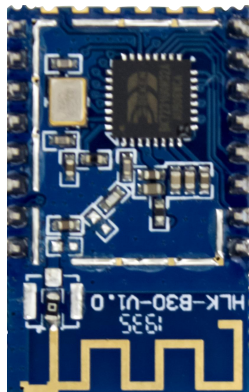




**Shenzhen Hi-Link Electronic Co., Ltd.**

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## **HLK-B30 User Manual**



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## 1. Product description

### 1.1. Brief introduction

HLK-B30 is a low-cost embedded UART-WiFi (serial-wireless network) module launched by Hi-Link Electronics.

This product is based on an embedded module that complies with the network standard through a serial interface and has a built-in TCP / IP protocol stack.

With the HLK-B30 module, traditional serial devices can transmit their own data over the Internet without changing any configuration, providing a complete and fast solution for users' serial devices to transmit data over the network.

### 1.2. Product Features

- Support 802.11b / g / n standards, integrating ARM9, WLAN MAC / Baseband / BLE 4.2
- Main frequency supports 120MHz
- Built-in 256KB RAM / 2MB FLASH
- Working voltage: 3.0-3.6V
- 2.4G / 1T1R WiFi, BLE 4.2
- Support BLE fast network configuration
- Support Station, Soft AP
- Support SmartConfig, WPA / WPA2 security mode, STA / AP working mode
- Support 802.11b / g / n standard, HT-40
- Support AP, STA and BLE mixed mode
- Rich peripheral interfaces, 1 \* SPI, 2 \* UART, 6 \* PWM, 19 \* GPIO
- Widely used in the Internet of Things
- Support multiple encryption methods WEP64 / 128, TKIP, AES, WPA, WPA2, WAPI

### 1.3. Technical specifications

Table 1 Product technical specifications

Module	Model	HLK-B30
	Encapsulation	Inline
Wireless parameters	Wireless standard	IEEE 802.11 b/g/n Bluetooth standard: BLE 4.2
	Frequency Range	2.412GHz-2.484GHz
	Transmit power	802.11b: +16 +/-2dBm (@11Mbps)
		802.11g: +14 +/-2dBm (@54Mbps)
		802.11n: +13 +/-2dBm (@HT20,HT40- MCS7)
	Receiving sensitivity	802.11b: -88.4 dBm (@11Mbps ,CCK)
		802.11g: -75.7dBm (@54Mbps, OFDM)
		802.11n: -73.6dBm (@HT20, MCS7)
		External: I-PEX connector
		Built-in: Built-in PCB antenna
Hardware parameters	Hardware interface	UART, IIC, PWM, GPIO, SPI
	Operating Voltage	3.3V
	GPIO drive capability	Max:16ma
	Working current	Send continuously =>
	Operating temperature	-40°C~80°C
	Storage environment	Temperature: <40 ° C, relative humidity: <90% R.H.
Serial port transparent transmission	Transmission rate	110-921600bps
	TCP Client	1
Software parameters	Wireless network type	STA/AP
	Security Mechanism	WEP/WPA-PSK/WPA2-PSK
	Encryption type	WEP64/WEP128/TKIP/AES
	Firmware upgrade	Wireless upgrade, serial port upgrade
	Network protocol	IPv4, TCP/UDP
	User configuration	AT + instruction set, intelligent configuration with one click

## 1.4. Pin Introduction

Table 2 Module pin interface

Pin	Network name	Type	Descriptions
1	CEN	I	Chip enabled, highly effective
2	P26_PWM5	I/O	P26,PWM5
3	P24_PWM4	I/O	P24,PWM4
4	P23_TDO_F_S0	I/O	P23,ADC3
5	P22_TDI_F_SI	I/O	ES0, enter at command mode / restore factory settings, please pull up if not used, same as P28
6	P21_TMS_F_CS	I/O	P21
7	P20_TCK_F_SC	I/O	P20
8	VBAT	P	3.3V power supply
9	P28	I/O	Enter at command mode / restore factory settings, please pull up if not in use, same as P22
10	P16	I/O	P16
11	P17	I/O	P17
12	P14	I/O	P14
13	P15	I/O	P15
14	P6_PWM0	I/O	P6,PWM0
15	GND	P	GND
16	P7_PWM1	I/O	P7,PWM1
17	P8_PWM2	I/O	WiFi Indicator light
18	P9_PWM3	I/O	P9,PWM3
19	P1_URAT2_RXD	I/O	P1,UART2
20	P0_UART2_TXD	I/O	P0,UART2
21	P10_UART1_RXD	I/O	P10,UART1, For upgrading, command setting and transparent transmission
22	P11_UART1_TXD	I/O	P11,UART1, For upgrading, command setting and transparent transmission

