



Semi-industrial LoRaWAN[®] Hotspot

UG65

User Guide



Safety Precautions

Milesight will not shoulder responsibility for any loss or damage resulting from not following the instructions of this operating guide.

- The device must not be modeled in any way.
- Do not place the device close to objects with naked flames.
- Do not place the device where the temperature is below/above the operating range.
- Do not power on the device or connect it to other electrical devices when installing.
- Check lightning and water protection when used outdoors.
- Do not connect or power the equipment using cables that have been damaged.

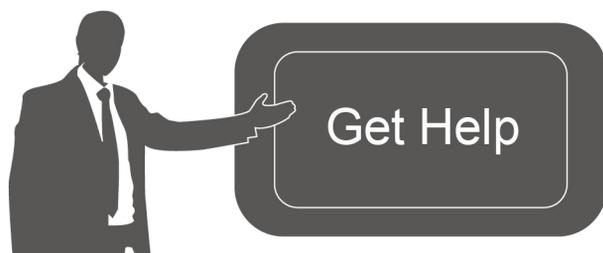
Related Documents

| Document | Description |
|----------------|--------------------------------------|
| UG65 Datasheet | Datasheet for UG65 LoRaWAN® Hotspot. |

The related documents are available on the Milesight website: <https://www.milesight-iot.com>

Declaration of Conformity

UG65 conforms with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.



For assistance, please contact
Milesight technical support:
Email: iot.support@milesight.com
Tel: 86-592-5085280
Fax: 86-592-5023065

Revision History

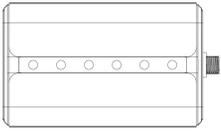
| Date | Doc Version | Description |
|---------------|-------------|---|
| Oct. 12, 2021 | V1.0 | Initial version |
| Nov. 23, 2021 | V1.1 | QR Code Generate Update |
| Feb. 23, 2022 | V1.2 | 1. Log in web GUI update 2. Add Helium section |

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1. Packing List

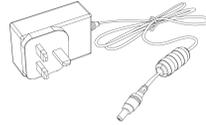
Before you begin to install the UG65 LoRaWAN® hotspot, please check the package contents to verify that you have received the items below.



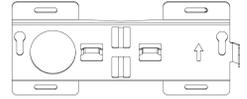
1 × UG65



1 × Ethernet Cable



1 × DC Jack Power Adapter



1 × Mounting Bracket



Bracket Fixing Screws



4 × Wall Mounting Kits



1 × Warranty Card



1 × Quick Start Guide



1 × LoRa Antenna

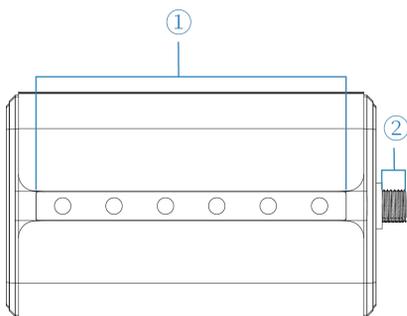


If any of the above items is missing or damaged, please contact your sales representative.

2. Hardware Introduction

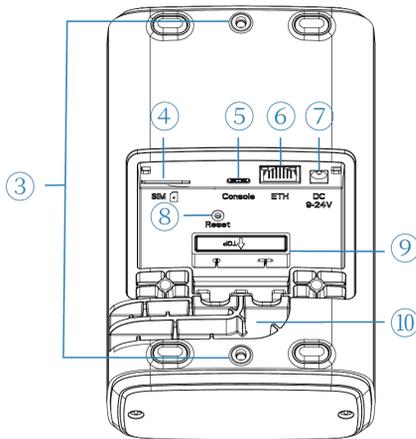
2.1 Overview

A. Front Panel



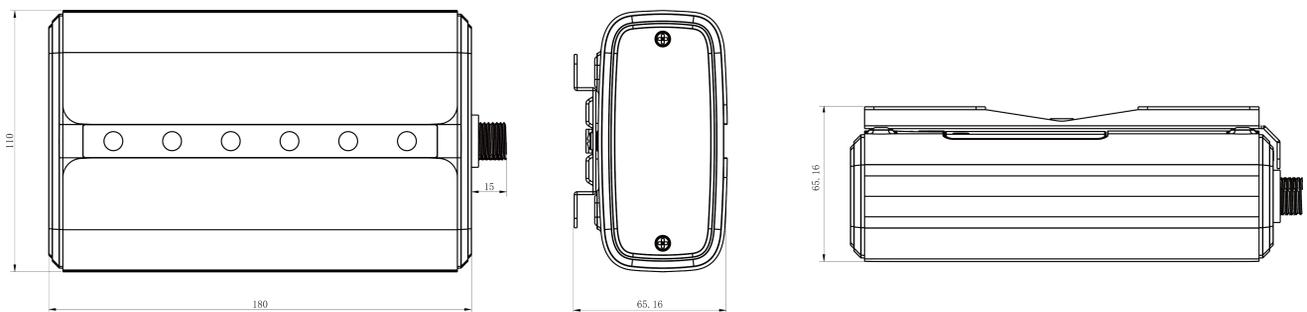
- ① LED Area
 - POWER: Power Indicator
 - STATUS: System Indicator
 - LoRa: LoRa Indicator
 - Wi-Fi: Wi-Fi Indicator
 - LTE: Cellular Indicator
 - ETH: Ethernet Port Indicator
- ② LoRa Antenna Connector

B. Rear Panel



- ③ Bracket Mounting Screws
- ④ SIM Slot
- ⑤ Type-C Port
- ⑥ Ethernet Port (PoE)
- ⑦ Power Connector
- ⑧ Reset Button
- ⑨ Waterproof Silicone
- ⑩ Cable Groove

2.2 Dimensions (mm)



2.3 LED Indicators

| LED | Indication | Status | Description |
|--------|-----------------|---|---|
| POWER | Power Status | Off | The power is switched off |
| | | On | The power is switched on |
| STATUS | System Status | Blue Light | Static: the system is running properly |
| | | Red Light | The system goes wrong |
| LoRa | LoRa Status | Off | Packet Forwarder mode is running off |
| | | Blue Light | Packet Forwarder mode is running well |
| Wi-Fi | Wi-Fi Status | Off | Wi-Fi is disabled |
| | | Blue Light | Wi-Fi is enabled |
| LTE | Cellular Status | Off | SIM card is registering or fails to register (or there are no SIM cards inserted) |
| | | Blue Light | Blinking slowly: SIM card has been registered and is ready for dial-up |
| | | | Blinking rapidly: SIM card has been registered and is dialing up now |
| | | Static: SIM card has been registered and dialed | |

| | | | |
|-----|----------------------|------------|-------------------|
| | | | up successfully |
| ETH | Ethernet Port Status | Off | Disconnected |
| | | Blue Light | Static: Connected |

