HCBG01

Bluetooth Gateway

User Guide

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1.Preparation

Welcome to use the Bluetooth gateway, Before proceeding to the next step, please prepare the following devices:

1. One Computer (with WiFi and Ethernet ports);
2. One Bluetooth gateway;
3. One Bluetooth gateway power adapter;
4. One wireless router.

2.Network Configuration

In order to come more families with the characteristics of Bluetooth gateway, it is recommended to follow the order of chapters 2.1, 2.2, and 2.3.

2.1 Directly Connect

Connect the computer directly to the Bluetooth gateway, quickly familiarize yourself with the Bluetooth gateway.The computer is connected to the Bluetooth gateway through WiFi, and the Bluetooth gateway can be configured through the computer, The computer can also act as a server to observe gateway data.

Step:

(1)Power the Bluetooth gateway through the power adapter, and the power indicator lightis on. When the WiFiindicator light flashes, the Bluetooth gateway'sWiFican be connected through the computer, with SSIDGW_*******, The connection password is:66668888;

(2)After successful connection, enter 10.10.10.254 in the web browser to enter the gateway configuration interface, and the login password is: admin;

(3) The Bluetooth gateway will assign an IPaddress to the computer. Please check the IPaddressobtained by the computer Wireless network interface controller, such as10.10.10. * * *;

(4) Configure the target server address of the gateway in the gateway configuration interface as10.10.10.***(default is10.10.10.100), and the port defaults to7628(if7628port is already occupied, please modify it to another port such as7629).

(5) The default configuration of the gateway isUDPprotocol, with Bytearray data format.

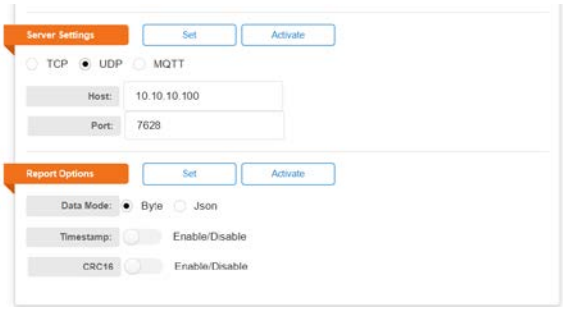
(6) Users can use networkdebug assistantssuch asNet Assist, to listen to Bluetooth gateway data. The Net Assisttool is configured as:

Protocol type:UDP

Local host address:10.10.10. * * *(needs to be consistent with the gateway)

Local host port:7628(needs to be consistent with the gateway)

SelectHEXin the receiving and sending settings



(7) After successful configuration,Net Assistwill receive data from the gateway.Can be parsed based on Bluetooth gateway data protocol;

(8)IfTCP is required, modify the gateway target server protocol toTCP, fill in the correspondingIPand port number, and configure the Net Assisttool as follows:

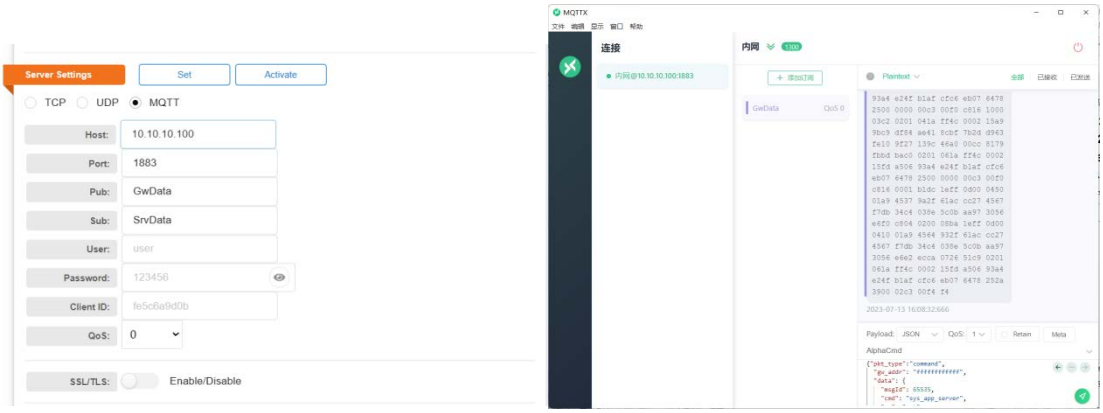
Protocol type:TCP Server

Local host address:10.10.10. * * *(needs to be consistent with the gateway)

