

DIREKTRONIK

Dataprodukter utöver det vanliga

UG65

Quick Start Guide



Xiamen Milesight IoT Co., Ltd.

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 device 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

This Quick Start Guide only explains the installation of Milesight UG65 LoRaWAN® Gateway. For more functionality and advanced settings, please refer to the relevant documents as below.

| Document | Description |
|-----------------|---|
| UG65 Datasheet | Datasheet for UG65 LoRaWAN® Gateway. |
| UG65 User Guide | Users can refer to the guide for instruction on how to log in the web GUI, and how to configure all the settings. |

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

Declaration of Conformity

UG65 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.



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Revision History

| Date | Doc Version | Description |
|---------------|-------------|-----------------|
| Aug. 31, 2020 | V1.0 | Initial version |
| Nov. 24, 2020 | V2.0 | Layout replace |

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1. Packing List

Before you begin to install the UG65 gateway, 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



Wall Mounting Kits



1 × Warranty Card



1 × Quick Start Guide

—



1 × LoRa Antenna
(External antenna
version included)

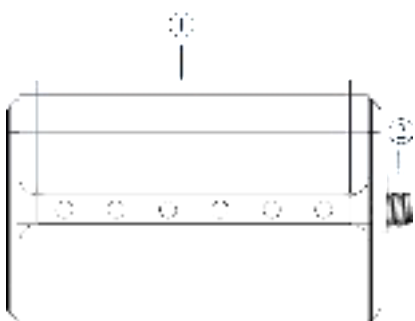


If any of the above items is missing or damaged, please contact your sales representative.

2. Hardware Introduction

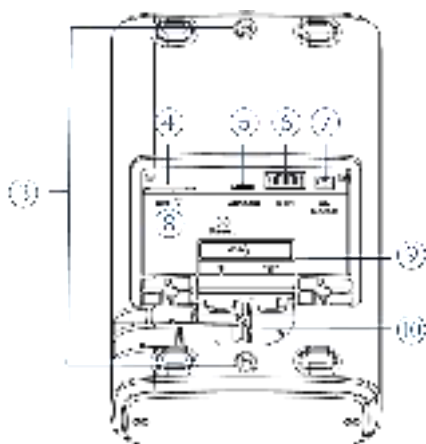
2.1 Overview

A. Front Panel



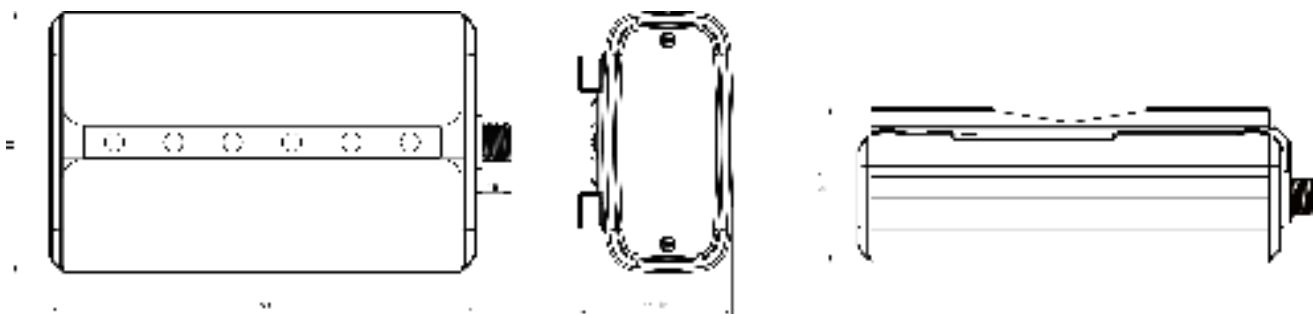
- ① LED Area
POWER: Power Indicator
STATUS: System Indicator
LoRa: LoRa Indicator
Wi-Fi: Wi-Fi Indicator
LTE: Cellular Indicator
ETH: Ethernet Port Indicator
- ② LoRa Antenna Connector
(only for external antenna version)

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 gateway resets to factory default. |

