



# 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

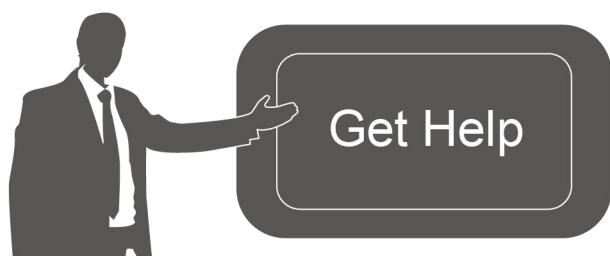
This Quick Start Guide only explains the installation of Ursalink UG85 LoRaWAN Gateway. For more functionality and advanced settings, please refer to the relevant documents as below.

Document	Description
Ursalink UG85 Datasheet	Datasheet for the Ursalink UG85 LoRaWAN Gateway.
Ursalink UG85 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 Ursalink website: <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](mailto:support@ursalink.com)  
Tel: 86-592-5023060  
Fax: 86-592-5023065

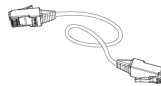
## 1. Packing List

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

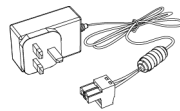
### 1.1 Package Contents



1 × UG85



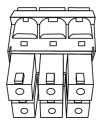
1 × Ethernet Cable



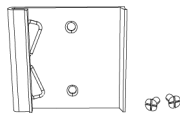
1 × Power Adapter



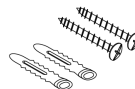
1 × Stubby LoRa  
Antenna



1 × 6-Pin Pluggable  
Terminal



1 × DIN Rail Kit



4 × Setscrews



1 × Warranty Card



1 × GPS Antenna  
(Optional)



1 × Magnetic Cellular  
Antenna (Optional)



1 × Stubby Wi-Fi  
Antenna (Optional)



1 × Stubby Cellular  
Antenna (Optional)

**Note:** If UG85 support cellular function, magnetic cellular antenna is default choice.

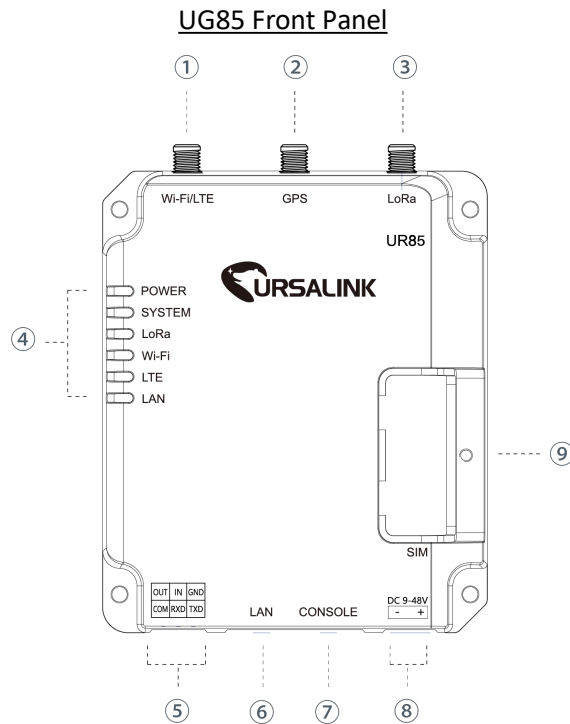


If any of the above items is missing or damaged, please contact your Ursalink sales representative.

