

Ultra Low Power Solar LoRaWAN[®] Gateway SG50

User Guide



Safety Precautions

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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 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.

Declaration of Conformity

SG50 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 |
|---------------|-------------|-----------------|
| Oct. 15, 2023 | V 1.0 | Initial version |

Contents



1. Product Introduction

1.1 Overview

SG50 is an energy-efficient solar LoRaWAN[®] gateway designed for outdoor environments with limited power availability and ample solar energy resources. With built-in batteries and accessorial solar panel, SG50 can work independently in various scenarios, especially the places with hard access to power resources.

Besides the high adaptability, SG50 is highly compatible with mainstream network servers and supports remote management via remote network servers which provides both convenience and secured management.

Benefiting from its robust structural design and high IP67 protection rate, SG50 can work smoothly in harsh environments. It is specifically tailored for applications such as oil and gas, mining, forestry, and remote industries where power consumption must be carefully managed.

1.2 Key Features

- Fast deployment with the all-in-one design and standard accessories
- Built-in rechargeable batteries & accessorial solar panel for wireless usage
- Support cellular for backhaul network enabling independent networking
- Equipped with high-efficient power management design prolonging its battery life up to 4 days
- IP67 enclosure and robust structural design promote its strength and working lifespan
- Equipped with SX1302 chip, handling a higher amount of traffic with lower consumption
- Support 8 channels for more than 2000 end-nodes connections
- Equipped with GPS for simple remote management and deployment

2. Hardware Introduction

2.1 Packing List











| 1 | × Battery | |
|---|-----------|--|
| | Pack | |

| 1 × SIM Card Ejector | |
|----------------------|--|
| Tool | |

1 × LoRaWAN® Antenna

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

2.2 Hardware Overview

Δ





2.3 Button and LED Indicator

LED Indicators

| LED | Indication | Status | Description |
|---------|------------------|-------------|---|
| Dower 8 | Dowor 9 | Off | The power is off |
| SYS | Puwer & | Green Light | The system is running properly |
| | System Status | Red Light | The system goes wrong |
| | O alludar Otatua | Off | SIM card is registering or failed to register |
| | | UII | (or there are no SIM cards inserted) |
| | | Green Light | Blinking slowly: SIM card has been registered |
| | | | and is ready for dial-up |
| | Cellular Status | | Blinking rapidly: SIM card has been registered |
| | | | and is dialing up now |
| | | | Static: SIM card has been registered and dialed |
| | | | up successfully |
| | | Off | Wi-Fi is off |
| Wi-Fi | Wi-Fi Status | Croop Light | Blinking slowly: Wi-Fi is starting |
| | | Green Light | Static: Wi-Fi is on |

Wi-Fi/Reset Button

| Function | Action | LED Indication |
|-----------------------------|--|----------------------|
| Turn On Wi-Fi | When Wi-Fi is disabled, quickly press the button once to turn on Wi-Fi for 10 minutes. | Wi-Fi: Off → On |
| Turn Off Wi-Fi | When Wi-Fi is enabled, quickly press the button once to turn off Wi-Fi for 10 minutes. | Wi-Fi: On → Off |
| Reset to Factory Default | Press and hold the button for more than 5 seconds | SYS: blinks rapidly. |

2.4 Dimensions (mm)

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3. Hardware Installation

3.1 SIM Card Installation

1. Take the SIM cover down, and use an ejector tool to open the SIM card tray. Insert the nano (4FF) SIM card, then put the slot with the SIM card back into the device.

2. Rotate back the cover and tighten it with a wrench to prevent water from entering the device.



3.2 Power Supply

SG50 can be powered by either a 12-24 VDC external supply or a solar panel. In the meantime, the internal battery pack will also be charged. When the external supply is disconnected or there is not enough power for the solar panel, SG50 can be powered by the internal battery pack.

Battery Installation

1. Release the fixing screw on the side of the device, and remove the battery compartment cover.

2. Push the battery into the battery compartment as the icon shows. If you need to take out the battery, hold on the latches on the battery to pull it out.