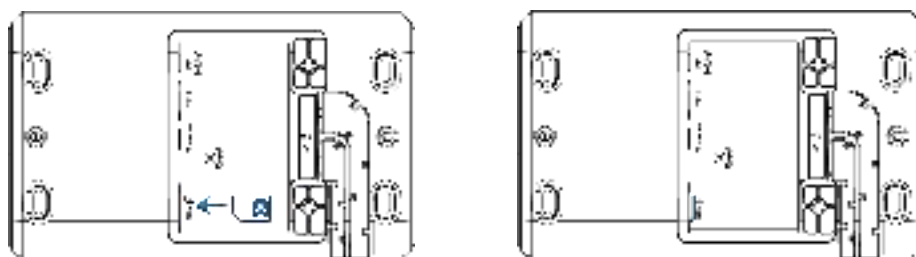
3. Hardware Installation

3.1 SIM Card Installation

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

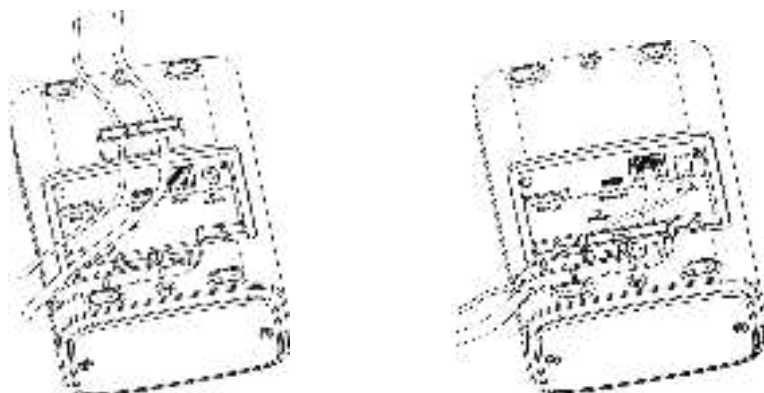
Note:

- 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 you insert or take off cards.



3.2 Ethernet Cable & Power Cable Installation

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

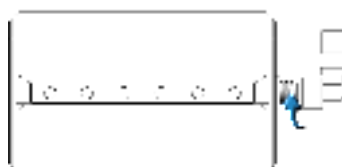


UG6x can also be powered by 802.3af standard PoE injector or other PoE devices. If both connected, DC power is preferred.

Note: When connecting, Ethernet cable of UG65 device side should be installed first, otherwise, PoE devices or gateway may be damaged.

3.3 Antenna Installation

For external antenna version, rotate the antenna into the antenna connector accordingly. The external antenna should be installed vertically always on a site with a good signal.



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

3.4 Gateway 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.

1. 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.

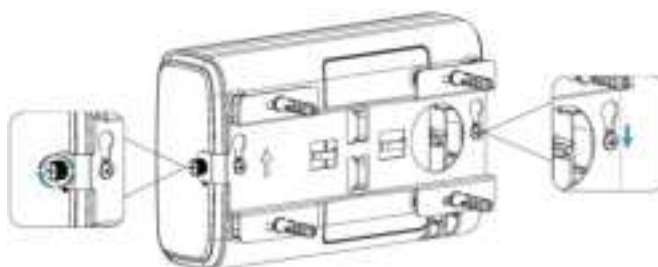
2. Drill four holes with a depth of 32 mm by using your drill with a 6 mm drill bit on the positions you marked previously on the wall.

3. Insert four wall plugs into the holes respectively.

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



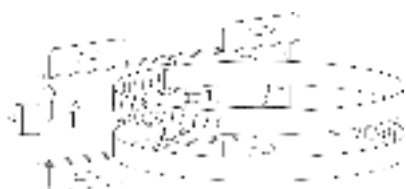
5. Screw the bracket fixing screws to the back panel of device, then hang the device to the mounting bracket on the wall.



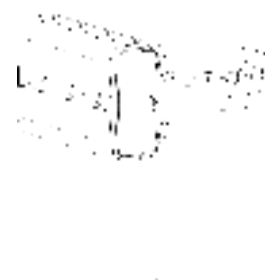
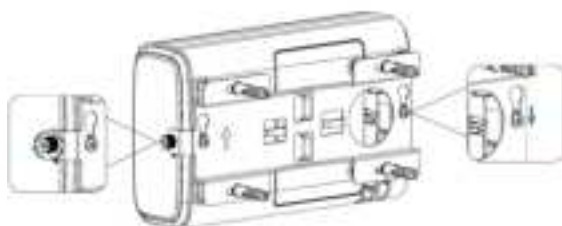
3.4.2 Pole Mounting

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

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



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



4. Log in the Web GUI of Gateway

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

ETH IP Address: **192.168.23.150**

Wi-Fi IP Address: **192.168.1.1**

Wi-Fi AP: **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.

