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Milesight UG63 V2 Mini LoRaWAN Gateway

Specifications

- **Model:** UG63
- **Controller Gateway:** UG56/UG65/UG67
- **Performance:** High-cost performance
- **Management Platform:** Milesight DeviceHub 2.0 & Development Platform
- **Compatibility:** Mainstream network servers like The Things Industries, ChirpStack, AWS

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 disassembled or remodeled 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 another 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.

Declaration of Conformity

UG63 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.

Product Introduction

Overview

- UG63 is an 8-channel lightweight indoor LoRaWAN® gateway. Adopting, the SX1302 chip, UG63 can set up packet forwarding connection between end nodes and mainstream network servers (such as TTN, ChirpStack, etc.). With its compact size and high performance, it is highly suitable for independent deployment of LoRaWAN® networks in small-scale scenarios or single spaces.
- It can also serve as a supplementary gateway, along with UG65/UG67 or other main gateways, to enhance LoRaWAN® signal coverage in large-scale scenarios by filling in signal blind spots. it is an ideal supplement for wide indoor areas such as offices, parking lots, campuses, etc.

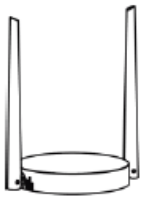
Key Features

- Equip with SX1302 chip, handing a higher amount of traffic with lower consumption
- 8 half-duplex channels for more than 2000 end-nodes connections
- Small in size for easy carrying & deployment
- Desktop, wall, or ceiling mounting support
- Multi-backhaul backups with Ethernet and Cellular (4G)
- Cover the blind spot of LoRaWAN® network by transmitting data to Milesight UG56/UG65/UG67 controller gateway
- High-cost performance, suitable for small applications

- Milesight DeviceHub 2.0 & Development Platform provide easy and centralized management of remote devices
- Compatible with mainstream network servers like The Things Industries, ChirpStack, AWS IoT Core for LoRaWAN®, etc.

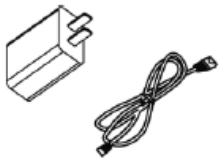
Hardware Introduction

Packing List



1 × UG63 Device

2 × Wall Mounting Kits



1 × Type-C Cable & Power Adapter

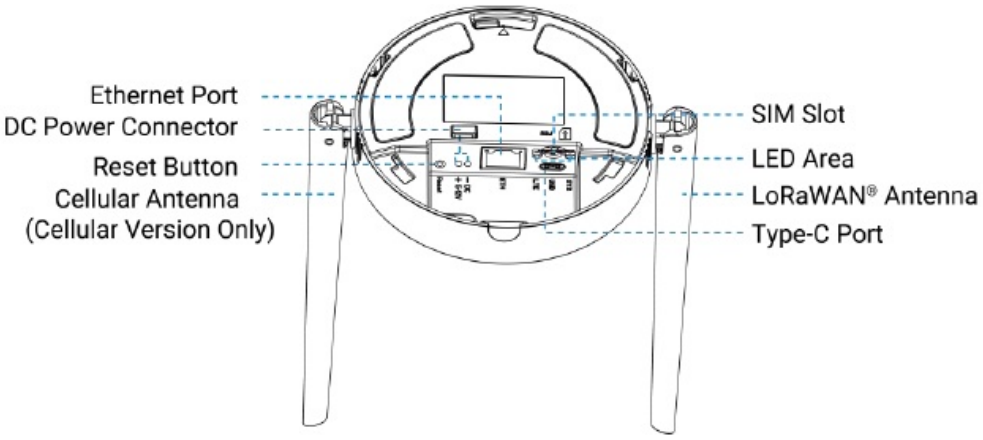
1 × Quick Guide

1 × Warranty Card

1 × PoE Splitter (Optional)

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

Hardware Overview



LED Indicator and Reset Button

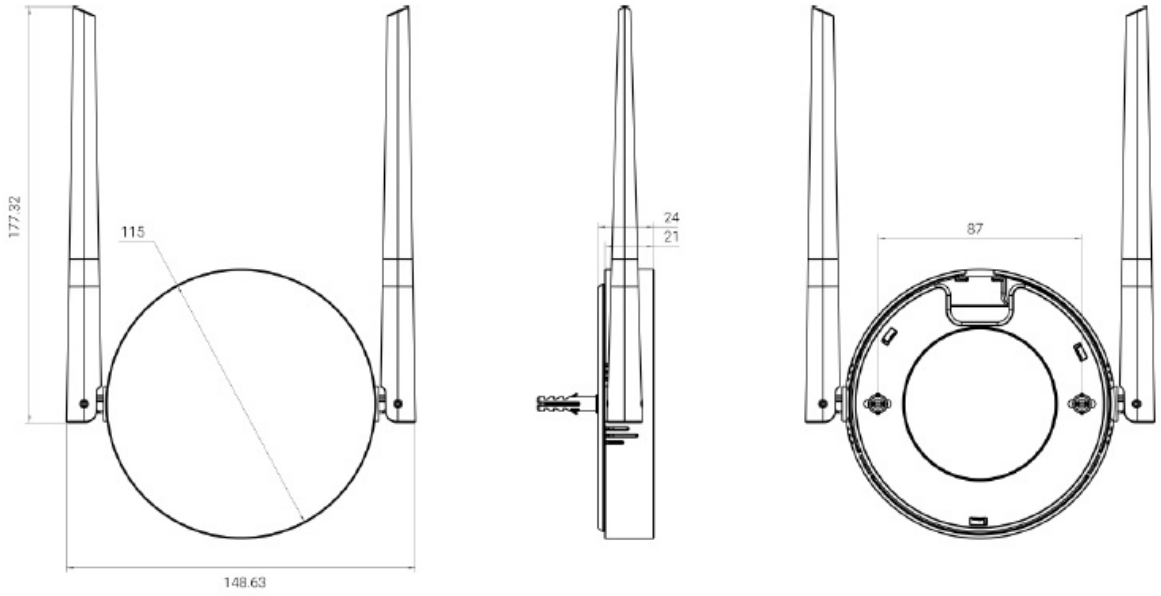
LED Indicators

LED	Indication	Status	Description
SYS	Power & System Status	Off	The power is off
		Green Light	The system is running properly
		Red Light	The system goes wrong
LTE	Cellular Status	Off	SIM card is registering or failed to register (or there are no SIM cards inserted)
		Green 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
Ethernet Port	Link Indicator	Off	Disconnected or connect failure
		Yellow Blinking	Transmitting data
	Connection Indicator	Off	Ethernet port is disconnected
		Green Light	Ethernet port is connected

Reset Button

Function	Action	LED Indication
Reset to Factory Default	Press and hold the button for more than 5 seconds	SYS: blinks rapidly.

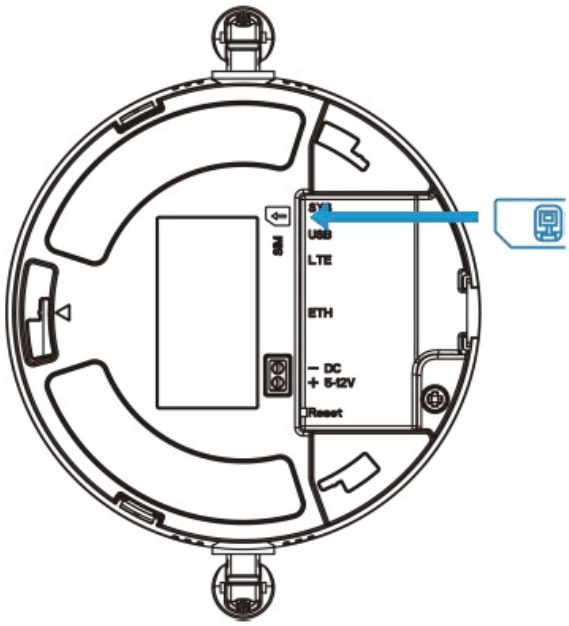
Dimensions (mm)



Hardware Installation

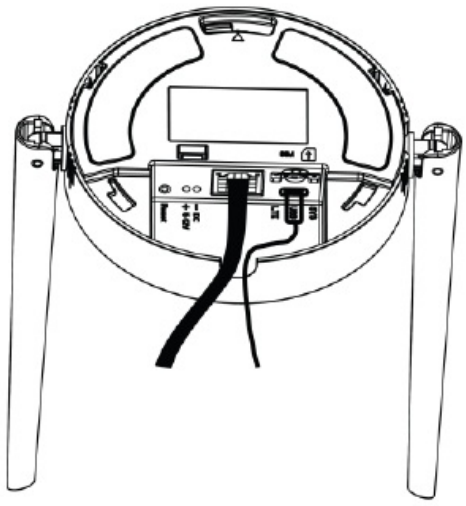
SIM Card Installation (Cellular Version Only)

Insert the micro (3FF) SIM card into the device according to arrows as follows. If you need to take out the SIM card, press the SIM card and it will pop up automatically

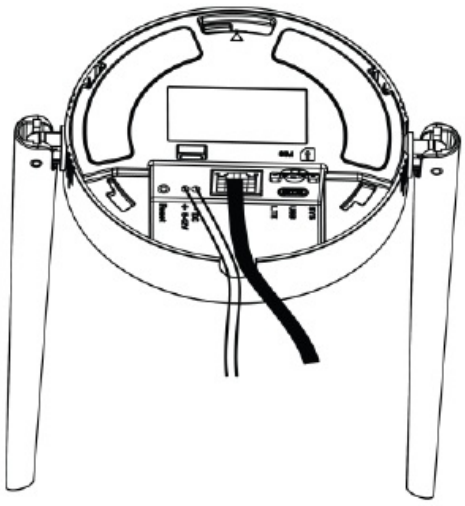


Power Supply

UG63 can be powered by USB (5V) or a DC power connector (5-12V) by default. When installing the power cables, pass them with Ethernet cables through the groove.



USB Powered



DC Powered

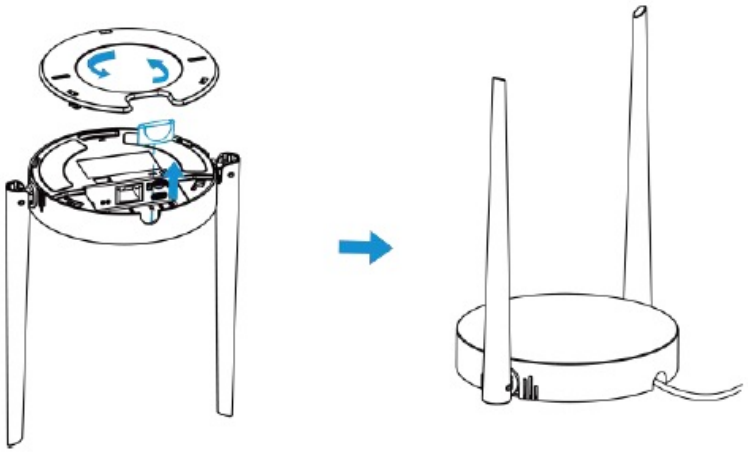
Additionally, it can also be powered by an 802.3af standard PoE source via a PoE splitter.

Gateway Installation

- UG63 supports multiple installation methods like desktop, wall mounting, ceiling mounting, etc.
- Before you start, make sure that all cables have been installed and configurations are completed.
- **Note:** Do not connect the device to the power supply or other devices when installing.