3. Fix the cover back to the device using the fixing screw.



Note:

- After installing the battery, the device will not power on automatically. Please connect the power cable of the solar panel to the device to turn it on. When the power cable is disconnected, the device will power off.
- The device can not be charged when its temperature is more than 50°C. Please avoid direct exposure of the device to sunlight.
- When the device detects the temperature is lower than 0°C and solar panel power is enough (more than 7W), the device will heat the battery until the temperature reaches to 10°C, then charge the battery if the battery level is not full.
- The battery should be removed from the device if it will not be used for an extended period.

3.3 Gateway Installation

SG50 with solar panel can be mounted either to a wall or pole. It is suggested to install the device on sunny days for solar panel adjustment and charging.

3.3.1 Mounting Bracket Installation

Wall Mounting:

Drill 4 holes on the wall according to the mounting bracket and insert the wall plugs into these holes. Then fix the mounting bracket to the wall by fixing the wall mounting screws into the wall plugs.



Pole Mounting:

Straighten the hose clamps and slide them through the rectangular rings in the mounting bracket. Wrap the hose clamps around the pole, then use a screwdriver to tighten the locking mechanism by turning it clockwise.



3.3.2 Solar Panel Installation

1. Fix the solar panel to the solar panel bracket using 6 fixing screws.



2. Hang the solar panel bracket onto the mounting bracket and fix both parts using 2 fixing screws first. Adjust the angle of the solar panel bracket (15°, 45°, and 75° is optional) based on the installation environment. Then fix the remaining two screws to the solar panel bracket.



3.3.3 Device Installation

1. Fix the device to the opposite side of the solar panel bracket using 4 screws. When installation, it is suggested to fix the 2 screws on the top at first.

2. Install antennas as Antenna Installation chapter.



3. Connect M12 power cable of the solar panel to DC power connector of the device, then the device will power on automatically.



3.3.4 Antenna Installation

U-strap Mounting:

1. Pass the LoRaWAN[®] antenna through the U-strap clamp and fix the U-strap clamp to the side of the mounting bracket using 2 flat washers and 2 screws.



2. Connect one end of the antenna coaxial cable to the LoRaWAN[®] antenna, the opposite end to the device's antenna connector.



U-bolt Mounting:

1. Pass the LoRaWAN[®] antenna through the antenna clamp and fix it using 4 screws, then wrap the U-bolt around the pole and fix the clamp with nuts and other accessories.



2. Connect one end of the antenna coaxial cable to the LoRaWAN[®] antenna, the opposite end to the device's antenna connector.



4. Access the Gateway

G50 provides user-friendly web GUI for configuration and users can get access to it via Wi-Fi connection. The default settings are listed below: Wi-Fi SSID: Gateway_XXXXXX (can be found on the label) Wi-Fi IP Address: 192.168.23.1 Browser: Chrome (Recommended) Username: admin Password: password

Configuration Steps:

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Step 1: Connect M12 power cable to the device to turn on the device and ensure the Wi-Fi LED is statically on.

Step 2: Enable the Wireless Network Connection on your computer and search for the corresponding access point, then connect the computer to this access point.

Step 3: Open the browser and type 192.168.23.1 to access the web GUI.

Step 4: Select the language.

Step 5: Enter the default username and password to log in the web GUI.

English



Step 6: 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 cellular 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 <u>Cellular</u> chapter.

| Milesight | | | | | | | Exit Wizard |
|--|--------|---------------------|--------|-----------|------------------|--------|-------------|
| 1 Cellular Network | 2 Time | > (3 | Packet | Forwarder | 4 Packet Filters | 5 WLAN | |
| You can set cellular network-related parameters. | | | | | | | |
| | 1 | APN | | | | | |
| | | Username | | | | | |
| | | Password | | | ۲ | | |
| | j | Authentication Type | | None | ~ | | |
| | Ĩ | PIN Code | | | ۲ | | |
| | , | Emergency Reboot | Ð | | | | |

2) Configure correct system time. For details please refer to Time chapter.

| Milesigh | it | | | | | Exit Wizard |
|----------|---|--------------------|----------------------|------------------|----------|-------------|
| | 1 Cellular Network | 2 Time > 3 Pa | icket Forwarder | 4 Packet Filters | > 5 WLAN | |
| | You can set system time of the gateway. | | | | | |
| | | Time Zone | Europe/London | ~ | | |
| | | Sync Type | Sync with NTP Server | ~ | | |
| | | NTP Server Address | pool.ntp.org | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

3) Configure the device to connect a LoRaWAN[®] network server. For details please refer to <u>Packet Forward-General</u> chapter.