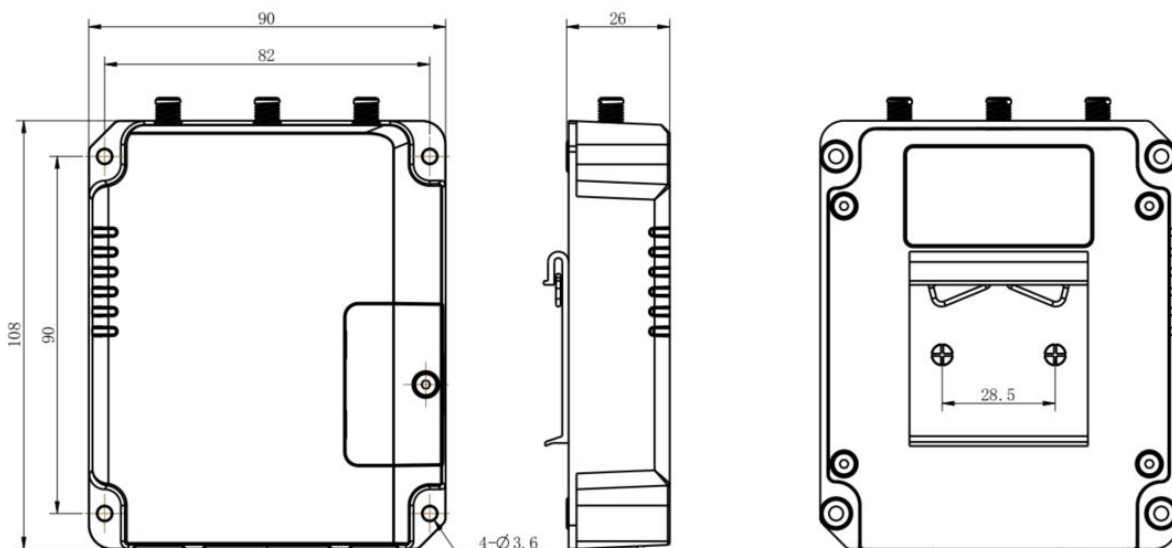
## 2. Hardware Introduction

### 2.1 Overview

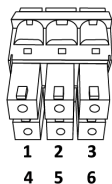
#### A. Front Panel



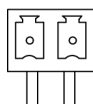
### 2.2 Dimensions (mm)



## 2.3 Pinouts



V+ V-



PIN	RS232	DI	DO	Description
1	---	---	OUT	Digital Output
2	---	IN	---	Digital Input
3	GND	---	---	Ground
4	---	COM	COM	Common Ground
5	RXD	---	---	Receive Data
6	TXD	---	---	Transmit Data

PIN	Description
11	Positive
12	Negative

## 2.4 LED Indicators

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

## 2.5 Reset Button

Function	Description	
	SYSTEM LED	Action
Reboot	Blinking	Press and hold the reset button for about 5-15 seconds.
	Static Green	Release the button and wait for system to reboot.
Reset	Blinking	Press and hold the reset button for more than 15 seconds.
	Static Green → Rapidly Blinking	Release the button and wait.
	Off → Blinking	The gateway is now reset to factory default.

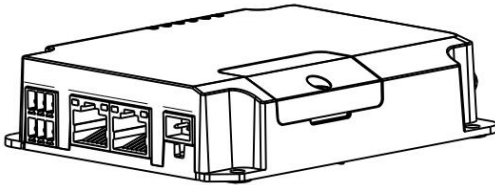
### 3. Hardware Installation

#### Environmental Requirements

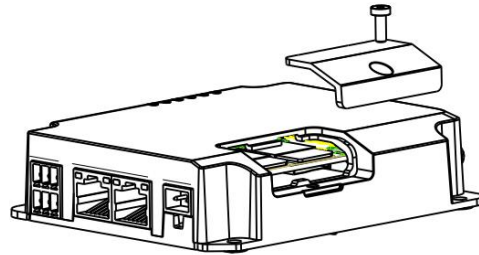
- Power Input: 9-48 VDC
- Power Consumption: Typical 3.3W (Max 6.4 W)
- Operating Temperature: -40°C to 70°C (-40°F -158°F)
- Relative Humidity: 0% to 95% (non-condensing) at 25°C/77°F

#### 3.1 SIM Card Installation

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



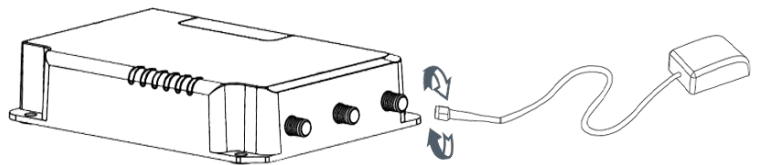
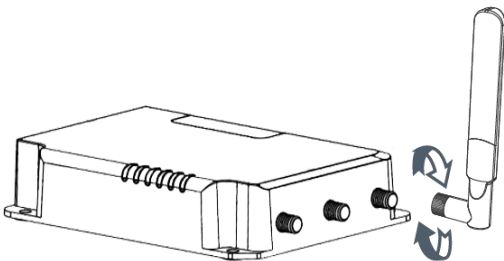
B. Put SIM card into the slot and screw it up.