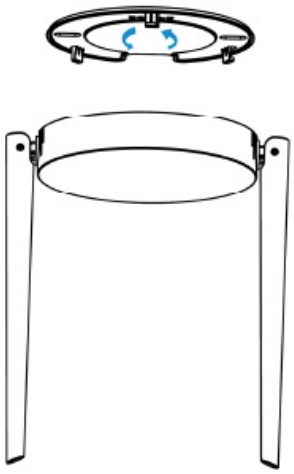
Desktop

- Take off the baffle and mounting plate on the back of the device, then you can place the device on the desktop.

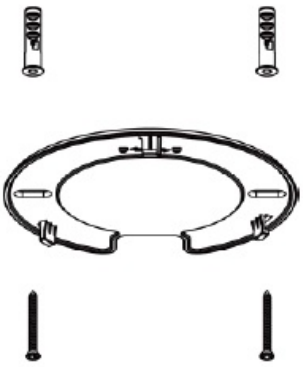


Wall/Ceiling Mounting

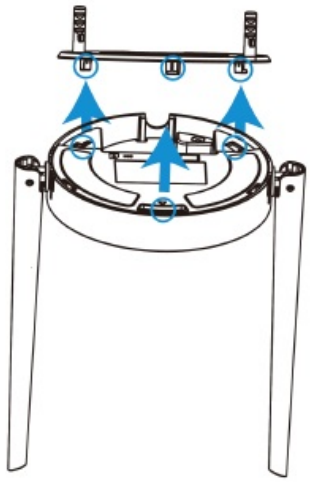
1. Take off the mounting plate on the back of the device.



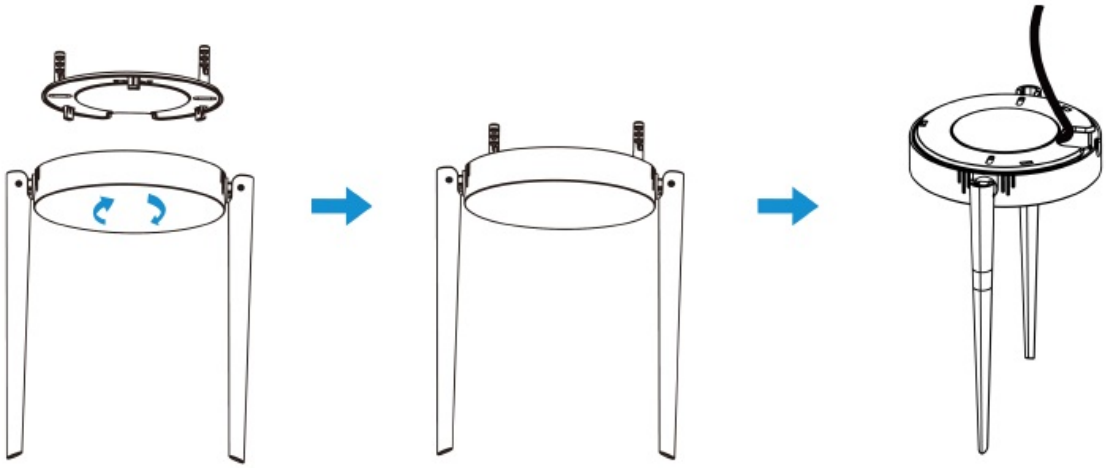
2. Align the mounting plate horizontally to the desired position on the wall or ceiling to mark two mounting holes, drill two holes as these marks, and insert wall plugs into the holes respectively.



3. Fix the mounting plate to the wall plugs with screws.



4. Turn the device clockwise to lock it to the mounting plate.



Access the Gateway

- UG63 provides user-friendly web GUI for configuration and users can get access to it via Wi-Fi.

The default settings are listed below:

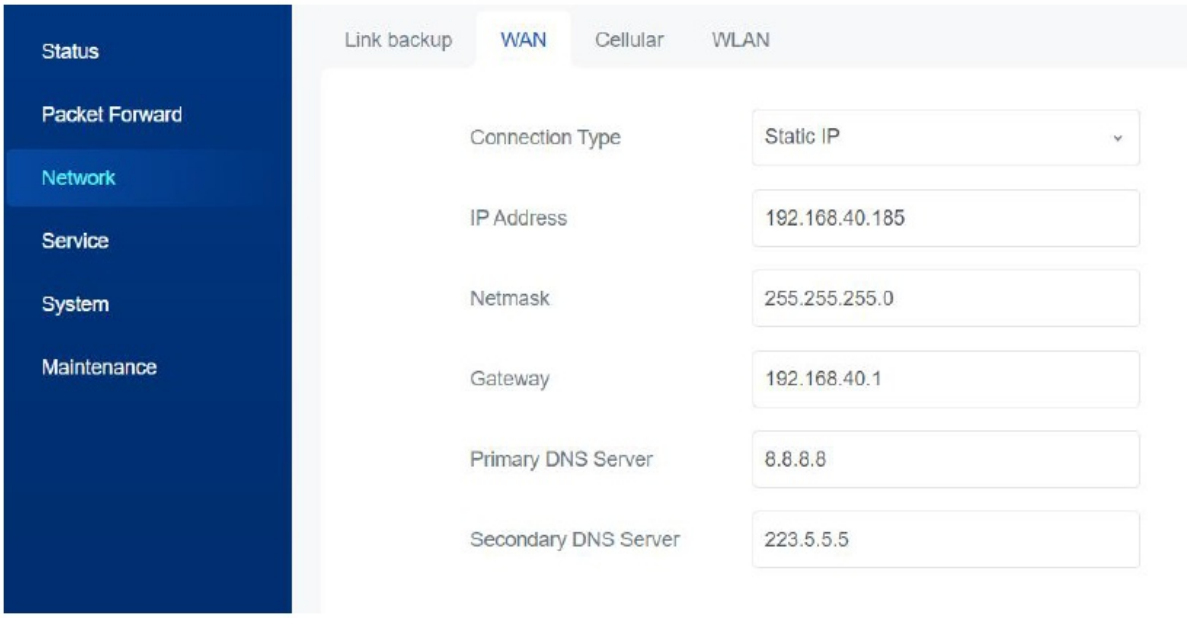
- **Wi-Fi SSID:** Gateway_XXXXXX (can be found on the label)
- **Wi-Fi IP Address:** 192.168.1.1
- **Browser:** Chrome (Recommended)
- **Username:** admin
- **Password:** password

Configuration Steps:

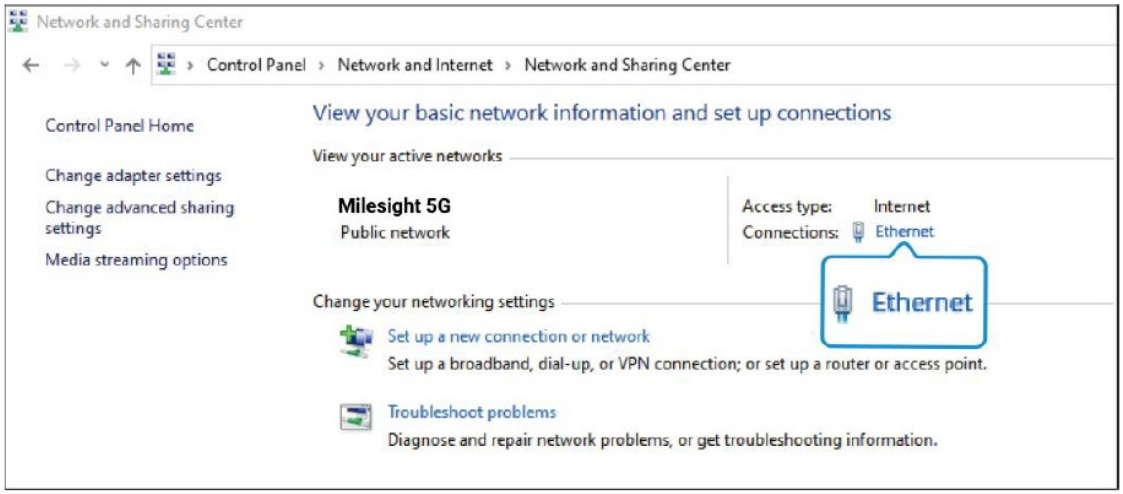
- **Step 1:** Enable the Wireless Network Connection on your computer and search for the corresponding access point, then connect the computer to this access point.

- **Step 2:** Open the browser and type 192.168.1.1 to access the web GUI.
- **Step 3:** Select the language.
- **Step 4:** Enter the default username and password to log in the web GUI.

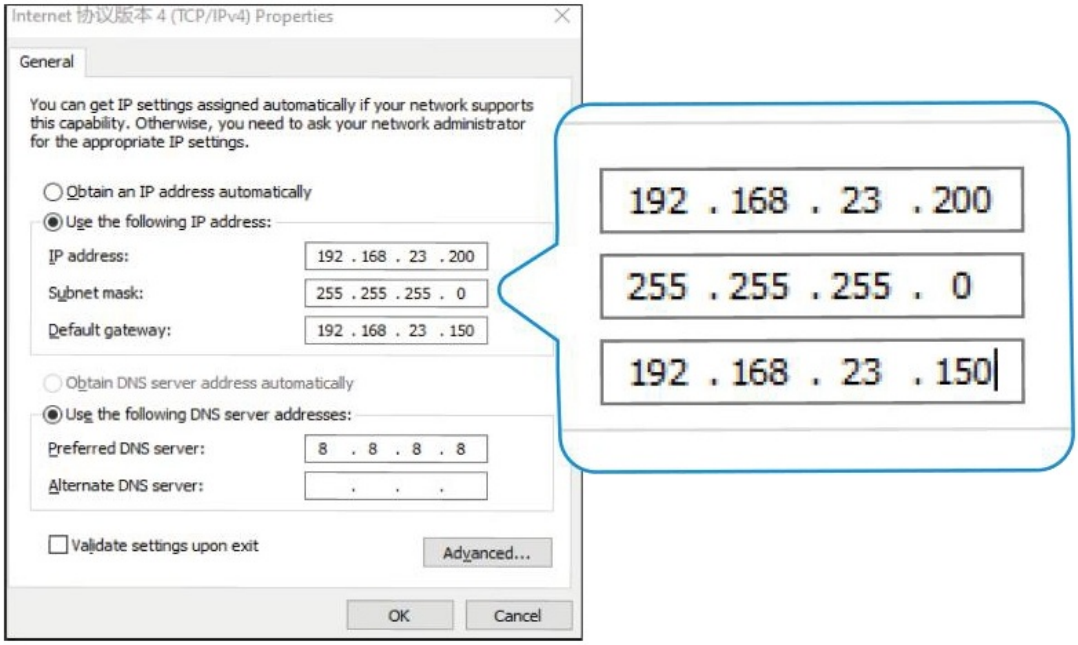
- **Step 5:** It is suggested to follow the wizard to complete basic settings. Users can also skip all steps or exit the wizard to configure the device.
    1. Configure the Link Failover settings to decide the main link as required and ping detection settings. For details please refer to Link Backup chapter.
    2. Configure the Ethernet WAN settings to set up network access as required. For details please refer to WAN chapter.
    3. Configure the cellular network settings to set up cellular connections. Usually, it is necessary to type the APN parameter to register to cellular networks. For details please refer to Cellular chapter.
    4. Configure correct system time. For details please refer to Time chapter.
    5. Configure the device to connect a LoRaWAN® network server. For details please refer to Packet Forward-General chapter.
    6. Configure the packet filter. For details please refer to Packet Forward-Packet Filters chapter.
    7. Configure the WLAN settings. For details please refer to WLAN chapter.
    8. Change a device password for security.
        - **Note:** The connection type of Ethernet port is DHCP by default. UG63 also supports wired access if you select the connection type of Ethernet port as static IP and assign an IP address to Ethernet port.
        - **Step 1:** Go to Network > WAN page to select connection type as Static IP and configure an IP address for the Ethernet WAN port.