Local host port:7628(needs to be consistent with the gateway)

SelectHEXin the receiving and sending settings,as shownin the following figure:

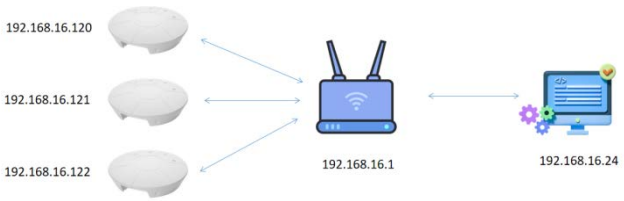
(9) If you need to useMQTT, build your ownMQTTserver and fill in the correspondingMQTTnode address and related subscription topics, as shown in the following figure:



2.2 Local area networks

Bluetooth gatewayand computer are connected to a router.

The Bluetooth gateway is connected to the router through a network cable, and the computer is also connected to the same router. The computer acts as a server to obtain gateway data.

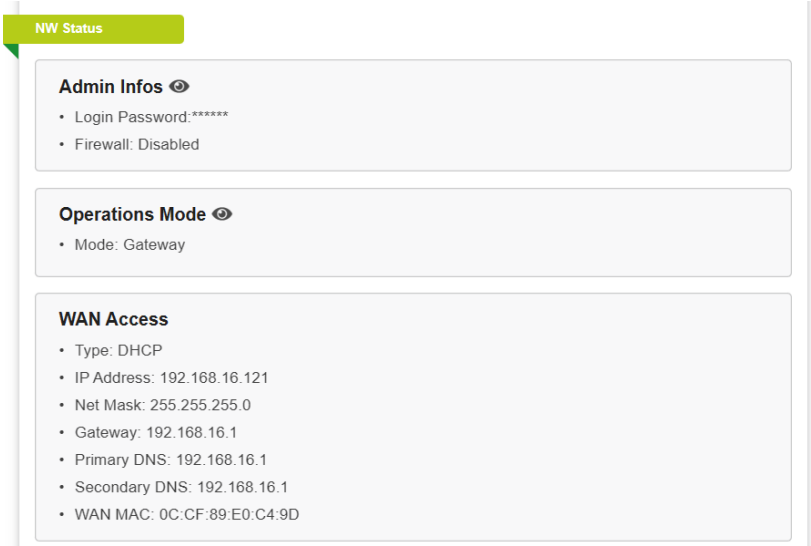


Step:

(1) Power the Bluetooth gateway through the power adapter, and the power indicator lightis on. When the WiFiindicator light flashes, the Bluetooth gateway'sWiFican be connected through the computer, with SSIDGW_*******, The connection password is:66668888;

(2) After successful connection, enter10.10.10.254in the web browser to enter the gateway configuration interface, and the login password is:admin;

(3) Configure a Bluetooth gateway to connect to the router through wired or wireless means (please refer to the relevant content on gateway configuration in this document).After successful connection, the router assignsIPaddressesto the gateway, such as192.168.16.120,192.168.16.121, and192.168.16.122. As shown in the following figure:



Connect the computer to the router through a network cable.Assuming that the IPaddressassigned by the router to the wired network card of the computeris192.168.16.24, the computer, router, and gateway form a local area network.

(4) Enter the Bluetooth gateway configuration interface again and set the target server address of the Bluetooth gateway to the IPaddress obtained by the computer from the router:192.168.16.24. The default port is7628(if the 7628port is already occupied, please modify it to another port such as7629).

(5) The default configuration of the gateway isUDPprotocol, with Bytearray data format.

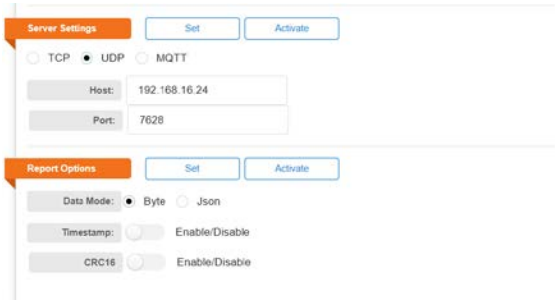
(6) Users canlisten to Bluetooth gateway datathrough network tools such asNet Assist, which is configured as:

Protocol type:UDP

Local host address:192.168.16.24(needs to be consistent with the gateway)

Local host port:7628(needs to be consistent with the gateway)

SelectHEXin the receiving and sending settings



(7) After successful configuration,Net Assistwill receive data from the gateway.Can be parsed based on Bluetooth gateway data protocol;

(8) IfTCP is required, modify the gateway target server protocol toTCP, fill in the correspondingIPand port number, and configure the Net Assistassistant tool as follows:

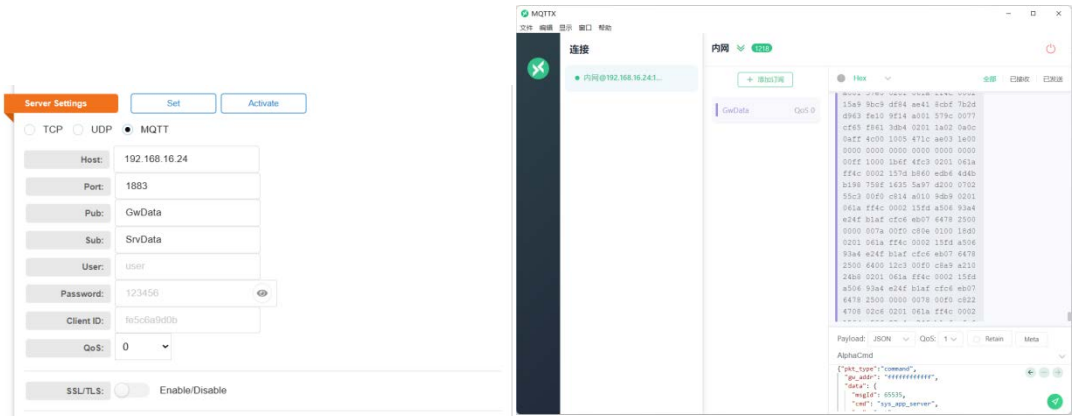
Protocol type:TCP Server

Local host address:192.168.16.24(needs to be consistent with the gateway)

Local host port:7628(needs to be consistent with the gateway)

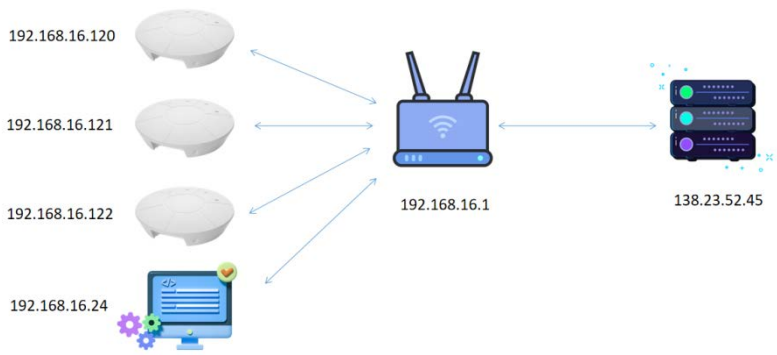
SelectHEXin the receive and send settings,as shownin the following figure:

(9) If you need to useMQTT, build your ownMQTTserver and fill in the correspondingMQTTnode address and related subscription topics, as shown in the following figure:



2.3 Wide Area Network

The Bluetooth gateway connects to the external network through a router, and users can obtain gateway data from the server. This application scenario requires routers to be able to connect to external networks.



Step:

(1) Power the Bluetooth gateway through the power adapter, and the power indicator lightis on. When the

WiFiindicator light flashes, the Bluetooth gateway'sWiFican be connected through the computer, with SSIDGW_*******, The connection password is:66668888;

(2) After successful connection, enter10.10.10.254in the web browser to enter the gateway configuration interface, and the login password is:admin;

(3) Configure a Bluetooth gateway to connect to the router through wired or wireless means (please refer to the relevant content on gateway configuration in this document).After successful connection, the router assignsIPaddressesto the gateway, such as192.168.16.120,192.168.16.121,192.168.16.122;

(4) Assuming the existing cloud serverIPis138.23.52.45(please refer to the relevant content on gateway configuration in this document for details).Enter the Bluetooth gateway configuration interface again and set the target server address of the Bluetooth gateway to the cloud serverIPaddress:138.23.52.45. The default port is7628(if the 7628port is already occupied, please modify it to another port such as7629).

