UG85 LoRaWAN Gateway

Quick Start Guide
Welcome

Thank you for choosing Ursalink UG85 LoRaWAN Gateway.

This guide teaches you how to install the UG85 and how to log in the web GUI to configure the device. Once you complete the installation, refer to the Ursalink UG85 User Guide for instructions on how to perform configurations on the device.

Related Documents

This Quick Start Guide only explains the installation of Ursalink UG85 LoRaWAN Gateway. For more functionality and advanced settings, please refer to the relevant documents as below.

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ursalink UG85 Datasheet</td>
<td>Datasheet for the Ursalink UG85 LoRaWAN Gateway.</td>
</tr>
<tr>
<td>Ursalink UG85 User Guide</td>
<td>Users can refer to the guide for instruction on how to log in the web GUI, and how to configure all the settings.</td>
</tr>
</tbody>
</table>

The related documents are available on Ursalink website: [http://www.ursalink.com](http://www.ursalink.com).

Declaration of Conformity

UG85 is in conformity with the essential requirements and other relevant provisions of the CE, FCC, and RoHS.

For assistance, please contact Ursalink technical support:
Email: support@ursalink.com
Tel: 86-592-5023060
Fax: 86-592-5023065

Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Doc Version</th>
<th>Firmware</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>Jun. 14,2019</td>
<td>V1.1</td>
<td>-</td>
<td>Initial version</td>
</tr>
<tr>
<td>Apr. 4, 2020</td>
<td>V1.2</td>
<td>80.0.0.62</td>
<td>1. Reset button definition change;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Default IP change from 192.168.1.1 to 192.168.23.150;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Web GUI interface change;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Add bulk import LoRaWAN devices.</td>
</tr>
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</table>
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1. Packing List

Before you begin to install the UG85 LoRaWAN Gateway, please check the package contents to verify that you have received the items below.

- 1 × UG85
- 1 × Ethernet Cable
- 1 × Power Adapter
- 1 × Stubby LoRa Antenna
- 1 × 6-Pin Pluggable Terminal
- 1 × DIN Rail Kit
- 4 × Setscrews
- 1 × Warranty Card
- 1 × GPS Antenna (GPS Version Only)
- 1 × Magnetic Cellular Antenna (Cellular Version Default)
- 1 × Stubby Wi-Fi Antenna (Wi-Fi Version Only)
- 1 × Stubby Cellular Antenna (Cellular Version Optional)

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

2.1 Overview

A. Front Panel

1. WIFI/LTE Antenna
2. GPS Antenna
3. LoRa Antenna
4. LED Indicator Area
   - POWER: Power Indicator
   - SYSTEM: Status Indicator
   - LORA: LoRa Indicator
   - WiFi: WIFI Indicator
   - LTE: Cellular Status Indicator
   - LAN: Ethernet Port Status Indicator
5. Serial Port & I/O
6. Ethernet WAN/LAN Port
7. Console Port
8. Power Connector
9. SIM and Reset Button Holder

2.2 Dimensions (mm)
2.3 Pinouts

<table>
<thead>
<tr>
<th>PIN</th>
<th>RS232</th>
<th>DI</th>
<th>DO</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>---</td>
<td>---</td>
<td>OUT</td>
<td>Digital Output</td>
</tr>
<tr>
<td>2</td>
<td>---</td>
<td>IN</td>
<td>---</td>
<td>Digital Input</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>---</td>
<td>---</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>---</td>
<td>COM</td>
<td>COM</td>
<td>Common Ground</td>
</tr>
<tr>
<td>5</td>
<td>RXD</td>
<td>---</td>
<td>---</td>
<td>Receive Data</td>
</tr>
<tr>
<td>6</td>
<td>TXD</td>
<td>---</td>
<td>---</td>
<td>Transmit Data</td>
</tr>
</tbody>
</table>