C. 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 the web GUI, follow the guide to complete the basic configurations. You can also skip the instructions. It's suggested that you change the password for the sake of security.



E. You can view system information and perform configuration of the gateway.



4.2 Wired Access

Connect PC to UG65 ETH port directly or through PoE injector. 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 gateway.



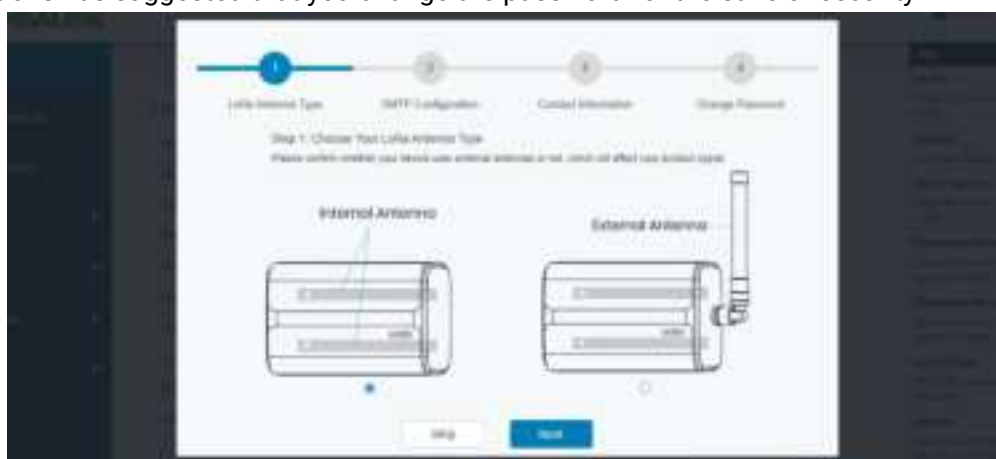
C. Open a Web browser on your PC (Chrome is recommended) and type in the IP address 192.168.23.150 to access the web GUI.

D. 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.

E. After logging the web GUI, follow the guide to complete the basic configurations. You can also skip the instructions. It's suggested that you change the password for the sake of security.



F. After guide complete, you can view system information and perform configuration of the gateway.



5. Network Configuration

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

5.1 Ethernet WAN Configuration

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

PortWLANCellularLoopback

Port_1

Enable☒

Porteth 0

Connection TypeStatic IP

IP Address192.168.23.64

Netmask255.255.255.0

Gateway192.168.23.1

MTU1500

Primary DNS Server8.8.8.8

Secondary DNS Server114.114.114.114

Enable NAT☒

Multiple IP Address

| IP Address | Netmask | Operation |
|------------|---------|----------------------------------|
| | | <input type="button" value="+"/> |

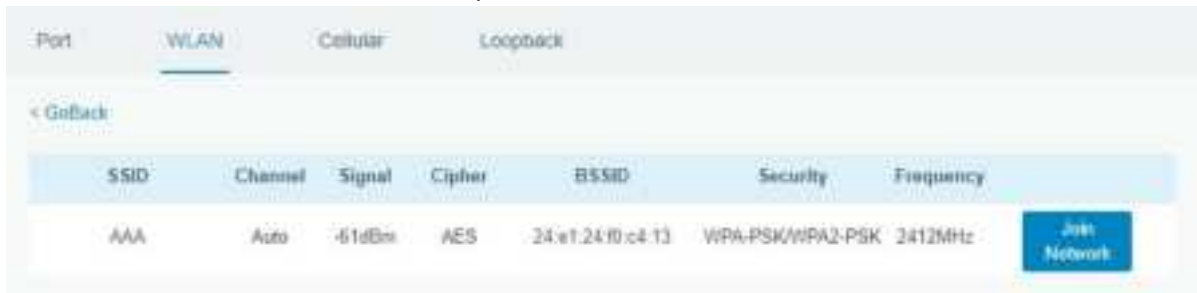
- C. Connect Ethernet port of gateway to devices like router or modem.
- D. Log in the web GUI via the newly assigned IP address and go to “Status”→ “Network” to check Ethernet port status.