(5) The default configuration of the gateway isUDPprotocol, with Bytearray data format.

(6) Users canlisten to Bluetooth gateway dataon the server through network tools such asNet Assist

(7) After successful configuration,Net Assistwill receive data from the gateway.Can be parsed based on Bluetooth gateway data protocol;

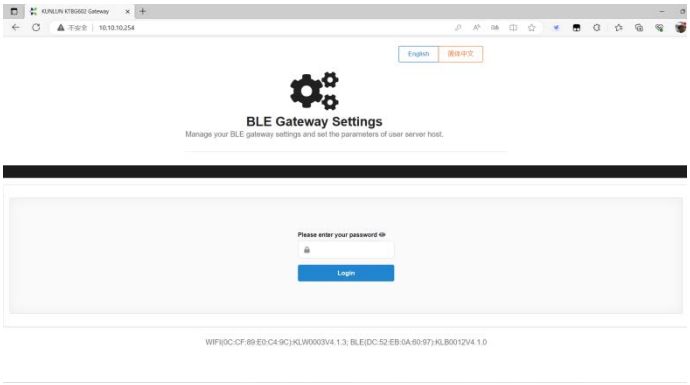
(8) IfTCPorMQTT is required,corresponding modificationscan be madeon the gateway andNet Assistsides.

3.Gateway Configuration

3.1 Login Gateway

3.1.1 It is recommended to use Google Chrome to open the page:http://10.10.10.254 ;

3.1.2Enter the default password: "admin″.



3.2 Gateway Home Page

3.2.1 The title corresponds to each gateway operation.

3.2.2 Web Administration: Review and administration password of webpage

- Network Configuration: Quickly configure about popular parameters of network
- BLE Configurations: Set filter conditions ans scan parameters from here
- Running Status: Here to show you what status the gateway is running on
- System Operations: Reload default configurations for the Gateway if necessary
- Upgrade GW: Update the new firmware for fixing your issues

3.3 Using wired networks

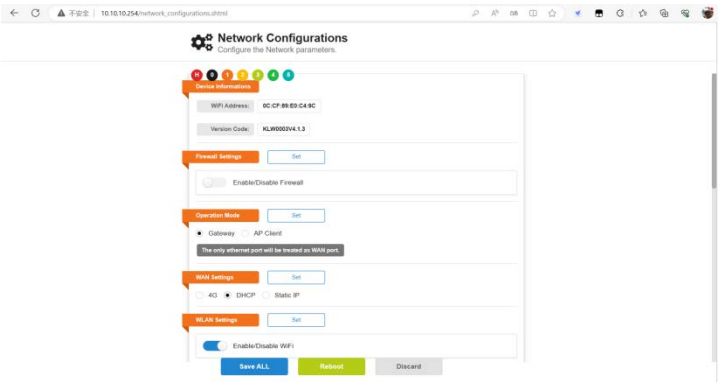
3.3.1Open the gateway network configuration;

3.3.1SelectGatewaymode;

3.3.3Choose dynamicDHCPor staticIPas needed;

3.3.4Bluetooth gateway connects to the routerLANportthrough a network cable;

3.3.5Click "Save All″andthen click "Reboot″to restart and take effect.



3.4 Using Wireless Networks

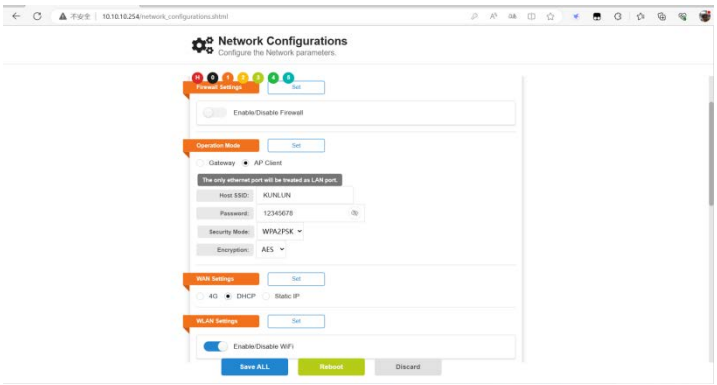
3.4.1When the Bluetooth gateway usesWiFi to connect to the WiFirouter, the network port of the Bluetooth gateway should not be connected to a network cable.