## 1.5. Product Encapsulation

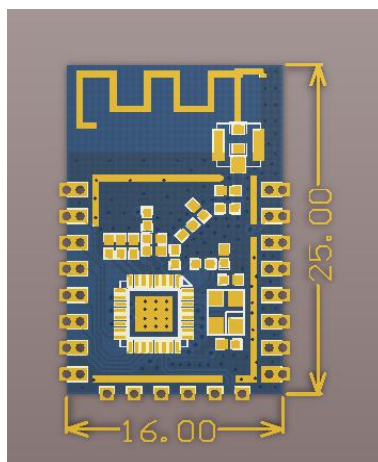


Diagram 1 HLK-B30 encapsulation size

## 1.6. Block diagram

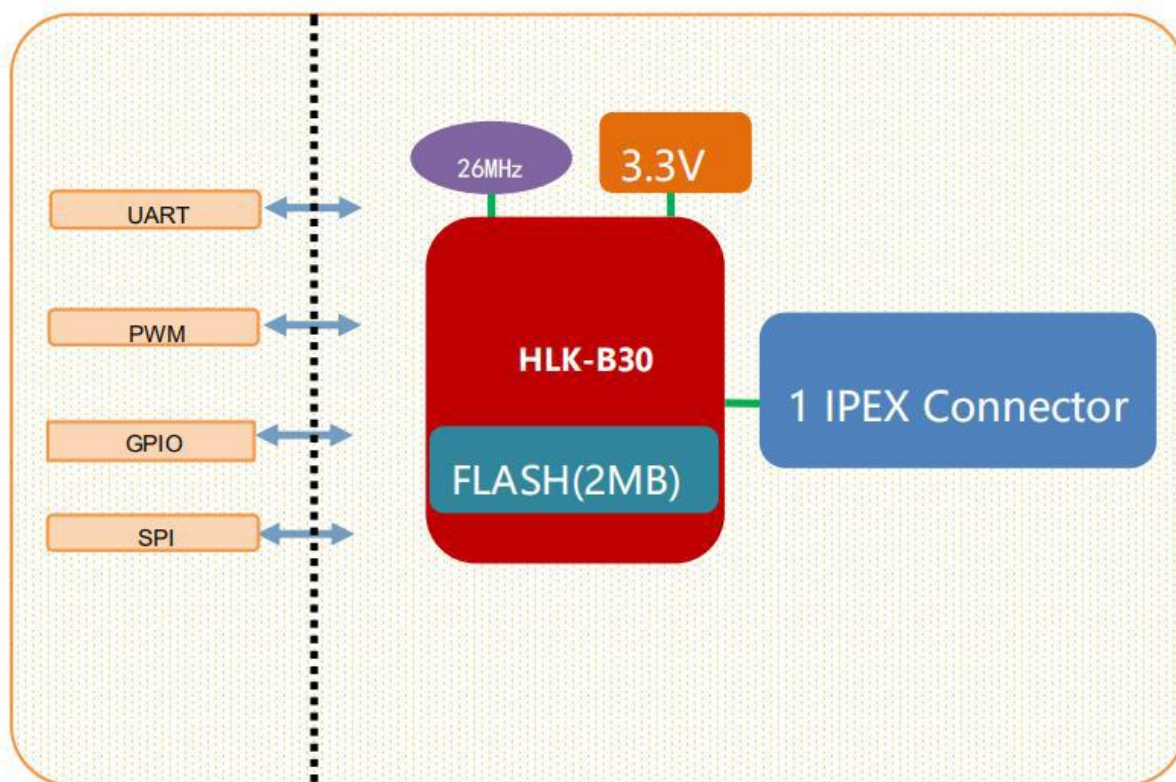


Diagram 2. HLK-B30 module architecture diagram

## 1.7 Base plate description

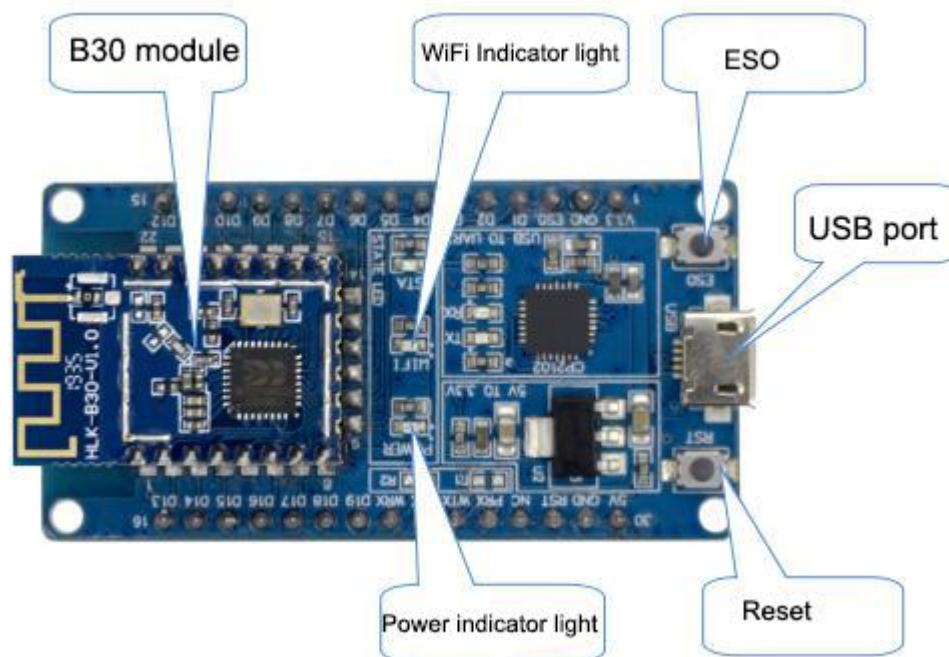


Diagram 3 Baseboard illustration

## 1.8 Power requirements

Power requirements	
Power input voltage	DC:3.3±0.3V
No-load running current	130±50mA
Supply current requirements	≥1000mA

## 1.9. WiFi Transmit power consumption

WiFi Transmit power consumption			
Mode	Rate	Transmit power	Current(ma)
11b	11Mbps	17.5dbm	280
11g	54Mbps	11dbm	150
11n	MCS7	10dbm	130



### 1.10. WiFi received power consumption

Mode	Rate	Current (ma)
11b	11Mbps	100
11g	54Mbps	100
11n	MCS7	100.5

### 1.11. WiFi power consumption in each working mode

Status	Descriptions	Average current (3v3)	Max current (3v3)	Unit
WiFi initialization	RF off, MCU full speed	45.2	46.3	ma
Keep WiFi connected	Keep connected router	101	342	ma
Udp send	After connecting to the AP, UDP packets are sent at full speed	93	363	ma
SoftAP	SoftAP networking status	100.5	193.7	ma
SmartConfig	Module distribution network status	100.8	129.5	ma

### 1.12. WiFi output power in each mode

Parameters	Minimum value	Typical value	Maximum value	Unit
RF average output power, 802.11b cck Mode 11m	-	17.5	-	dBm
RF average output power, 802.11g OFDM Mode 54m	-	15	-	dBm
RF average output power, 802.11n OFDM Mode MCS7	-	13	-	dBm
Frequency error	-10	-	10	ppm

### 1.13. WiFi receive sensitivity in each mode

Parameters	Minimum value	Typical value	Maximum value	Unit
RF average output power, 802.11b cck Mode 11m	-	-91	-	dBm
RF average output power, 802.11g OFDM Mode 54m	-	-74	-	dBm
RF average output power, 802.11n OFDM Mode MCS7	-	-70	-	dBm

## 2. Functional description

HLK-B30 supports serial port to WiFi STA, serial port to WiFi AP, and serial port to BLE mode.

### 2.1. The description of flashing WiFi indicator

The module is indicated by the flashing LED indicator in different modes, so that you can quickly and easily know the module's operating status. The module's WiFi indicator has the following states:

(1) The WiFi indicator flashes twice periodically, it indicates that the module is in One-click network configuration mode.

(2) The WiFi indicator flashes three times periodically, it indicates that the module is in sta mode, and the target AP hotspot has not been connected yet.

(3) The WiFi indicator flashes four times periodically, it indicates that the module is in 2.4g ap mode, but it cannot indicate whether there is a sta client device connected.

(4) The WiFi indicator flashes quickly, it indicates that the module is in sta mode and connected to the WiFi hotspot. When there is data transmission, the module led will flash quickly.