Save & Apply

Previous Skip

| Milesigh | nt | | | | | | | | | | Exit Wizard |
|----------|------------------------------------|-----------------|-------------------|--------------------|-----------------|----------------------|----------------|------------|---------|--------|-------------|
| | 1 Cellular Network | | 2 Time | > | 3 Packe | et Forwarder | > | 4 Packet F | Filters | 5 WLAN | |
| | You can set the destination for Lo | RaWAN data pack | et forwarding. Th | e gateway will for | rward the nodes | ' data to the corres | ponding server | address. | | | |
| | | | | Gateway ID * | | 24E124FFFEF7 | FCCE | | | | |
| | | | | Enable | | | | | | | |
| | | | | Туре | | Semtech | | ~ | | | |
| | | | | Server Address | S | eu1.cloud.theth | ngs.network | | | | |
| | | | | Port Up | | 1700 | | | | | |
| | | | | Port Down | | 1700 | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | Previo | us Skip | Save & A | Apply | | | | |

4) Configure the packet filter. For details please refer to Packet Forward-Packet Filters chapter.

| sight | | | | | | | | Exit Wiza |
|--|---|------------------------------|------------------------------|---------------------------|----------------------------|---------------------|------------|-----------|
| 1 Cellular Network | > 2 Time | > (| 3 Packet Forwarder | > 0 | Packet Filters | | 5 WLAN | |
| You can set a filter for the packets bandwidth and to reduce power co | from chosen devices. By choosi onsumption. | ng whitelist or blacklist, y | you can decided whether forw | ard the data from nodes o | r not within the specifier | d criteria, thus to | o optimize | |
| | Filters by NetID | | | | | | | |
| | Mode | O White List | Black List | | | | | |
| | List | | + | | | | | |
| | Filters by JoinEUI | 0 | | | | | | |
| | Mode | O White List | Black List | | | | | |
| | List | | То | | + | | | |
| | Filters by DevEUI | 0 | | | | | | |
| | Mode | • White List | Black List | | | | | |
| | List | | То | | + | | | |

5) Configure the WLAN settings. For details please refer to <u>WLAN</u> chapter.

| Milesigt | ht | | | | | | Exit Wizard |
|----------|---|--------------|---------------------------|----------------|------------------|--------|-------------|
| | 1 Cellular Network | 2 Time | > 3 Pack | set Forwarder | 4 Packet Filters | 5 WLAN | |
| | You can set your own Wi-Fi SSID and Wi- | Fi password. | | | | | |
| | | | Enable | | | | |
| | | | Disable When Discharged 📵 | | | | |
| | | | Timing Turnoff | | | | |
| | | | Timing Turnoff Time | 19:00 | O | | |
| | | | Timing Turnon Time | 09:00 | 0 | | |
| | | | SSID | Gateway_F7FCCE | | | |
| | | | Encryption Mode | WPA-PSK | ~ | | |
| | | | Key | | ۲ | | |
| | | | Previous Ski | p Save & Apply | | | |

5. Operation Guide

5.1 Status

| verview Cellular | | | Manual Refresh ¥ Refre |
|--------------------------------------|---------------------|-----------------------------------|------------------------|
| G50-L09NA-868M | | GPS | ž. |
| 6781D31002200001 EU 24E124FFFEF7FC26 | | Longitude | - |
| Battery Level | Battery Temperature | Latitude | |
| 84% Charging | 27°C | Altitude | - |
| System Information | • | WLAN Enabled | |
| Firmware Version | | 50.0.0.1 SSID | Gateway_F7FC26 |
| Hardware Version | | V1.1 | |
| Region | | EU868 LoRaWAN Packet Forward Conn | ected |
| Local Time | 2023-10-24 16:1 | 19:59 Tuesday Server Type | ChirpStack-Generic |
| Uptime | Od, | 00h06min27s Server Address | 112.124.8.125 |
| CPU Temperature | | 37.6° | |
| Solar Status | | Inactive Cellular Connected | |
| | | IP Address | 10.139.25.142 |
| | | Connection Duration | 0days, 00:05:50 |