2.4 Reset Button

| Function | Description | |
|----------|--------------------------------|--|
| | STATUS LED | Action |
| Reset | Static Blue | Press and hold the reset button for more than 5 seconds. |
| | Static Blue → Rapidly Blinking | Release the button and wait. |
| | Off → Static Blue | The hotspot resets to factory default. |

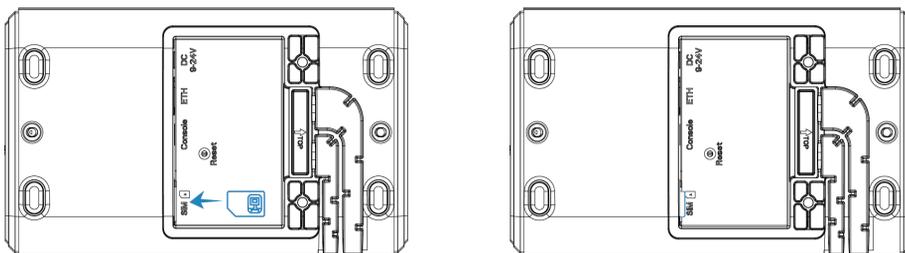
3. Hardware Installation

3.1 SIM Card Installation (Cellular Version Only)

- Use a screwdriver to open the protective cover on the back panel of UG65.
- Insert the SIM card into the device according to the direction icon on the device.

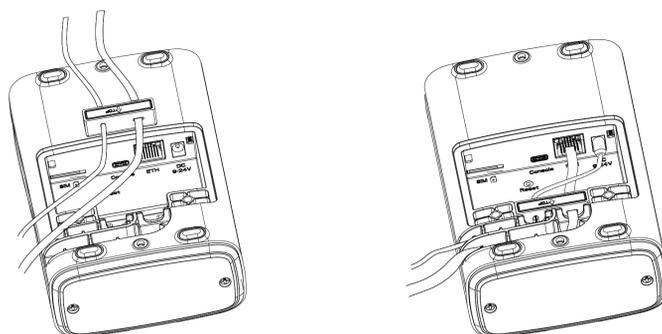
Note:

- If you need to take out the SIM card, press into the SIM card and it will pop up automatically.
- UG65 does not support hot-plugging (also called hot swapping). please turn off the power before inserting or taking off cards.



3.2 Ethernet Cable & Power Cable Installation

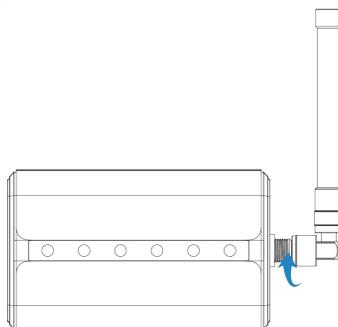
- Connect the Ethernet cable and power cable to corresponding interfaces.
- Pass two cables through the waterproof silicone and slide into the grooves.
- Screw the protective cover back to the device.



UG65 can also be powered by an 802.3af standard PoE injector or other PoE device. If both are connected, DC power is preferred.

3.3 Antenna Installation

The antenna should be installed vertically always on a site with a good signal. After installation, please select the corresponding installation type in web GUI.



Note: do not let the front panel of products faces to walls if using embedded LoRa antennas.

3.4 Hotspot Installation

UG65 can be mounted to a wall or a pole. Before you start, make sure that your SIM card has been inserted, your antennas have been attached and all cables have been installed.

3.4.1 Wall Mounting

Preparation: mounting bracket, bracket fixing screws, wall plugs, wall mounting screws and other required tools.

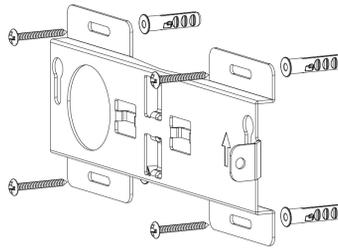
A. Align the mounting bracket horizontally to the desired position on the wall, use a marker pen to mark four mounting holes on the wall, and then remove the mounting bracket from the wall.

Note: The connecting lines of adjacent points are at right angles.

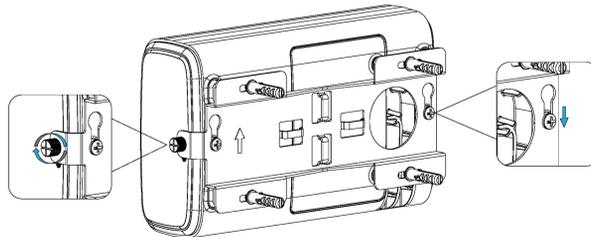
B. Drill four holes with a depth of 32 mm by using your drill with a 6 mm drill bit on the positions you marked previously on the wall.

C. Insert four wall plugs into the holes respectively.

D. Mount the mounting bracket horizontally to the wall by fixing the wall mounting screws into the wall plugs.



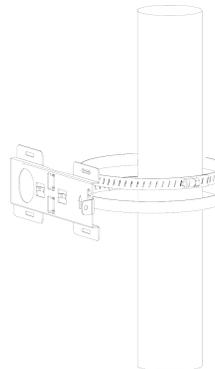
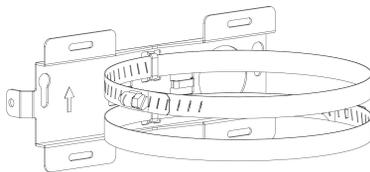
E. Screw the bracket fixing screws to the back panel of the device, then hang the device to the mounting bracket on the wall.