| Overview | Packet Forward | Cellular | Network | WLAN | VPN | Host List | |
|----------|----------------|----------|---------------|---------------|--------------|-----------|----------|
| WAN | | | | | | | |
| Port | Status | Type | IP Address | Netmask | Gateway | DNS | Duration |
| eth 0 | up | Static | 192.168.23.64 | 255.255.255.0 | 192.168.23.1 | 8.8.8.8 | 03h 12s |

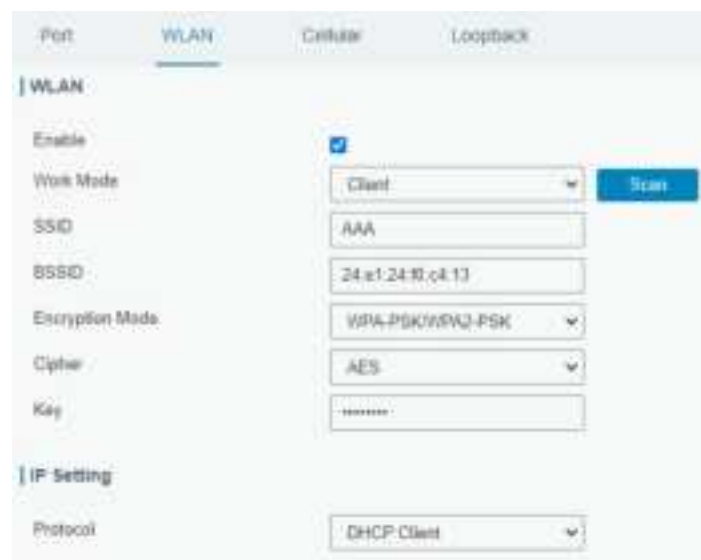
5.2 Wi-Fi Connection Configuration

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

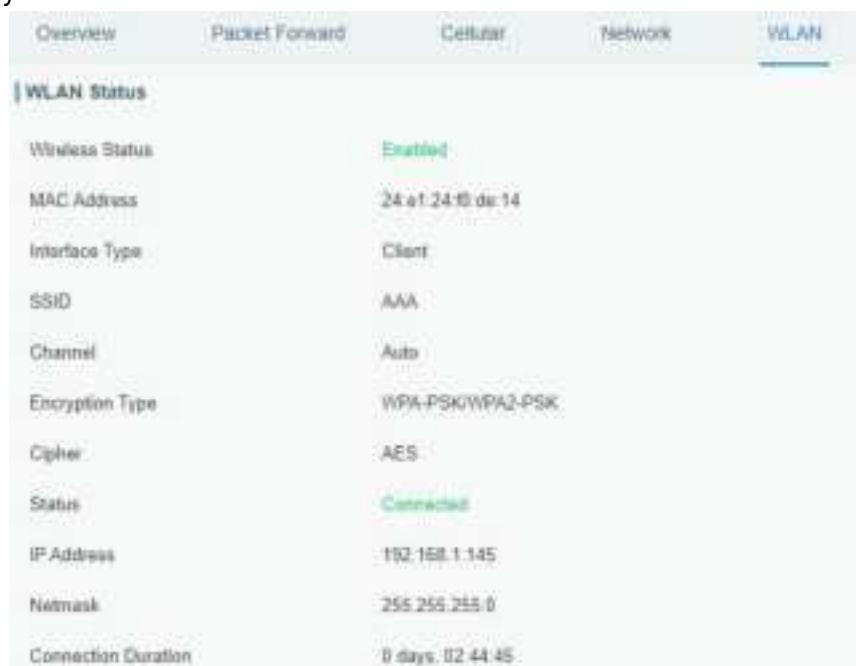
B. Click “Scan” to search for Wi-Fi access point. Select the available one and click “Join Network”.