3.4.2Open the gateway network configuration;

3.4.3Select the AP/Clientmode and fill in the SSID, password,Security Mode, and Encryptionof the connectedWiFirouter;

3.4.4Choose dynamicDHCPor staticIPas needed;

3.4.5Click "Save All″and then click "Reboot″to restart and take effect.

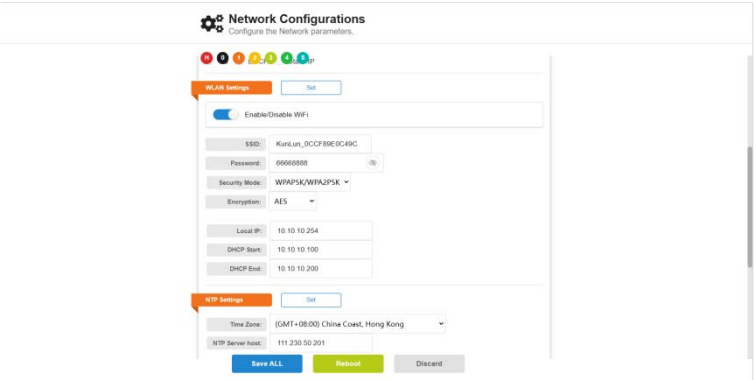


3.5 Modifying Gateway Hotspots

3.5.1Turn on or off the WiFiof the Bluetooth gateway itself;

3.5.2Modify the SSIDand passwordofWiFi;

3.5.3Click "Save All" and then click "Reboot" to restart and take effect.

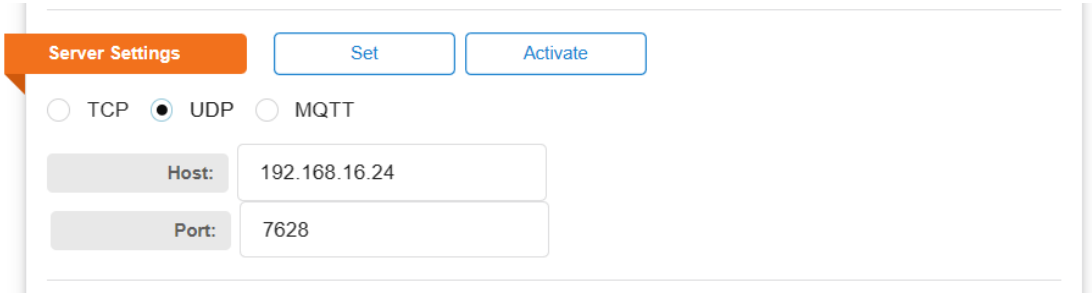


3.6 Setting the Target Server

3.6.1Select the server protocol type;

3.6.2Fill in the corresponding parameters;

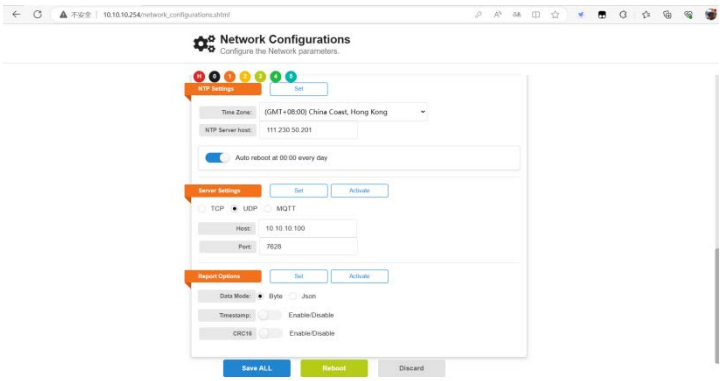
3.6.3After clicking the "SET" button, click "Activate" to take effect.



3.7 Setting Data Format

3.7.1ChooseBytearray orJsonstring format;

3.7.2There are corresponding document protocols for different formats. Please refer to the specific protocol documents provided by the manufacturer.