| 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. |
| Battery Level & | The intermed hetter developed events at any status |
| Status | i ne internal dattery level and current charging status. |
| Battery | The temperature of the internal betten |
| Temperature | The temperature of the internal battery. |
| System Information | |
| Firmware Version | The currentl 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 currently local time of the system. |
| Uptime | The information on how long the gateway has been running. |
| CPU Temperature | The temperature of CPU. |
| Solar Status | The current solar powering status. |
| GPS | |
| Longitude | The latitude of the location. |
| Latitude | The longitude of the location. |
| Altitude | The altitude of the location. |

| WLAN | | | |
|------------------------|--|--|--|
| SSID | The SSID of the WLAN access point. | | |
| LoRaWAN Packet F | orward | | |
| Server Type | The LoRaWAN [®] packet forward connection type. | | |
| Server Address | The LoRaWAN [®] network server address. When server type is Basic Station, this will show LNS URI and CUPS URI. | | |
| Cellular | | | |
| IP Address | The IP address of cellular network. | | |
| Connection Duration | The information on how long the cellular network has been connected. | | |

| rview Cellular | | | Manual Refresh 🛩 Re |
|---|----------------------|---|---------------------|
| Ready Register Status: Registered (Home network) | | NET Connected Connection Duration: 0days, 00:27:49 | |
| Modem | | Network | |
| Model | EG912U | IPv4 Address | 10.139.25.142/3 |
| Version | EG912UGLAAR03A09M08 | IPv4 Gateway | 192.168.0. |
| Signal Level | 31 asu(-51 dbm) | IPv4 DNS | 218.85.152.9 |
| IMEI | 869487060733168 | | |
| IMSI | 460115210733084 | | |
| ICCID | 89860321245923785509 | | |
| ISP | CHN-CT | | |
| Network Type | FDD LTE | | |
| PLMN ID | 46011 | | |
| LAC | 5F0C | | |
| Call ID | 0E0B70B | | |

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

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| 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 which the SIM card registers on. |
| 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. |

5.2 Packet Forward

SG50 supports to work as a packet forwarder to set up communication between LoRaWAN[®] end devices and LoRaWAN[®] network server.

5.2.1 General

| General Radi | os Packet Filters | Advanced Traffic | |
|----------------------|--|---|---|
| EUI | | 24E124FFFEF7FC26 | |
| Gate | eway ID * | 24E124FFFEF7FC26 | |
| Destinat | ion | | |
| Ena | ble | | |
| Туре | 2 | Semtech 🗸 | Connected |
| Sen | ver Address | eu1.cloud.thethings.network | |
| Port | Up | 1700 | |
| Port | Down | 1700 | |
| General | | | |
| Parameters | | Description | |
| EUI | The unique identi | fier of the gateway and it's non-edital | ole. |
| Gateway ID | The customizable It is the same as | e ID for registering gateway to networ gateway EUI by default. | k server, such as TTN. |
| Destination | | | |
| Enable | Enable or disable | the packet forward feature. | |
| Туре | Select packet forward type among Semtech, Chirpstack-Generic or Basic Station. Semtech: connect to network server through the Semtech UDP protocol. It supports to connect to most of 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. | | |
| Semtech | | | |
| Server Address | The LoRaWAN [®] r | network server IP address or domain. | |
| Port Up | The UDP port to f | orward uplinks from end device to ne | twork server. |
| Port Down | The UDP port to f | orward downlinks from network serve | er to end device. |
| Basic Station | | | |
| URI | The URL of LoR replace <i><server-a< i=""></server-a<></i> | aWAN [®] network server. Please type address> and <i><port></port></i> as real server add | e as below format and lress and server port. |

LNS URI: wss://<server-address>:<port> or ws://<server-address>:<port>

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| | CUPS URI: https:// <server-address>:<port></port></server-address> | | |
|----------------------------|--|--|--|
| | 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. | | |
| | Select from "Self signed certificates", "CA signed server certificate". | | |
| TLS | CA signed server certificate: verify with the certificate issued by | | |
| | Certificate Authority (CA) that pre-loaded on the device. | | |
| Aumentication | Self signed certificates: upload the custom CA certificates, client | | |
| | certificates and secret key for verification. | | |