## 2.2. One-click network configuration mode

For the IOT WiFi module, based on cost and performance considerations, there is no touch screen interactive interface like a mobile phone. The user can see the ap list on the mobile phone and click on the password to connect to the network. What should I do? One-click configuration is that the WiFi module is in promiscuous mode (can capture all 802.11 frames in the air), the APP sends the SSID and password to the WiFi module through UDP broadcast or multicast with certain coding rules, the module parses them out, and then connects to the router. Install the Android app HLK-TCPdemo, then select the configuration network, select the airkiss mode, enter the password, click to start the configuration and start the configuration. When the network connection is successful, the module will change from dual flash to fast flash, indicating that the network is successful.



Diagram 4 One-click network configuration

When the module is configured in one-click mode, you need to set the module to one-click mode. You can use the serial configuration tool to set the module to one-click mode.

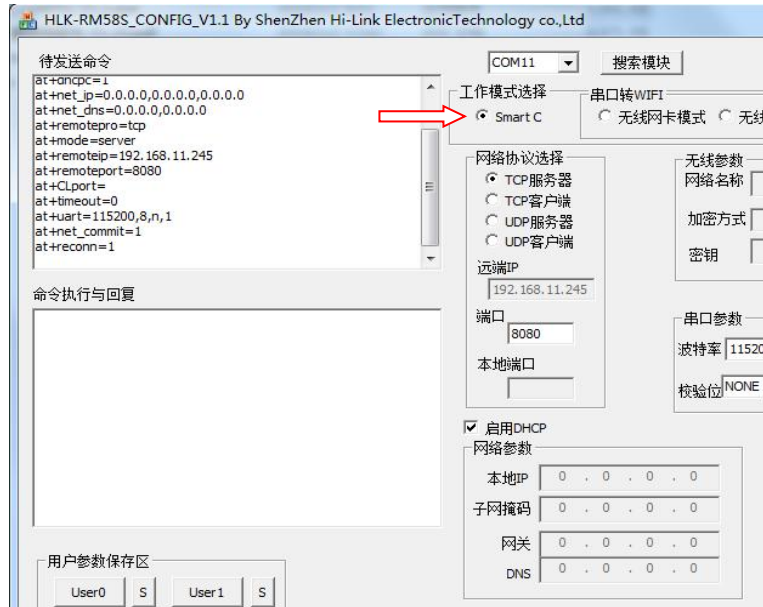


Diagram 5 Set to one-click network mode

### 2.3. Serial to WiFi STA

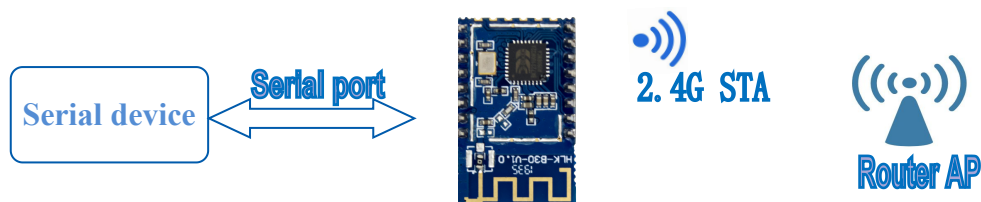


Diagram 6 Module as STA

The module converts the serial data of the device into WiFi data to achieve the purpose of device networking.

## 2.4. Serial to WiFi AP

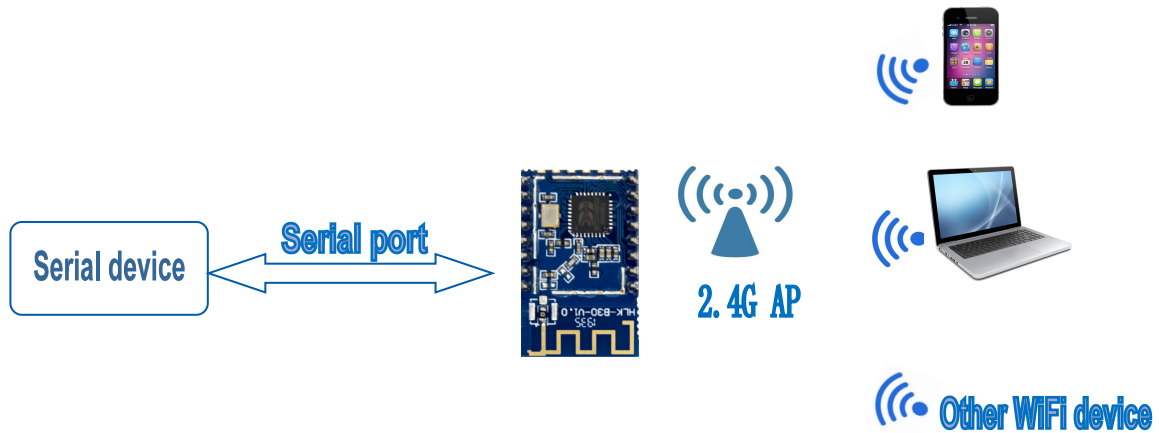


Diagram 7 Module as ap

In AP mode, mobile phones, PCs or other WiFi devices can be connected to the B30 module via WiFi, and serial devices can transmit data through the B30 module and other WiFi devices.

## 2.5. Serial working state conversion

After HLK-B30 is powered on, the default mode is transparent transmission mode. By pulling down the ES0 (PIN5) pin for more than 50ms to enter the at command mode, the module will regard the received data as an at command and send the at command to let the module enter the transparent transmission mode. After the network connected, the data received by the serial port will be transmitted as transparent transmission data.

