKA\_ON**

The serial port sends a parameter request, and you can see the data replied by the server.



### 3.5. Heartbeat Package, Registration Package

Configure the enable heartbeat packet and the registration packet function as shown below (for details of the heartbeat packet and registration package, see the product function documentation). The corresponding configuration AT command is as follows.

```

AT+HEART=A,10,%MAC__          // Enable the heartbeat packet function and report the
                                module's actual IMEI code once every 10 seconds
AT+NREGEN=A,on                 // Enable the registration package function
AT+NREGSND=A,link               // Send the registration package only when connected
AT+NREGDT=A,%MAC!              // Registration package content is the version number
                                of the product

AT+NETP=TCP,CLIENT,8899,192.168.83.106
+ok

AT+HEART=A,10,%MAC__
+ok

AT+NREGEN=A,on
+ok

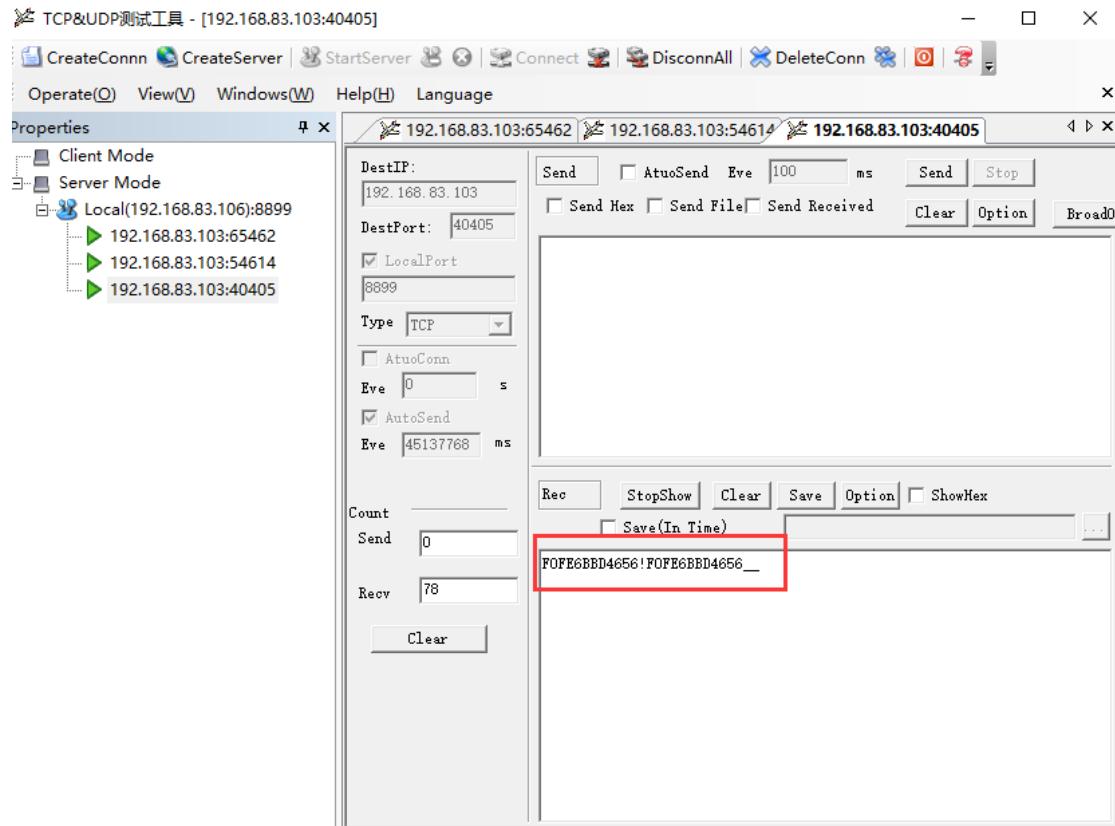
AT+NREGSND=A,link
+ok

AT+NREGDT=A,%MAC!
+ok

AT+Z
+ok

```

After setting up according to the above figure, restart and test to establish a TCP client. After the data is connected to the TCP server, the following data is sent.



#### Example 1:

Registration code requirements: FFFFFFFFFA+MAC+0F

Parameter content setting: %FF%FF%FF%FF%FA%MAC%0F

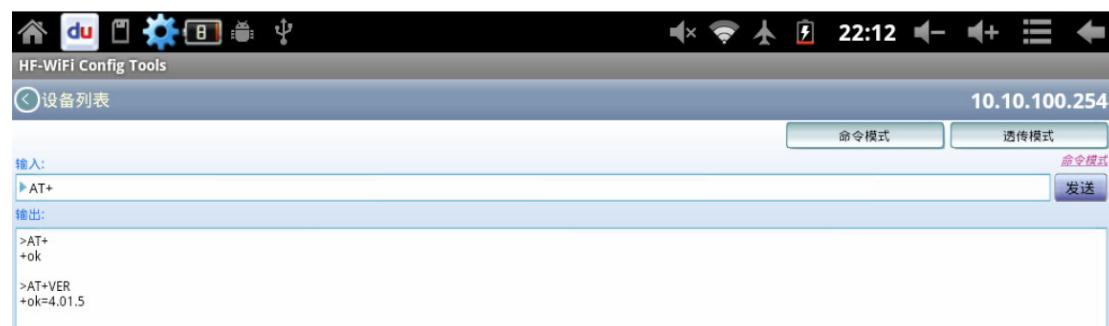
Actual data: FF FF FF FF FA 38 36 38 35 37 35 30 32 36 36 31 34 0F

### 3.6. Sending AT Commands in Network Mode

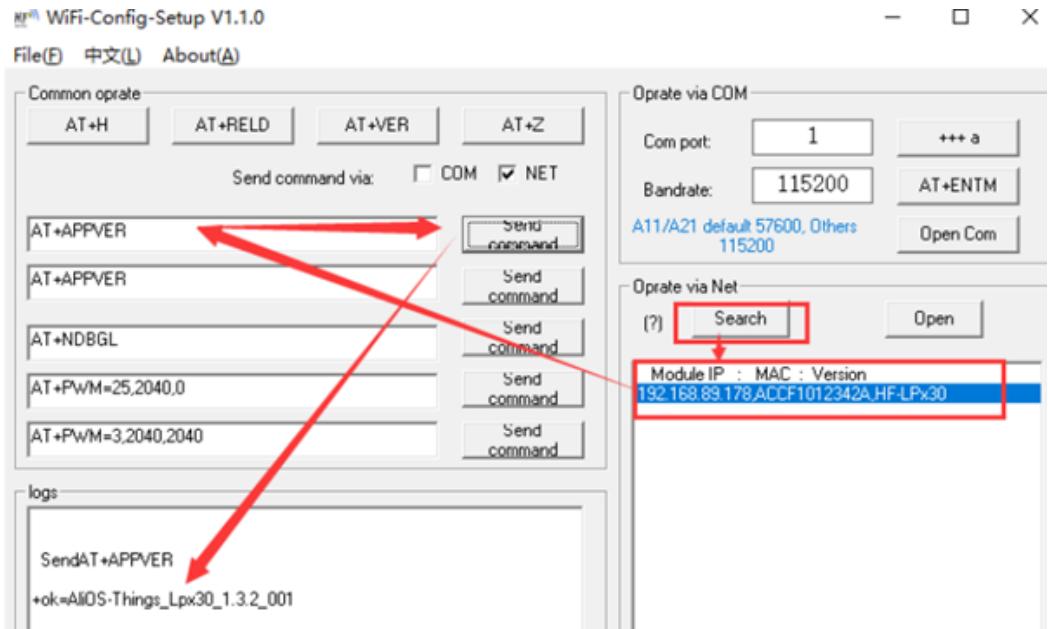
When the PC is directly connected to the AP hot spot or the PC and the module are connected to the same router, the AT command can be sent through the network. For details, see the Wi-Fi Config Tools tool.

<http://www.hi-flying.com/download-center-1/applications-1/download-item-wifi-config-tools-v1-0>

Android Version:



PC Version:



## 4. FIRMWARE UPGRADE

Wi-Fi firmware supports serial and wireless upgrades, including the following.

- 1、Use the communication serial port 0 to upgrade the application
- 2、Use the web page to upgrade the application
- 3、Upgrade the application using the HFUpdate production tool
- 4、AT+UPURL command remote upgrade