C. Type the key of Wi-Fi.

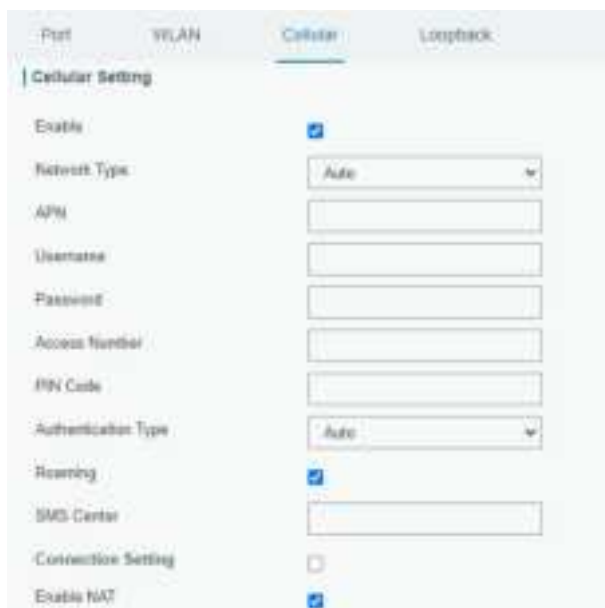


D. Go to “Status”→“WLAN” to check Wi-Fi status. If it shows “Connected”, it means gateway connects to Wi-Fi successfully.



5.3 Cellular Connection Configuration

- 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"/> | |
| SMS Center | | | |
| Connection Setting | | <input type="checkbox"/> | |
| Enable NAT | | <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 LTE indicator. If it keeps on blue light statically, it means SIM has dialed up successfully.



| Overview | Packet Forward | Cellular | Network | WLAN |
|-----------------|----------------|---------------------------|---------|------|
| Modem | | | | |
| Status | | Ready | | |
| Model | | EC25 | | |
| Version | | EC25EC03AR06A07M1Q | | |
| Signal Level | | 23asu (-67dBm) | | |
| Register Status | | Registered (Home network) | | |
| IMEI | | 880425047388338 | | |
| IMSI | | 460019425301842 | | |
| ICCID | | 89860117038009034120 | | |
| ISF | | CHN-UNICOM | | |
| Network Type | | LTE | | |
| PLMN-ID | | | | |
| LAC | | 5922 | | |
| Cell ID | | 3400681 | | |
| Network | | | | |
| Status | | Connected | | |
| IP Address | | 192.132.132.99 | | |
| Netmask | | 255.255.255.240 | | |
| Gateway | | 192.132.132.98 | | |

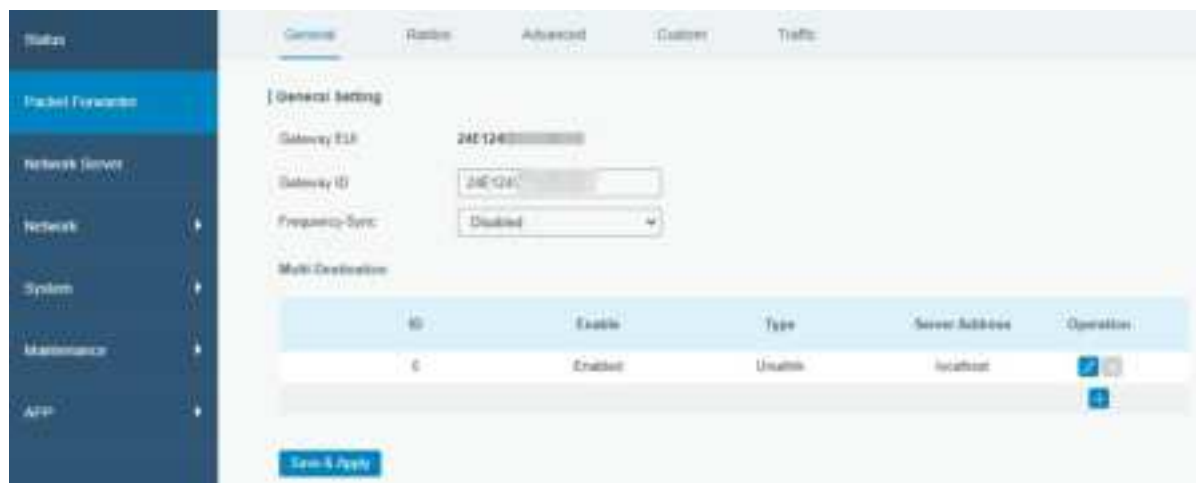
6. Packet Forwarder Configuration

UG65 has embedded multiple packet forwarders like Semtech and Chirpstack Generic MQTT broker. This section explains how to connect the gateway to third-party network servers.