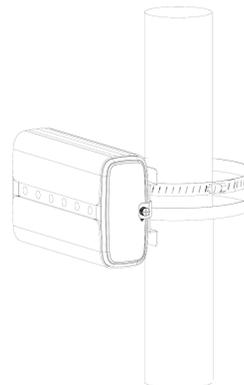
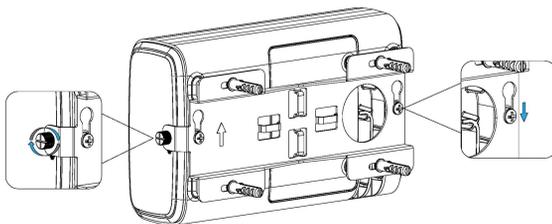
3.4.2 Pole Mounting

Preparation: mounting bracket, bracket fixing screws, hose clamp and other required tools.

- A. Loosen the hose clamp by turning the locking mechanism counter-clockwise.
- B. Straighten out the hose clamp and slide it through the rectangular rings in the mounting bracket, wrap the hose clamp around the pole.
- C. Use a screwdriver to tighten the locking mechanism by turning it clockwise.



D. Screw the bracket fixing screws to the back panel of the device, then hang the device to the mounting bracket on the pole.



4. Login the Web GUI

UG65 provides a web-based configuration interface for management. If this is the first time you configure the hotspot, please use the default settings below:

ETH IP Address: **192.168.23.150**

Wi-Fi IP Address: **192.168.1.1**

Wi-Fi SSID: **Gateway_*******

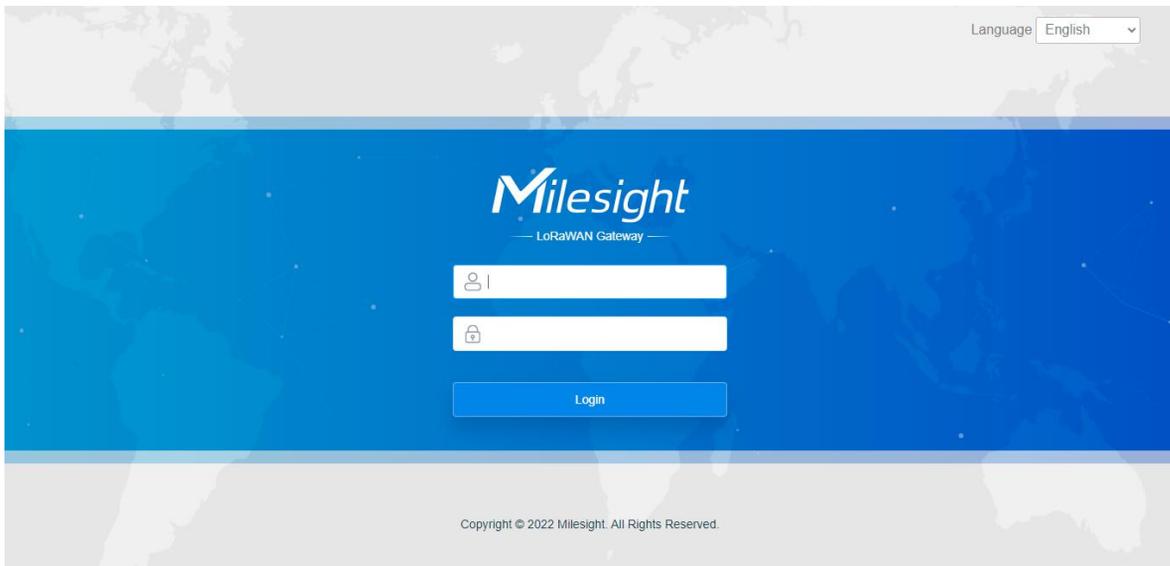
Username: **admin**

Password: **password**

4.1 Wireless Access

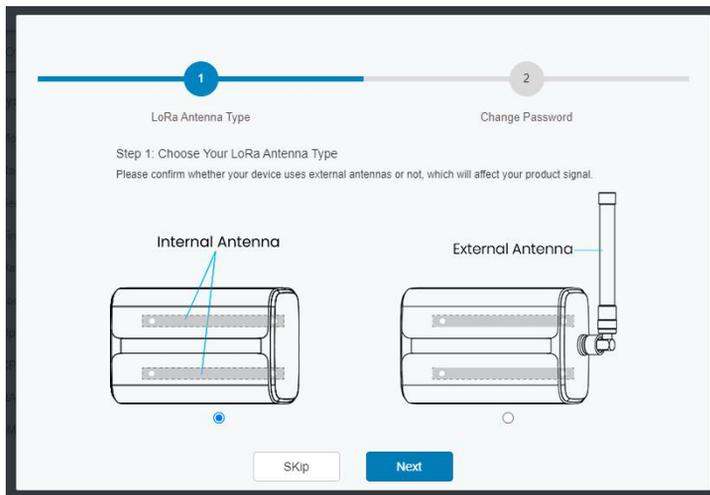
A. Enable wireless network connection on your computer and search for access point "**Gateway_*******" to connect it.

B. Open a web browser on your PC (Chrome is recommended) and type in the IP address **192.168.1.1** to access the web GUI, enter the username and password, click "Login".



If you enter the username or password incorrectly more than 5 times, the login page will be locked for 10 minutes.

C. After logging, select the correct antenna type according to your antenna installation and change the default password following the guide.



After the guide completed, you can view system information and perform more advanced settings.

| System Information | Value |
|---------------------------|------------------------------|
| Model | UG65-L00E-470M-EA-H32 |
| Region | CN470 |
| Serial Number | 6819B4300645 |
| Firmware Version | 61.0.0.36 |
| Hardware Version | V1.3 |
| Local Time | 2021-11-18 10:31:08 Thursday |
| Uptime | 13:10:05 |
| CPU Load | 9% |
| RAM (Capacity/Available) | 2048MB/629MB(30.71%) |
| eMMC (Capacity/Available) | 27.9G/14.5G(52.03%) |

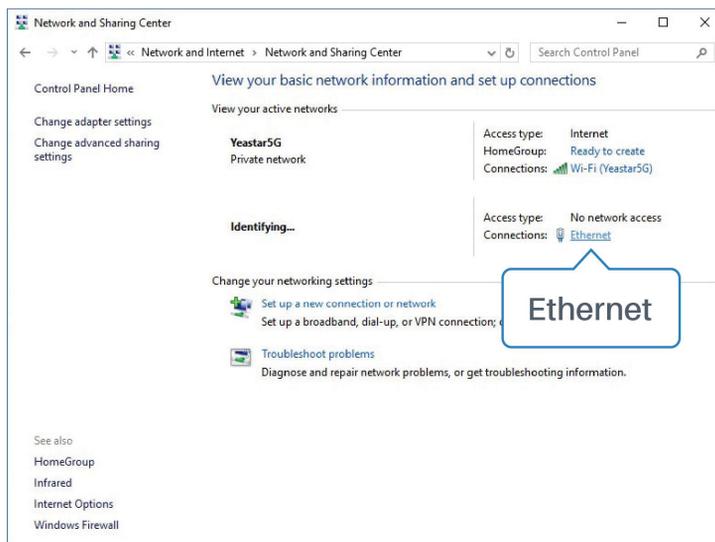


Disable WLAN feature or add password after you completed all hotspot settings!