- **Step 2:** Connect computer to Ethernet port of UG63 directly or via switch.
- **Step 3:** Assign the IP address to computer manually. Take Windows 10 system as an example,
  - **A.** Go to “Control Panel” → “Network and Internet” → “Network and Sharing Center”, then click “Ethernet” (It may have different names).



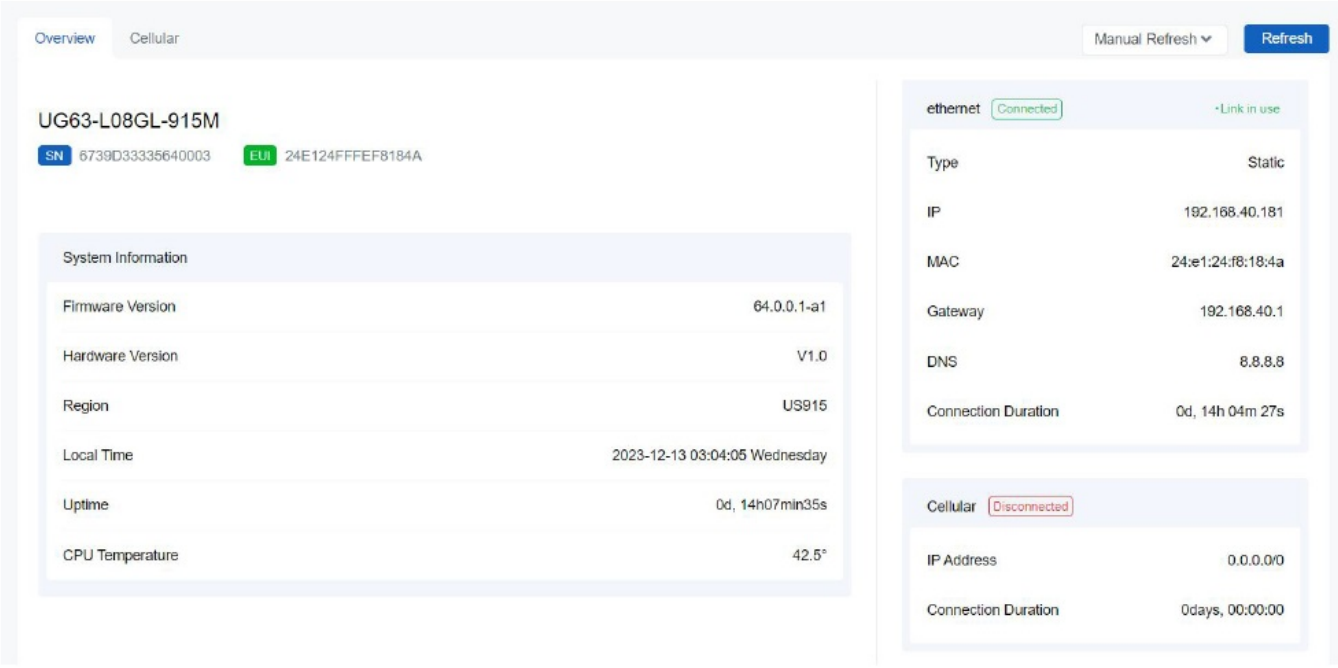
  - **B.** Go to “Properties” → “Internet Protocol Version 4 (TCP/IPv4) ”and select “Use the following IP address”, then assign a static IP manually within the same subnet of UG63.



- **Step 4:** Open the browser and type the IP address of Ethernet port to access the web GUI.

Operation Guide

Status

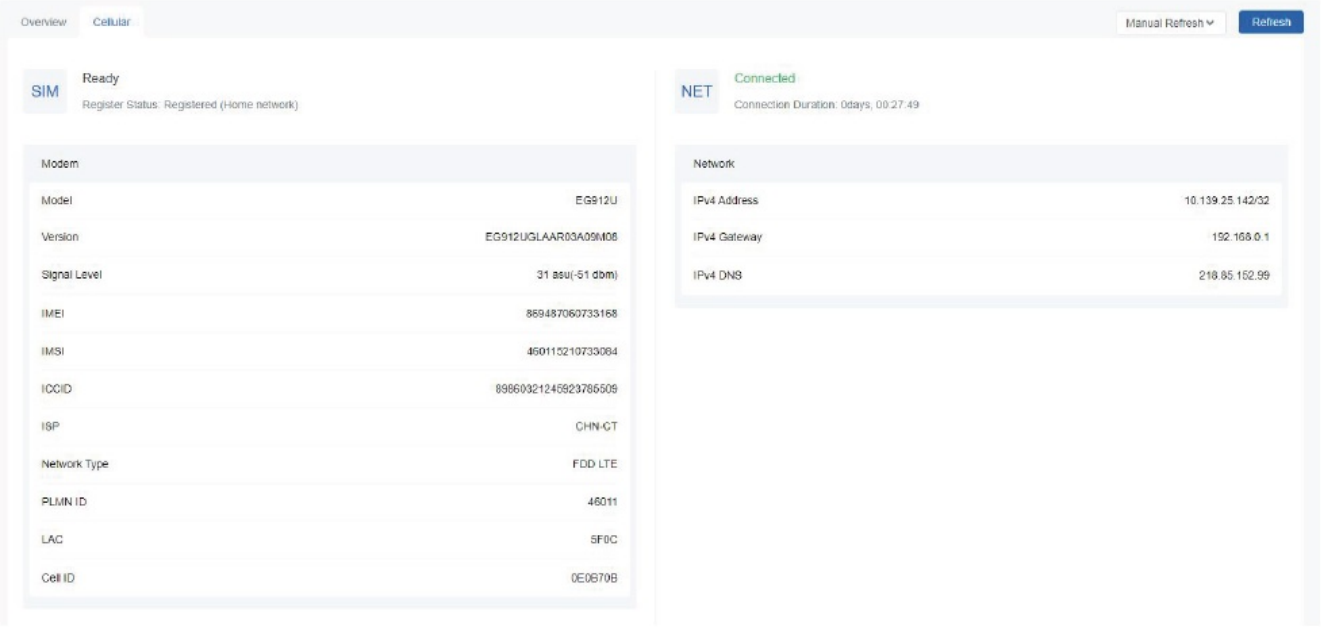


Overview	
Parameters	Description
Model	The whole model name of the gateway.

SN	The serial number of the gateway.
EUI	The unique identifier of the gateway and it’s non-editable.
System Information	
Firmware Version	The current firmware version of the gateway.
Hardware Version	The current hardware version of the gateway.
Region	The LoRaWAN® frequency region of the gateway. This is non-editable. Note: the frequency plan can be changed on Packet Forward > Radios page

	and will be not affected by this region value. For example, the gateway with region AU915 can also change the frequency plan to US915, AS923-1, etc.
Local Time	The current local time of the system.
Uptime	The information on how long the gateway has been running.
CPU Temperature	The temperature of CPU.
Ethernet	
Type	The latitude of the location.
IP	The IP address of Ethernet port.
MAC	The MAC address of the Ethernet port.

Gateway	The upper gateway address of the Ethernet port.
DNS	The DNS server address of the Ethernet port.
Connection Duration	The information on how long the Ethernet network has been connected.
Cellular (Cellular Version Only)	
IP Address	The IP address of cellular network.
Connection Duration	The information on how long the cellular network has been connect ed.
WLAN	
SSID	The SSID of the WLAN access point.
LoRaWAN Packet Forward	
Server Type	The LoRaWAN® packet forward connection type.
Server Address	The LoRaWAN® network server address. When server type is Basi c Station, this will show LNS URI and CUPS URI.



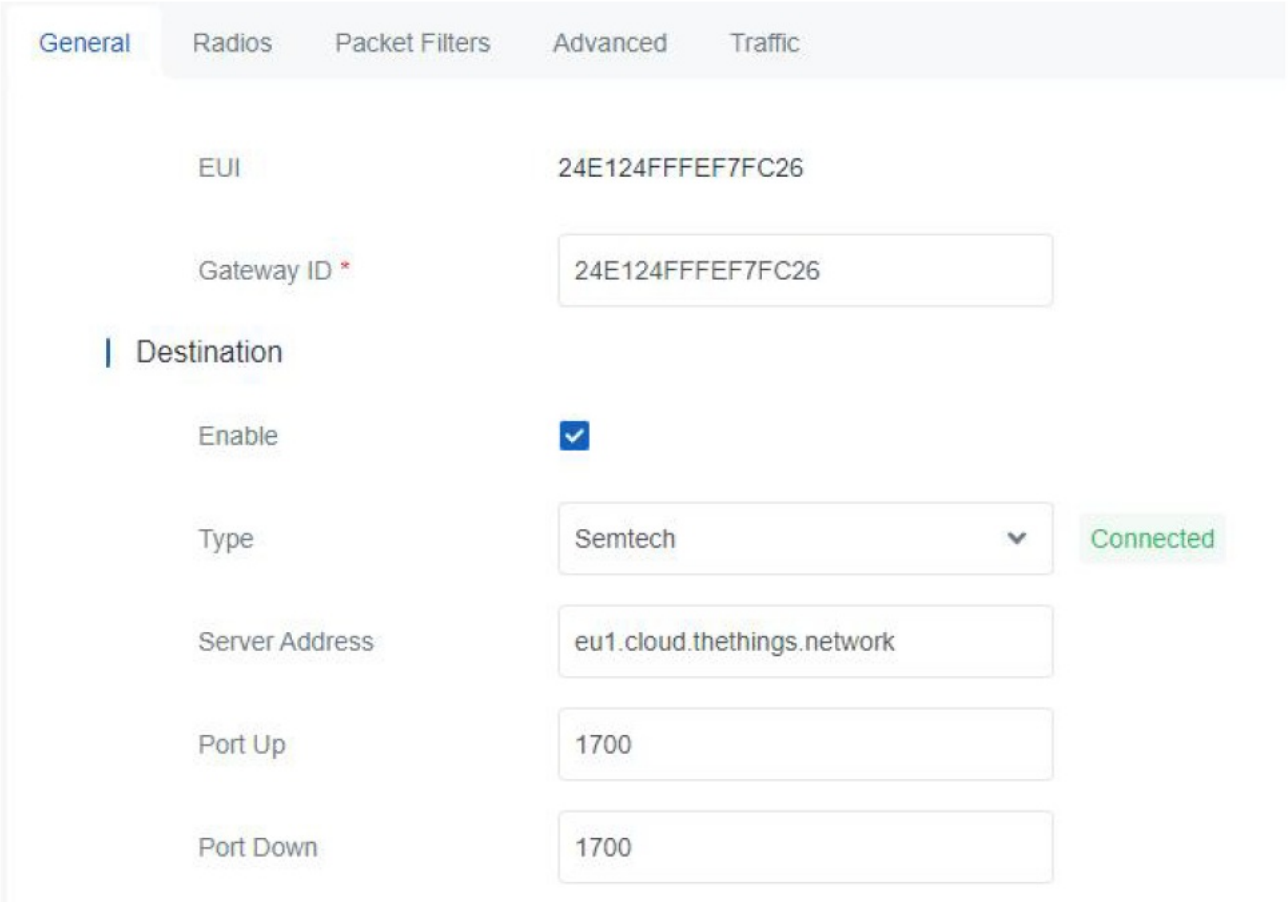
Cellular (Cellular Version Only)	
Parameters	Description
Modem	
SIM Status	Corresponding detection status of module and SIM card. l No SIM Card: the SIM card is not inserted l SIM Card Error: the SIM card is error l PIN Error: the PIN code is error l PIN Required: the SIM card requires to type PIN code l PUK Required: the SIM card requires to be unlocked by PUK code l No Signal: no cellular signal l Ready: the SIM card is inserted l Down: the SIM card is deactivated
Register Status	The registration status of SIM card.