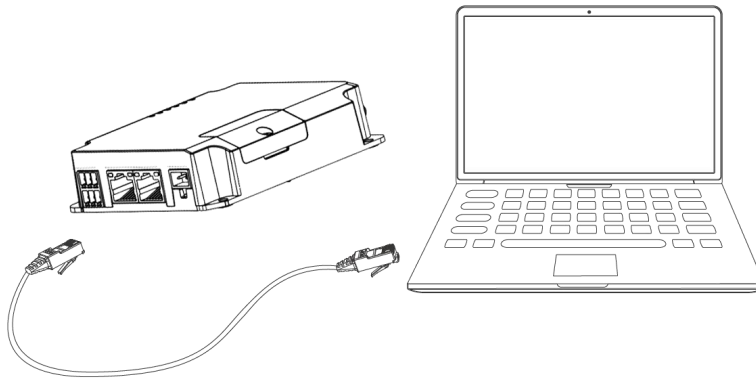
#### 3.2 Antenna Installation

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 Connect the UG85 to a Computer



### 3.4 Mount the gateway

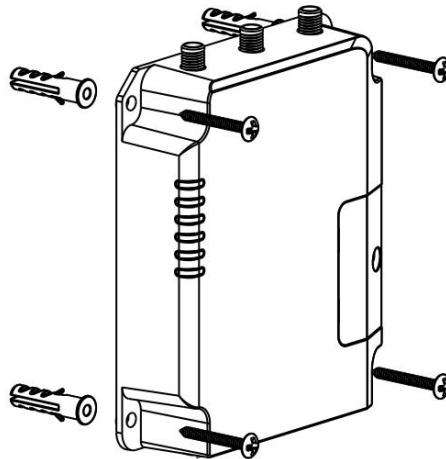
The gateway can be placed on a desktop or mounted to a wall or a DIN rail.

#### 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.



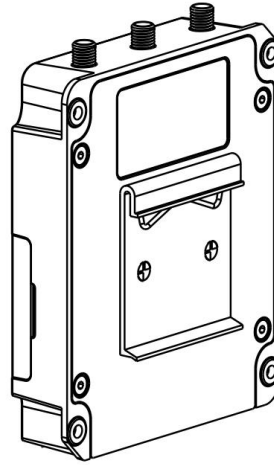
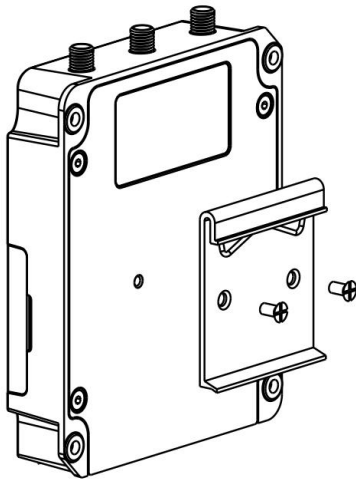
#### 3.4.2 DIN Rail Mounting (Measured in mm)

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.



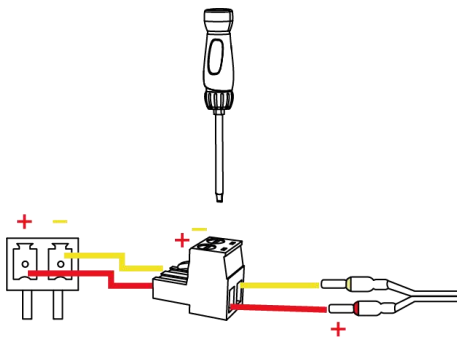
Recommended torque for mounting is 1.0 N·m, and the maximum allowed is 1.2 N·m.





### 3.5 Power Supply Installation

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



Connecting the Power Cable

Color	Polarity
Red	+
Yellow	-

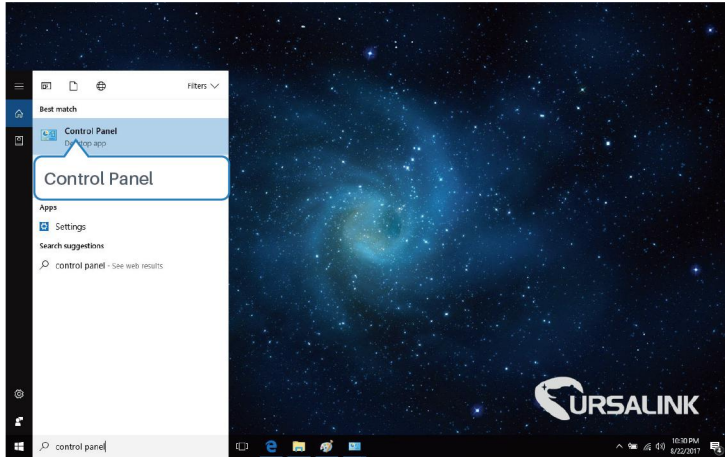


If you insert wires into the reverse holes, the gateway will not start and you must switch the wires into the correct holes.