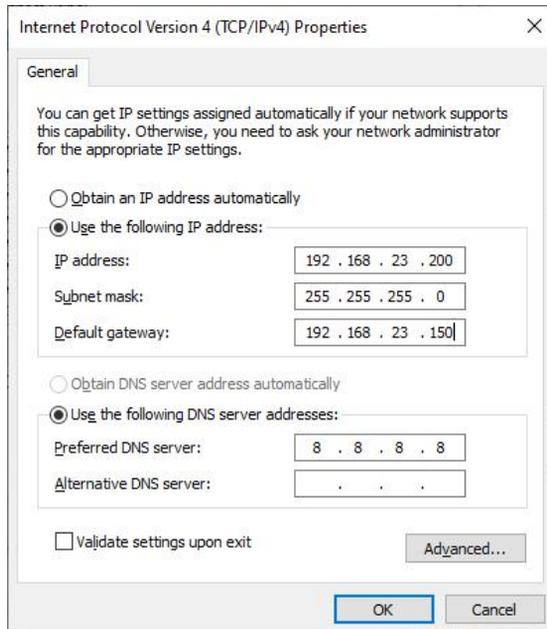
4.2 Wired Access

Connect PC to UG65 ETH port directly. The following steps are based on Windows 10 operating system for your reference.

A. Go to “Control Panel” → “Network and Internet” → “Network and Sharing Center”, then click “Ethernet” (May have different names).



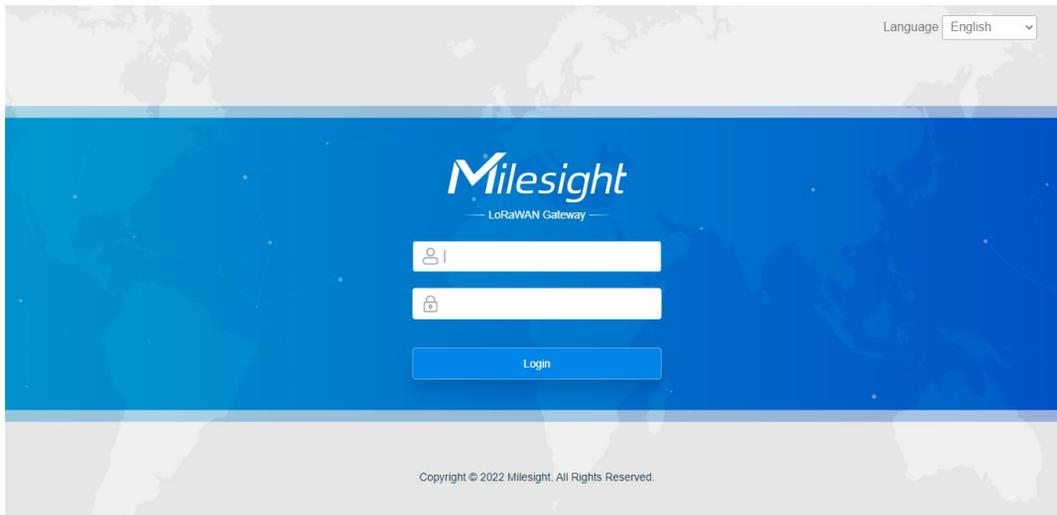
B. Go to “Properties” → “Internet Protocol Version 4 (TCP/IPv4)” and select “Use the following IP address”, then assign a static IP manually within the same subnet of the hotspot.



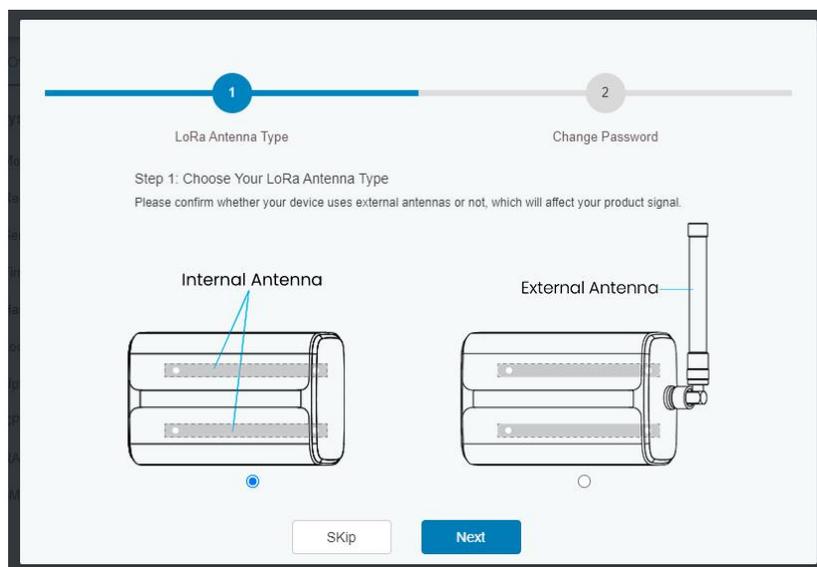
C. Open a web browser on your PC (Chrome is recommended) and type in the IP address **192.168.23.150** to access the web GUI, enter the username and password, click “Login”.



If you enter the username or password incorrectly more than 5 times, the login page will be locked for 10 minutes.



D. After logging, select the correct antenna type according to your antenna installation and change the default password following the guide.



After the guide completed, you can view system information and perform more advanced settings.

| System Information | Value |
|---------------------------|------------------------------|
| Model | UG65-L00E-470M-EA-H32 |
| Region | CN470 |
| Serial Number | 6819B4300645 |
| Firmware Version | 61.0.0.36 |
| Hardware Version | V1.3 |
| Local Time | 2021-11-18 10:31:08 Thursday |
| Uptime | 13:10:05 |
| CPU Load | 9% |
| RAM (Capacity/Available) | 2048MB/629MB(30.71%) |
| eMMC (Capacity/Available) | 27.9G/14.5G(52.03%) |

5. Network Connection

This section explains how to connect the hotspot to the network via WAN connection, Wi-Fi or cellular.