Model	The name of cellular module.
Version	The firmware version of cellular module.
Signal Level	The RSSI (Received Signal Indicator) of registered cellular network.
IMEI	The IMEI of the cellular module.
IMSI	The IMSI of the SIM card.
ICCID	The ICCID of the SIM card.
ISP	The network provider on which the SIM card registers.
Network Type	The connected network type, such as FDD LTE.
PLMN ID	The current PLMN ID, including MCC, MNC, LAC and Cell ID.
LAC	The location area code of the SIM card.
Cell ID	The Cell ID of the SIM card location.
Network	
Connection Status	The connection status of the cellular network.
Connection Duration	The information on how long the cellular network has been connected.
IPv4 Address	The IPv4 address of the cellular network.
IPv4 Gateway	The IPv4 gateway of the cellular network.
IPv4 DNS	The IPv4 DNS sever of the cellular network.

Packet Forward

UG63 supports to work as a packet forwarder to set up communication between LoRaWAN® end devices and LoRaWAN® network server.

General



General	
Parameters	Description
EUI	The unique identifier of the gateway and it’s non-editable.
Gateway ID	The customizable ID for registering gateway to network server, such as TTN. It is the same as gateway EUI by default.
Destination	
Enable	Enable or disable the packet forward feature.

Type	Select packet forward type among Semtech, Chirpstack-Generic, Basic Station, Remote Embedded NS, DeviceHub LNS or Milesight Development Platform LNS. Semtech: connect to network server through the Semtech UDP protocol. It supports to connect to most mainstream network servers. Chirpstack-Generic: connect to Chirpstack via generic MQTTgateway bridge. Basic Station: connect to network server through TCP protocol. When configuring, there is no need to configure both LNS and CUPS settings. Remote Embedded NS: connect to embedded network server of Milesight UG65/UG67/UG56 gateways. DeviceHub LNS: connect to Milesight DeviceHub LNS. This needs to select and enable DeviceHub 2.0 option on Service page and type the platform address.

	Milesight Development Platform LNS: connect to Milesight Development Platform LNS. This needs to select and enable Milesight Development Platform option on Service page and add the gateway to your platform account.

Semtech

Server Address	The LoRaWAN® network server IP address or domain.
Port Up	The UDP port to forward uplinks from end device to network server.

Port Down	The UDP port to forward downlinks from network server to end device.

Basic Station

URI	The URL of LoRaWAN® network server. Please type as below format and replace *<server-address>*and *<port>*as real server address and server port. LNS URI: *wss://<server-address>:<port>*or *ws://<server-address>:<port>* CUPS URI: *htps://<server-address>:<port>*
CA File	CA certificate to secure the server domain. Note: change the certificate file format as*.trust*before import.
Client Certificate File	Client certificate file to verify the identity of the gateway.
Client Key File	Private key file to verify the identity of the gateway.
GPS	When connecting via LNS, enable or disable it to forward gateway GPS data to network server.

Chipstack-Generic

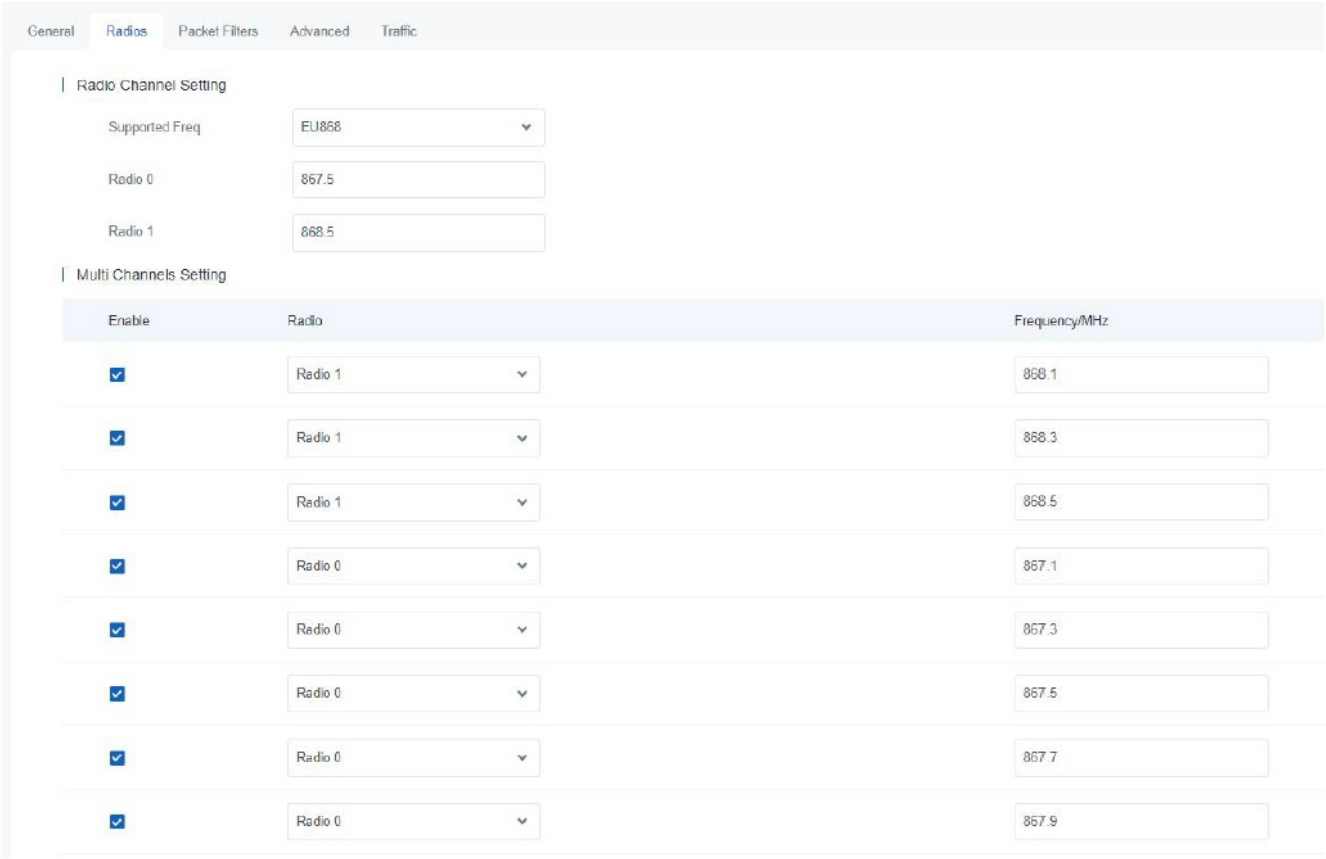
Server Address	The LoRaWAN® network server IP address or domain.

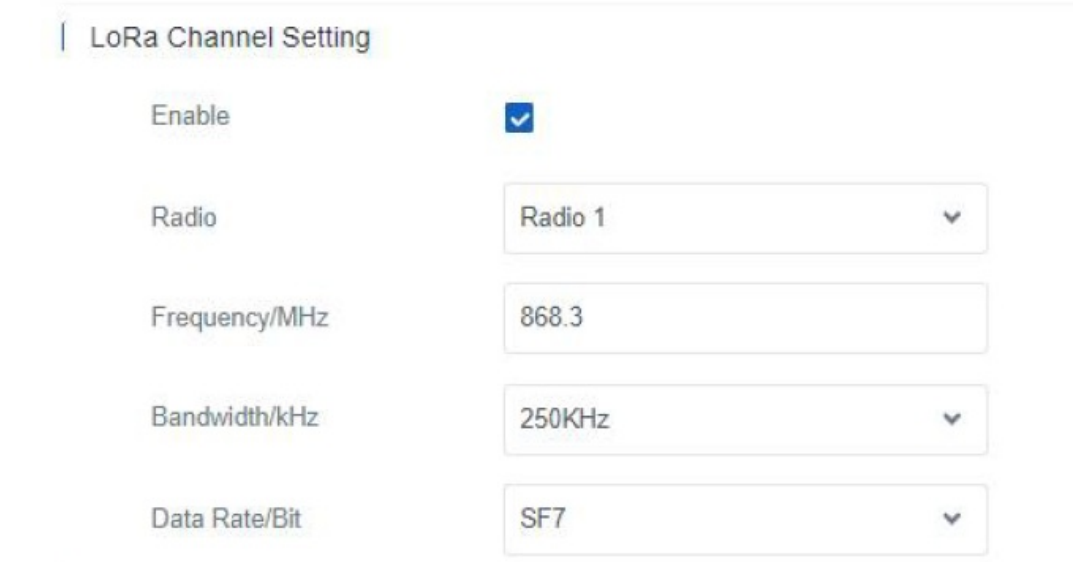
MQTT Port	The LoRaWAN® network server port.
User Credentials	After enabled, username and password are required to type for verification.
TLS Authentication	Select “Self signed certificates” or “CA signed server certificate”. CA signed server certificate: verify with the certificate issued by Certificate Authority (CA) that pre-loaded on the device. Self signed certificates: upload the custom CA certificates, client certificates and secret key for verification.

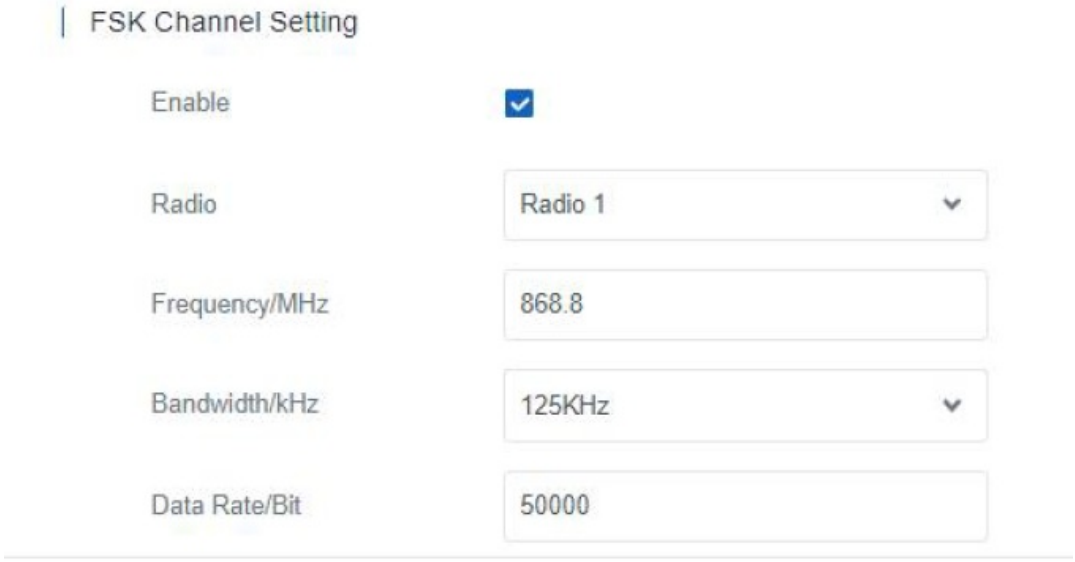
Remote Embedded NS

Server Address	The IP address or domain name of Milesight controller gateway.
MQTT Port	The communication port to Milesight controller gateway.