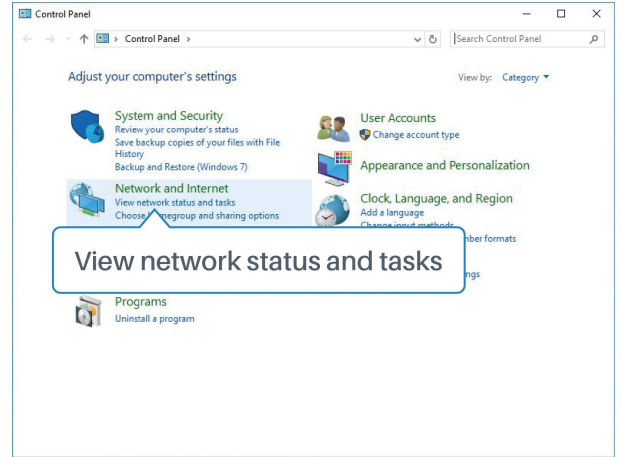
## Getting Started

### 4. PC Configuration for UG85 Web GUI

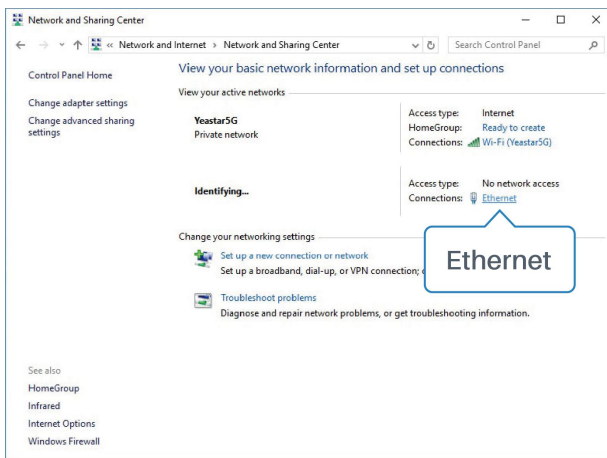
Please connect PC to GE port of UG85 directly. PC can obtain an IP address, or you can configure a static IP address manually. The following steps are based on Windows 10 operating system for your reference.



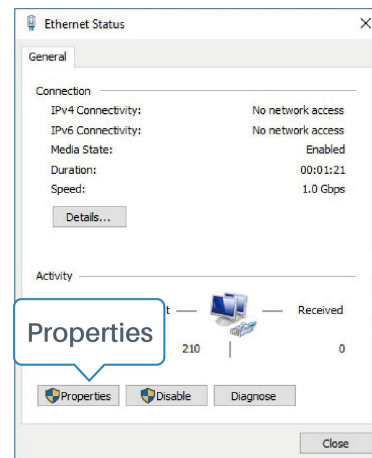
① Click “Search Box” to search “Control Panel” on the Windows 10 taskbar.



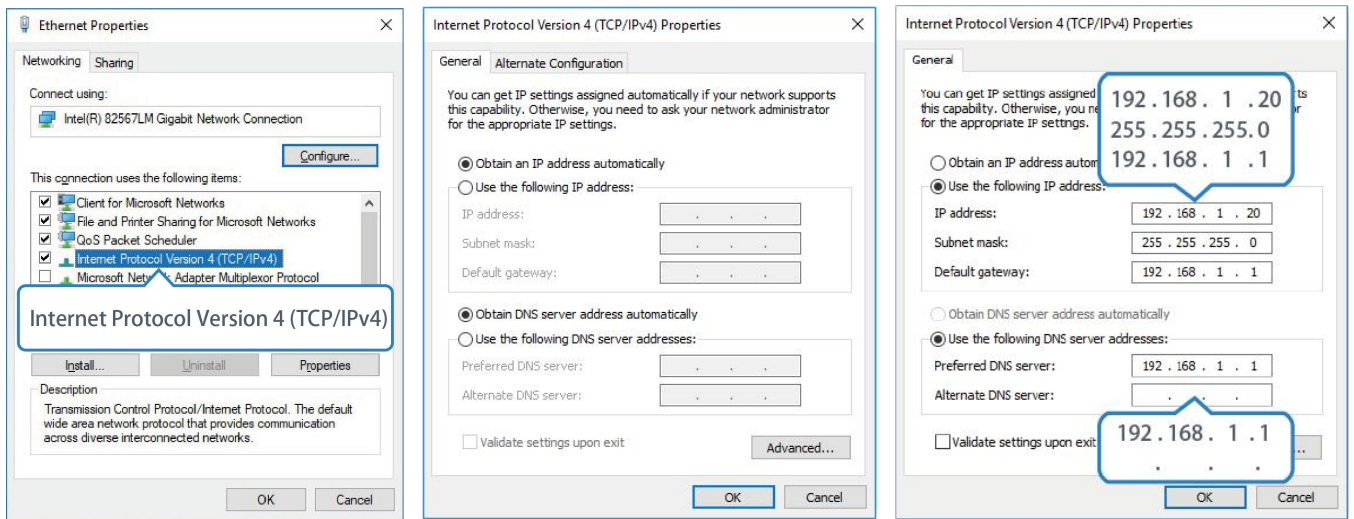
② Click “Control Panel” to open it, and then click “View network status and tasks”.