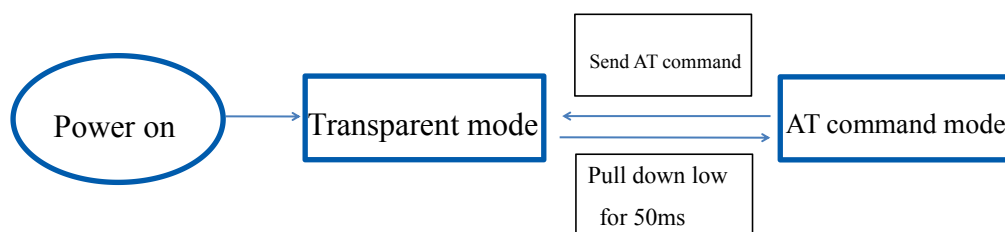


Diagram 8 Serial working mode conversion

## 2.6. Serial to Network Data Conversion

### 2.6.1. Module as TCP Server

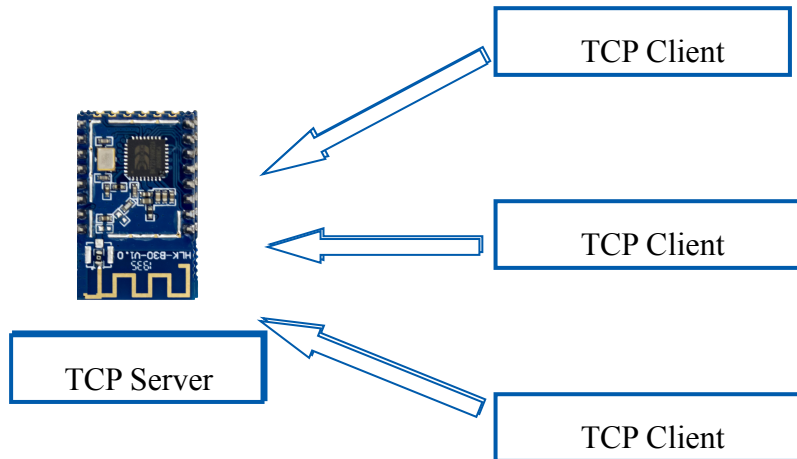


Diagram 9 TCP Server

In this mode, the module monitors the designated port and waits for the TCP Client to connect. After the connection, all TCP data are sent directly to the serial port, and the data at the serial port is sent to all TCP Clients. When the module is as TCP Server, it supports up to 5 TCP Client connected to TCP Server.

### 2.6.2. Module as TCP Client

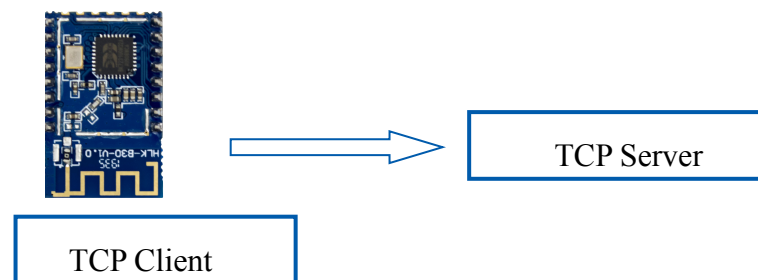


Diagram 10 TCP Client

In this mode, the module will actively connect to the specified IP and port. All data sent by the TCP Server is sent directly to the serial port, and data from the serial port is sent to the TCP Server. Abnormal network disconnection will cause the module to reconnect actively.

### 2.6.3. Module as UDP Server

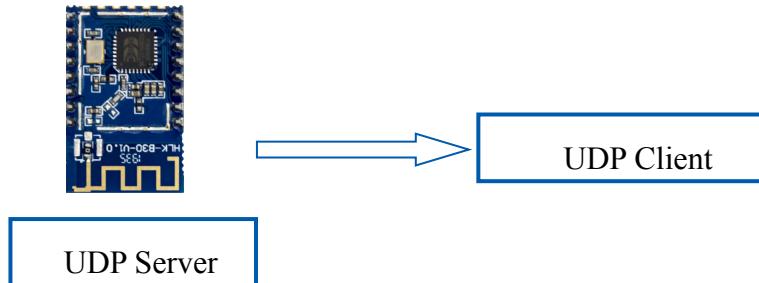


Diagram 11 UDP Server

In this mode, the module opens the local designated port. Once receiving the data sent to this port, the module will send the data to the serial port and record the remote IP and port. The module will only record the remote information on the last connection, and the data sent by the serial port will be directly sent to the recorded remote IP and port.

### 2.6.4. Module as UDP Client

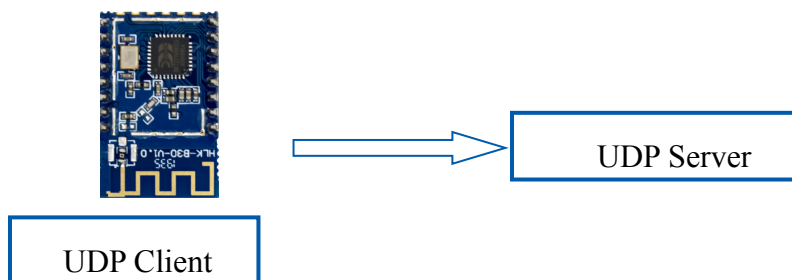


Diagram 12 UDP Client

In this mode, the module sends the serial port data directly to the specified IP and port, and the data returned from the server will be sent to the serial port.

## 2.7. Application Area

- ◆ Smart home
- ◆ Instruments
- ◆ Wi-Fi remote monitoring / control
- ◆ Toy field
- ◆ Color LED control
- ◆ Intelligent integrated management of fire protection and security
- ◆ Smart card terminals, wireless POS machines, hand-held devices, etc.

## 3. AT instruction instructions

Instruction format: In the AT instruction mode, the system can be configured through the AT instruction of the serial port.

The instruction format is as follows:

at + [command] = [value], [value], [value] .....

All commands start with "at" and end with "\ r". If the command is not encapsulated in this format, it will not be processed, and different return values will be returned according to different command of modules.

Example: "at + ver =?"

The module will return: HLK-B30 (b.1.00.120191206180224)

Query instruction format:

at + [command] =?

### 3.1. Query the current module version: at + ver

Grammar rules:

Command type	Grammar/ Syntax	Return and description
Executing command	at+ver=?	at+ver=HLK-B30(b.1.00.120191206180224): current version



### 3.2. Local port operation: at + CLport

Command type	Grammar/ Syntax	Return and description
Executing command	at+CLport=8080	at+CLport=8080 Ok Description: Set the local port to port 8080
	at+CLport=?	at+CLport=? 8080 Description: Query local port

### 3.3. Set the serial port: at + uart

Command type	Grammar/ Syntax	Return and description
Executing command	at+uart=115200,8,n,1	at+uart=115200,8,n,1 Ok Description: Set serial parameters
Query command	at+uart=?	at+uart=? 115200,8,n,1 Description: Query serial port parameters

### 3.4. Set DHCP: at + dhcpc

Command type	Grammar/ Syntax	Return and description
Executing command	at+dhcpc=1	at+dhcpc=1 ok
Query command	at+dhcpc=?	at+dhcpc=? 1 Description: 1: dhcp mode, 0: static ip

### 3.5. Set WiFi connection mode: at + netmode

Command type	Grammar/ Syntax	Return and description
Executing command	at+netmode=3	at+netmode=3 Ok Description: Set the module to ap mode
Query command	at+netmode=?	at+netmode=? 3 Description: 1: One-click distribution network 2: sta mode 3: 2.4G ap mode