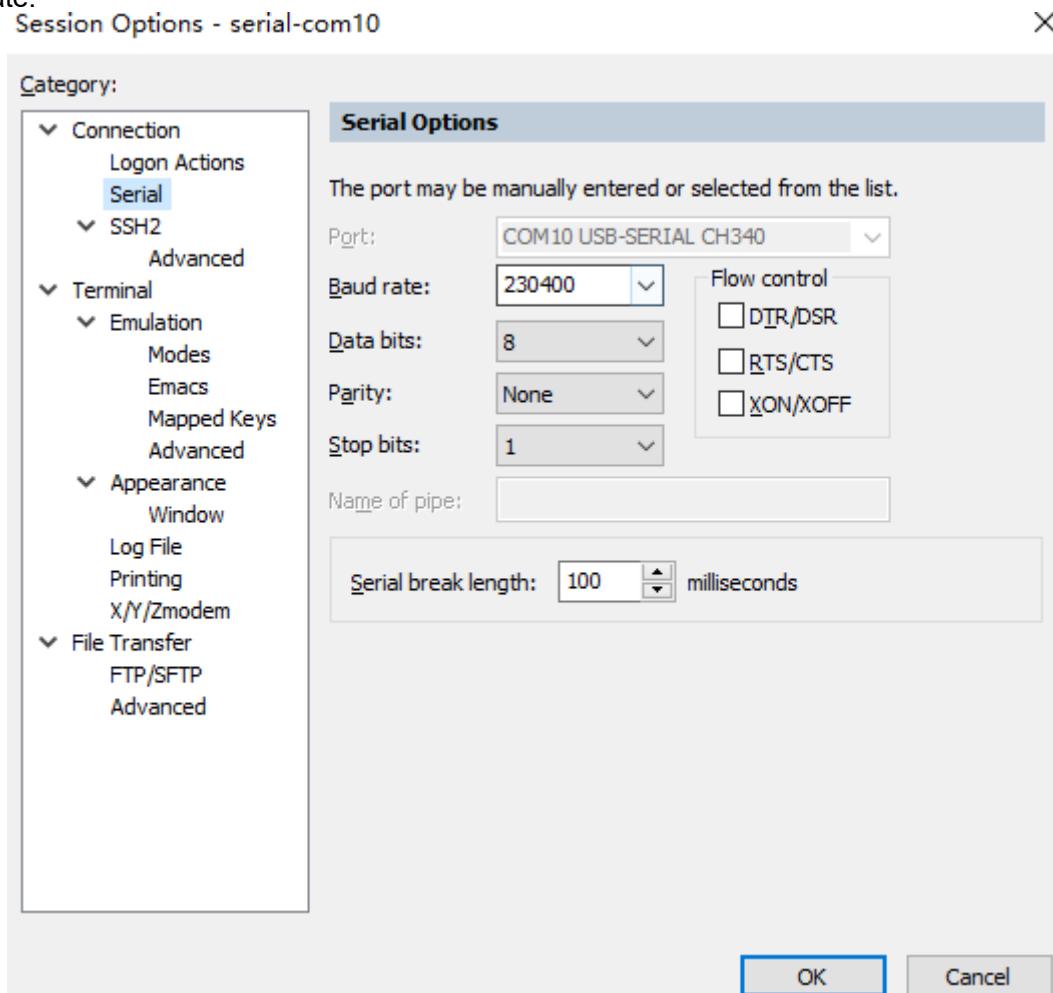
Notes: The upgrade file of the serial port mode is different from the web page and the upgrade file of the HFUpdate mass production tool. The file name is UPGRADE for webpage and mass production tool upgrade, and UPGRADE is used for serial port upgrade. For example:

HF-LPT230\_HFV4.10.03 : Used only for serial port upgrade

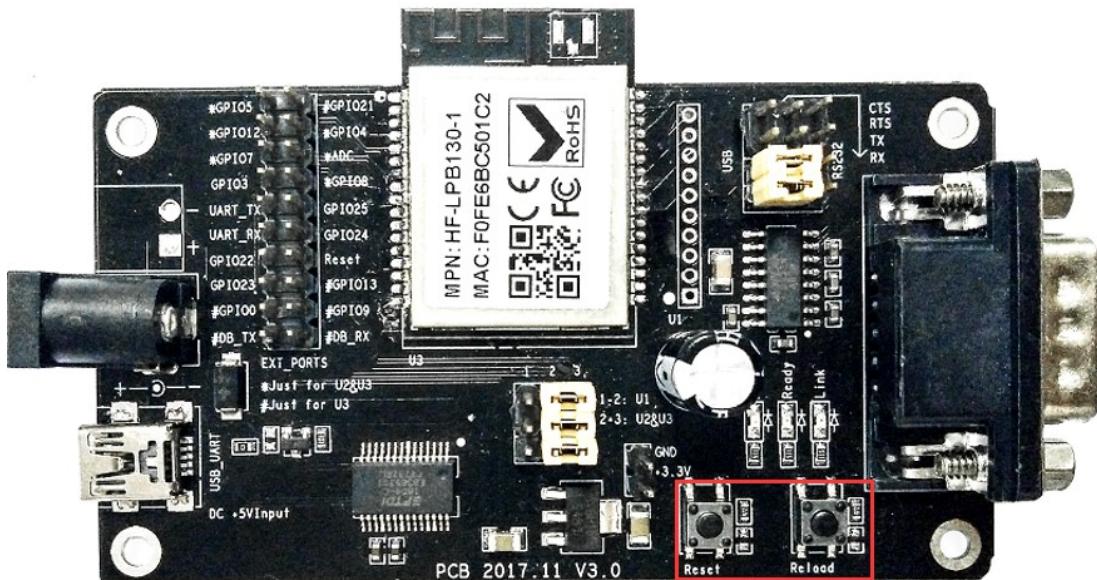
HF-LPT230\_UPGRADE\_HFV4.10.03: It is used for mass production tool mode, webpage mode or OTA wireless upgrade. It has more CRC check than serial port upgrade file, which is convenient for legal verification of files during remote upgrade.

### 4.1. Serial Port Firmware Upgrade

Modify the SecureCRT serial port baud rate to 230400, the bootloader uses this baud rate.



**Press and hold** the Reload button, press the Reset button and then press the keyboard space button to enter the serial port bootloader interface. At this time, you can release the Reload button. If you cannot enter, you can repeat the above actions.



Bootloader interface is as follows.

```
HF-LPBX30 Bootloader v3.0.10, please entry code to choose :
'B': Clean All Config.
'S': Program application.
'G': Run applications.
```

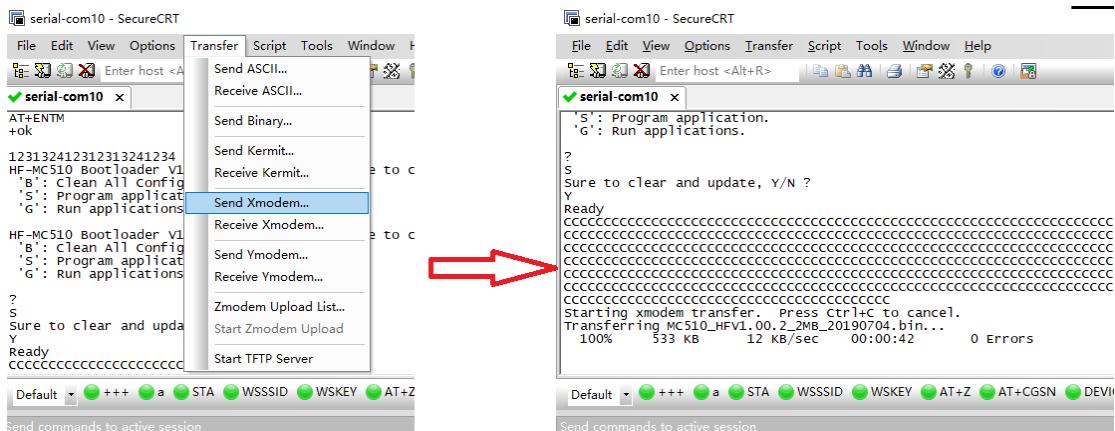
The command description is as follows. To execute the corresponding command, press the Enter key:

Command 'B': Clear all setting parameters, including factory parameters.

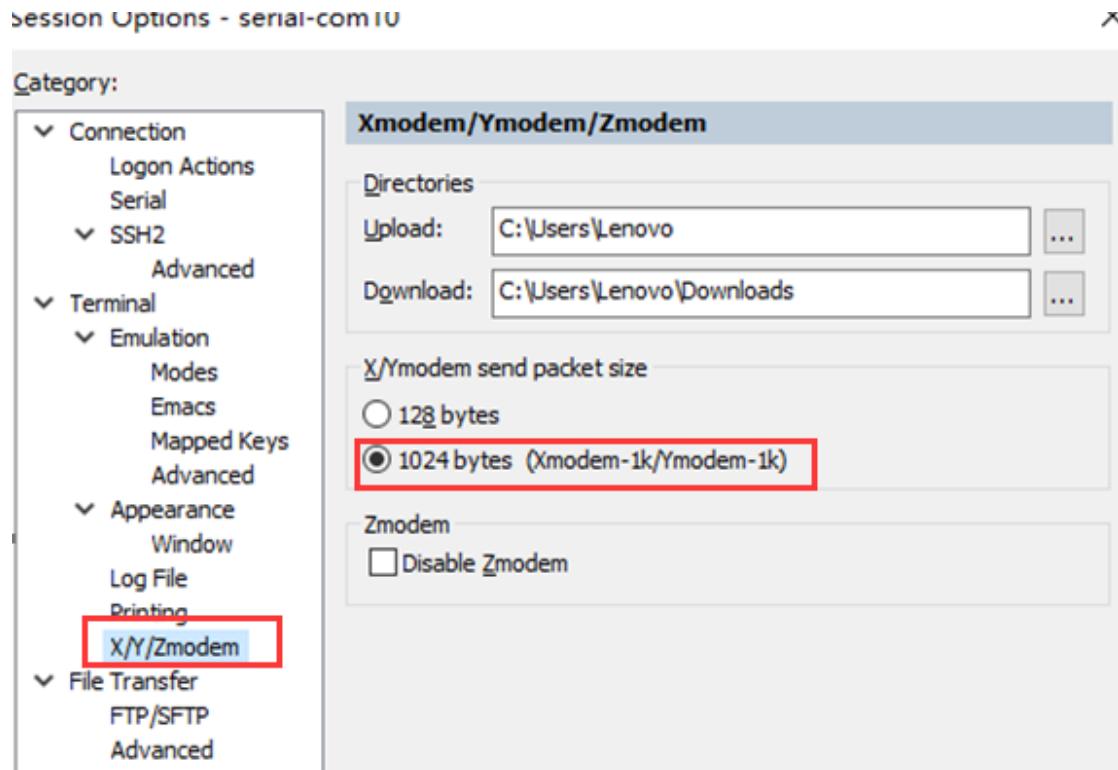
Command 'S' : Upgrade the application; upgrade the file compiled by SDK (using the serial port upgrade file) with this option, for example: HF-LPT230\_HFV4.10.03.

Command 'G' : Execute the application.

Enter the command 'S' to upgrade the application, the screen displays Ready, wait for the character 'C' to appear, select the file to be upgraded using Xmodem, and upgrade the file example: MC510\_HFV1.00.2\_2MB\_20190704. Wait until 100% of the time to complete the upgrade.



You can adjust the size of the tool package to speed up the serial port upgrade.



## 4.2. Internal Web Page Firmware Upgrade

The hot spot of the PC direct connection module (IP: 10.10.100.254/iweb.html) or the module is connected to the router with the IP assigned to the module by the router (example: http://192.168.0.117/iweb.html), enter The internal web page of the module.

1: Upgrade Application: Load the HF-LPT230\_UPGRADE\_HFV4.10.03 upgrade file upgrade application.