3.8 Setting Data Content

3.8.1 Type 1:Only scan and report surrounding Bluetooth broadcast packets;

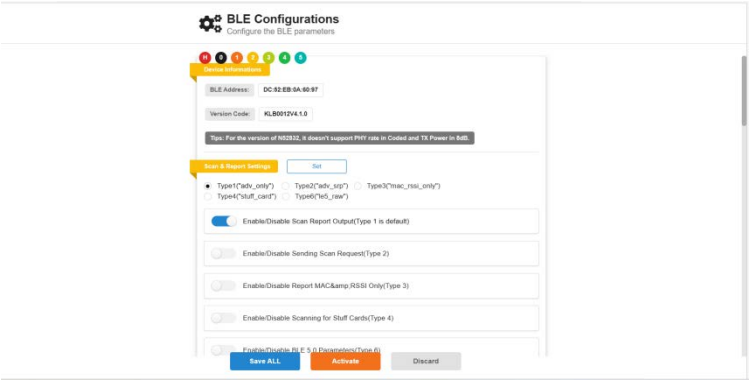
3.8.2 Type 2:Add a scanning report response package and report it togetherwith Type1;

3.8.3 Type 3:Only scan and report deviceMACandRSSIvalues;

3.8.4 Type 4:Only scan and report specific Bluetooth work card devices;

3.8.5 Type 5:scan and reportBLEdevices;

3.8.6Click on "Save All″and then click on "Activate" to take effect.



3.9 Setting Scan Parameters

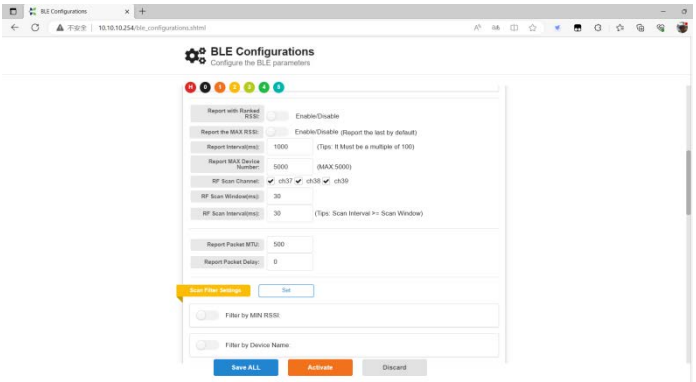
3.9.1Reporting cycle interval, default to once every 1second;Indicates the centralized reporting of devices scanned within one second;

3.9.2Maximum cache, default maximum value of 5000, with a maximum cache of 5000devicesin one cycle;

3.9.3Scanning channel: default to fully open37/38/39channels, full scan;

3.9.4Scan interval/scan window: default30ms.Indicatesscanning once every30ms, with each scan lasting for 30ms and scanning continuously.If it is100/50ms,it meansscanning once every100ms, lasting50mseach time, and not scanning for the remaining50ms.

3.9.5Number of devices per packet: default to 500. If1000devices are scanned within one second, the data packet will be sent in two batches of 500each.



3.10 Setting Scan Filtering

3.10.1Support multiple sets of UUIDfiltering;

3.10.2Support signal strength filtering;

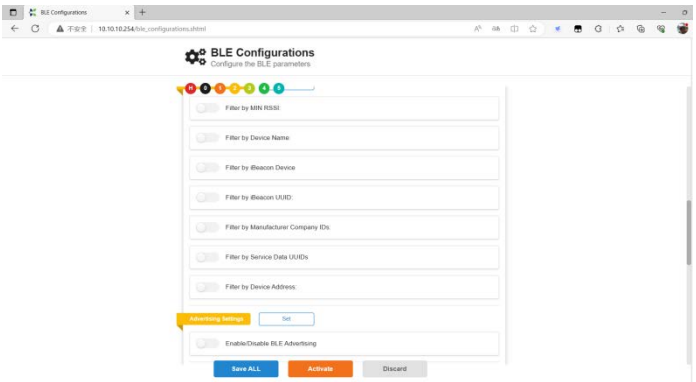
3.10.3Support filtering of multiple sets of device names;

3.10.4SupportiBeacontype filtering;

3.10.5Supportfiltering of multiple sets of Company IDs;

3.10.6Support multi group serviceUUIDfiltering;

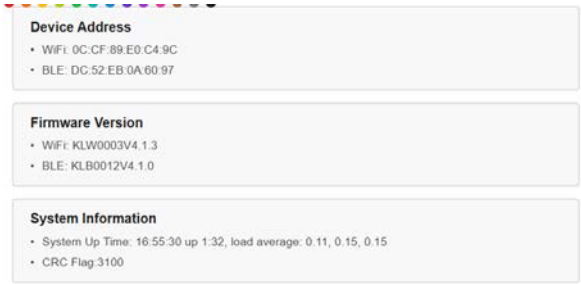
3.10.7SupportMACaddress range filtering.