Make sure the gateway connects to the network as shown in [Section 5](#).

- A. Go to “Packet Forwarder” → “General” page and click to add a network server.



- B. Fill in the server information and enable this server.

- C. Go to “Packet Forwarder” → “Radio” page to configure antenna type, center frequency and channels. The channels of the gateway and network server need to be the same.



Region: US913

| Name | Center Frequency(MHz) |
|---------|-----------------------|
| Radio 0 | 904.3 |
| Radio 1 | 905.0 |

Multi Channels Setting

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

D. Add the gateway on network server page. Take TTN for example, type and save the gateway EUI and other information when you connect it via Semtech packet forwarder. After you add the gateway, TTN will show connection status.

Gateways > Register

REGISTER GATEWAY

Gateway EUI
The EUI of the gateway to add. It can be manually entered.

24 23 24 FF FE 00 00 00

☒ I'm using the legacy packet forwarder
Select this if you're using the legacy [Semtech packet forwarder](#).

Description
A human-readable description of the gateway.

Frequency Plan
The [Semtech](#) plan this gateway will use.

Available: 1 (0/100)

E. Go to "Traffic" page to view the data communication of UG65.

General Radio Advanced Custom Traffic

Traffic Setting

Stop Clear

| Msg | Direction | Time | Index | Frequency | Datarate | CodeRate | RSSI | SNR |
|-----|-----------|----------|----------------|-----------|-----------|----------|------|------|
| 0 | up | 01:57:30 | 212136749 3 | 903.9 | SF125W125 | 4/5 | -51 | 13.2 |
| 0 | up | 01:57:29 | 211544823 1 | 904.5 | SF125W125 | 4/5 | -60 | 8.5 |
| 0 | up | 01:57:13 | 210431205 7 | 904.6 | SF125W125 | 4/5 | -53 | 11.5 |
| 0 | up | 01:57:06 | 209008655 6 | 903.9 | SF125W125 | 4/5 | -62 | 14.2 |

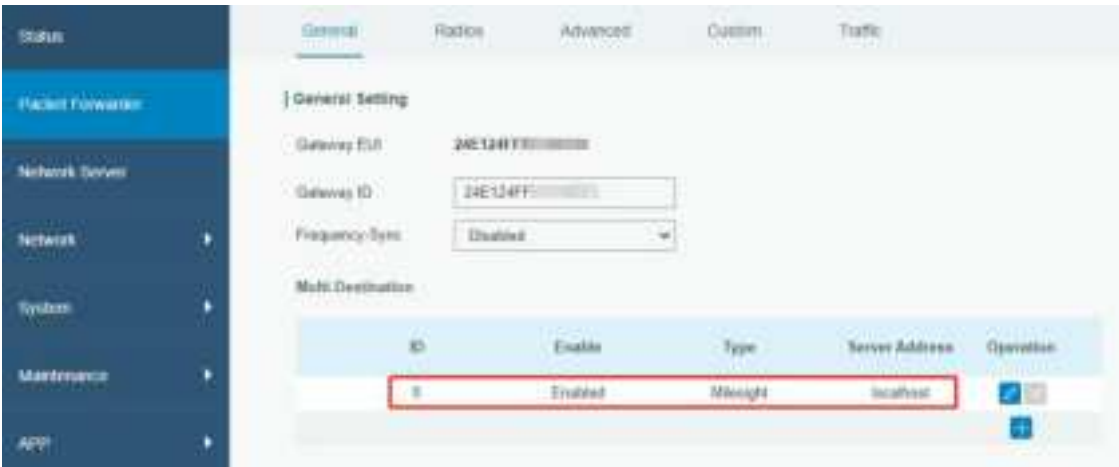
7. Network Server Configuration

UG65 can work as network server and transmit data to Milesight IoT Cloud or other platform via MQTT/HTTP/HTTPS.