③ Click “Ethernet” (May have different names).



④ Click “Properties”.



- ⑤ Double Click “Internet Protocol Version 4 (TCP/IPv4)” to configure IP address and DNS server.

- ⑥ Method 1: click “Obtain an IP address automatically”;

Method 2: click “Use the following IP address” to assign a static IP manually within the same subnet of the gateway.

(Note: Remember to click “OK” to finish configuration.)

## 5. Access to UG85 Web GUI for Cellular Connection

This chapter explains how to log in UG85 Web GUI, and connect the gateway to cellular network.

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: **192.168.1.1**

Username: **admin**

Password: **password**

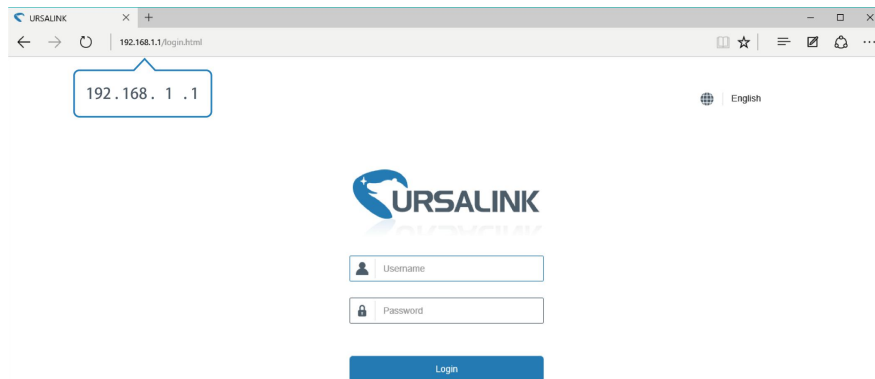
### 5.1 Log in the Gateway



**Make sure your PC is connected to the same network as shown in [Section 4](#).**

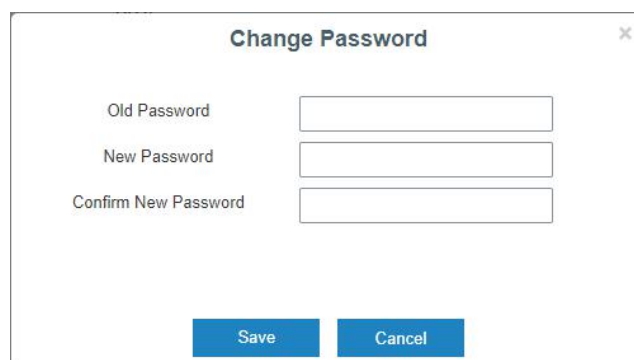
A. Open a Web browser on your PC (Chrome and IE are recommended), type in the IP address, and press Enter on your keyboard.