Radios


General
Radios
Packet Filters
Advanced
Traffic
Radio Channel Setting
Supported Freq
EU868
Radio 0
867.5
Radio 1
868.5
Multi Channels Setting
Enable
Radio
Frequency/MHz
Radio 1
868.1
Radio 1
868.3
Radio 1
868.5
Radio 0
867.1
Radio 0
867.3
Radio 0
867.5
Radio 0
867.7
Radio 0
867.9


LoRa Channel Setting
Enable
Radio
Radio 1
Frequency/MHz
868.3
Bandwidth/kHz
250KHz
Data Rate/Bit
SF7

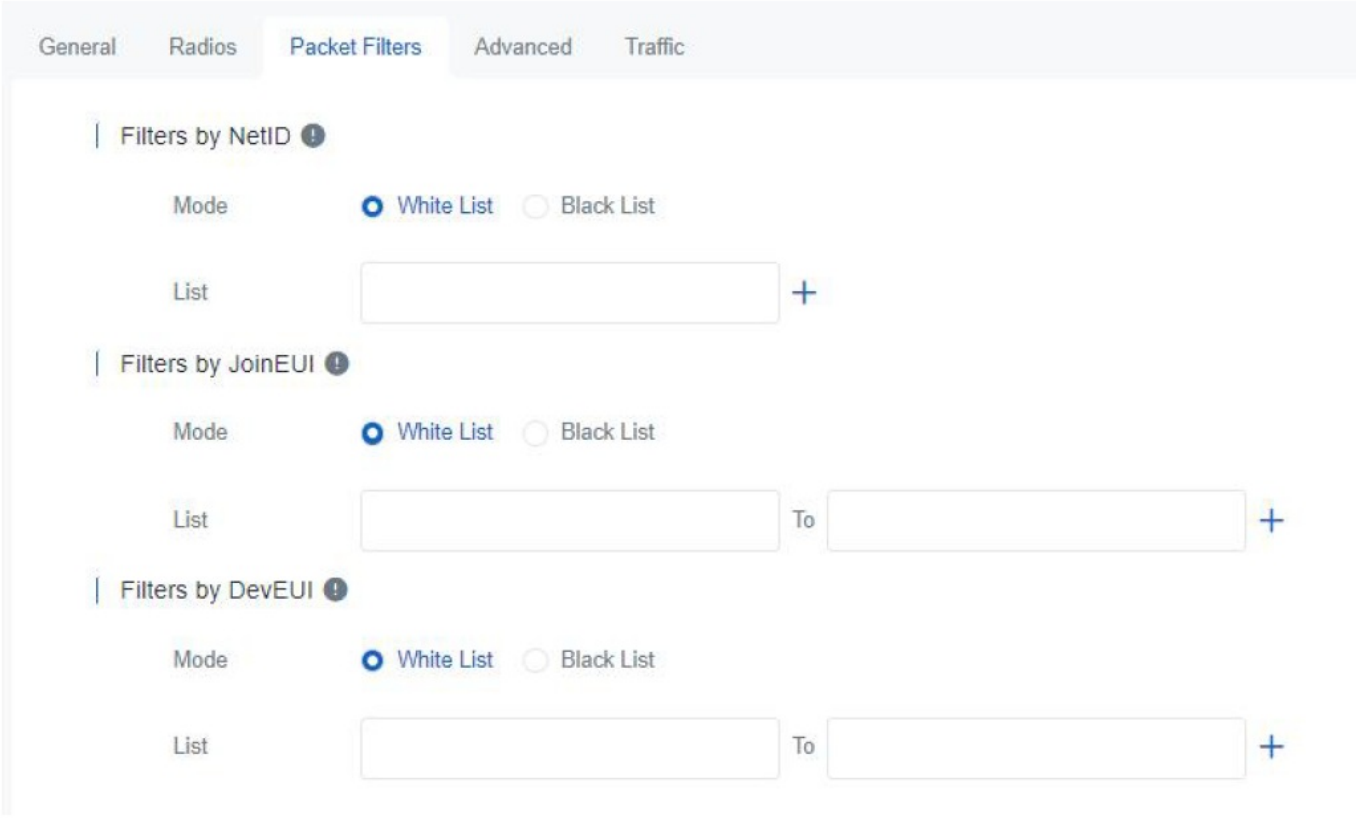

FSK Channel Setting
Enable
Radio
Radio 1
Frequency/MHz
868.8
Bandwidth/kHz
125KHz
Data Rate/Bit
50000

Radios	
Parameters	Description
Radio Channel Setting	

Supported Freq	The LoRaWAN® frequency plan used for the uplink and downlink frequencies and datarates. Available options depend on the gateway's model: -470M: CN470 -868M: EU868, RU864, IN865 -915M: US915, AU915, KR920, AS923-1&2&3&4
Radio 0/Radio 1	The center frequencies to receive packets from LoRaWAN® nodes.
Multi Channels Setting	
Enable	Enable or disable this channel to transmit packets.
Radio	Choose Radio 0 or Radio 1 as the center frequency.
Frequency/MHz	Set the frequency of this channel. Range: center frequency ± 0.4625.
LoRa/FSK Channel Setting	
Enable	Enable or disable this channel to transmit packets.
Radio	Choose Radio 0 or Radio 1 as the center frequency.
Frequency/MHz	Set the frequency of this channel.
Bandwidth/kHz	Set the bandwidth of this channel.
Data Rate/Bit	Set the data rate.

Packet Filters

UG63 supports to filter uplink packets via different conditions to reduce network congestion, save network traffic and ensure the safe operations.

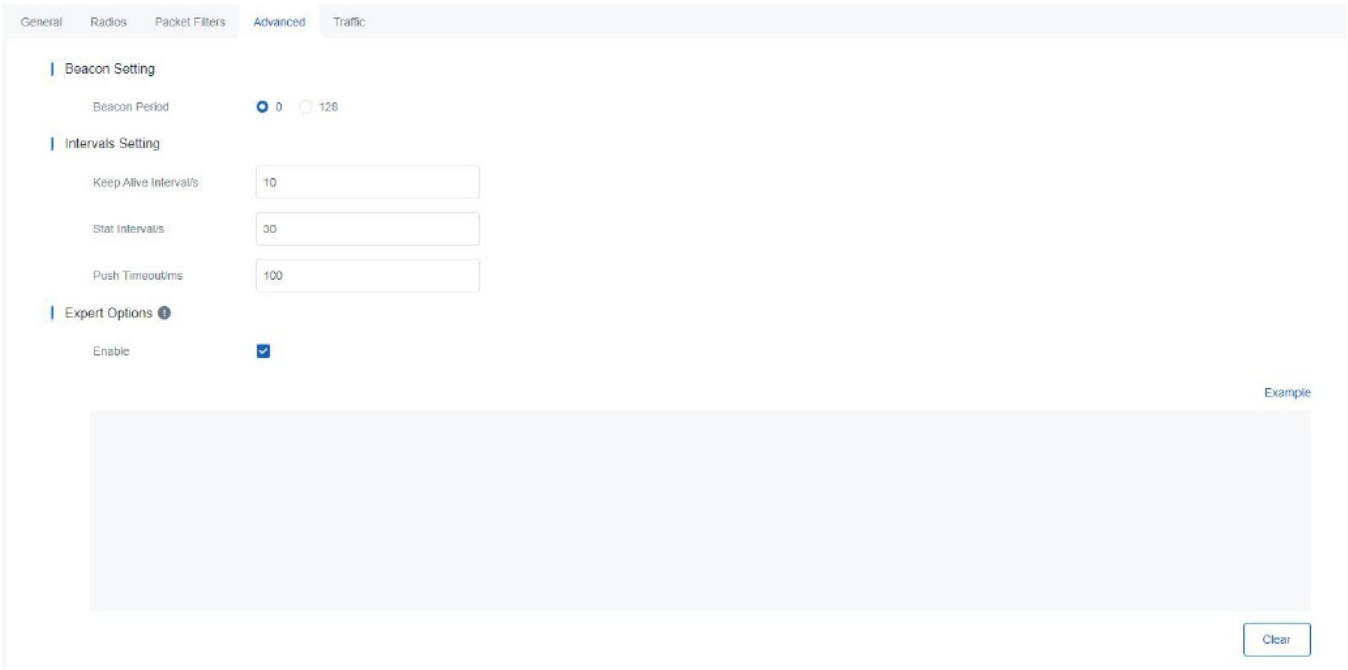


Packet Filters	
Parameters	Description
Filters by NetID	Forward/Not forward the uplink packets that meet the NetID.
Filters by JoinEUI	Forward/Not forward the join request packets that meet the JoinEUI range.
Filters by DevEUI	Forward/Not forward the join request packets that meet the DevEUI range.

Mode	Select the filter mode as black list or white list. White List: Only forward the packets in this list to the network server. Black List: Only forward the packets except this list to the ne twork server.
List	Set the specific filtering value or range list. Every condition supports to add 5 lists at most.

Note: When join EUI and dev EUI are both configured, only packets that meet both conditions will be forwarded.

Advanced



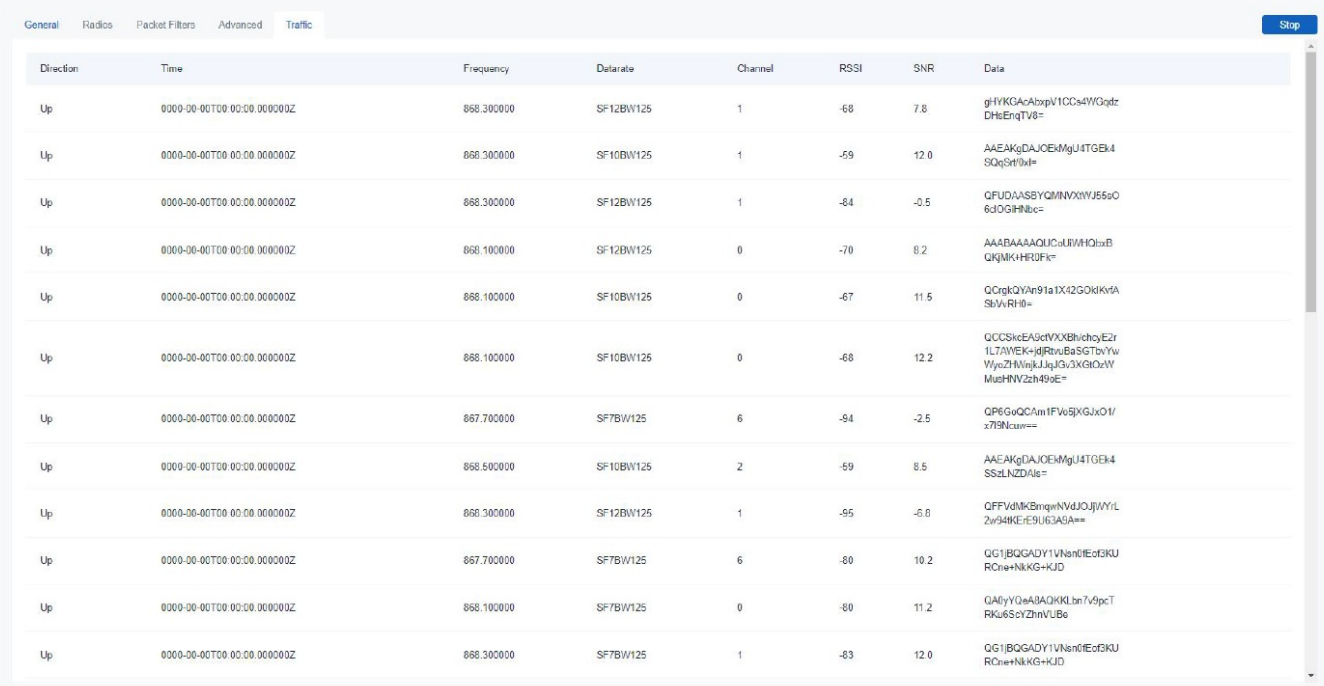
Advanced	
Parameters	Description
Beacon Setting	

Beacon Period	Interval of gateway sending beacons for Class B device time synchronization. 0 means the gateway will not send beacons. Please select the value as 128 if end device type is Class B.
Intervals Setting	
Keep Alive Interval/s	The interval of keepalive packet which is sent from gateway to network server to keep the connection stable and alive.

