# Bluetooth gateway

# PRODUCT SPECIFICATION


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# 目录

# 1. Product introduction

The Bluetooth gateway is used to monitor the wireless signal of the BLE Bluetooth device to monitor and manage the BLE Bluetooth device. Any BLE Bluetooth device data can be monitored, iBeacon and Eddystone in a beacon or custom tag format can be read and sent to a local TCP server or Internet HTTP / MQTT server. The Bluetooth gateway itself does not have data parsing function, the gateway can only obtain the broadcast of the BLE Bluetooth device and then upload the data to the server. The Bluetooth gateway can obtain data of iBeacon including MAC address, UUID, major, minor, RSSI and other data.

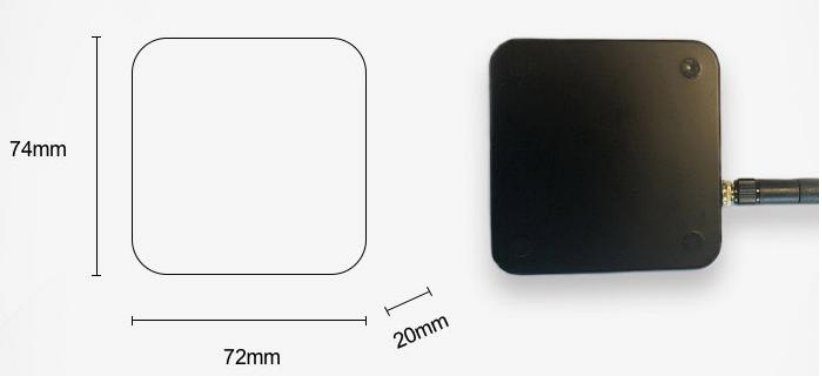
# 2. Features

- ✧ URF52832 Bluetooth chip, ultra-high Bluetooth receiving sensitivity for wide-range monitoring
- ✧ Cortex-M4 microcontroller core, ultra high speed processing speed
- ✧ Support MQDT, HTTP and websocket three data upload methods
- ✧ Scan a variety of medium BLE data types (Connectable undirected advertisement, Connectable directed advertisement, Scannable undirected advertisement, Non-Connectable undirected advertisement and Scan Response
- ✧ Filterable by RSSI
- ✧ Built-in watchdog to ensure product stability
- ✧ Support software upgrade

## 3. Applications

- ✧ Indoor Positioning
- ✧ Parking management
- ✧ Temperature and humidity monitoring
- ✧ Light detection
- ✧ asset Management
- ✧ Remote monitoring
- ✧ Personnel management
- ✧ automated industry

## 4. Product parameters




| Item | | Description |
|---|---|---|
| name | | Bluetooth gateway |
| Bluetooth | chip | NRF52832 |
| | Operating Voltage | 1.8 - 3.6v |
| | working frequency | 2402 - 2480MHz |
| | Receiving current | 5.4mA |
| | Sleep current | 0.3uA |
| | Receiving sensitivity | -97dBm |
| | Antenna | PCBantenna |
| | Scanning distance | >=50m |
| WIFI | chip | ESP32 |
| | protocol | support 802.11 b / g / n / e / i |
| | Frequency band | 2.4GHz |
| | Transmit power | @ 802.11dB + 20dBm<br>@ 802.11n + 14dBm |
| | Speed rate | 150Mbps |
| | Antenna | PCBantenna |

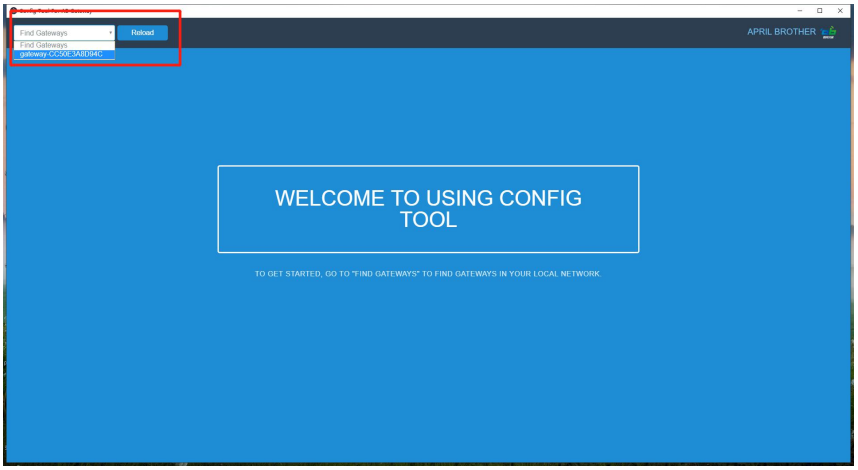
| | | |
|---|---|---|
| | distance | In the open space 100M range |
| Ethernet | Operating mode | Full-duplex 10-BASE-T 100BASE-TX transceiver supporting 10Mbps (10BASE-T) and 100Mbps (100BASE-TX) operation. |
| | POE | 15W Power over Ethernet is compliant with the IEEE 802.3 a af specification |
| Power supply mode | | 5V/2A Micro usb/POE |
| Protocol | | MQTT、HTTP、Websocket |
| Size | | 72mmx74mmx20mm |
| Operating temperature | | -20℃ ~ 60℃ |