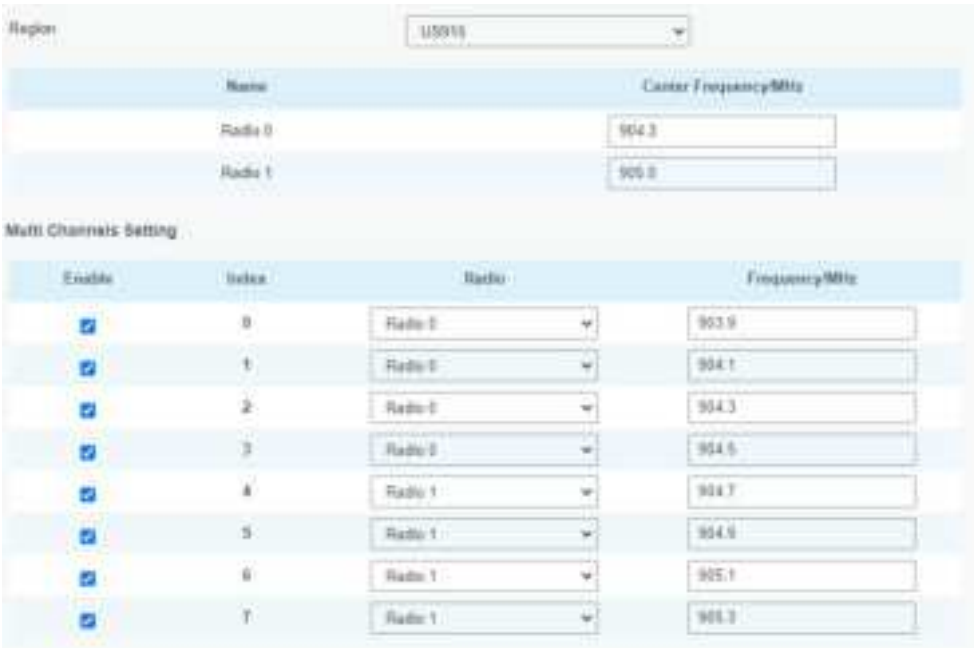
 Make sure the gateway connects to the network as shown in [Section 5](#).

7.1 Connect UG65 to Milesight IoT Cloud

A. Go to “Packet Forwarder” → “General” page to enable the “Milesight” type server.



B. Go to “Packet Forwarder” → “Radio” page to select the antenna type, center frequency and channels. The channels of the gateway and nodes need to be the same.



C. Go to “Network Server” → “General” page to enable the network server and “Milesight IoT Cloud” mode.



D. Log in the Milesight IoT Cloud. Then go to “My Devices” page and click “+New Devices” to add gateway to Milesight IoT Cloud via SN. Gateway will be added under “Gateways” menu.



E. The gateway is online on Milesight IoT Cloud.



7.2 Connect UG65 to MQTT/HTTP Server

A. Go to “Packet Forwarder” → “General” page to enable the “Milesight” type server.

| ID | Enable | Type | Server Address | Operation |
|----|---------|-----------|----------------|-----------|
| 1 | Enabled | Milesight | localhost | |

B. Go to “Packet Forwarder” → “Radio” page to select the antenna type, center frequency and channels. The channels of the gateway and nodes need to be the same.