Start Interval/s	The interval to update the network server with gateway statistics.
Push Timeout/ms	The timeout to wait for the response from server after the gateway sends data.
Expert Options	
Enable	After enabled, the device supports customizing the configuration file to configure packet forwarder and customized configuration will overwrite the packet forward configurations of web GUI. To customize configuration file with correct format, click “Example” to go to reference page.

Traffic

UG63 supports to display latest 30 pieces of traffic received from end devices or network server.

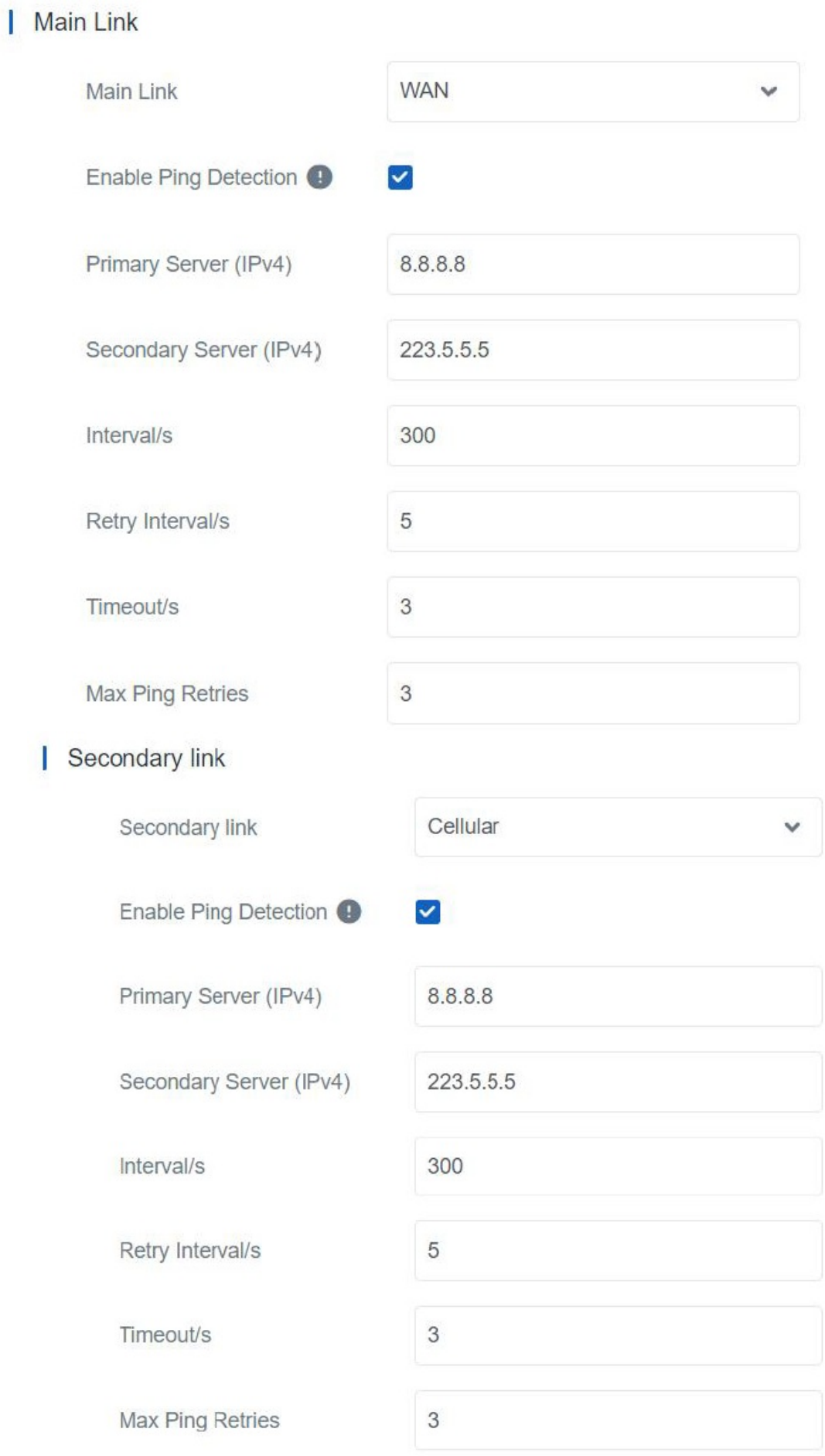


Traffic	
Parameters	Description
Fresh/Stop	Fresh: click to fresh this page to update latest data automatically. St op: click to stop fresh this page to update latest data.
Direction	The transmission direction of this packet.
Time	The receiving time of this packet.
Frequency	The frequency of receiving or sending this packet.
Datarate	The datarate of this packet.
Channel	The frequency channel of receiving or sending this packet.
RSSI	The received signal strength of this packet.
SNR	The signal-to-noise ratio of this packet.
Data	The encrypted data of this packet.

Network Link Backup

UG63 supports to set the priorities of both network links and the ping detection settings

to check if the link is available.



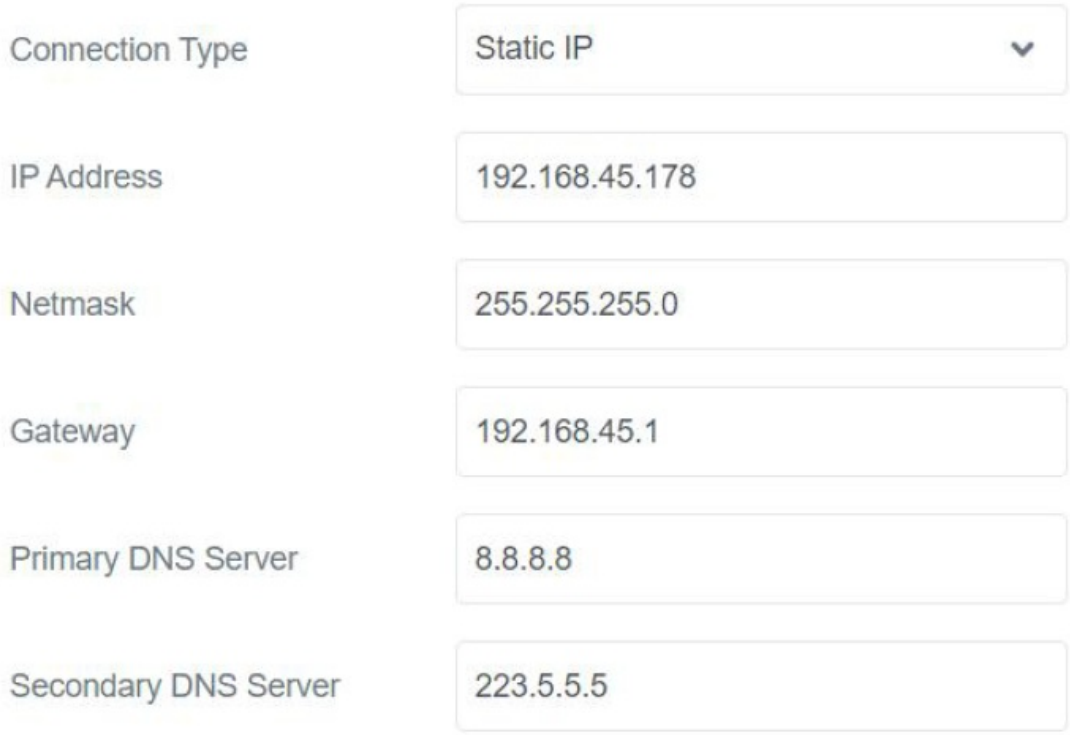
Link Backup	
Parameters	Description

Main Link	Select from WAN and Cellular.
Secondary Link	Select from WAN (Cellular) or None.
Enable Ping Detection	After enabled, the device will send ICMP packets to corresponding servers to detect the connection periodically. Note: it is suggested to disable this option if the device is connected to the private network (Non-internet).
Primary Server (IPv4)	The device will send ICMP packet to this server address to determine whether the Internet connection is still available or not.
Secondary Server (IPv4)	The device will try to ping the secondary server address if primary server is not available.
Interval/s	Time interval between two Pings.
Retry Interval/s	When ping failed, the device will ping again at every retry interval.
Timeout/s	The maximum time which the device will wait for a response to a ping request. If it does not receive a response for the timeout, the ping request will be considered to have failed.

Max Ping Retries	The number of times the device will retry sending a ping request until determining that the connection has failed.
More	
Revert to Main Link	When the connection of main link returns back, reverting back to main link.
Recovery interval/s	Specify the number of seconds to wait for switching to the main link, 0 means disable the function.
Emergency Reboot	Enable to reboot the device if no link is available.

WAN

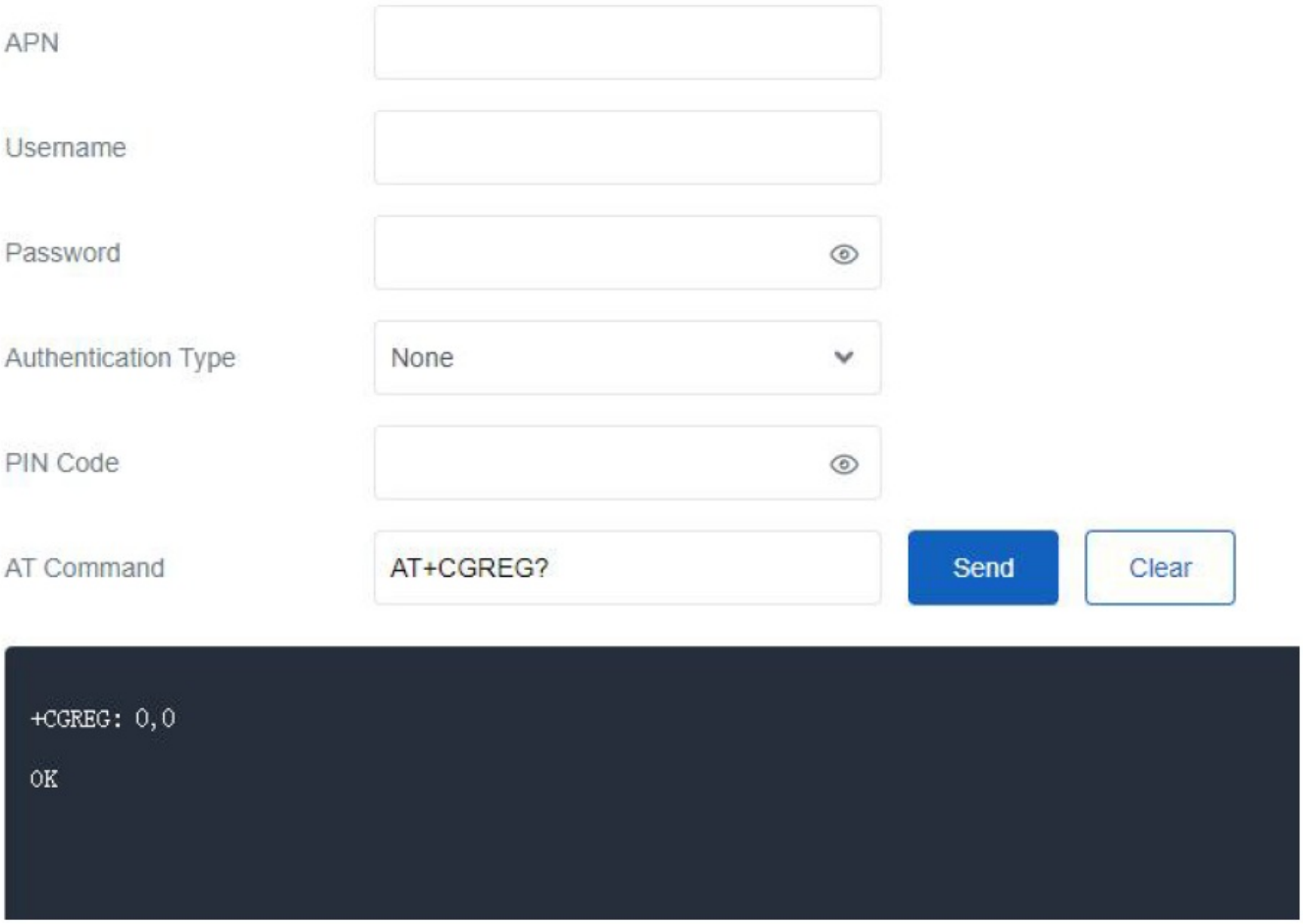
UG63 supports to connect Ethernet port to a router to get network access.