2: Upgrade customized webpage: Upgrade corresponding web external configuration webpage, lpx30\_webpage\_1.0.14.bin: You can switch webpage language by AT+PLANG command.



Upgrade application

未选择任何文件

Upgrade customized webpage

未选择任何文件

### 4.3. External Configuration Web Page Firmware Upgrade

If PC direct connect to module's hot spot (IP: 10.10.100.254) or the module is connected to the router, use the IP address assigned to the module by the router (for example: http://192.168.83.131) to enter the external configuration page of the module.



**Note:**

**HF-LPX70 series 2MB version support webpage upgrade, 1MB does not have web function.**

**HF-LPX30 series has 1MB and 2MB Flash difference, and the content of external web pages is different. See the user manual for details.**

### 4.4. HF Update Mass Production Tool Mode Upgrade

Download the mass production upgrade tool from High Flying official website.

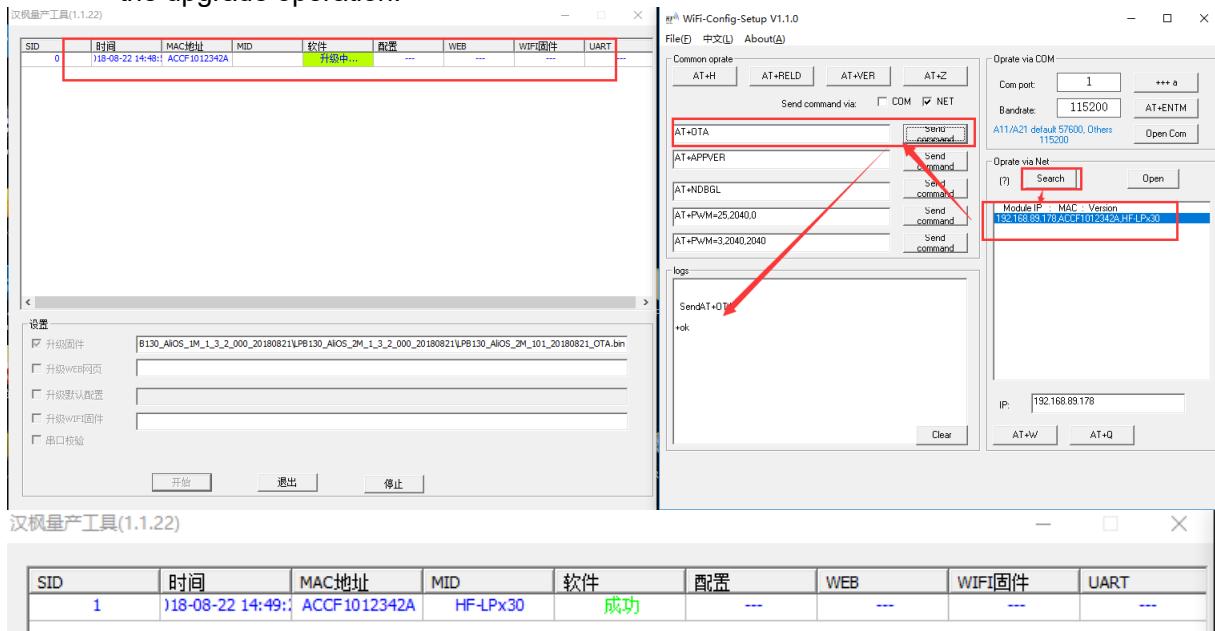
<http://www.hi-flying.com/download-center-1/applications-1/download-item-production-tool>

Open HFUpdate to load the upgrade program. **In this way, the LAN OTA needs to shut down the computer's firewall and leave only one network card(Disable other network card).**

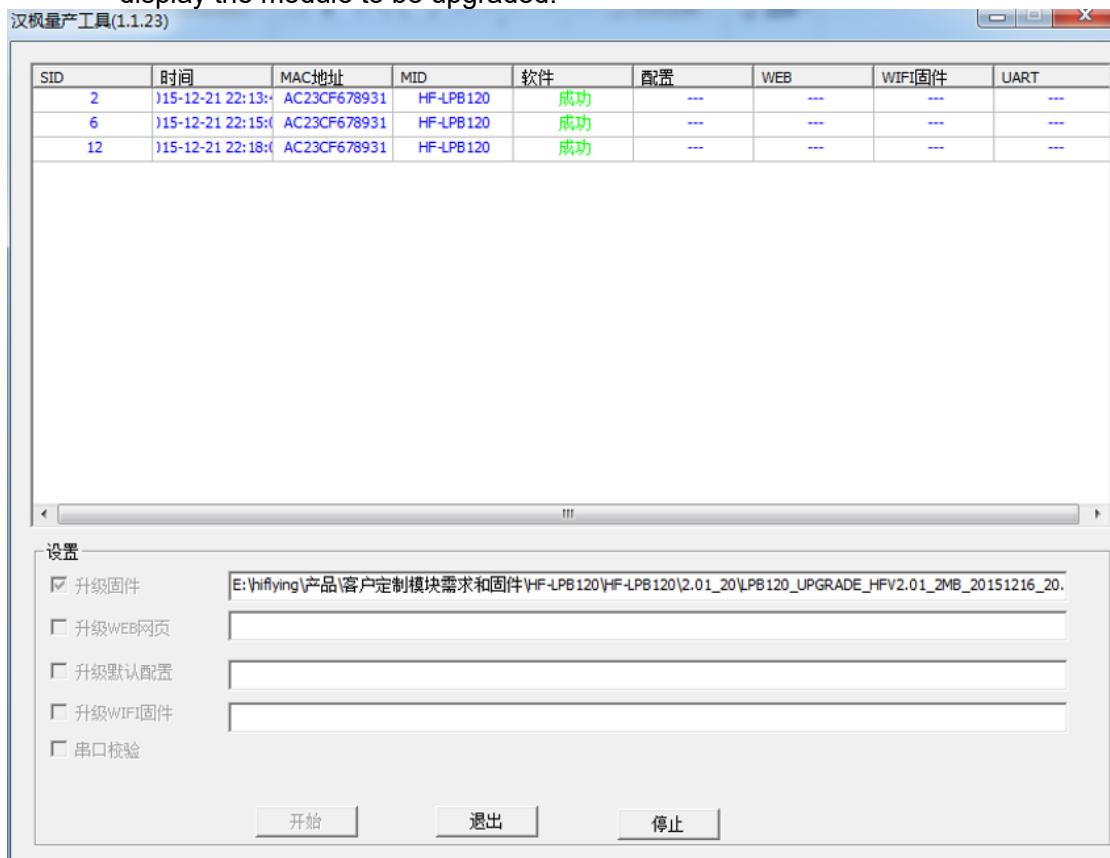


- ◆ Method 1: Manually configure the module and PC to connect to the same router (the way to configure the router can use the method mentioned above), enter the AT+OTA command on the serial port or network mode of the module to perform

the upgrade operation.



- ◆ Method 2: The router SSID is modified to UPGRADE-AP and is not encrypted. The PC network cable or wireless connection is connected to the router. The module end presses the nReload button and powers up, waiting for the tool to display the module to be upgraded.



## 4.5. AT+UPURL Command Mode Upgrade

Put the OTA upgrade file on the local LAN or remote server, you can simply use the AT command to complete the firmware upgrade. For example, the upgrade file in the intranet environment is stored in the following location.

[http://192.168.1.28:9000/HF-LPT230/MC510\\_UPGRADE\\_2MB.bin](http://192.168.1.28:9000/HF-LPT230/MC510_UPGRADE_2MB.bin)

Send the following AT command, note that there is a comma between the path and the file in the command.

AT+UPURL=[http://192.168.1.28:9000/HF-LPT230/,MC510\\_UPGRADE\\_2MB.bin](http://192.168.1.28:9000/HF-LPT230/,MC510_UPGRADE_2MB.bin)

Prompt Update success requires a reboot to run this new firmware.

```
AT+UPURL= http://192.168.1.28:9000/HF-MC510/,MC510_UPGRADE_2MB.bin  
+ok=Update success
```

```
AT+Z  
+ok
```

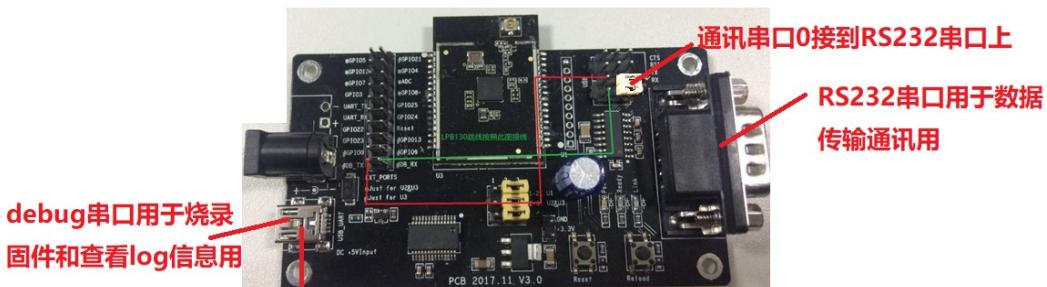
## 5. DEBUG INFORMATION FUNCTION

If the test encounters a problem (data communication, distribution network failure, etc.), you need to send the serial port log information to us for analysis. Please enable the module to run the log information as described below. Debug UART usually use 921600bps

### 5.1. HF-LPX30 Serial Port Log Information Output Enable

Open SecureCRT (the baud rate defaults to 115200). See the previous command to enter the AT command mode.