## 5. Configuring the gateway

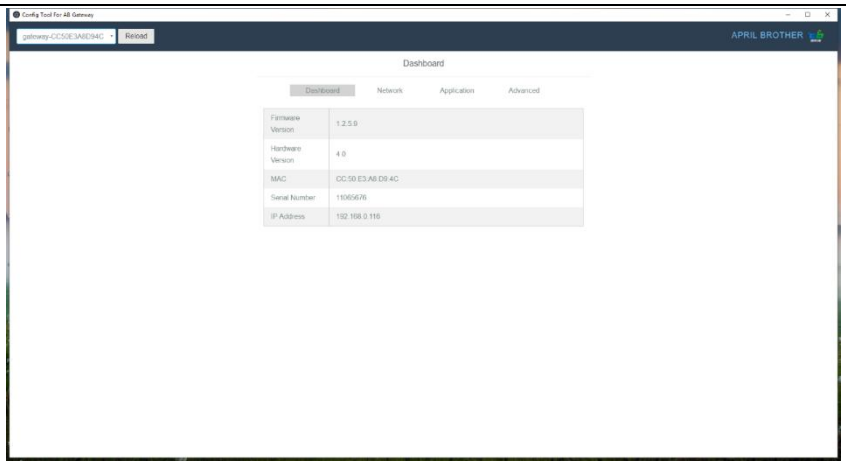
a) Prepare a 5V/2A power adapter, pay attention to the power must be enough.

b) Connect the gateway to the router with a network cable. Please use the black micro usb cable we sent to the power supply cable. Connect the power cable to the power adapter. Do not connect the USB cable directly to the computer. Power supply will not be enough. If the yellow light of the network port is on, the network is connected.

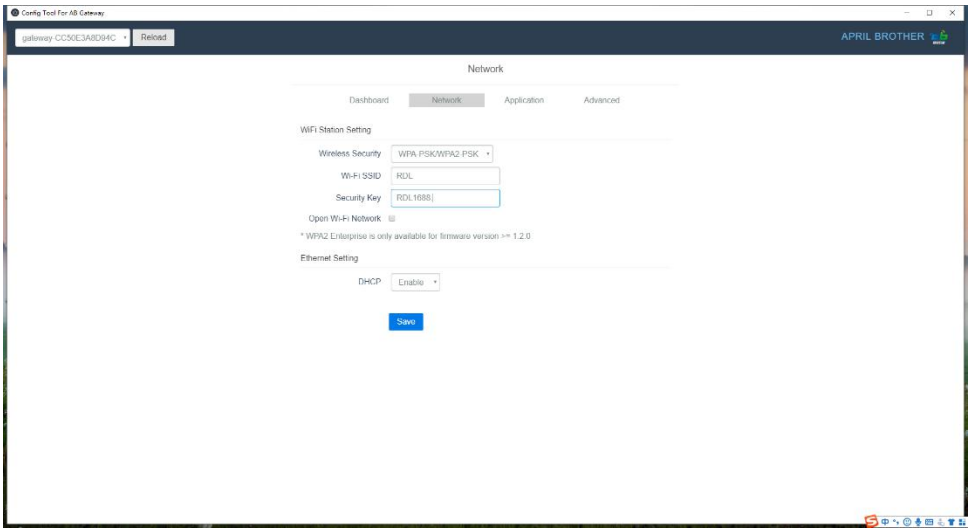
c) Install the configuration tool on the same router and open it. It must be the computer under the same router, otherwise the search tool will not search. Click Reload to search for the gateway, then select the gateway with the same mac address as the gateway shell.