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

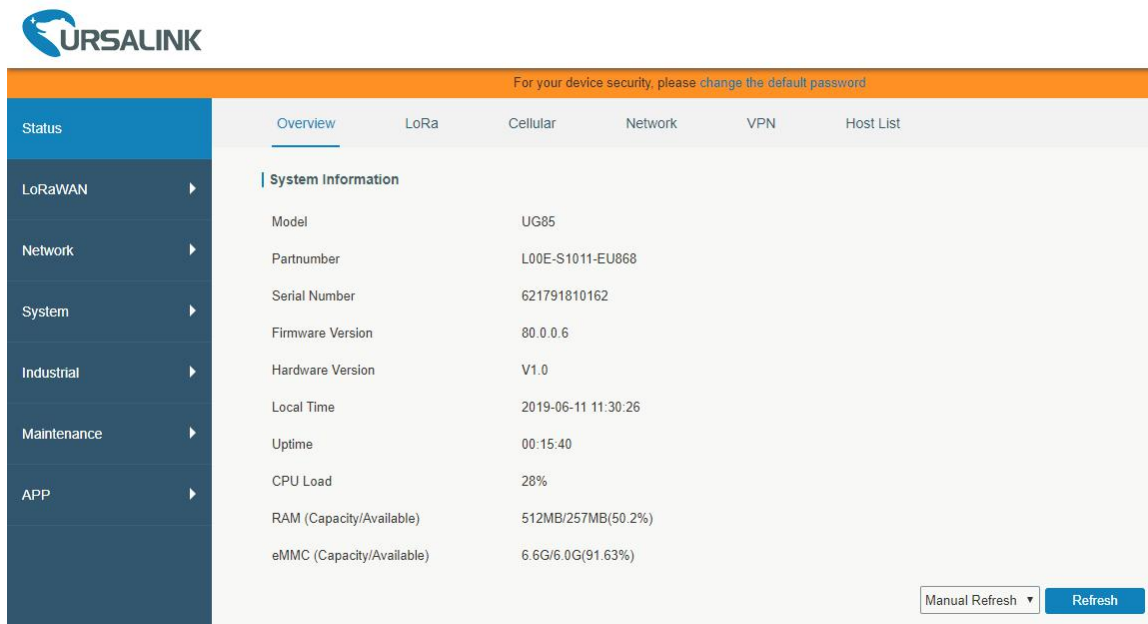


**If you enter the username or password incorrectly more than 5 times, the login page will be locked for 10 minutes.**

C. When you log in with the default username and password, you will be asked to modify the password. It's suggested that you change the password for the sake of security. Click “Cancel” button if you want to modify it later.



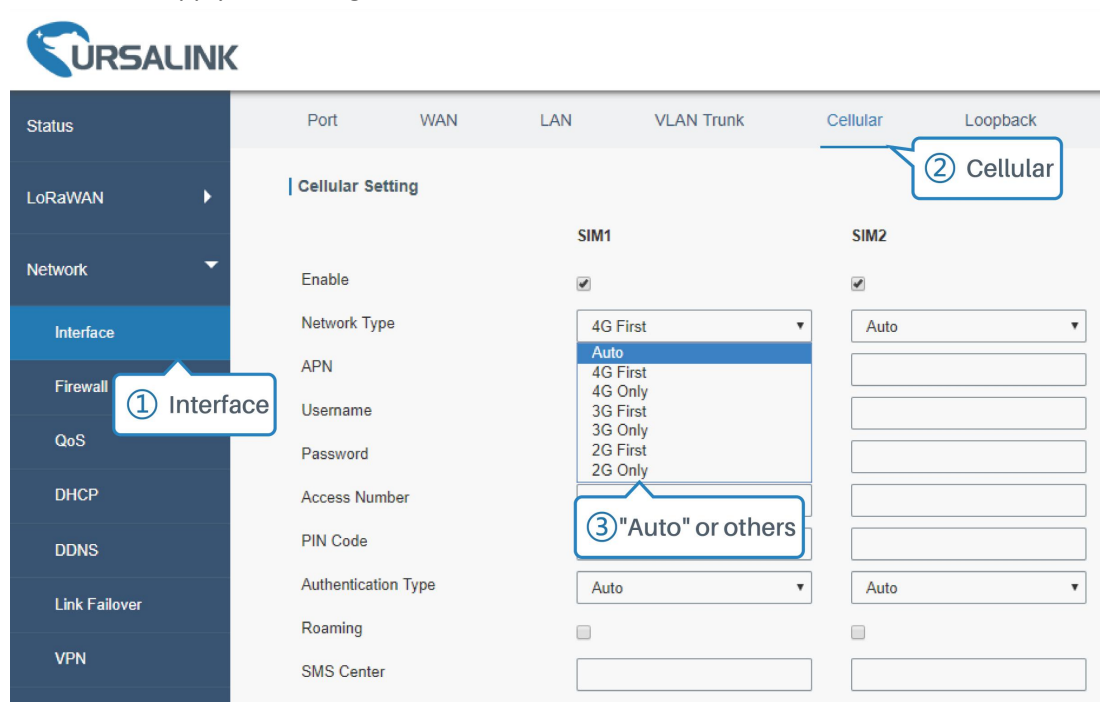
D. After you log in the Web GUI, you can view system information and perform configuration of the gateway.