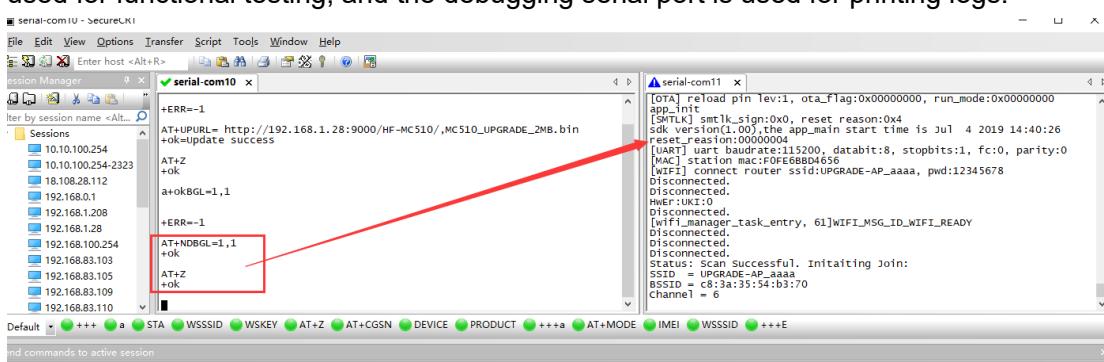
The communication serial port input AT+NDBGL=1, 1 enables debugging serial port output log information, AT+NDBGL=0 can turn off log information output function. The development board is connected as shown below. Use the DuPont line to connect the jump pins between the red and green lines to bring up the two serial ports.



Can also purchase USB to TTL serial port, and debug the serial port UART1 to the USB serial port. Need to connect GND, UART1\_TX and UART1\_RX (see the module manual for the specific debugging serial port pin).



This dual serial port can be used at the same time, the communication serial port is used for functional testing, and the debugging serial port is used for printing logs.

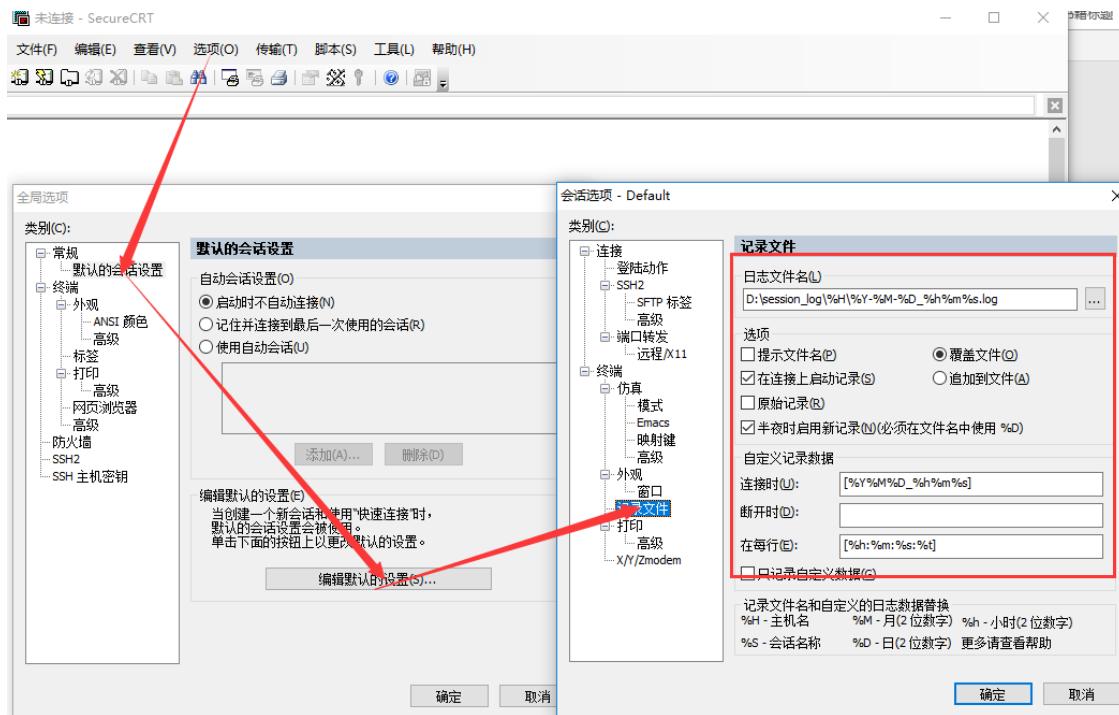


Set the logging function of the SecureCRT software as shown below.

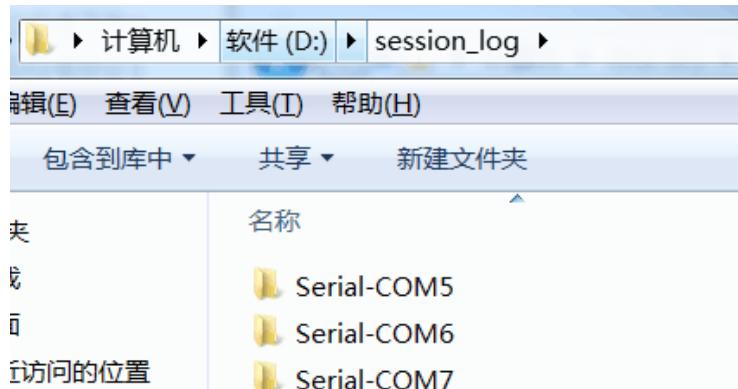
```
D:\session_log\%H\%Y-%M-%D_%h%m%s.log
```

```
[%Y%M%D_%h%m%s]
```

```
[%h:%m:%s:%t]
```

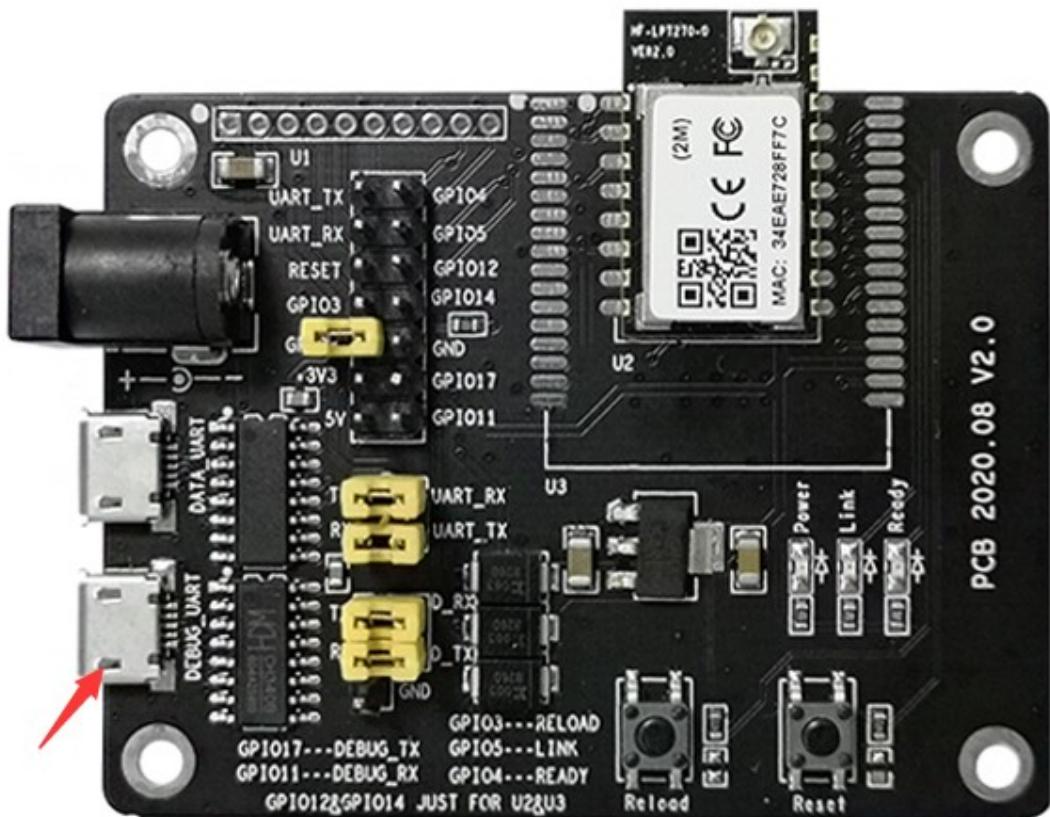
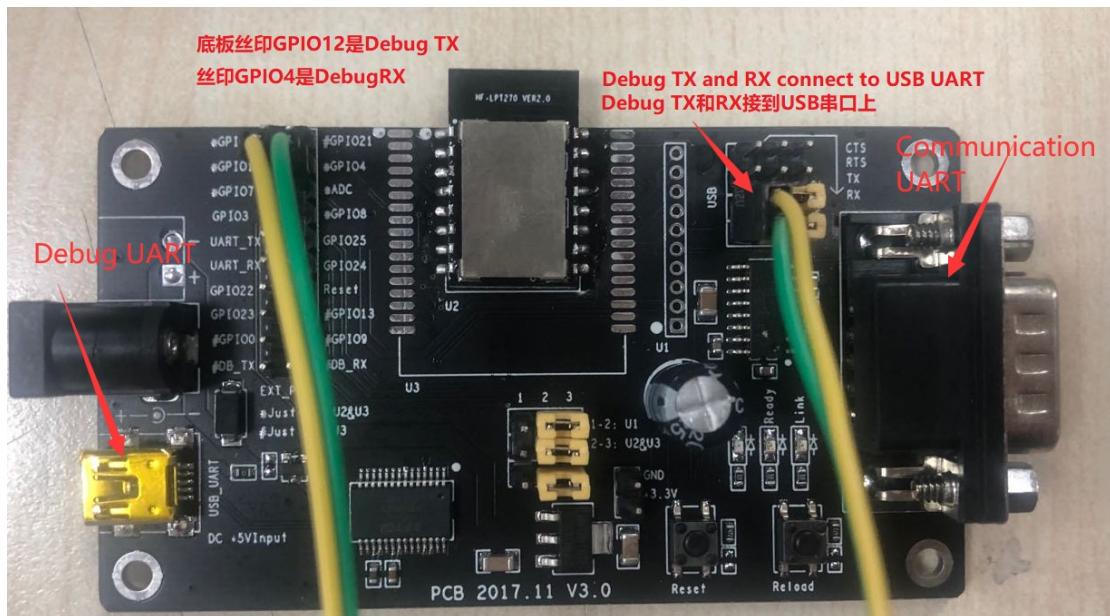


In this case, if the serial port is printed, the file can be automatically generated in the corresponding directory.