2.4 LED Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>Power Status</td>
<td>On</td>
<td>The power is switched on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>The power is switched off</td>
</tr>
<tr>
<td>SYSTEM</td>
<td>System Status</td>
<td>Green Light</td>
<td>Static: Start-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blinking slowly: the system is running properly</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red Light</td>
<td>The system goes wrong</td>
</tr>
<tr>
<td>LoRa</td>
<td>LoRa Status</td>
<td>Green Light</td>
<td>Packet Forwarder mode is running well.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>Packet Forwarder mode is running off.</td>
</tr>
<tr>
<td>WIFI</td>
<td>WIFI Status</td>
<td>Green Light</td>
<td>WIFI is connected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off</td>
<td>WIFI is disconnected</td>
</tr>
<tr>
<td>LTE</td>
<td>Cellular Status</td>
<td>Off</td>
<td>SIM1 or SIM2 is registering or fails to register (or there are no SIM cards inserted)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green Light</td>
<td>Blinking slowly: SIM1 or SIM2 has been registered and is ready for dial-up</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blinking rapidly: SIM1 or SIM2 has been registered and is dialing up now</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Static: SIM1 or SIM2 has been registered and dialed up successfully</td>
</tr>
<tr>
<td>LAN</td>
<td>Ethernet Port Status</td>
<td>Off</td>
<td>Disconnected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green Light</td>
<td>Blinking: Transmitting data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Static: Connected</td>
</tr>
</tbody>
</table>
# 2.5 Reset Button

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM LED blinking</td>
<td>Press and hold the reset button for more than 5 seconds.</td>
<td></td>
</tr>
<tr>
<td>SYSTEM LED static green → rapidly blinking</td>
<td>Release the button and wait.</td>
<td></td>
</tr>
<tr>
<td>SYSTEM LED off → blinking</td>
<td>The gateway is now reset to factory default.</td>
<td></td>
</tr>
</tbody>
</table>
3. Hardware Introduction

Environmental Requirements

- Power Input: 9-48 VDC
- Power Consumption: Typical 3.3W (Max 6.4 W)
- Operating Temperature: -40°C to 70°C (-40°F to 158°F)
- Relative Humidity: 0% to 95% (non-condensing) at 25°C/77°F

3.1 SIM Card Installation

A. Unscrew the cover of the SIM card then take it off.

B. Put SIM card into the slot and screw it up.

3.2 Antenna Installation

Rotate the antenna into the antenna connector accordingly.
The external antenna should be installed vertically always on a site with a good cellular signal.
3.3 Ethernet Port Connection

Connect LAN port of UG85 to computer or network devices. Please note that do not connect to console port.

3.4 Mount the gateway

The gateway can be placed on a desktop or mounted to a wall or a DIN rail.

3.4.1 Wall Mounting (Measured in mm)

Use 4 pcs of M3 × 6 flat head Phillips screws to fix the gateway on the wall.

⚠️ Recommended torque for mounting is 1.0 N·m, and the maximum allowed is 1.2 N·m.

3.4.2 DIN Rail Mounting (Measured in mm)

Use 2 pieces of M3 × 6 flat head Phillips screws to fix the DIN rail to the gateway, and then hang the DIN rail on the mounting bracket. It is necessary to choose a standard bracket.

⚠️ Recommended torque for mounting is 1.0 N·m, and the maximum allowed is 1.2 N·m.
3.5 Power Supply Installation

A. Take out the terminal from the gateway and unscrew the bolt on terminal.
B. Screw down the bolt after inserting power cable into the terminal.

![Diagram](image)

Connecting the Power Cable

<table>
<thead>
<tr>
<th>Color</th>
<th>Polarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>+</td>
</tr>
<tr>
<td>Yellow</td>
<td>-</td>
</tr>
</tbody>
</table>

⚠️ If you insert wires into the reverse holes, the gateway will not start and you must switch the wires into the correct holes.
4. Access the Web GUI of UG85

Ursalink UG85 provides web-based configuration interface for management. If this is the first time you configure the gateway, please use the default settings below:
IP Address: 192.168.23.150
Username: admin
Password: password

4.1 PC Configuration

Please connect PC to LAN port of UG85 directly and configure a static IP address manually. The following steps are based on Windows 10 operating system for your reference.

① Click “Search Box” to search “Control Panel” on the Windows 10 taskbar.
② Click “Control Panel” to open it, and then click “View network status and tasks”.
③ Click “Ethernet” (May have different names).
④ Click “Properties”.

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4.2 Log in the Web GUI of UG85

A. Open a Web browser on your PC (Chrome and IE are recommended), type in the IP address, and press Enter on your keyboard.