5.2.2 Radios

| General Radios Packet Filte | rs 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 | ~ |

| Radios | |
|----------------------|--|
| Parameters | Description |
| Radio Channel Setti | ng |
| 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 Setti | ing |
| Enable | Enable or disable this channel to transmit packets. |
| Radio | Choose Radio 0 or Radio 1 as center frequency. |
| Frequency/MHz | Set the frequency of this channel. Range: center frequency \pm 0.4625. |
| LoRa/FSK Channel | Setting |
| Enable | Enable or disable this channel to transmit packets. |
| Radio | Choose Radio 0 or Radio 1 as 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.

5.2.3 Packet Filters

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SG50 supports to filter uplink packets via different conditions to reduce network congestion, save network traffic and ensure the safety operations.

| General Radios Pa | acket Filters Advanced Traffic | | |
|-------------------|--------------------------------|----|---|
| Filters by NetID | Ð | | |
| Mode | • White List 	Black List | | |
| List | | + | |
| Filters by JoinEU | | | |
| Mode | • White List • Black List | | |
| List | | То | + |
| Filters by DevEU | 0 | | |
| Mode | • White List 	Black List | | |
| List | | То | + |

| 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. |
| | Select the filter mode as black list or white list. |
| Mode | White List: Only forward the packets in this list to the network server. |
| | Black List: Only forward the packets except this list to the network 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 meets both conditions will be forwarded.

5.2.4 Advanced

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| Beacon Petilog Beacon Petilog Beacon Petilog Intervals Setting Keep Alive Intervals 10 Stat Intervals 00 Push Timeouthms 100 LBT Setting RSSI Target _able Expet Options • Enable Enable | Beacon Petitog Beacon Period Beacon Period Beacon Period Intervals Setting Kesp Alive Intervals 0 Stat Intervals 0 Push Timeoutins 100 LBT Settings Enable Expert Options C Enable | eneral Radios Packet Filters | Advanced Traffic | | |
|---|---|------------------------------|-------------------|--|--|
| Beacon PeriodIIntervals SettingKeep Alive IntervalsIStat IntervalsJ0Push TimeouthmsI00LBT SettingsEnableEspSI TargetExper Options IEnableEnableEnableStargetEnableEnableIEnableIEnableIEnableIIEnableIII </th <th>Beacon Period 0 Beacon Period 128 Intervals Setting Stat Intervalis J0 Push Timeoutims 100 IBT Settings Enable Enable Expert Options © Enable</th> <th>Beacon Setting</th> <th></th> <th></th> <th></th> | Beacon Period 0 Beacon Period 128 Intervals Setting Stat Intervalis J0 Push Timeoutims 100 IBT Settings Enable Enable Expert Options © Enable | Beacon Setting | | | |
| IntervalsI0Stat Intervals30Push Timeoutims100LBT SettingsLBT SettingsEnableI SSI TargetExpert Options •EnableIEnableIEnableIExpert Options •IEnableII Station •II Station • | Intervals 10 Stat Intervals 30 Push Timooutims 00 LBT Settings - Enable - RSSI Target - Enable - Enable - | Beacon Period | O 0 () 128 | | |
| Keep Alive Intervalis10Stat Intervalis30Push Timeoutims100LBT SettingsLBT SettingsRSSI Target-00[Expert Options •-EnableI | Keep Alve Interval's 10 Stat Interval's 30 Push Timeout'ms 100 LBT Settings LBT Settings Enable - RSSI Target 80 Expert Options • • | Intervals Setting | | | |
| Stat Interval/s30Push Timeout/ms100LBT SettingsEnableRSSI Target-00Expert Options •Enable | Stat Interval/s 30 Push Timeout/ins 100 LBT Settings LBT Settings Enable -80 RSSI Target -80 Expert Options © Image: Compare the set of the set | Keep Alive Interval/s | 10 | | |
| Push Timsoutims100LBT SettingsEnableRSSI TargotRSSI TargotExpert Options ●EnableImable <td>Push Timeout/ms 100 LBT Settings </td> <td>Stat Interval/s</td> <td>30</td> <td></td> <td></td> | Push Timeout/ms 100 LBT Settings | Stat Interval/s | 30 | | |
| LBT Settings Enable RSSI Target _BD Expert Options Enable I Sample | LBT Settings Enable RSSI Target -80 Expert Options ● Enable | Push Timeout/ms | 100 | | |
| Enable RSSI Target -00 Expert Options Enable | Enable RSSI Target 80 Expert Options Enable | LBT Settings | | | |
| RSSI Target -50 Expert Options Enable | RSSI Target -60 Expert Options ● Enable | Enable | | | |
| Expert Options | Expert Options Enable Enable E | RSSI Target | -80 | | |
| Enable | Enable 🗹 | Expert Options | | | |
| | | Enable | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | Clear |
|--------------------------|--|
| 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. |
| LBT Setting | |
| Enable | Enable or disable LBT feature. Listen before talk (LBT) is used to detect whether the downlink channel is idle and avoid channel access conflicts. Note: AU915 and US915 do not support LBT feature. |
| RSSI Target | The criteria of an idle channel. If actual RSSI of a channel is less than the criteria/target, the channel is considered as idle. |
| 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. |