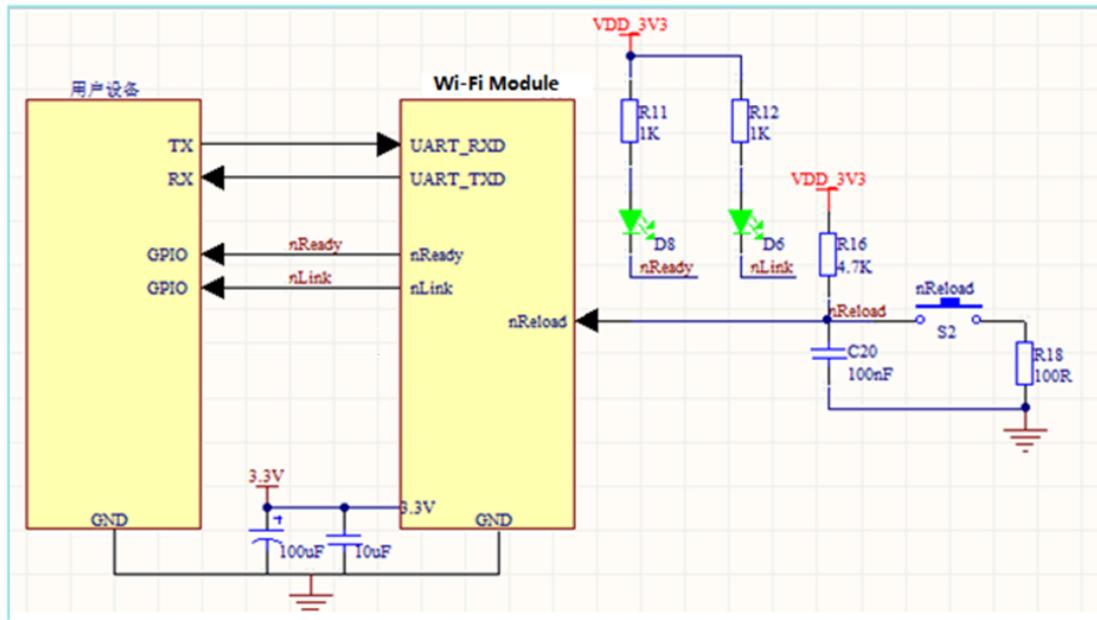
## 5.2. HF-LPX70 Series EVK Debug UART1 Connection

HF-LPX70 Series different EVK debug UART1 connection as following.



## 6. MODULE HARDWARE DESCRIPTION

The typical wiring of the module is shown below.



**nLink-** (optional, general debugging) Module WIFI connection indication, batch upgrade, configuration status indication, output.

If the module is set to STA mode and successfully connected to the AP, the output low level can be used to determine whether the module is in a networked state. There is a pull-up resistor inside, no external pull-up resistor is required. If you do not need to use this pin function, leave it unconnected, ie no connection is required.

**nReady-** (optional, for general debugging) The module completes normal startup and output.

When the module starts normally, the output low level can be used to judge whether the module starts normally and works in the normal mode; if the pin function is not needed, it is left floating, that is, no connection is needed.

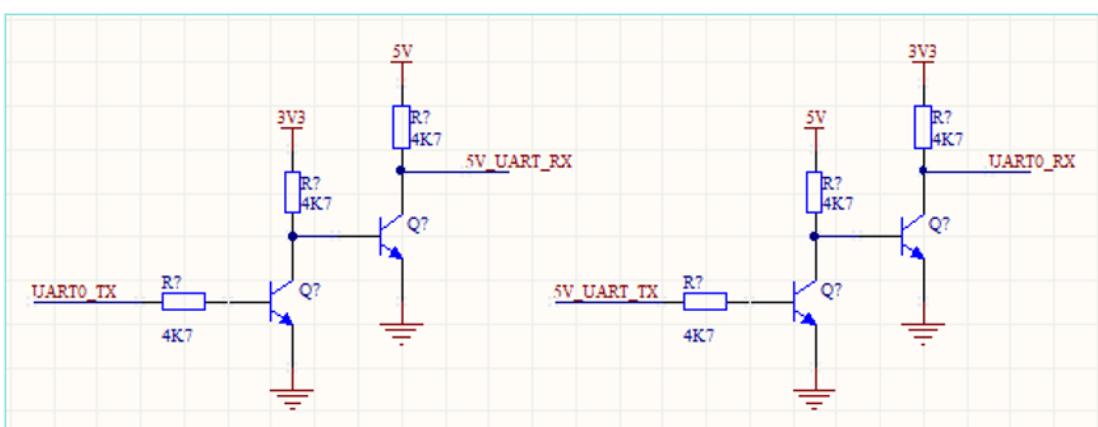
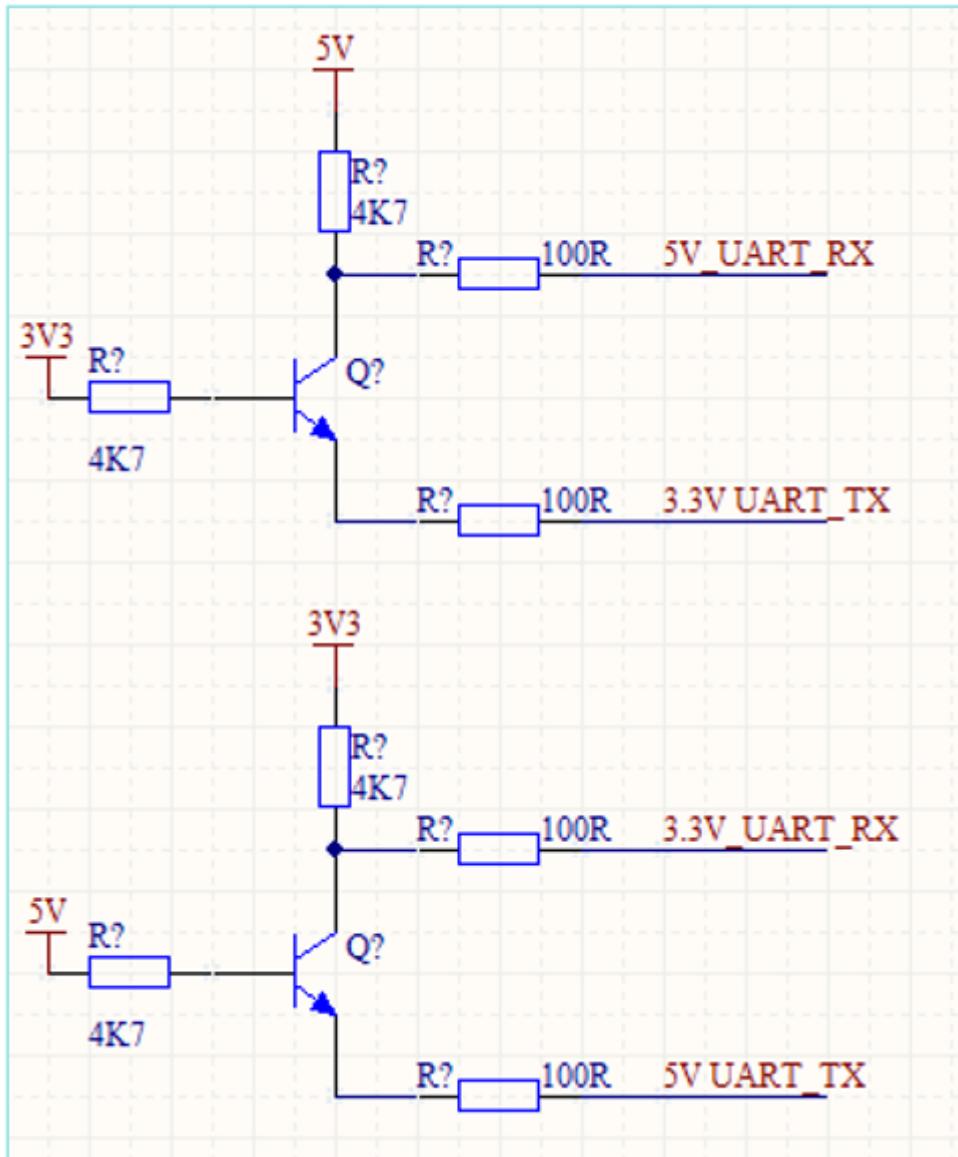
**nReload-** (recommended, important function) Restore factory default settings, batch upgrade, SmartAPLink distribution network, input, active low. It can be connected to an external button or chip pin. When the button is pressed, pull the pin low, release it after 4 seconds, the module is restored to the factory settings, and then restarted. If you do not need to use this pin function, you can hang it.

UART0\_TXD/RXD (required) - Serial data transmission and reception signal.

### 6.1. Serial Port Level Conversion

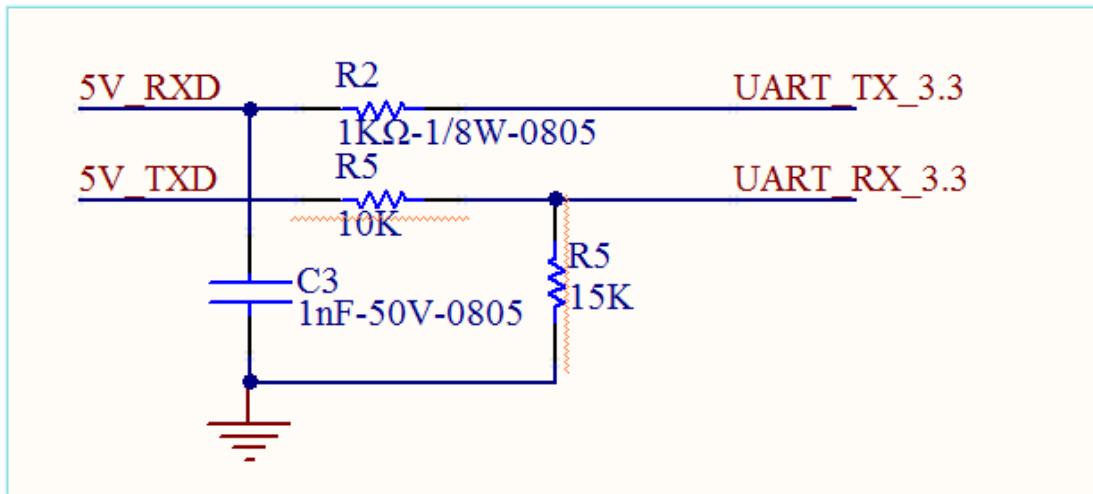
◆ Triode tube compression (recommended)

If the RX pin of the user equipment considers 3.3V to be high, it can be directly connected.