### 3.6. Set TCP connection mode: at + mode

Command type	Grammar/ Syntax	Return and description
Executing command	at+mode=client	at+mode=client Ok Description: Set the module to client mode
Query command	at+mode=?	at+mode=? client Description: client: client, server: server

### 3.7. Set the remote IP when the module as client : at + remoteip

Command type	Grammar/ Syntax	Return and description
Executing command	at+remoteip=192.168.1 1.102	at+remoteip=192.168.11.102 ok Description: Set the remote IP address of the module
Query command	at+remoteip=?	at+remoteip=? 192.168.11.102 Description: Query remote IP

### 3.8. Set the remote port when the module as client: at + remoteport

Command type	Grammar/ Syntax	Return and description
Executing command	at+remoteport=1234	at+remoteport=1234 ok Description: Set the remote IP address of the module
Query command	at+remoteport=?	at+remoteport=? 1234 Description: Query remote IP

### 3.9. Set parameter submission: at + net\_commit

Command type	Grammar/ Syntax	Return and description
Executing command	at+net_commit=1	at+net_commit=1 Ok Description: Submit setting parameters

### 3.10. System restart / exit at command mode: at + reconn

Command type	Grammar/ Syntax	Return and description
Executing command	at+reconn=1	at+reconn=1 Description: Exit at command mode
Query command	at+net_commit=1 at+reconn=1	at+net_commit=1 ok at+reconn=1 ok Description: System restart

### 3.11. Set the module's ssid and password: at + WiFi\_confs

Command type	Grammar/ Syntax	Return and description
Executing command	at+WiFi_conf=HI-LINK_5FE8,none,12345678	at+WiFi_conf=HI-LINK_5FE8,none,12345678 ok Description: Set the ssid and password of the module
Query command	at+WiFi_conf=?	at+WiFi_conf=? HI-LINK_5FE8,none,12345678 Description: Query the ssid and password of the module

### 3.12. Set the socket connection protocol: at + remotepro

Command type	Grammar/ Syntax	Return and description
Executing command	at+remotepro=tcp	at+remotepro=tcp ok Description: Set the module socket protocol to tcp
Query command	at+remotepro=?	at+remotepro=? tcp Description: Query module socket connection protocol

### 3.13. Set network connection parameters: at + net\_ip

Command type	Grammar/ Syntax	Return and description
Executing command	at+net_ip=192.168.16.254,255.255.255.0,192.168.16.254	at+net_ip=192.168.16.254,255.255.255.0,192.168.16.254 ok Description: Set the module's ip, gateway, dns
Query command	at+net_ip=?	at+net_ip=? 192.168.16.254,255.255.255.0,192.168.16.254 Description: Query module's ip, gateway, dns

### 3.14. Query STA Mode Network Connection Status: at + WiFi\_ConState

Command type	Grammar/ Syntax	Return and description
Query command	at+WiFi_ConState=?	at+WiFi_ConState=? Disconnected Description: In sta mode, the module WiFi is not connected, Connected means the network is connected

### 3.15. Query module MAC address: at + Get\_MAC

Command type	Grammar/ Syntax	Return and description
Query command	at+Get_MAC=? 40:D6:3C:15:5F:E8	at+Get_MAC=? 40:D6:3C:15:5F:E8 Description: Query module mac address

### 3.16. Set the framing length: at + uartpacklen

Command type	Grammar/ Syntax	Return and description
Executing command	at+uartpacklen=64	at+uartpacklen=64 ok Description: Set the framing length of the module to 64 bytes
Query command	at+uartpacklen=?	at+uartpacklen=? 64 Description: Query the frame length of the module is 64 bytes

### 3.17. Set framing time: at + uartpacktimeout

Command type	Grammar/ Syntax	Return and description
Executing command	at+uartpacktimeout=200	at+uartpacktimeout=200 ok Description: Set the framing time of the module to 200ms
Query command	at+uartpacktimeout=?	at+uartpacktimeout=? 200 Description: Query the framing time of the module is 200ms

### 3.18. Set the Bluetooth name: at + ble\_name

Command type	Grammar/ Syntax	Return and description
Executing command	at+ble_name=aaaaa	at+ble_name=aaaaa ok Description: Set the module's Bluetooth name to aaaaa
Query command	at+ble_name=?	at+ble_name=? aaaaaa Description: Query the Bluetooth name of the module is aaaaa

## 4. AT instruction control code routine

### 4.1. Query Configuration Information

Code:

```
char * query = "\\ // define string pointer
at + netmode=? \r \n \\ // Query WiFi connection mode
at + WiFi_conf=? \r \n \\ // Query module ssid and password
at + dhcp=? \r \n \\ // Query dhcp
at + net_ip=? \r \n \\ // Query module IP
at + remoteip=? \r \n \\ // Query the remote IP
at + remoteport=? \r \n \\ // Query the port
at + remotepro=? \r \n \\ // Query socket connection protocol
at + mode=? \r \n \\ // Query TCP connection mode
at + uart=? \r \n \\ // Query serial port parameters
at + uartpacklen=? \r \n \\ // Query the frame length of the serial port
at + uartpacktimeout=? \r \n \\ // Query the frame time of the serial port
at + ver=? \r \n \\ // Query firmware version number
";
Com_send(query); // Send these data from the serial port
```

Running returns:

```
at+netmode=? 0
at+WiFi_conf=? Hi-Link,wpa2_aes,12345678
at+dhcp=? 0
at+dhcp=? 1
at+net_ip=? 192.168.15.254,255.255.254.0,192.168.11.1
at+remoteip=? 192.168.11.245
at+remoteport=? 8080
at+remotepro=? tcp
```

```
at+mode=? server
at+uart=? 115200,8,n,1
at+uartpacklen=? 64
at+uartpacktimeout=? 10
at+ver=? V1.39(Dec 6 2012)
```

## 4.2. Serial port to WiFi client (static IP address)

Code:

```
char * commands_WiFi_client_static = "\
at + netmode = 2 \r \n \ // Set to wireless network card sta mode
at + WiFi_conf = HI-LINK, wpa2_aes, 12345678 \r \n \ // Set WiFi, encryption method and
password
at + dhcpc = 0 \r \n \ // Use static IP method
at + net_ip = 192.168.11.254,255.255.255.0,192.168.11.1 \r \n \ // Set the module's IP
at + remoteip = 192.168.11.245 \r \n \ // Set the IP to be connected to the remote end
at + remoteport = 8080 \r \n \ // Set the port to be connected at the remote end
at + remotepro = tcp \r \n \ // Set the socket connection method
at + mode = client \r \n \ // Use client mode to connect to remote server
at + uart = 115200,8, n, 1 \r \n \ // Set serial port parameters
at + uartpacklen = 64 \r \n \ // Set the frame length
at + uartpacktimeout = 10 \r \n \ // Set the frame time
at + net_commit = 1 \r \n \ // Submit parameters
at + reconn = 1 \r \n \ "; // Restart the module
Com_send (commands_WiFi_client_static); // Send parameters from the serial port
```