5.1 Configure the Ethernet Connection

A. Go to “Network” → “Interface” → “Port” page to select the connection type and configure Ethernet port information, click “Save & Apply” for changes to take effect.

The screenshot shows the 'Port' configuration page with the following settings:

| Field | Value |
|----------------------|-------------------------------------|
| Port | eth 0 |
| Connection Type | Static IP |
| IP Address | 192.168.22.112 |
| Netmask | 255.255.255.0 |
| Gateway | 192.168.22.1 |
| MTU | 1500 |
| Primary DNS Server | 8.8.8.8 |
| Secondary DNS Server | 114.114.114.114 |
| Enable NAT | <input checked="" type="checkbox"/> |

B. Connect Ethernet port of hotspot to network devices like router or modem.

C. Log in the web GUI via the newly assigned IP address and go to “Status” → “Network” to check Ethernet port status.

The screenshot shows the 'Network' status page with the following WAN connection details:

| Port | Status | Type | IP Address | Netmask | Gateway | DNS | Duration |
|-------|--------|--------|----------------|---------------|--------------|---------|----------------------|
| eth 0 | up | Static | 192.168.22.112 | 255.255.255.0 | 192.168.22.1 | 8.8.8.8 | 1days,02h 34m 22s |

5.2 Configure the Wi-Fi Connection

A. Go to “Network” → “Interface” → “WLAN” and select “Client” mode.

B. Click “Scan” to search for a Wi-Fi access point. Select the available one and click “Join Network”.

Note: please do use [wired access](#) method to access the web GUI of hotspot, or you will fail to configure Wi-Fi setting.

| Port | WLAN | Cellular | Loopback | | | | |
|-----------------------------|---------|----------|----------|-------------------|------------------|-----------|------------------------------|
| < GoBack | | | | | | | |
| SSID | Channel | Signal | Cipher | BSSID | Security | Frequency | |
| AAA | Auto | -61dBm | AES | 24:e1:24:f0:c4:13 | WPA-PSK/WPA2-PSK | 2412MHz | Join Network |

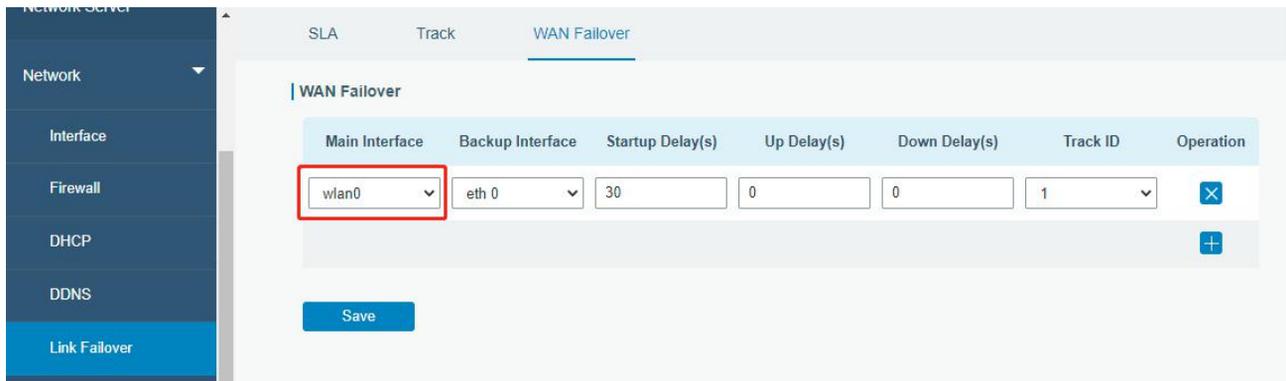
C. Type the key of Wi-Fi.

| Port | WLAN | Cellular | Loopback |
|-------------------|-------------------------------------|----------|----------------------|
| WLAN | | | |
| Enable | <input checked="" type="checkbox"/> | | |
| Work Mode | Client | | Scan |
| SSID | AAA | | |
| BSSID | 24:e1:24:f0:c4:13 | | |
| Encryption Mode | WPA-PSK/WPA2-PSK | | |
| Cipher | AES | | |
| Key | | | |
| IP Setting | | | |
| Protocol | DHCP Client | | |

D. Go to "Status" → "WLAN" to check Wi-Fi status. If it shows "Connected", it means that the hotspot has connected to Wi-Fi successfully.

| Overview | Packet Forward | Cellular | Network | WLAN |
|---------------------|-------------------|----------|---------|------|
| WLAN Status | | | | |
| Wireless Status | Enabled | | | |
| MAC Address | 24:e1:24:f0:de:14 | | | |
| Interface Type | Client | | | |
| SSID | AAA | | | |
| Channel | Auto | | | |
| Encryption Type | WPA-PSK/WPA2-PSK | | | |
| Cipher | AES | | | |
| Status | Connected | | | |
| IP Address | 192.168.1.145 | | | |
| Netmask | 255.255.255.0 | | | |
| Connection Duration | 0 days, 02:44:45 | | | |

E. Go to "Network" → "Failover" → "WAN Failover" to switch the wlan0 as main interface, then gateway can use the Wi-Fi to access the Internet.



5.3 Configure the Cellular Connection (Cellular Version Only)

- Go to "Network" → "Interface" → "Cellular" → "Cellular Setting" page to enable cellular settings.
- Choose relevant network type and fill in SIM card information like APN or PIN code, click "Save" and "Apply" for changes to take effect.

| Port | WLAN | Cellular | Loopback |
|-------------------------|------|-------------------------------------|----------|
| Cellular Setting | | | |
| Enable | | <input checked="" type="checkbox"/> | |
| Network Type | | Auto | |
| APN | | | |
| Username | | | |
| Password | | | |
| Access Number | | | |
| PIN Code | | | |
| Authentication Type | | Auto | |
| Roaming | | <input checked="" type="checkbox"/> | |

- Go to "Status" → "Cellular" page to view the status of the cellular connection. If it shows "Connected", it means the SIM has dialed up successfully. On the other hand, you can check the status of the LTE indicator. If it keeps on light statically, it means SIM has dialed up successfully.