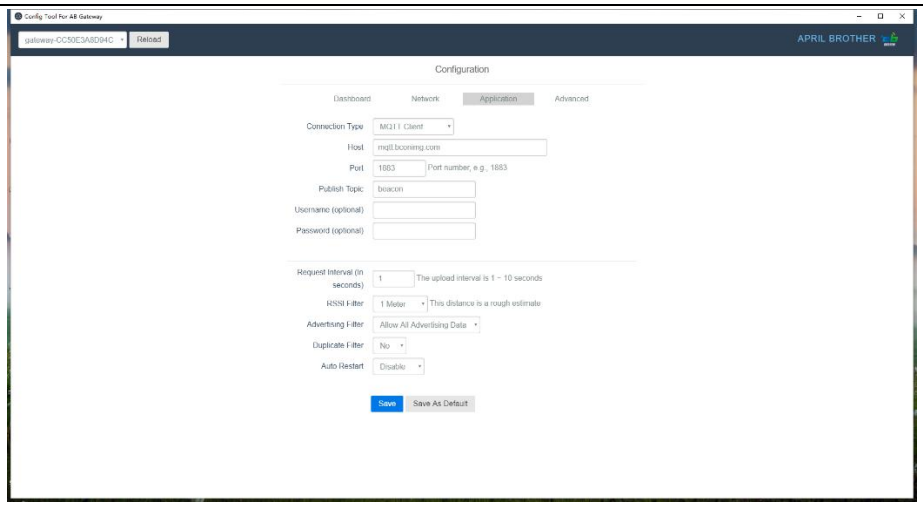

d) After entering the configuration tool, some information about the gateway is displayed, including the Fimware Version, Hardware Version, MAC address, production number and IP address.



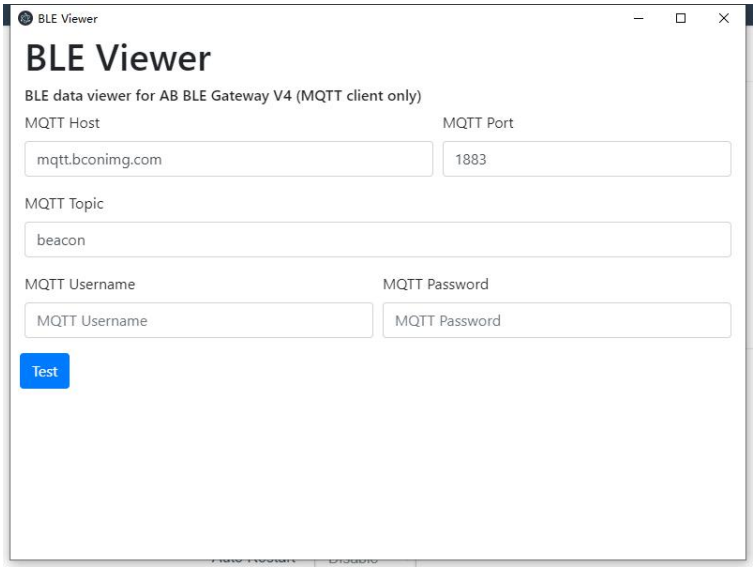

e) In the Network section, you can configure the gateway to connect to WIFI. After the WIFI connection is successful, the Ethernet disconnect configuration tool can also be connected to the network. The device only supports 2.4G wireless network. Please check if the router is a 5G network. In addition, the SSIDs of 2.4G and 5G cannot be the same, because in this case, it is difficult for the device to connect to the WiFi network.



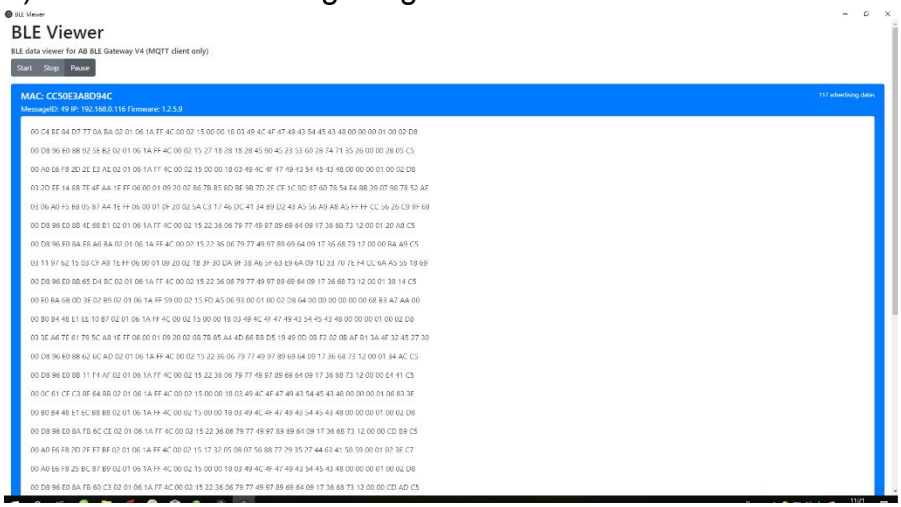

f) Open the Application in the configuration tool, where you can configure the IP address of the gateway data upload protocol and data upload. Select the data upload protocol in connection type, support Websocket, HTTP and MQTT. If you are testing the gateway, you can choose the MQTT mode. Others select the default option and click Save to save the configuration. The gateway starts scanning data and uploading data.