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

C. Go to “Network Server” → “General” page to enable the network server mode.

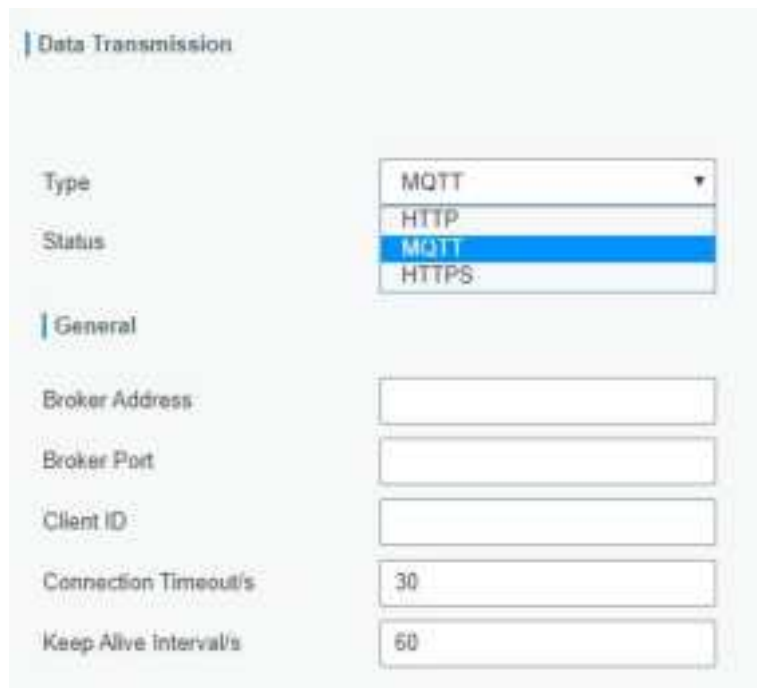
| Field | Value | Unit |
|---------------------|-------------------------------------|------------|
| Enable | <input checked="" type="checkbox"/> | |
| Milesight IoT Cloud | <input type="checkbox"/> | |
| NetID | 010293 | |
| Join Delay | 5 | sec |
| RX1 Delay | 1 | sec |
| Lease Time | 676000-0-0 | Min-sec-cc |
| Log Level | info | |

D. Go to “Network Server”→“Application” to add a new application.



The screenshot shows the 'Applications' tab in the configuration interface. On the left sidebar, 'Network Server' is selected. The main area has tabs for 'General', 'Applications', 'Profiles', and 'Device'. Under the 'Applications' tab, there is a section titled 'Applications' with three input fields: 'Name' (containing 'cloud'), 'Description' (containing 'cloud'), and 'Payload Codec' (a dropdown menu set to 'None').

After saving the application, you can select HTTP, HTTPS or MQTT protocol and fill in correspond server information to send data to another server.



The screenshot shows the 'Data Transmission' and 'General' sections. In the 'Data Transmission' section, the 'Type' dropdown menu is open, showing options: HTTP, MQTT (highlighted), and HTTPS. Below this, the 'General' section contains several input fields: 'Broker Address', 'Broker Port', 'Client ID', 'Connection Timeout/s' (set to 30), and 'Keep Alive interval/s' (set to 60).

E. Go to “Profiles” page to add a new profile for the device.



The screenshot shows the 'Profiles' tab in the configuration interface. On the left sidebar, 'Profiles' is selected. The main area has tabs for 'General', 'Applications', 'Profiles', 'Device', and 'Packets'. Under the 'Profiles' tab, there is a section titled 'Device Profiles' with four input fields: 'Name' (containing 'ClassA-OTAA'), 'Max TXPower' (set to 0), 'Join Type' (a dropdown menu set to 'OTAA'), and 'Class Type' (a dropdown menu set to 'Class A'). At the bottom, there is an 'Advanced' checkbox (unchecked) and two buttons: 'Save' and 'Cancel'.



F. Go to “Device” page and click “Add” to add LoRaWAN® node devices.



You can also click “Bulk Import” if you want to add many nodes all at once.



Click “Template Download” to download template file and add device information to this file. Application and device profile should be the same as you created on web page.

| | A | B | C | D | E | F | G | H | I |
|---|------------------|-------------|------------------|-------------|---------------|----------------------------------|---|----------|--------|
| 1 | name | description | deviceid | application | deviceprofile | appkey | | deviceid | appkey |
| 2 | 24e336215f323266 | | 24e336215f323266 | class | ClassA-OTAA | 312233445566778899aa112233445566 | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

Import this file to add bulks of devices.

F. Go to “Packets” page to check the packets from LoRaWAN® node devices. The type starts from “Up” means uplinks and “Dn” means downlinks.

Click “Details” to check the properties and payload contents of packets.

| Packets Details | |
|-----------------|----------|
| Freq | 14 |
| Port | 85 |
| Modulation | LORA |
| Bandwidth | 125 |
| SpreadFactor | 7 |
| Bitrate | 0 |
| CodeRate | 4/5 |
| SNR | 8.5 |
| RSSI | -85 |
| Power | - |
| Payload(hex) | A3cYAA== |
| Payload(hex) | 03771800 |
| MIC | f5acdeb2 |

[END]

DIREKTRONIK
Dataprodukter utöver det vanliga