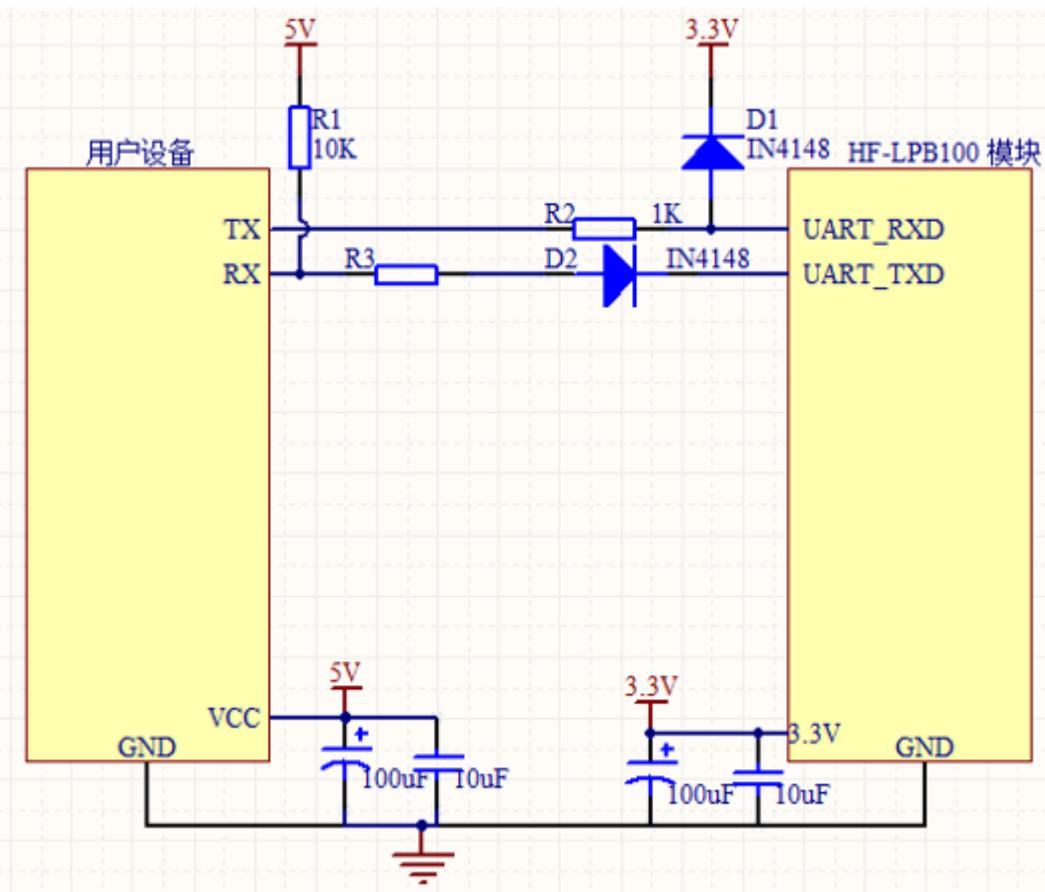
◆ Resistor divider (low cost solution)

If the RX pin of the user equipment considers 3.3V to be high, it can be directly connected.



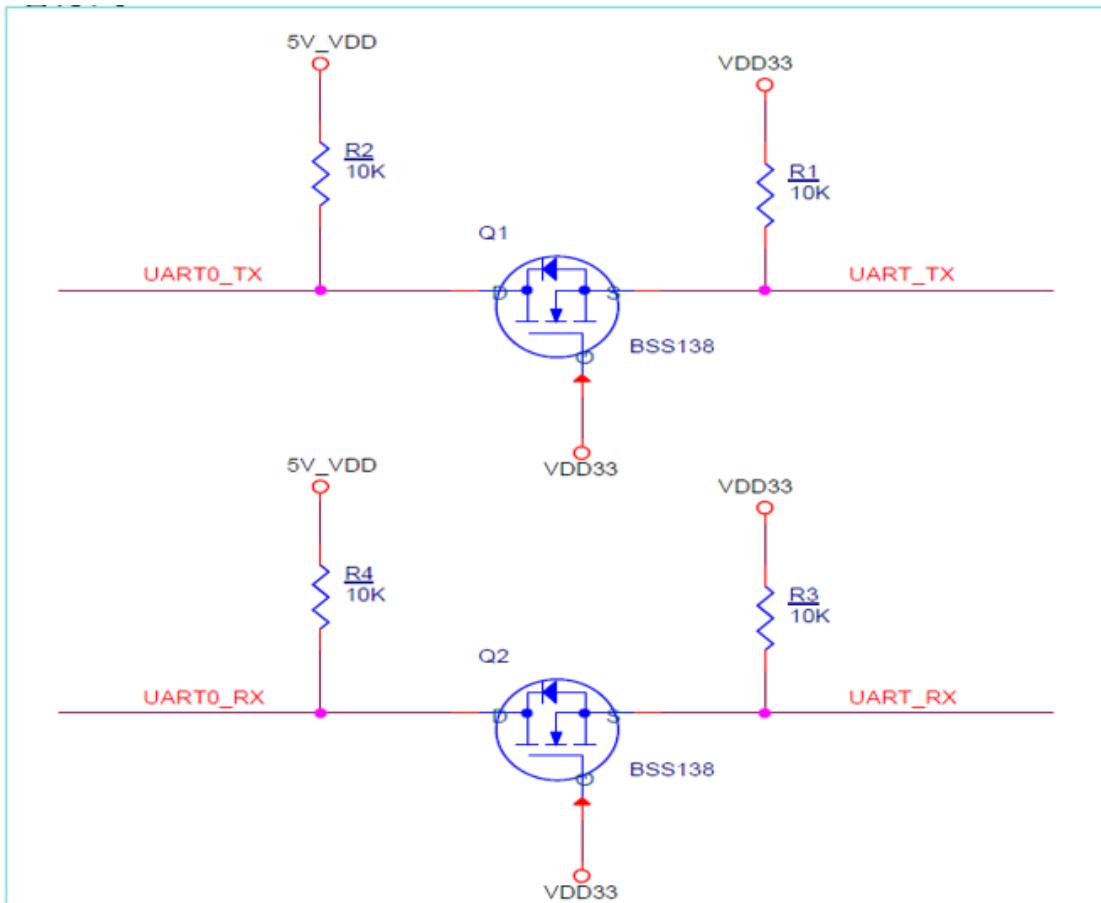
◆ Diode buck

If the RX pin of the user equipment considers 3.3V to be high, R1, R3, and D2 can be removed.



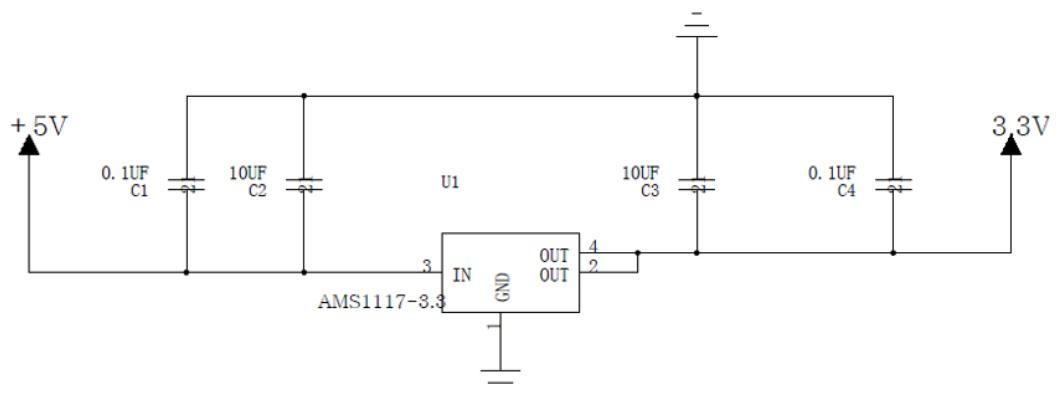
◆ MOS tube compression

The most stable version of the hardware supports high-speed transmission (baud rate 921600, etc.), but at a higher cost.