g) Open the data viewer tool data viewer software (only supports 64-bit Windows, 32-bit system cannot be used). Just fill in the beacon in the MQTT Topic fill, other options default and then click TEST to get the data.




h) Click Start to start getting data。



## 6. Data format analysis

The gateway submits data in MessagePack format. MessagePack is an efficient binary serialization format. It allows you to exchange data between languages like JSON. But it's faster and smaller than JSON. This format is small and fast, supporting more than 50 programming languages and environments.

The data after unpacking is a dictionary containing the following key values:

v - firmware version

Mid - message ID

Time - the length of the start, in seconds

Ip - gateway IP

Mac - gateway mac address

Devices - an array of BLE broadcast packets that are collected by the gateway

The devices array contains the original content of the BLE broadcast. Below is an example of a data frame.

```
00 C4 BE 84 D7 77 0A BA 02 01 06 1A FF 4C 00 02 15 00 00 18 03 49 4C 4F 47 49 43 54 45 43 48 00 00 00 01 00 02 D8
```

Data format description:

| Byte | description | Example |
|---|---|---|
| Byte1 | advertising type, see the table below | 00 |
| Byte2 - 7 | mac address for BLE device | C4BE84D7770A |
| Byte8 | RSSI, minus 256 for real value | BA：rssi=0xBA-256=-68 |
| Byte9-end | Advertisement data | 0201061AFF4C000215000018034 94C4F47 49435445434800000010002D8 |

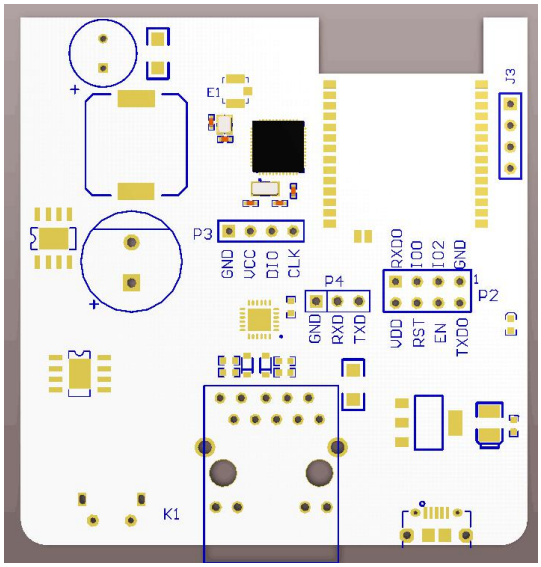
Data type description：

| | |
|---|---|
| 0 | Connectable undirected advertisement |
| 1 | Connectable directed advertisement |
| 2 | Scannable undirected advertisement |
| 3 | Non-Connectable undirected advertisement |

| | |
|---|---|
| 4 | Scan Response |

## 7. PCB layout

layout :




Pin Description:

| Pin | Description |
|---|---|
| J3 | ESP32 module I2C port |
| P2 | Programming pin of ESP32 module |
| P3 | Programming pin of NRF52832 module |
| P4 | Uart of NRF52832 module |

J3：VCC GND GPIO07 GPIO06

## 8. Common problems

Q: How to upgrade the firmware of the gateway?

A: You need to install our configuration tool to upgrade the firmware.

Open the configuration tool

Select the device to upgrade from the drop-down menu in the top left corner

Click "Advance" -> "Update" to start upgrading firmware.

Wait until the upgrade is complete

Q: Does the gateway support static IP?

A: Yes. Gateway 4 uses DHCP-assigned IP by default. You can still set a static IP for it through the configuration tool.

Q: How do I reset the gateway?

A: There is a small hole on the left side of the network port. Use a small needle to push in and hold it, then connect the power to the gateway, so that the reset can be completed.

Q: Is the gateway able to connect directly to WiFi without using a network cable?

A: Yes. If there is no Ethernet connection available, then it will use WiFi

Q: Why can't WiFi connect?

A: The device only supports 2.4G wireless network. Please check if the router is a 5G network. In addition, the SSIDs of 2.4G and 5G cannot be the same, because in this case, it is difficult for the device to connect to the WiFi network.