WAN	
Parameters	Description
Connection Type	Select connection type as required. Static IP: assign a static IP address, netmask and gateway for Ethernet WAN port. DHCP Client: configure Ethernet WAN interface as DHCP Client to obtain IP address automatically.
Primary DNS Server	Set the primary IPv4 DNS server.
Secondary DNS Server	Set the secondary IPv4 DNS server.

Cellular (Cellular Version Only)

UG63 supports to insert a SIM card to get cellular network connections.



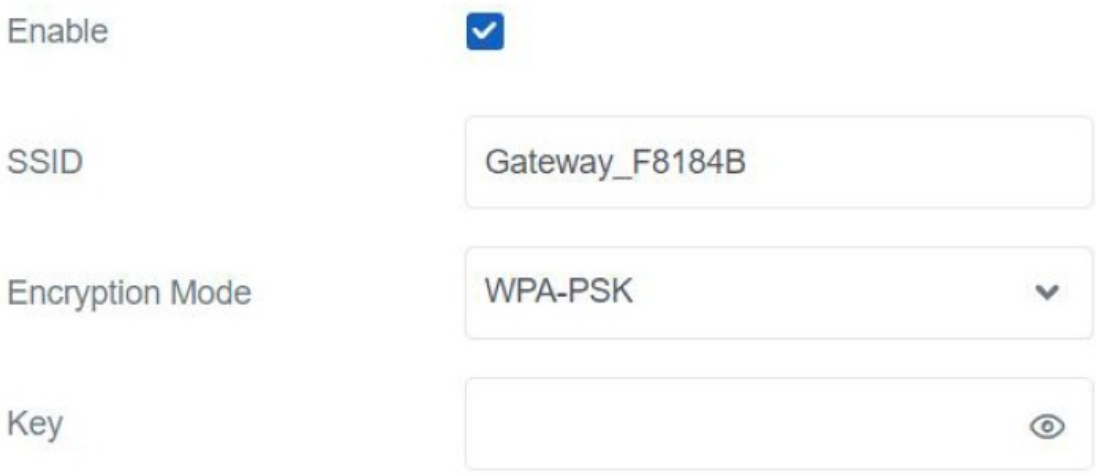
Cellular	
Parameters	Description
APN	The Access Point Name for cellular dial-up connection provided by l ocal ISP. Please contact cellular operator or search for the Internet to get it.
Username	The username for cellular dial-up connection provided by local ISP.
Password	The password for cellular dial-up connection provided by local ISP.
Authentication Type	Select from None, PAP and CHAP.
PIN Code	A 4-8 characters PIN code to unlock the SIM.

AT Command	Send AT Command to get cellular information or configure advanced settings.

WLAN

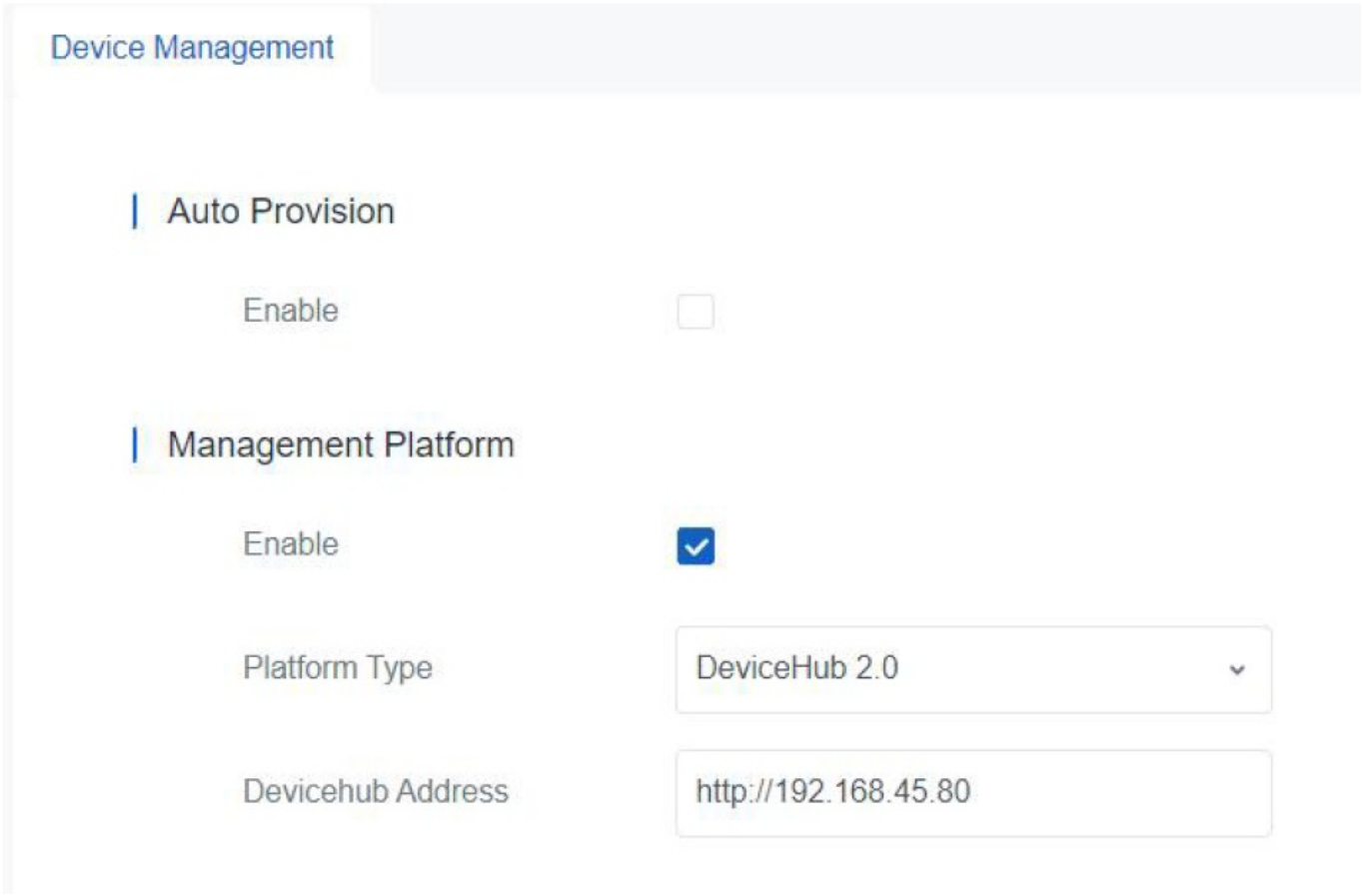
UG63 supports wlan feature to work as AP mode to configure device and it can not connect to other access points.

Note: one UG63 device only supports 2 devices' WLAN connection to log in this device at the same time.



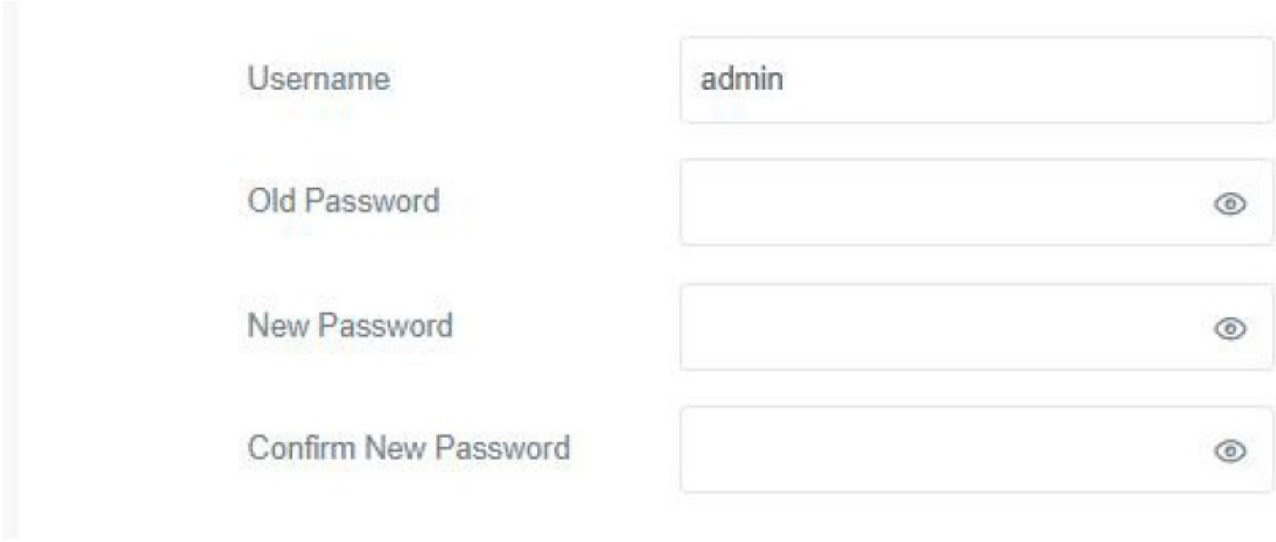
WLAN	
Parameters	Description
Enable	Enable or disable Wi-Fi feature.
SSID	The unique name for this device Wi-Fi access point. The default SSID is Gateway_XXXXXX. (XXXXX=last 6 digits of MAC address)
Encryption Mode	No Encryption and WPA-PSK are optional.
Key	Customize the Wi-Fi password when security mode is WPA-PSK.