| Overview | Packet Forward | Cellular | Network | WLAN |
|-----------------|---------------------------|----------|---------|------|
| Modem | | | | |
| Status | Ready | | | |
| Model | EC25 | | | |
| Version | EC25ECGAR06A07M1G | | | |
| Signal Level | 23asu (-67dBm) | | | |
| Register Status | Registered (Home network) | | | |
| IMEI | 860425047368939 | | | |
| IMSI | 460019425301842 | | | |
| ICCID | 89860117838009934120 | | | |
| ISP | CHN-UNICOM | | | |
| Network Type | LTE | | | |
| PLMN ID | | | | |
| LAC | 5922 | | | |
| Cell ID | 340db83 | | | |
| Network | | | | |
| Status | Connected | | | |
| IP Address | 10.132.132.59 | | | |
| Netmask | 255.255.255.240 | | | |
| Gateway | 10.132.132.60 | | | |

6. Helium Hotspot Setup

- Download Helium App from Google Play or Apple App Store and create a Helium Wallet.
- Log in the web GUI, click "QR Code for Onboarding" at the top right corner.

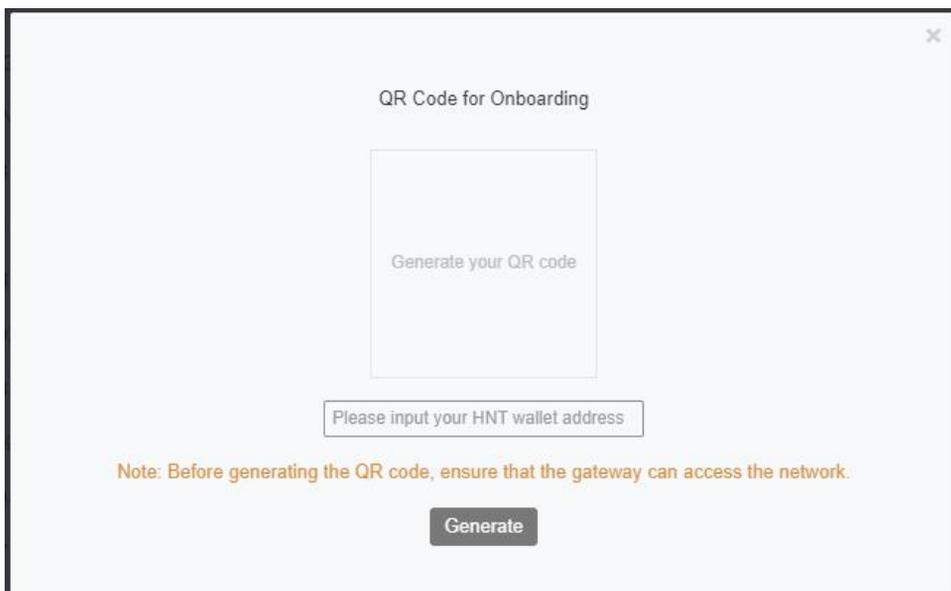
The screenshot shows the Milesight web GUI interface. At the top, there is a navigation bar with the Milesight logo, a QR code for onboarding, and a user profile for 'admin'. Below the navigation bar, there is a warning message: "For your device security, please change the default password". The main content area is divided into several sections: a left sidebar with navigation options (Status, Packet Forwarder, Network Server, Network, System, Maintenance, APP), a central table for system information, and a right sidebar with help documentation.

| Status | Overview | Cellular | Network | WLAN | VPN | Host List | Help |
|---------------------------|------------------------------|----------|---------|------|-----|-----------|------|
| System Information | | | | | | | |
| Model | UG65-L00E-470M-EA-H32 | | | | | | |
| Region | CN470 | | | | | | |
| Serial Number | 6819B4300645 | | | | | | |
| Firmware Version | 61.0.0.36 | | | | | | |
| Hardware Version | V1.3 | | | | | | |
| Local Time | 2021-11-18 10:31:08 Thursday | | | | | | |
| Uptime | 13:10:05 | | | | | | |
| CPU Load | 9% | | | | | | |
| RAM (Capacity/Available) | 2048MB/629MB(30.71%) | | | | | | |
| eMMC (Capacity/Available) | 27.9G/14.5G(52.03%) | | | | | | |

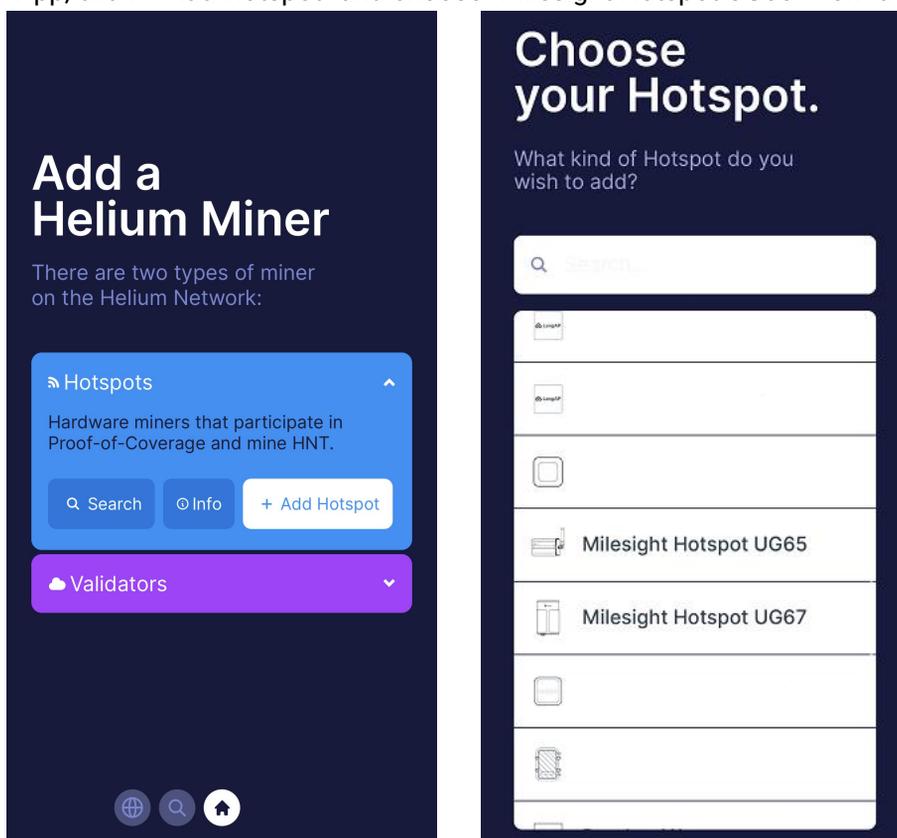
At the bottom of the main content area, there are buttons for "Manual Refresh" and "Refresh". The right sidebar contains help documentation for various system information items:

- Model**: Show the model name of router.
- Region**: Show the Region of router.
- Serial Number**: Show the serial number of router.
- Firmware Version**: Show the current firmware version of router.
- Hardware Version**: Show the current hardware version of router.
- Local Time**: Show the current local time of system.
- Uptime**: Show the information on how long the router has been running.
- CPU Load**: (partially visible)

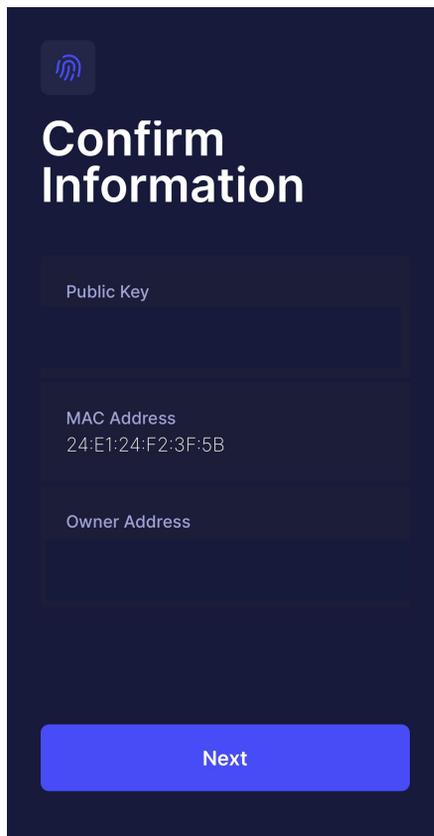
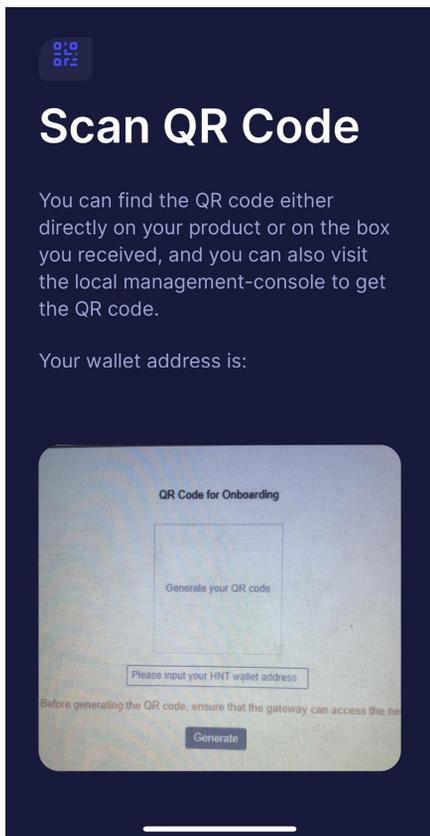
- Fill in the wallet address in hotspot web GUI and click "Generate" to generate the QR code.



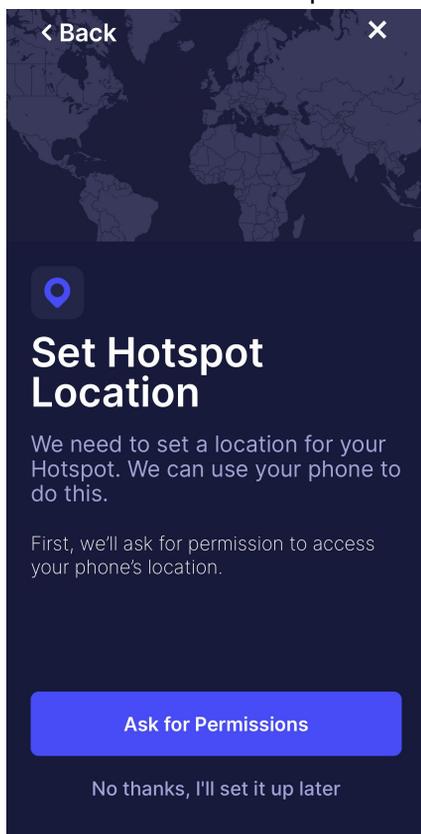
D. Open Helium App, click “+Add Hotspot” and choose “Milesight Hotspot UG65” from the list.



E. Scan the QR code on the hotspot login web GUI, then App will get the hotspot information. Click “Next”.



F. Click “Ask for Permissions” to set hotspot location, then click “Set Location”.



G. Set hotspot antenna gain and height according to your external antenna type, it's 1dBi by default. Click "Next" and "Register Hotspot". This registration requires \$10 and it's already paid by Milesight.

Antenna Setup
Submit antenna and height details for your Hotspot.

Milesight Hotspot UG65

TX / RX Gain 1.0 dBi

Height (meters) 0

Next

Location Fee
Your Location Fee (\$10) has been prepaid.

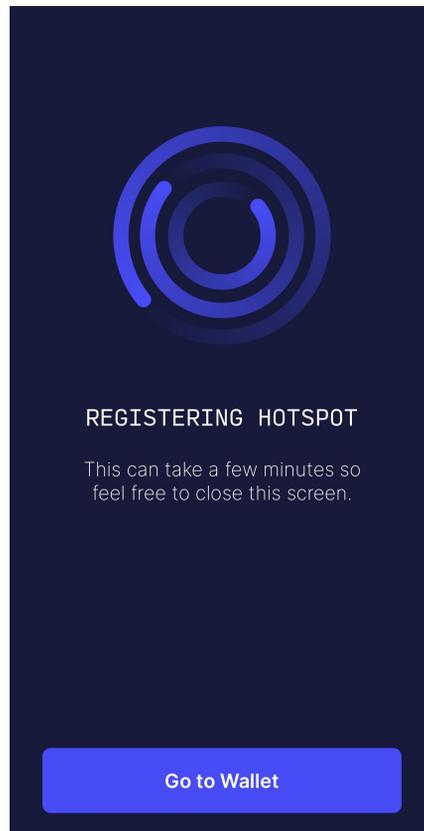
Confirm the location selected is correct and register your Hotspot.