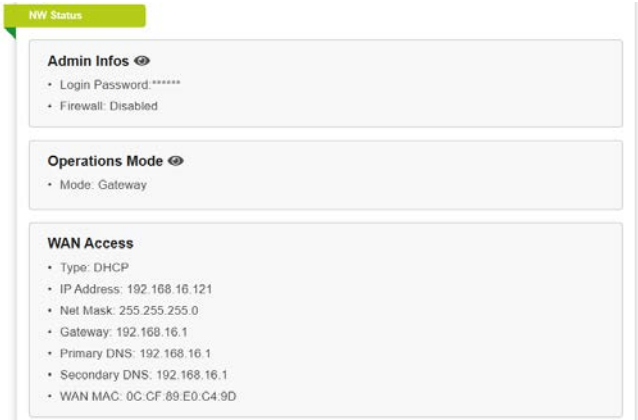
3.11 Gateway Status

3.11.1In the running status interface, you can see all the status of the gateway;

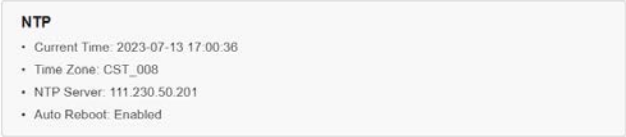
3.11.2Gateway firmware version andMACinformation



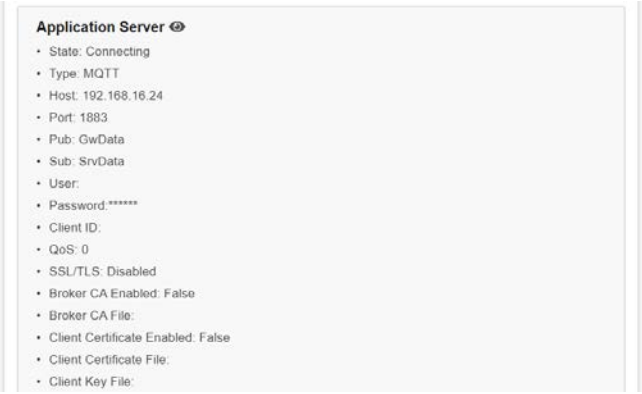
3.11.3Distribution Network Status



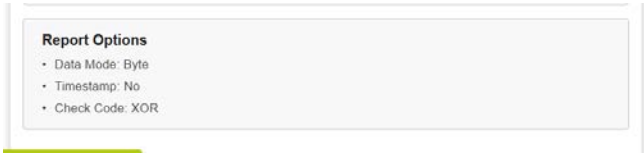
3.11.4Gateway Time Synchronization Status



3.11.5Target Server Connection Status



3.11.6Gateway Data Format



3.11.7Gateway Scan Parameters and Report Data Types

Scan & Report

- Packet State: Type 1("adv_only")
- Report Output: Yes
- Report Interval: 1000ms
- Report MAX RSSI: No
- MAX Device Number: 5000
- Rank RSSI: No
- MAC & RSSI Only: No
- Scan Request: No
- Scanning for Stuff Cards: No
- RF Scan Channel: 37,38,39
- RF Scan Window: 30ms
- RF Scan Interval: 30ms
- Report Packet MTU: 500
- Report Packet Delay: 0ms
- Scanning with BLE5.0:No
- Primary PHYs Scan Timing:1M:0S,Coded:0S

3.11.8Gateway Scan Filter Parameters

Scan Filters

- by MIN RSSI: No
- MIN RSSI: -127
- by Device Name: No
- Device Name List:
- by iBeacon Device: No
- by iBeacon UUID: No
- iBeacon UUID Value:
- by Company ID: No
- Company ID List:
- by Service UUID: No
- Service UUID List:
- by Device Address: No
- Address Range: 00:00:00:00:00:00 ~FF:FF:FF:FF:FF:FF