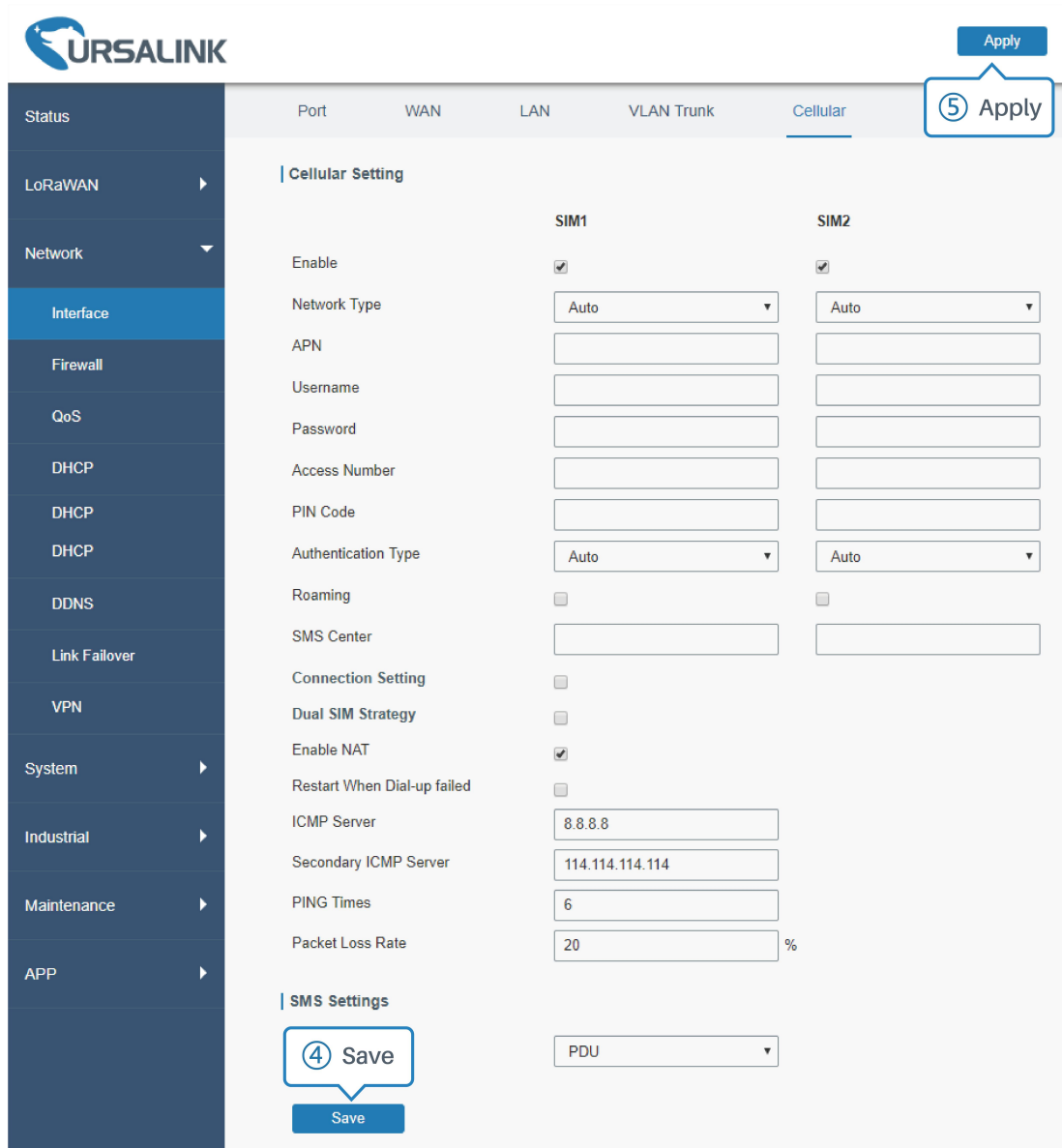


## 5.2 Configure the Cellular Connection

Take inserting SIM card into SIM1 slot as an example; please refer to the following detailed operations.

- Click "Network" → "Interface" → "Cellular" → "Cellular Setting" to configure the cellular info.
- Enable SIM1.
- Choose relevant network type. "Auto", "4G First", "4G Only", "3G First", "3G Only", "2G First" and "2G Only" are optional.
- Click "Save" and "Apply" for configuration to take effect.





If you select “Auto”, the gateway will obtain ISP information from SIM card to set APN, Username, and Password automatically. This option will take effect when the SIM card is issued from a well-known ISP.

If you select “4G First” or “4G Only”, you can click “Save” to complete the configuration directly.

If you select “3G First”, “3G Only”, “2G First” or “2G Only”, you should manually configure APN, Username, Password, and Access Number.


UG85 have 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.

## 5.3 Check the Cellular Connection Status

### 5.3.1 Check the Cellular Connection Status by Web GUI of Router

Click “Status” → “Cellular” to view the status of the cellular connection. If it shows “Connected”, it means

SIM1 has dialed up successfully.