5.2.5 Traffic

Milesight

SG50 supports to display latest 30 pieces of traffic received from end devices or network server.

| General Radios | Packet Filters Advanced Traffic | | | | | | s |
|----------------|---------------------------------|------------|-----------|---------|------|------|---|
| Direction | Time | Frequency | Datarate | Channel | RSSI | SNR | Data |
| Up | 0000-00-00T00:00:00.000000Z | 868.300000 | SF12BW125 | 1 | -68 | 7.8 | gHYKGAcAbxpV1CCs4WGqdz DHsEnqTV8= |
| Up | 0000-00-00100:00:00.000000Z | 868.300000 | SF10BW125 | 4 | -59 | 12.0 | AAEAKgDAJOEkMgU4TGEk4 SQqSrt/0x1= |
| Up | 0000-00-00100:00:00:000000Z | 868.300000 | SF12BW125 | 1 | -84 | -0.5 | QFUDAASBYQMNVXtWJ55sO 6dOGIHNbc= |
| Up | 0000-00-00T00:00:00:000000Z | 868.100000 | SF12BW125 | 0 | -70 | 8.2 | AAABAAAAQUCoUIWHQbxB QKjMK+HR0Fk= |
| Up | 0000-00-00T00:00:00.000000Z | 868.100000 | SF10BW125 | 0 | -67 | 11.5 | QCrgkQYAn91a1X42GOklKvfA SbVvRH0= |
| Up | 0000-00-00T00:00:00.000000Z | 868.100000 | SF10BW125 | 0 | -68 | 12.2 | QCC5kcEA9ctVXXBh/chcyE2r 1L7AWEK+jdfRvuBaSGTbv/w Wyc2HvhgJu3QGxXXGCzW MusHNV2zh49oE= |
| Up | 0000-00-00T00:00:00.000000Z | 867.700000 | SF7BW125 | 6 | -94 | -2.5 | QP6GoQCAm1FVo5jXGJxO1/ x7i9Ncuw== |
| Up | 0000-00-00100:00:00.000000Z | 868.500000 | SF10BW125 | 2 | -59 | 8.5 | AAEAKgDAJOEkMgU4TGEk4 SSzLNZDAIs= |
| Up | 0000-00-00100:00:00.000000Z | 868.300000 | SF12BW125 | 1 | -95 | -6.8 | QFFVdMKBmqwNVdJOJjWYrL 2w94tKErE9U63A9A== |
| Up | 0000-00-00100:00:000000Z | 867.700000 | SF7BW125 | 6 | -80 | 10.2 | QG1jBQGADY1VNsn0fEof3KU RCne+NkKG+KJD |
| Up | 0000-00-00100:00:00.000000Z | 868.100000 | SF7BW125 | 0 | -80 | 11.2 | QA0yYQeA8AQKKLbn7v9pcT RKu6ScYZhnVUBe |
| Up | 0000-00-00T00:00:00.000000Z | 868.300000 | SF7BW125 | T. | -83 | 12.0 | QG1jBQGADY1VNsn0fEof3KU RCne+NkKG+KJD |

| Traffic | |
|------------|--|
| Parameters | Description |
| Fresh/Stop | Fresh: click to fresh this page to update latest data automatically. |
| | Stop: 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. |

5.3 Network

5.3.1 WLAN

SG50 supports whan feature to work as AP mode to configure device and it can not connect to other access points.