3.11.9 Gateway BeaconBroadcast Parameters

Advertising

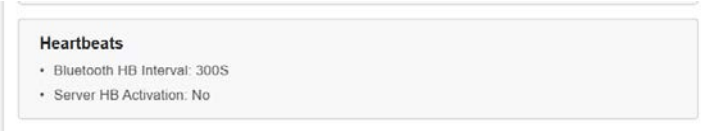
- State: OFF
- Device Name: K^
- ADV Interval: 1000ms
- Tx Power: 0dB
- iBeacon UUID: FDA50693A4E24FB1AFCFC6EB07647825
- iBeacon Major: 0
- iBeacon Minor: 0
- RSSI at 1M: -61
- BLE5: OFF
- Primary PHY: 1Mbps
- Secondary PHY: 1Mbps

3.11.10Gateway Custom Broadcast Parameters

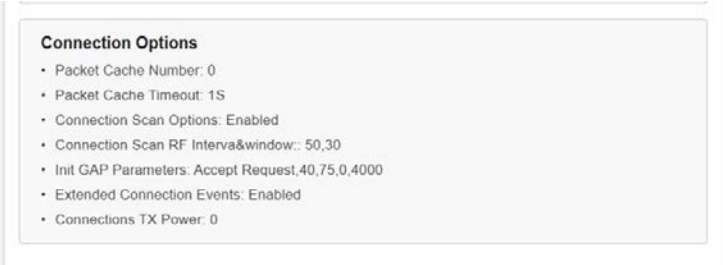
User Advertising

- State: OFF
- Packet Type: Type1(Self Input Data)
- Command SN: 0
- Alternate: No
- BLE5: False
- Primary PHY: 1Mbps
- Secondary PHY: 1Mbps
- ADV Interval: 500 ms
- ADV Timeout: 60S
- Rest Time: 0S
- Working Time: 0S

3.11.11Network care packet skip interval



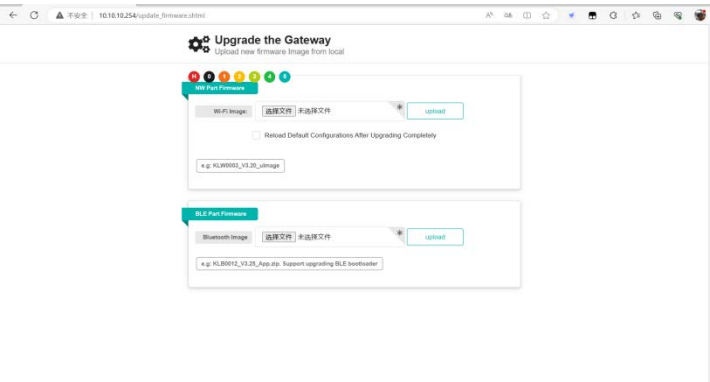
3.11.12Gateway ConnectionBLEDevice Parameters



3.12 Firmware Upgrade

3.12.1SupportWiFifirmware upgrade, firmware provided by the manufacturer, file name format:KLW00x_Vxxx_ UImage;

3.12.2Support Bluetooth firmware upgrade. Firmware provided by the manufacturer, file name format:KLB00xx_Vxxx_ App. zip.



4.Server and Bluetooth Gateway Business Logic

4.1 The Bluetooth gatewaycan be connected to a routerthrough a network cable orWiFi;

4.2Configure the server address and port on the Bluetooth gateway configuration interface, with data protocols such asTCP,UDP, andMQTT, and data formats such asHEXarray orJSON;

4.3Server monitoring to obtain raw scan data reported by the Bluetooth gateway;

4.4 The server analyzes and scans the data, and according to the actual configuration of the Bluetooth gateway, refer to the data protocolHCBG01Gateway BluetoothJSONFormat Protocol5.7V2.01.

docxandHCBG01Gateway Bluetooth Hexadecimal Format ProtocolV2.01. docx;

4.5 The server obtains the gateway uniqueMACaddress (BluetoothMACaddress)from the dataas the gateway unique identifier;

4.6 The server analyzes the Bluetooth device signals and device broadcast data around the Bluetooth gateway based on the reported data, and implements relevant business logic such as asset management, personnel positioning, and data collection;

4.7 The server analyzes the Bluetooth devices around the Bluetooth gateway based on the reported data, and issues instructions as needed to connect the devices. After establishing the connection, the server can send data or instructions to the Bluetooth devices through the Bluetooth gateway, such as causing the Bluetooth bracelet to vibrate and the Bluetooth light to light up, and other business logic;

4.8If necessary, the server issues a disconnect command, requiring the gateway to disconnect from surrounding Bluetooth devices to avoid occupying internal resources of the gateway;

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different
from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.