Service



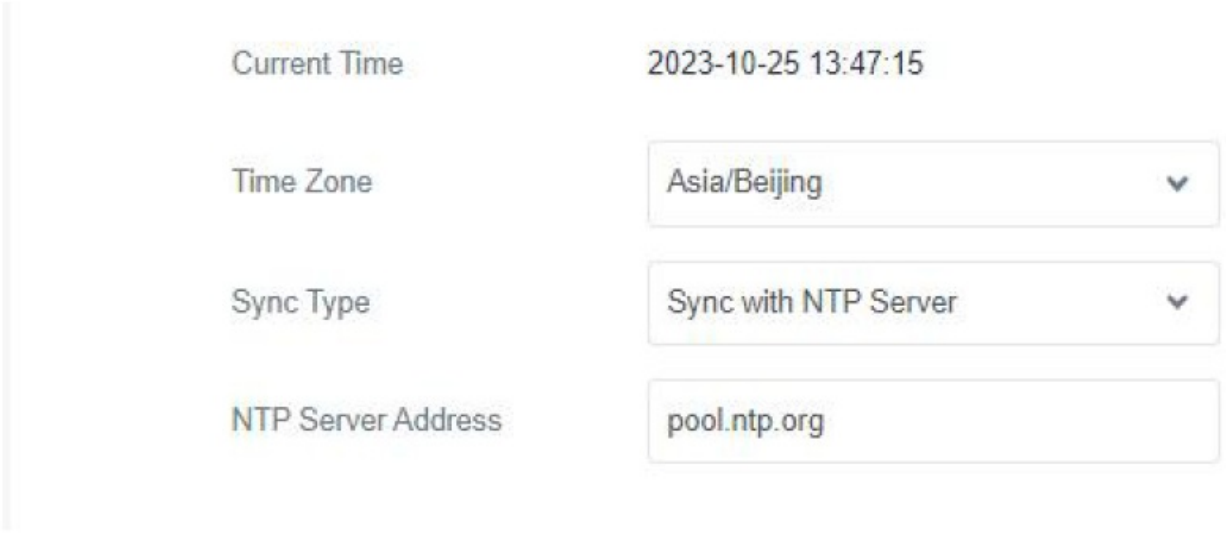
Parameters	Description
Auto Provision	Enable to receive the configurations from Milesight Development Platform once after the device is connected to Internet. This will work even management platform mode is disabled.
Management Platform	
Enable	Enable the device to be managed by Milesight management platforms.
Platform	Milesight DeviceHub 2.0 or Milesight Development Platform is optional.
DeviceHub Address	Set the DeviceHub server IP address or domain name.

System General



Parameters	Description
Username	Enter a new username. Only capital, lowercase, digits, “_”, and “-” are allowed.
Old Password	Enter the old password.
New Password	Enter a new password.
Confirm New Password	Enter the new password again.

Time

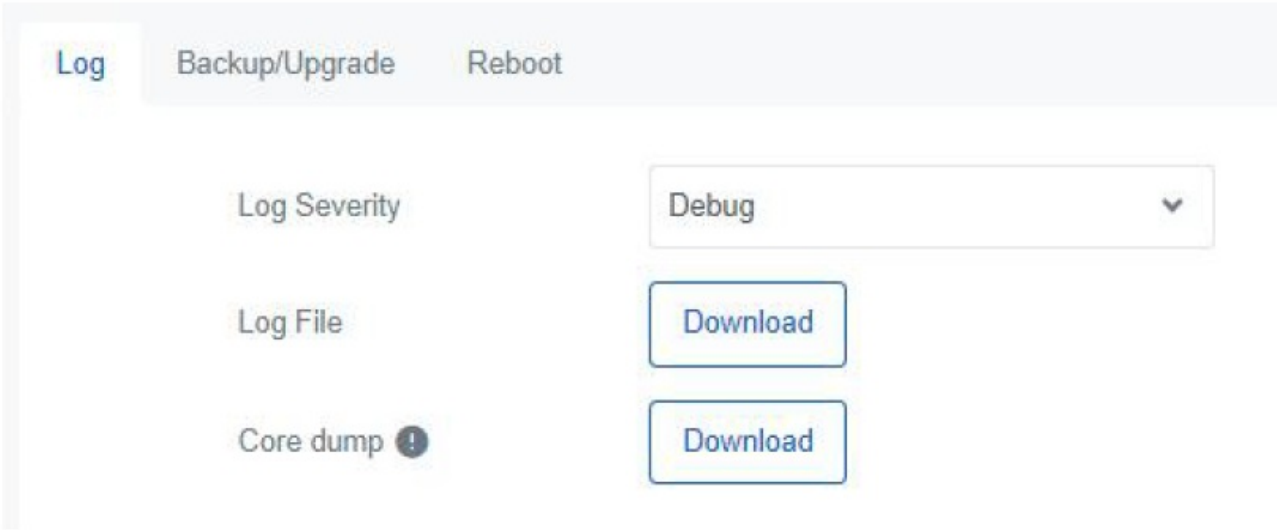


Parameters	Description
Current Time	Show the current system time.
Time Zone	Click the drop-down list to select the time zone you are in.
Sync Type	It’s fixed as Sync with NTP Server.
NTP Server Address	Set the NTP Server’s IP address or domain name.

Access Service

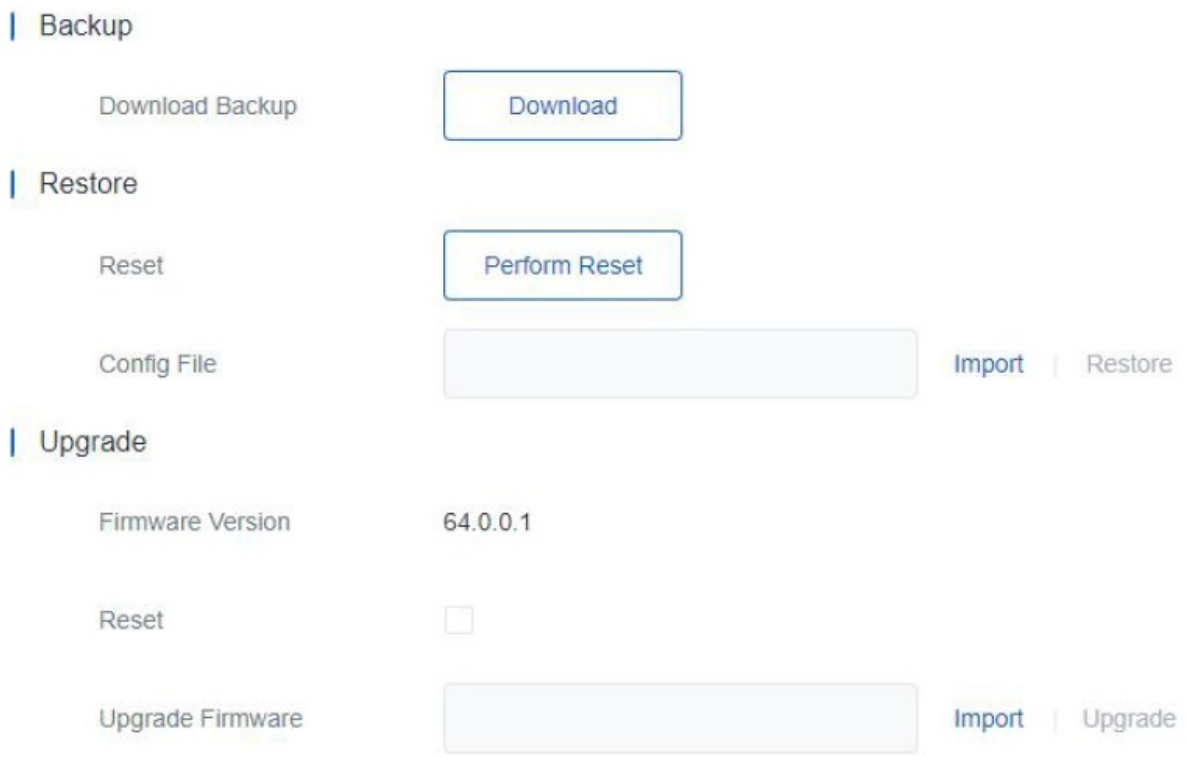
Parameters	Description
Local access	Enable or disable the local access of HTTP.
Access port	Set the service port of HTTP.

Maintenance Log



Parameters	Description
Log Severity	The list of severities follows the syslog protocol.
Log File	Download log file.
Core dump	Core dump file contains a snapshot of a program’s memory at a s pecific point in time when the program encounters a critical error or crashes, which can be used for debugging and troubleshooting purposes.

Backup/Upgrade

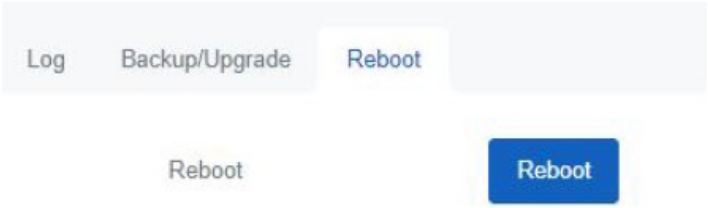


Backup/Upgrade	
Parameters	Description
Backup	
Backup	Export the current configuration file to the PC.
Restore	
Reset	Reset device to factory default settings. The device will restart after reset process is done.
Config File	Click “Import” button to select configuration file, and then click “Restore ” button to upload the configuration file to the device.
Upgrade	

Firmware Version	Show the current firmware version.
Reset	When this option is enabled, the device will be reset to factory defaults after upgrade.
Upgrade Firmware	Click “Import” button to select the new firmware file, and click “Upgrade ” to upgrade firmware.

Reboot

On this page, you can reboot the gateway and return to the login page. We strongly recommend clicking “Save” button before rebooting the gateway so as to avoid losing the new configuration.



Appendix Default Frequency

Supported Freq	Channel/MHz
CN470	471.9, 472.1, 472.3, 472.5, 472.7,472.9, 473.1, 473.3 (8~15)
EU868	868.1, 868.3, 868.5, 867.1, 867.3, 867.5, 867.7, 867.9

IN865	865.0625, 865.4025, 865.6025, 865.985, 866.185, 866.385, 866.585 , 866.785
RU864	868.9, 869.1, 869.3, 867.3, 867.5, 867.7, 867.9, 868.1
AU915	916.8, 917, 917.2, 917.4, 917.6, 917.8, 918, 918.2 (8~15)
US915	903.9, 904.1, 904.3, 904.5, 904.7, 904.9,905.1, 905.3 (8~15)
KR920	922.1, 922.3, 922.5, 922.7, 922.9, 923.1, 923.3, 923.5
AS923-1	923.2, 923.4, 922, 922.2, 922.4, 922.6, 922.8, 923
AS923-2	921.2, 921.4, 921.6, 921.8, 922, 922.2, 922.4, 922.6
AS923-3	916.6, 916.8, 917, 917.3, 917.4, 917.6, 917.8, 918
AS923-4	917.3, 917.5, 917.7, 917.9, 918.1, 918.3, 918.5, 918.7

CONTACT INFORMATION

- **Tel:** +33 477 92 03 56
- **Email:** contact@rg2i.com
- www.rg2i.com.

GET HELP

For assistance, please contact Milesight technical support:

- **Email:** iot.support@milesight.com
- **Support Portal:** support.milesight-iot.com
- **Tel:** 86-592-5085280
- **Fax:** 86-592-5023065
- **Address:** Building C09, Software Park Phase III, Xiamen 361024, China

Revision History

Date	Doc Version	Description
Jan. 5, 2024	V 2.0	Initial version based on UG63 V2

FAQs

- **Q: What should I do if the LED indicators show unusual patterns?**
  - **A:** If the LED indicators display unusual patterns or do not match the provided descriptions, please contact Milesight technical support for assistance.

Documents / Resources

	Milesight UG63 V2 Mini LoRaWAN Gateway [pdf] User Guide UG63 V2, UG63 V2 Mini LoRaWAN Gateway, UG63, V2 Mini LoRaWAN Gateway, Mini LoRaWAN Gateway, LoRaWAN Gateway

References

- User Manual

Milesight

LoRaWAN Gateway, Milesight, Mini LoRaWAN Gateway, UG63, UG63 V2, UG63 V2 Mini LoRaWAN Gateway, V2 Mini LoRaWAN Gateway

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