Running returns:

```
at+netmode=2 ok
at+WiFi_conf=HI-LINK,wpa2_aes,12345
678 ok
at+dhcpc=1 ok
at+remoteip=192.168.11.245 ok
at+remoteport=8080 ok
at+remotepro=tcp
at+mode=server
at+uart=115200,8,n,1 ok
at+uartpacklen=64 ok
at+uartpacktimeout=10 ok
at+net_commit=1
```

### 4.3. Serial port to WiFi server (dynamic IP address)

Code:

```
char * commands_WiFi_ap = "\
at + netmode = 2 \r \n \// Set to wireless network card mode
at + WiFi_conf = Hi-Link_, wpa2_aes, 0000000000 \r \n \// Set the hotspot name and
password for WiFi connection
at + dhcpc = 1 \r \n \// Using the method of dynamically obtaining IP
at + remoteport = 8080 \r \n \// Set the local monitor port
at + remotepro = tcp \r \n \// Set the socket connection method
at + mode = server \r \n \// socket connects as server
at + uart = 115200,8, n, 1 \r \n \// Set serial port parameters
at + uartpacklen = 64 \r \n \// Set the frame length
at + uartpacktimeout = 10 \r \n \// Set the frame time
at + net_commit = 1 \r \n \// Submit parameters
```



```
at + reconn = 1 \r \n \"; // Restart the module
```

```
Com_send (commands_WiFi_ap);
```

Running returns:

```
at+netmode=2 ok
```

```
at+WiFi_conf=HI-LINK,wpa2_aes,12345678 ok
```

```
at+dhcpc=1
```

```
at+remoteip=192.168.11.245 ok
```

```
at+remoteport=8080 ok
```

```
at+remoteport=tcp
```

```
at+mode=server
```

```
at+uart=115200,8,n,1 ok
```

```
at+uartpacklen=64 ok
```

```
at+uartpacktimeout=10 ok
```

```
at+net_commit=1
```

#### 4.4. Restore factory settings

Code:

```
char *commands_device_default="\n
```

```
at+default=1\r\n\ // Restore factory settings
```

```
Com_send(commands_device_default);
```

Returning returns:

```
at+default=1
```

After 1s, the module starts normally, and all configuration parameters are the factory configuration.

For more functions, use the serial port with software for configuration.

The serial port on the left of the software automatically generates the corresponding setting instructions.

## 4.5. Configuration Software Instructions



Diagram 13 Serial configuration interface

- 1: Command window to be sent
- 2: Serial port number selection
- 3: Work mode selection
- 4: WiFi name and password
- 5: Network protocol selection
- 6: Serial parameters
- 7: Commit configuration
- 8: Query configuration
- 9: Enter transparent transmission mode
- 10: Factory reset
- 11: Serial port return command
- 12: Bluetooth name setting
- 13: IP settings

## 5. Firmware upgrade

The module is upgraded through the serial port. Before the upgrade, please connect according to the following figure:

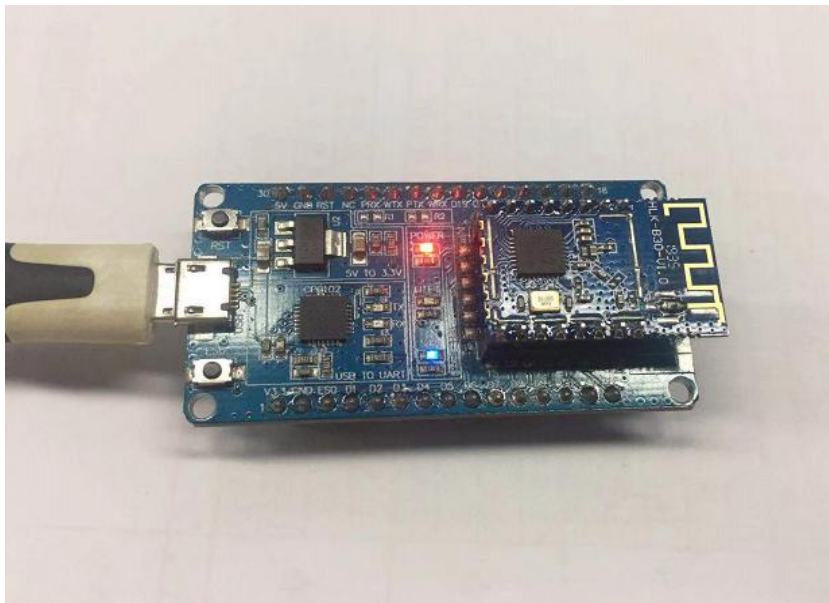


Diagram 14 Serial configuration interface

Open the upgrade software, select the corresponding serial port, set the baud rate to 115200, and complete the settings before the upgrade:

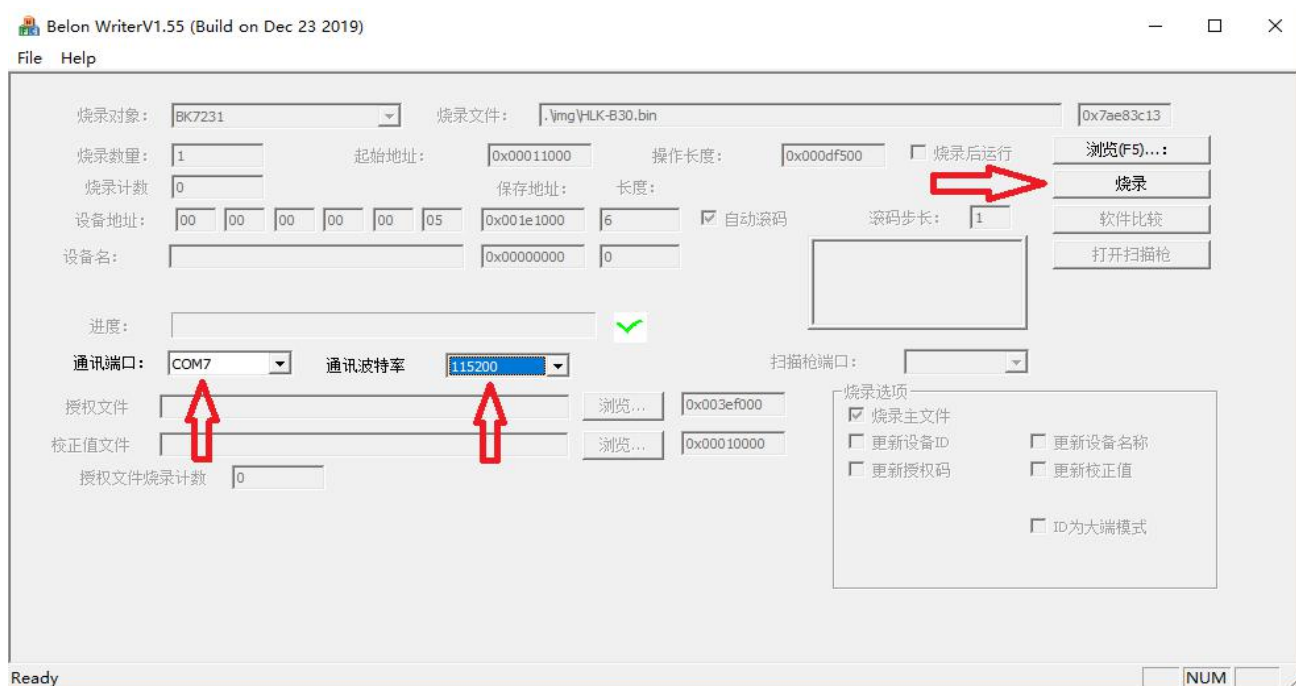


Diagram 15 Upgrade configuration

Then click the Burn button first,

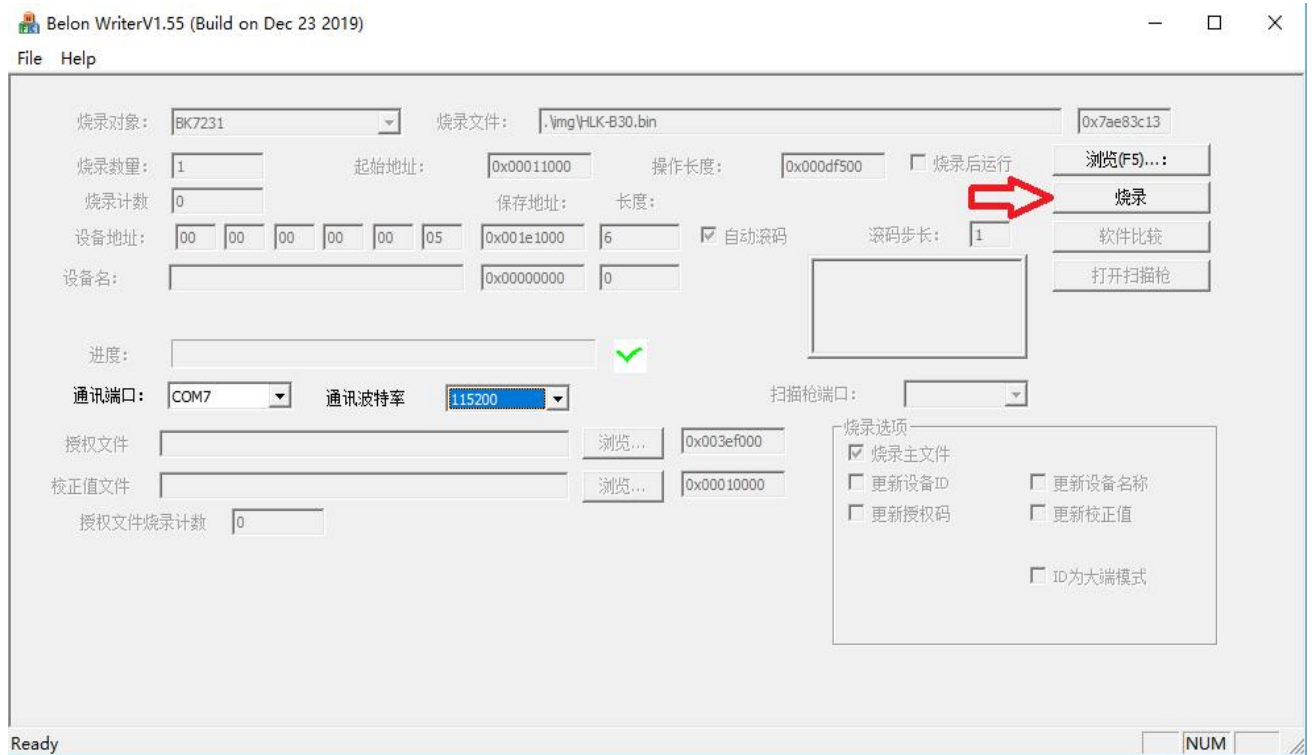


Diagram 16 1. Burn

Then short press the reset button again, and the upgrade begins.

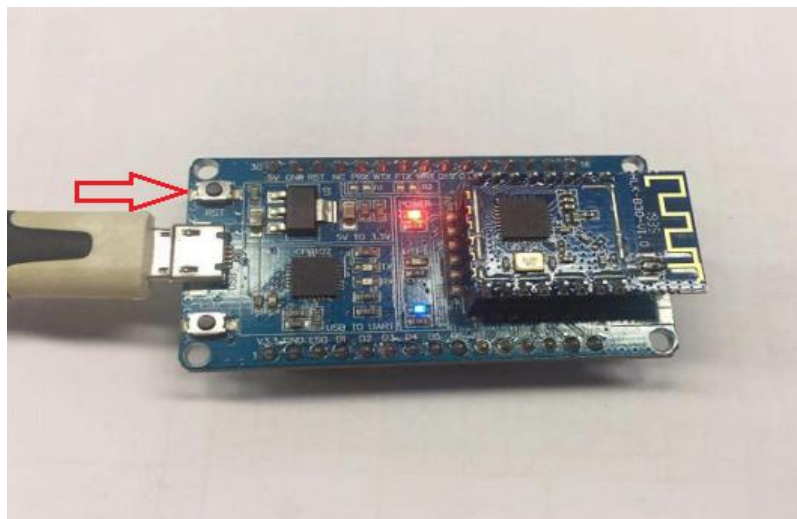


Diagram 17 2. Short press the reset button

In progress of upgrading:

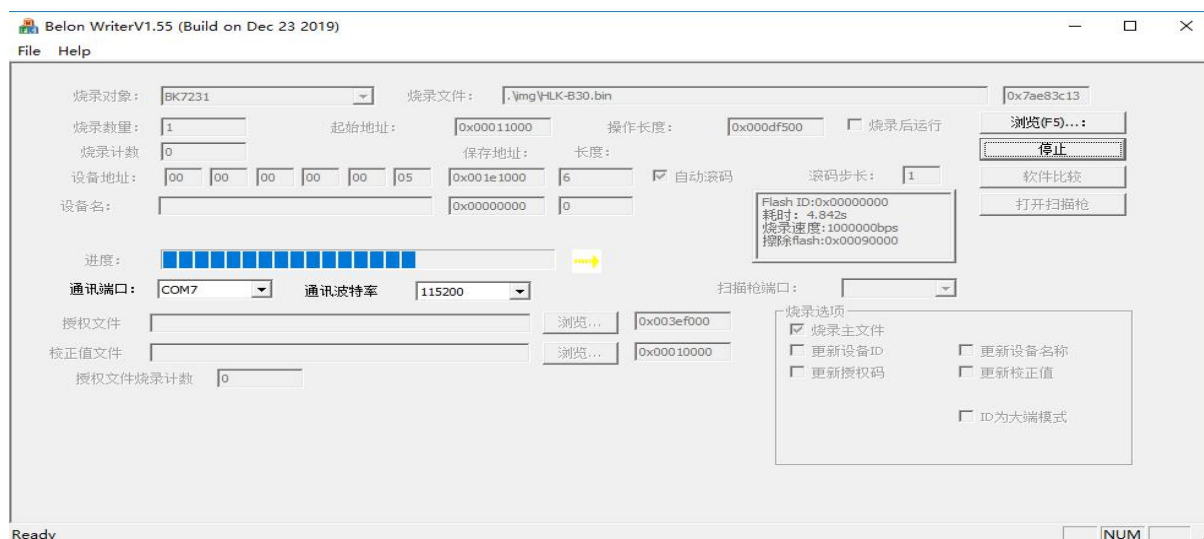


Diagram 18 Upgrading

## 6. Method of restoring factory settings

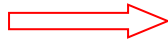
Press and hold the ES0 key on the baseboard for 6 seconds to restore the factory settings.

## 7. Bluetooth data transmission

Bluetooth data transmission is that after the Bluetooth connection is successful, the module will send the data received from Bluetooth through the serial port, and the data received by the module serial port will be sent through Bluetooth.

The module Bluetooth function only supports Bluetooth 4.2.

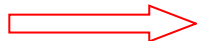
Install the Bluetooth mobile phone test software HLK-BLE.apk, turn on the mobile phone's Bluetooth function, and then open the app, and the Bluetooth name beginning with HLK-BLE\_ will be searched on the app.



设备列表	
<b>HLK-BLE_0000</b> 00:00:00:8C:47:C9 Rssi: -23 preParse: 0201060D09484C4B2D424C455F3030303 00D08484C4B2D424C455F30303030 postParse: @Len = 02, @Type = 0x01 -> 06 @Len = 0D, @Type = 0x09 -> HLK-BLE_0000 @Len = 0D, @Type = 0x08 -> HLK-BLE_0000	
<b>NULL</b> 78:AF:96:52:C7:0A Rssi: -62 preParse: 02011A020A0C0BFF4C001006131E4110C634 postParse: @Len = 02, @Type = 0x01 -> 1A @Len = 02, @Type = 0x0A -> 0C @Len = 0B, @Type = 0xFF -> 4C 00 10 06 13 1E 41 10 C6 34	
<b>NULL</b> 71:1B:CA:80:7E:FB Rssi: -66 preParse: 0201060AFF4C0010050B18BC43F7 postParse: @Len = 02, @Type = 0x01 -> 06 @Len = 0A, @Type = 0xFF -> 4C 00 10 05 0B 18 BC 43 F7	
<b>NULL</b> 21:FE:97:B7:33:EA Rssi: -71 preParse: 1EFF060001092002C7DEFED0CD57A9A0C 0D62F5392A4A943E48F54AB226AB4 postParse: @Len = 1E, @Type = 0xFF -> 06 00 01 09 20 02 C7 DE FE D0 CD 57 A9 A0 C0 D6 2F 53 92 A4 A9 43 E4 8F 54 AB 22 6A B4	

Diagram 19 Bluetooth search list

Then select the last item



00:00:00:8C:47:C9	
Service: FCE3EC41-59B6-4873-AE36-FAB25BD59ADC	
Characteristic: 7E9869ED-4DB3-4520-88EA-1C21EF1BA834	
Service: 00001800-0000-1000-8000-00805F9B34FB	
Characteristic: 00002A00-0000-1000-8000-00805F9B34FB	
Characteristic: 00002A01-0000-1000-8000-00805F9B34FB	
Service: 00001801-0000-1000-8000-00805F9B34FB	
Service: 0000FE28-0000-1000-8000-00805F9B34FB	
Characteristic: 00000002-FE28-435B-991A-F1B21BB9BCD0	
Characteristic: 00000003-FE28-435B-991A-F1B21BB9BCD0	
Characteristic: 00000001-FE28-435B-991A-F1B21BB9BCD0	
Characteristic: 00000004-FE28-435B-991A-F1B21BB9BCD0	
Characteristic: 00000005-FE28-435B-991A-F1B21BB9BCD0	
Service: 0000FFF0-0000-1000-8000-00805F9B34FB	
Characteristic: 0000FF1-0000-1000-8000-00805F9B34FB	
Characteristic: 0000FF2-0000-1000-8000-00805F9B34FB	
Service: 1CF0FE66-3ECF-4D6E-A9FC-E287AB124B96	
Characteristic: 1F80AF6E-2B71-4E35-94E5-00F854D8F16F	

Diagram 20 Bluetooth attribute list

Then enter the data to be sent in the send box, and then click Send. The data will be received on the serial port and the data sent by the serial port will be received on the app.



Diagram 21 Bluetooth transmission test

## 8. Bluetooth distribution network

Bluetooth network configuration is to connect the Bluetooth, send the WiFi name and password to the module, and then the module connects to the router according to the received WiFi name and password.

In sta and ap mode, Bluetooth is turned on, and you can connect the module through the mobile phone's Bluetooth.

After connecting the module's Bluetooth, click the configure networking button on the app to enter the network configuration interface.



Diagram 22 Bluetooth distribution network interface

First enter the WiFi name and password, and then click the "Start Configuration" button. The phone will send the hotspot name and password to the module via Bluetooth. After receiving, the module will save and then restart it, and connect to the WiFi according to the hotspot name and password sent by the mobile phone.



## 9. Appendix A Document Revision Record

Version number	Scope of revision	Date
V1.00	First edition	2019-6-27
V1.01	First edition Modify the description of the serial port upgrade tool	2019-12-27