B. Enter the username and password, click “Login”.

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

C. When you log in with the default username and password, you will be asked to change password. It’s suggested that you change the password for the sake of security. Click “Cancel” button if you want to modify it later.
D. After you log in the Web GUI, you can view system information and perform configuration of the gateway.
This chapter explains how to connect the gateway to network via WAN connection, cellular or Wi-Fi.

5. Connect UG85 to the Network

5.1 Configure the WAN Connection

A. Go to “Network” → “Interface” → “Port” page to select the connection type and configure WAN information.
B. Click “Save&Apply” for configuration to take effect.
C. Connect Ethernet port of gateway to network 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.

5.2 Configure the Cellular Connection

Take inserting SIM card into SIM1 slot as an example; please refer to the following detailed operations.
A. Go to “Network” → “Interface” → “Cellular” → “Cellular Setting” page to configure the cellular info.
B. Enable SIM1.
C. Choose relevant network type. “Auto”, “4G Only”, “3G Only” and “2G Only” are optional.
D. Click “Save” and “Apply” for configuration to take effect.
UG85 has two cellular interfaces named SIM1 & SIM2. Only one cellular interface is active at one time. If both cellular interfaces are enabled, SIM1 interface takes precedence by default.

E. Go to “Status” → “Cellular” page to view the status of the cellular connection. If it shows “Connected”, it means SIM1 has dialed up successfully. On the other hand, you can check the status of LTE indicator. If it keeps on green light statically, it means SIM has dialed up successfully.

![Ursalink UG85 Status Page]

5.3 Configure the Wi-Fi Connection

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”.

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C. Type the correct 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.
## WLAN Status

<table>
<thead>
<tr>
<th>Overview</th>
<th>Packet Forward</th>
<th>Cellular</th>
<th>Network</th>
<th>WLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wireless Status</strong></td>
<td>Enabled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MAC Address</strong></td>
<td>24:00:12:4:10:27:dc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interface Type</strong></td>
<td>Client</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SSID</strong></td>
<td>Ursalink_TechnologyCenter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Channel</strong></td>
<td>Auto</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Encryption Type</strong></td>
<td>WPA-PSK/WPA2-PSK</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cipher</strong></td>
<td>AES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Connected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IP Address</strong></td>
<td>0.0.0.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Netmask</strong></td>
<td>0.0.0.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection Duration</strong></td>
<td>0 days, 00:00:01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UG85 has embedded multiple packet forwarders like TTN, Loriot and chirpstack. This chapter explains how to connect the gateway to third-party network servers.

⚠️ Make sure the gateway connects to the network as shown in Chapter 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.

**Note:** When you select one of TTN, Loriot or chirpstack, other servers are not allow to enable.

C. Go to “Radios” page to configure the center frequency and channels.

**Note:** the channel plan of the gateway and network server need to be the same.
D. Add the gateway in network server page. Take TTN for example, type and save the gateway EUI and other information when you connect via Semtech packet forwarder. After you add the gateway, TTN will show connection status.

E. Go to “Traffic” page to view the data communication of UG85.
7. Network Server Configuration

UG85 can work as network server and transmit data to Ursalink Cloud or other platform via MQTT/HTTP/HTTPS.

⚠️ Make sure the gateway connects to the network as shown in Chapter 5.

7.1 Connect UG85 to Ursalink Cloud

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

B. Go to “Network Server” → “General” page to enable the network server and Ursalink Cloud mode.

C. Register and log in the Ursalink Cloud (cloud.ursalink.com).
D. Go to “Gateway” page and click “Add” to add a gateway.

E. The gateway is online on Ursalink Cloud.

7.2 Connect UG85 to Other Platform

A. Go to “Packet Forwarder” → “General” page to enable the “Ursalink” type server.
B. Go to “Radios” page to configure the center frequency and channels.  
**Note:** the channel plan of the nodes and gateway need to be the same.

C. Go to “Network Server” → “General” page to enable the network server mode.
D. Go to “Network Server”→“Application” to add a new application.

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

E. Go to “Profiles” page to add a new profile for the device.
F. Go to “Device” page and click “Add” to add LoRaWAN node devices.

You can also click “Bulk Import” if many LoRaWAN nodes need to add.
Click “Template Download” to download template file and add LoRaWAN device information to this file. Application and device profile should be the same as you created in web page.

Import this file to add bulks of devices.

G. 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.