Note: one SG50 device only supports 2 devices' WLAN connection to login this device at the same time.



| WLAN | |
|--------------------|--|
| Parameters | Description |
| Enable | Enable or disable Wi-Fi feature. |
| Disable When | After enabled, the device will turn off the Wi-Fi when the battery is |
| Discharged | discharging to save power. |
| Timing Turnoff | If this option is enabled, the device will turn off and turn on the Wi-Fi at preset time points of a day. |
| 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. |

5.3.2 Cellular

SG50 supports to insert a SIM card to get cellular network connections.

| WLAN | Cellular | | | | |
|------|---------------------|-----------|---|------|-------|
| | APN | | | | |
| | Username | | | | |
| | Password | | 0 | | |
| | Authentication Type | None | * | | |
| | PIN Code | | ۲ | | |
| | AT Command | AT+CGREG? | | Send | Clear |
| | +CCRFG 0.1 | | | | |
| | OK | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | 57. | | | | |

| Ping Detection

| Enable () | |
|-------------------------|----------|
| Primary Server (IPv4) | 8.8.8.8 |
| Secondary Server (IPv4) | 23.5.5.5 |
| Interval/s | 300 |
| Retry Interval/s | 5 |
| Timeout/s | 3 |
| Max Ping Retries | 3 |

Cellular

Milesight

| Parameters | Description |
|----------------------------|---|
| APN | The Access Point Name for cellular dial-up connection provided by local 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. |
| Emergency Reboot | Enable to reboot the device if cellular connection is not available. |
| Ping Detection | |
| Enable | After enabled, the device will send ICMP packets to corresponding servers to detect the connection periodically. |
| Primary Server (IPv4) | The device will send ICMP packet to this server address or hostname to determine whether the Internet connection is still available or not. |
| Secondary Server (IPv4) | The device will try to ping the secondary server name if primary server is not available. |
| Interval/e | |
| interval/s | Time interval between two Pings. |
| Retry Interval/s | Time interval between two Pings.When ping failed, the device will ping again in every retry interval. |
| Retry Interval/s | Time interval between two Pings. When ping failed, the device will ping again in every retry interval. 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. |

5.4 System

5.4.1 General

| General | Time | |
|---------|----------------------|-------|
| | Username | admin |
| | Old Password | ۲ |
| | New Password | ۲ |
| | Confirm New Password | ۲ |

| 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. |

5.4.2 Time

| General Time | | |
|--------------------|----------------------|---|
| Current Time | 2023-10-25 13:47:15 | |
| Time Zone | Asia/Beijing | ~ |
| Sync Type | Sync with NTP Server | ~ |
| NTP Server Address | pool.ntp.org | |

| 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 NTP Server's IP address or domain name. |

5.5 Maintenance

5.5.1 Log

| Log | Backup/Upgrade | Reboot | |
|-----|----------------|----------|---|
| | Log Severity | Debug | * |
| | Log File | Download | |
| | Core dump | Download | |

| 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 specific point int time when the program encounters a critical error or crashes, which can be used for debugging and troubleshooting purposes. |

5.5.2 Backup/Upgrade

| Log Backup/Upgrade Reboot | | |
|---------------------------|---------------|----------------|
| Backup | | |
| Download Backup | Download | |
| Restore | | |
| Reset | Perform Reset | |
| Config File | | Import Restore |
| Upgrade | | |
| Firmware Version | 50.0.0.1 | |
| Reset | | |
| Upgrade Firmware | | Import 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 | Click "Import" button to select the new firmware file, and click "Upgrade" to | |

|--|

5.5.3 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.

| Log | Backup/Upgrade | Reboot | | |
|-----|----------------|--------|--------|--|
| | Reboot | | Reboot | |

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 |

-END-