Loading...

TX / RX Gain: 1 dBi
Height: 0 meters

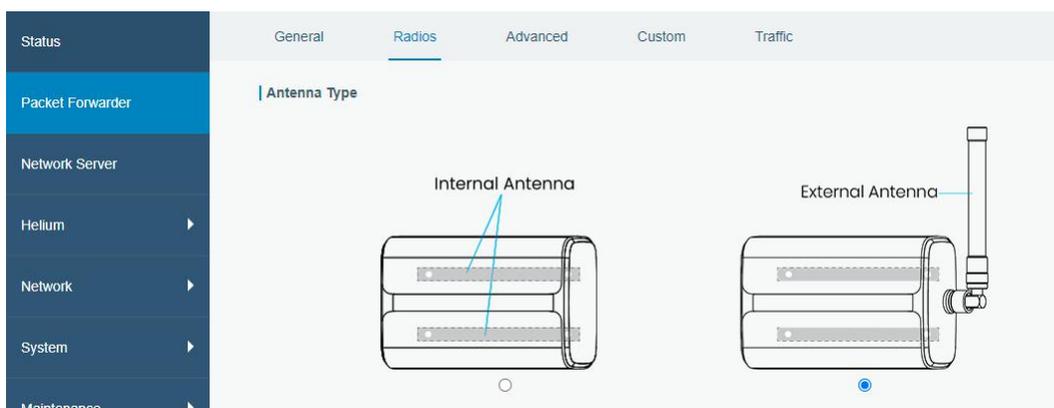
Register Hotspot

H. It will submit all hotspot information and add it to the Helium network.



7. Antenna and Frequency Configuration

A. Go to “Packet Forwarder” → “Radio” page to configure correct antenna type according to your antenna installation mode.



B. Center frequency and channels can also be configured here. Usually, the channels should be the same as LoRaWAN® nodes and network server.

Region:

| Name | Center Frequency/MHz |
|---------|------------------------------------|
| Radio 0 | <input type="text" value="904.3"/> |
| Radio 1 | <input type="text" value="905.0"/> |

Multi Channels Setting

| Enable | Index | Radio | Frequency/MHz |
|-------------------------------------|-------|---------|------------------------------------|
| <input checked="" type="checkbox"/> | 0 | Radio 0 | <input type="text" value="903.9"/> |
| <input checked="" type="checkbox"/> | 1 | Radio 0 | <input type="text" value="904.1"/> |
| <input checked="" type="checkbox"/> | 2 | Radio 0 | <input type="text" value="904.3"/> |
| <input checked="" type="checkbox"/> | 3 | Radio 0 | <input type="text" value="904.5"/> |
| <input checked="" type="checkbox"/> | 4 | Radio 1 | <input type="text" value="904.7"/> |
| <input checked="" type="checkbox"/> | 5 | Radio 1 | <input type="text" value="904.9"/> |
| <input checked="" type="checkbox"/> | 6 | Radio 1 | <input type="text" value="905.1"/> |
| <input checked="" type="checkbox"/> | 7 | Radio 1 | <input type="text" value="905.3"/> |

8. Helium Advanced Setting

Milesight UG65 Helium hotspot provides options to get the latest sync status and Helium process status and control.

8.1 Sync

Sync page is used for checking sync status and configure the sync settings.

8.1.1 Sync Status

For your device security, please change the default password

Sync Status
Fast Sync

Hotspot Sync Status Synced

| Time | Hotspot Height | Blockchain Height |
|---------------------|----------------|-------------------|
| 2022-02-23 11:09:05 | 1238277 | 1238296 |
| 2022-02-23 11:04:05 | 1238277 | 1238290 |
| 2022-02-23 10:59:04 | 1238277 | 1238277 |
| 2022-02-23 10:54:04 | 1238277 | 1238277 |
| 2022-02-23 10:49:03 | 1238275 | 1238275 |
| 2022-02-23 10:44:03 | 1238270 | 1238269 |

| Item | Description |
|---------------------|--|
| Hotspot Sync Status | <p>There are 4 status:</p> <p>Not syncing: the hotspot does not start the syncing.</p> <p>Absorbing: when the hotspot is absorbing the snapshot, other sync operations and Helium reboot are forbidden.</p> <p>Syncing: the hotspot is catching up the latest blockchain height.</p> <p>Synced: when the hotspot height is within the range of 100 of blockchain height, it will shows synced.</p> |
| Hotspot Height | Show the latest 6 hotspot height records, the record will update every 5 minutes. |
| Blockchain Height | Show the latest 6 blockchain height records, the record will update every 5 minutes. |

8.1.2 Fast Sync

Sync Status
Fast Sync

Automatic Sync

Snapshot Address

Manual Sync (Download and absorb the snapshot from the Milesight server)

| Item | Description |
|----------------|---|
| Automatic Sync | Hotspot will download and absorb the latest snapshot from the selected address automatically when current height far behind the latest blockchain height. Default: Milesight server |

Manual Sync

Click "Sync" to download and absorb the snapshot from the Milesight server.

8.2 Onboarding

This page is used for generating QR code for onboarding and check hotspot events. You can also click the button on the top right corner to generate the QR code.

| Item | Description |
|------------------------|---|
| QR Code for Onboarding | Type the wallet address, then click "Generate" to generate the QR code for hotspot onboarding. Before generate, ensure the hotspot can access the Internet. |
| Hotspot Events | Click "View" to check hotspot transaction status and information. Including onboard and transfer hotspot. |

8.3 Operation

This page is used for setting Helium upgrade interval and operate the Helium process.

| Operation | |
|--------------------------|---|
| Item | Description |
| Automatic Upgrade | |
| Helium Version | Show the current hotspot Helium program version. |
| Enable | When enabled, the hotspot will check and upgrade the Helium version automatically. |
| Upgrade Schedule | Set the time interval of checking Helium version. If there is a newer version, the hotspot will update the version automatically. Range: 1-168 hours. |
| Helium Log | |
| Download | Download the Helium logs containing the Helium progress running status, configuration changes, and so on. |
| Helium Reboot | |
| Reboot | Reboot the Helium progress. |
| Helium Reset | |
| Reset | Reset the Helium progress and block data, then download the latest Helium progress automatically. |

[END]