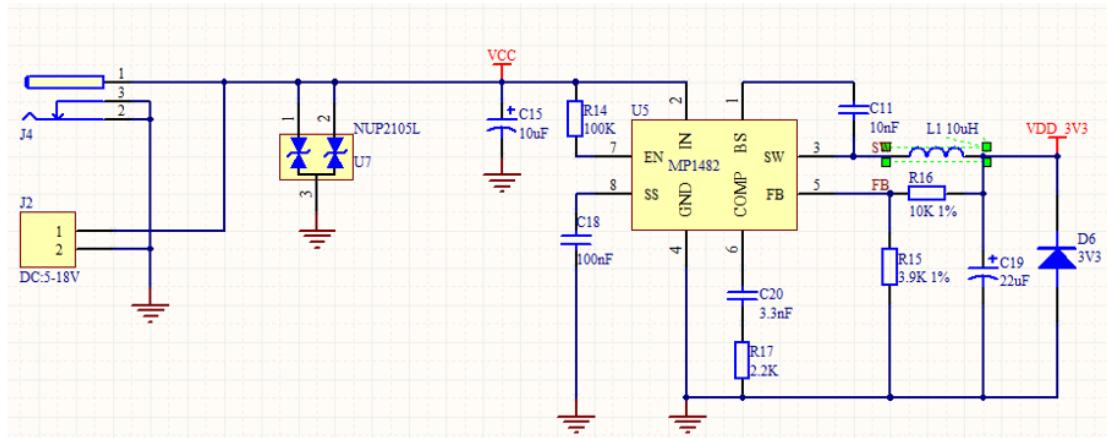


## 6.2. Power Supply Design

- ◆ LDO method (recommended)  
Input 5VDC to 3.3VDC



- ◆ DC-DC method (recommended)  
Input 5~18VDC to 3.3VDC

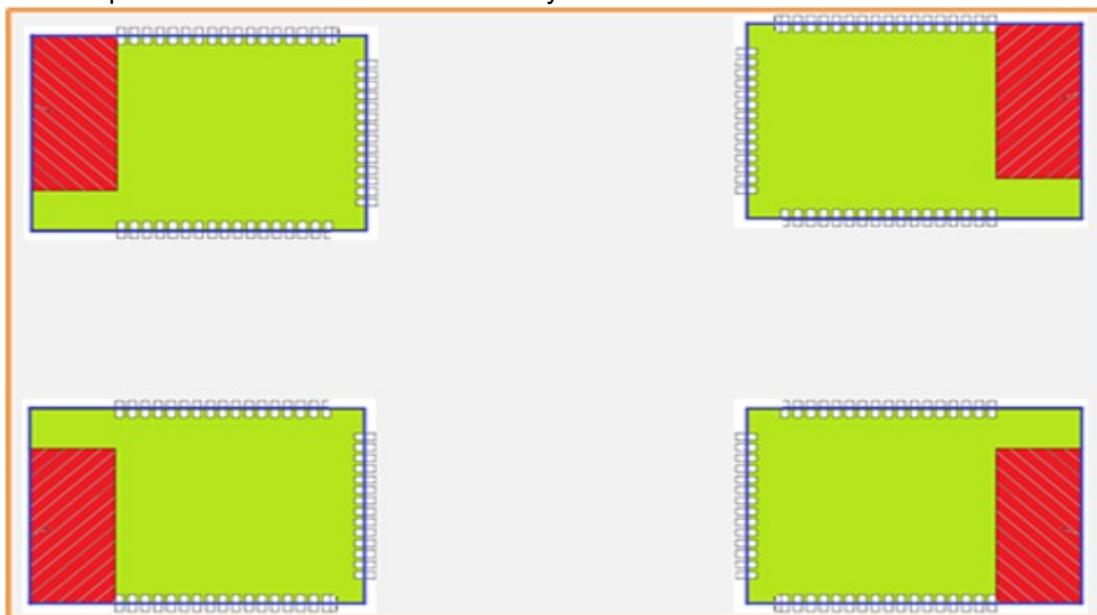


### 6.3. Internal antenna

Optional built-in antenna. When the customer selects the built-in antenna, the following rules for the built-in antenna and the overall rules for the placement of the module are required (see the manual for each module, HF-LPB130 for example):

- ◆ On the user's PCB, the area corresponding to the red area (8.3x18.4m) in the figure below cannot be placed and GND
- ◆ The antenna is far away from the metal, at least 10 mm above the higher components.
- ◆ The antenna part cannot be blocked by the metal case

High Flying recommends that the HF-LPB100 module be placed in the following areas of the user board as much as possible to reduce the impact on the antenna and wireless signals. Please also consult High Flying's technical support personnel to assist with the placement of the module and the layout of the relevant area.



## 7. MODULE BLE THROUGHPUT

BLE can also be used for those combo modules(HF-LPX70 series, HF-LPC3XX series, HF-LPF100)

 High Performance Wi-Fi	 Low Power Wi-Fi	 Low Power WiFi&BLE	 2.4/5G Dual Band
SMT Package [HF-A21-SMT] [HF-A11-SMT]	SMT Package [HF-LPB130] [HF-LPB120] [HF-LPB100]	SMT Package [HF-LPC300]	SMT Package [HF-LPD100]
DIP Package [HF-A21] [HF-A11] [HF-A12]	Small SMT Package [HF-LPT330] [HF-LPT230] [HF-LPT220] [HF-LPT200]	Small SMT Package [HF-LPT270]	DIP Package [HF-LPD130]
	Small DIP Package [HF-LPT130A] [HF-LPT130B] [HF-LPT120A] [HF-LPT120] [HF-LPT120G] [HF-LPT100] [HF-LPT100F]	DIP Package [HF-LPC330]	
	5V Power [HF-LPB135] [HF-LPB105] [HF-LPB125]	5V Power [HF-LPC305]	
	System in Package [HF-SIP120]		

 BLE	 Cellular Network	 Special Wi-Fi
BLE Patch package [HF-BL300] [HF-BL200A]	4G DTU Module [Gport-G43]	2.4G/5GWIFI+BLE5.0 [HF-LPF100]
	GPRS+GPS DTU Module [Gport-G12]	Linux SDIO 2.4G Wi-Fi+BLE5.0 [HF-LPS170]
	GPRS Serial Module [Gport-G11] [Gport-G10]	

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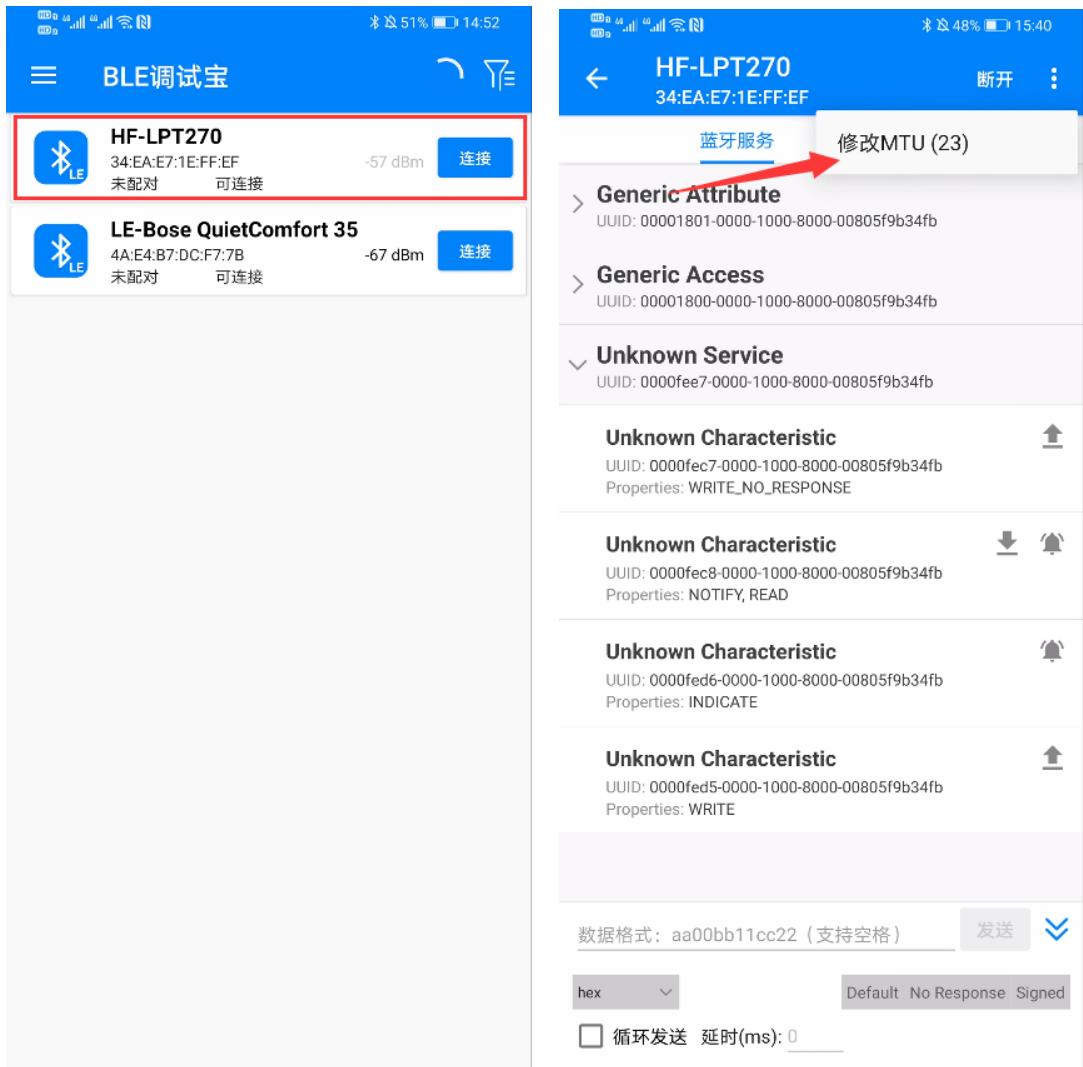
Config module with **【AT+BLE=on】** and reboot, enable BLE throughput function

Open BLE APP and choose HF-LPT270 and click **【连接】**

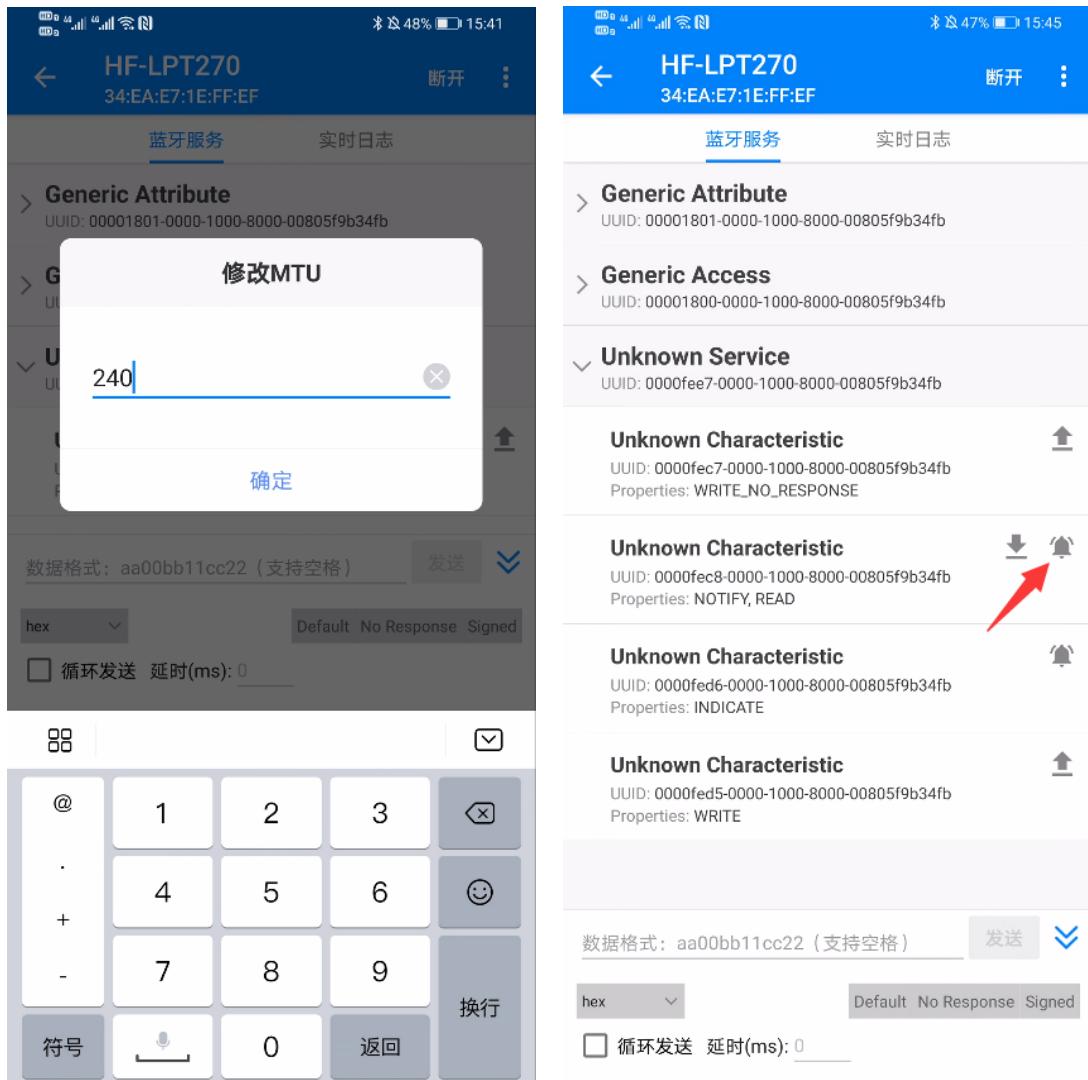
**Note:**

HF-LPX70 series module BLE name is different in SmartBLELink config mode and throughput mode, default SmartBLELink config mode name is AZ and module name(HF-LPT270, HF-LPB170, HF-LPT170) in throughput mode, SmartBLELink config mode is not for throughput data transmission. Use AT+BLENANE to change the two name.

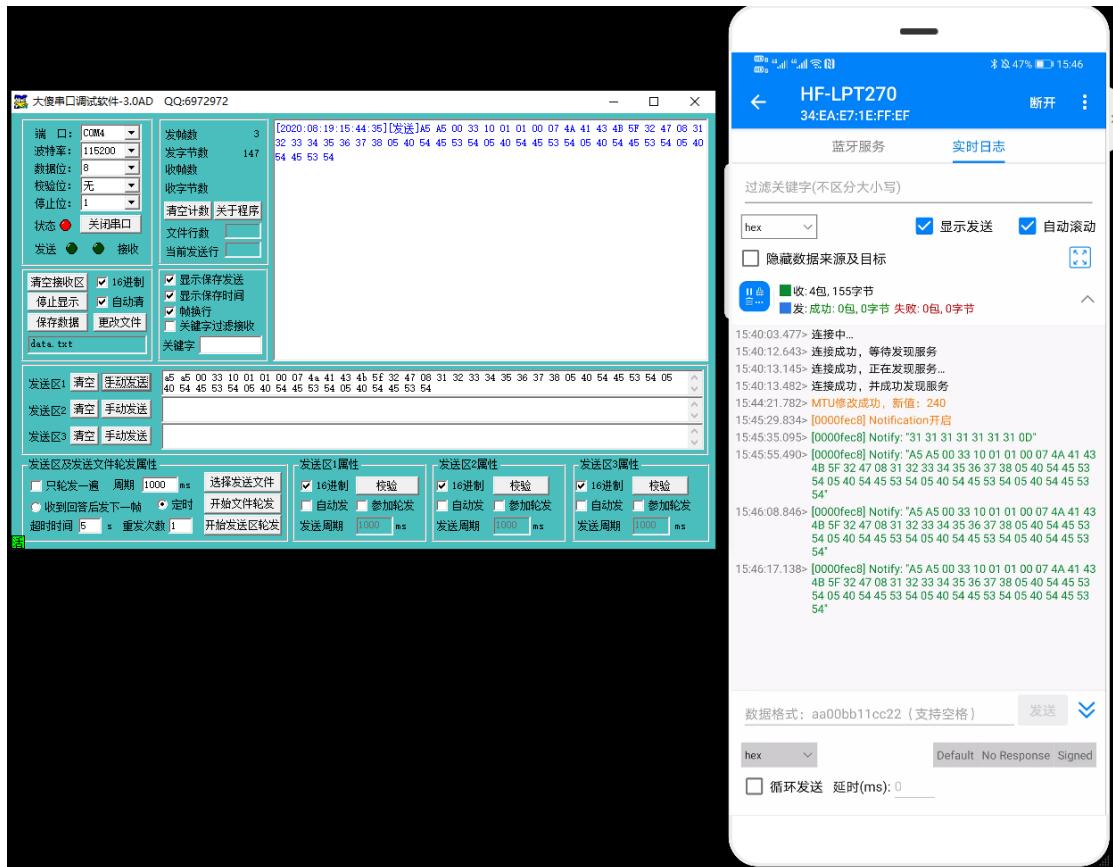
HF-LPC3XX series module and HF-LPF100 use the same name AZ in SmartBLELink and throughput mode, but we may update this to the same as HF-LPX70 later.



Set MTU to 240(BLE 5.0 version module HF-LPX70 and HF-LPF100 module support large packet, while HF-LPC3XX series modules keep default MTU:23).



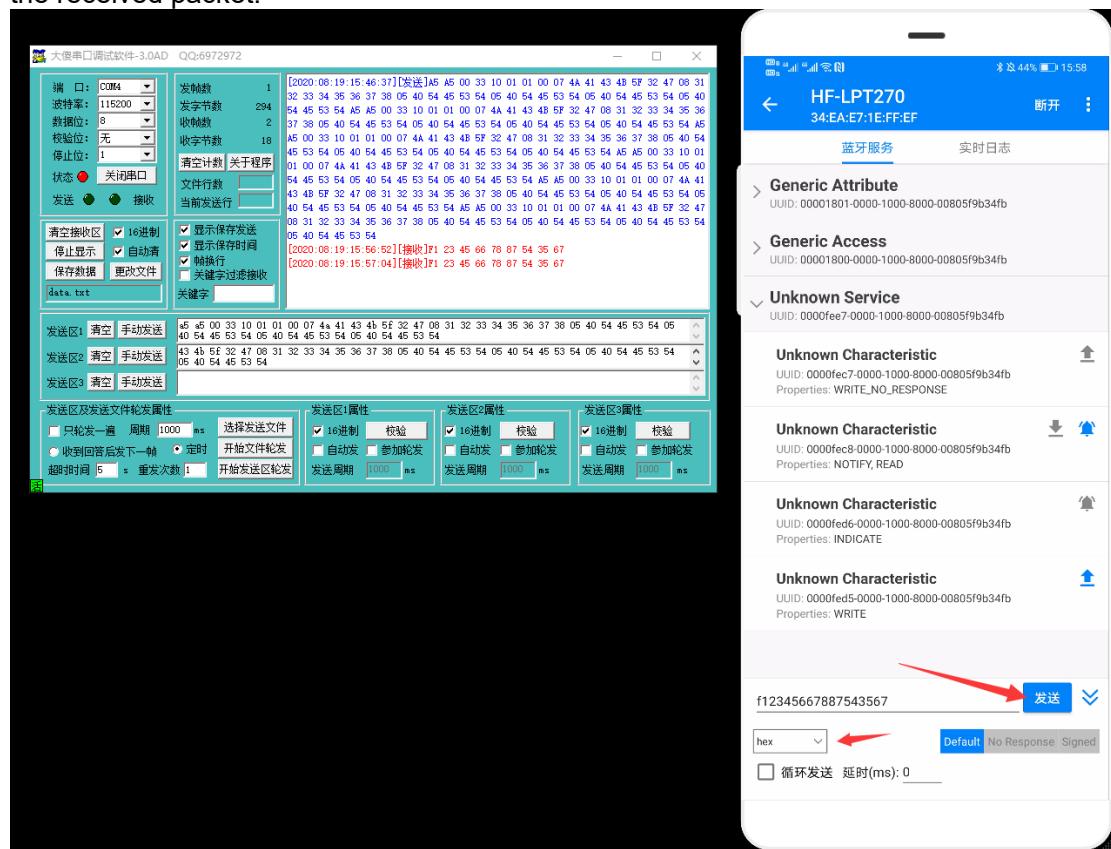
When read packet, click read UUID, it will show received packet in 【实时日志】  
Send UART packet to module (module should in default throughput mode, if in AT command mode, all packet will be considered as AT command, it won't sent to APP):



Click WRITE UUID, send packet with APP.



APP send the following data, data format support HEX and ASCII, UART will output the received packet.



If need to change the BLE name and UUID, use the following command, parameters will be valid after reboot.

```
AT+BLENANE=AZ,HF-LPT270      //modify BLE name
AT+BLENTFUUIDS=0000FEE700001000800000805F9B34FB
// Modify notification service UUID
AT+BLENTFUUIDR=0000FEC800001000800000805F9B34FB
//Modify notification read UUID
AT+BLENTFUUIDW=0000FEC700001000800000805F9B34FB
//Modify Notification write UUID
AT+BLEINDUUUIDR    // Modify Indication read UUID
AT+BLEINDUUUIDW    // Modify Indication write UUID
```