Status	Overview	LoRa	Cellular	Network	VPN
<div>LoRaWAN</div> <div>Network</div> <div>System</div> <div>Industrial</div> <div>Maintenance</div> <div>APP</div>	<div>Modem</div> <div> <div>Status</div> <div>Ready</div> </div> <div> <div>Model</div> <div>EC25</div> </div> <div> <div>Current SIM</div> <div>SIM1</div> </div> <div> <div>Signal Level</div> <div>31asu (-51dBm)</div> </div> <div> <div>Register Status</div> <div>Registered (Home network)</div> </div> <div> <div>IMEI</div> <div>861107032321490</div> </div> <div> <div>IMSI</div> <div>460110269496240</div> </div> <div> <div>ICCID</div> <div>89860317245923922835</div> </div> <div> <div>ISP</div> <div>CHN-CT</div> </div> <div> <div>Network Type</div> <div>LTE</div> </div> <div> <div>PLMN ID</div> <div>46011</div> </div> <div> <div>LAC</div> <div>5f02</div> </div> <div> <div>Cell ID</div> <div>5fb0d34</div> </div> <div>Network</div> <div> <div>Status</div> <div>Connected</div> <div>Connected</div> </div> <div> <div>IP Address</div> <div>172.21.143.187</div> </div> <div> <div>Netmask</div> <div>255.255.255.248</div> </div> <div> <div>Gateway</div> <div>172.21.143.188</div> </div> <div> <div>DNS</div> <div>218.85.152.99</div> </div> <div> <div>Connection Duration</div> <div>0 days, 00:01:39</div> </div>				

### 5.3.2 Check the Cellular Connection Status by Hardware

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.

### 5.4 Check if Network Works Properly by Browser on PC

Open your preferred browser on PC, then type any available web address into address bar and see if it is able to visit Internet via UG85.

## 6. Packet Forwarder Testing

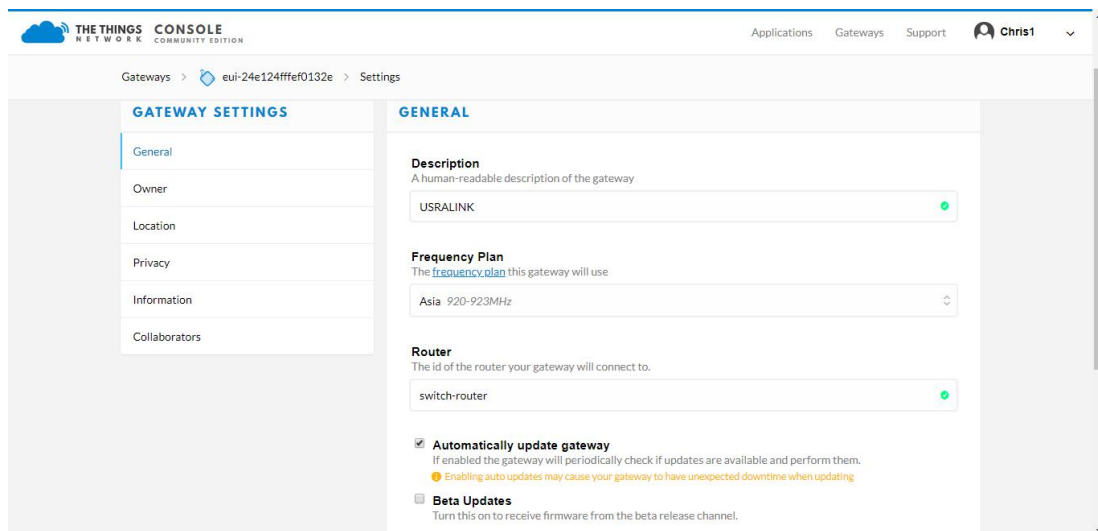
### 6.1 Node Parameters

Channel Plan	AS923
Frequency	923.4MHZ, 923.2MHZ
Join Type	OTAA
Device EUI	60C5A8FFFE0003F9
Application EUI	70B3D57ED0007AC2
App Key	328F2A3F5BA8D0B236459CF06D0512B5

### 6.2 Configure The Things Network

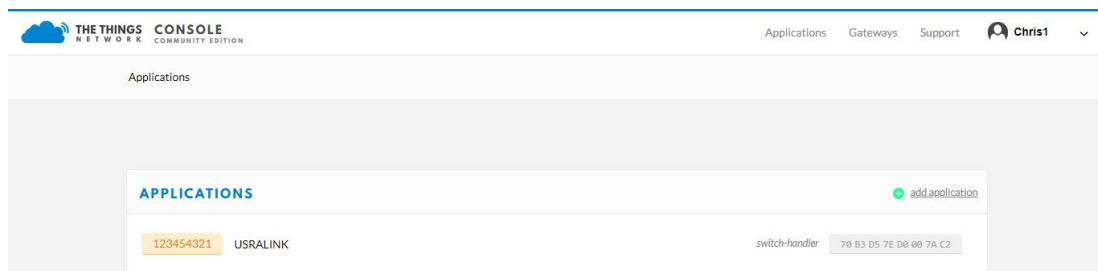
#### A. Gateway Configuration

Gateway EUI	24E124FFFEF0132E
Frequency Plan	Asia 920-923MHZ
Server ID	Switch-router (ttn.opennetworkinfrastructure.org)



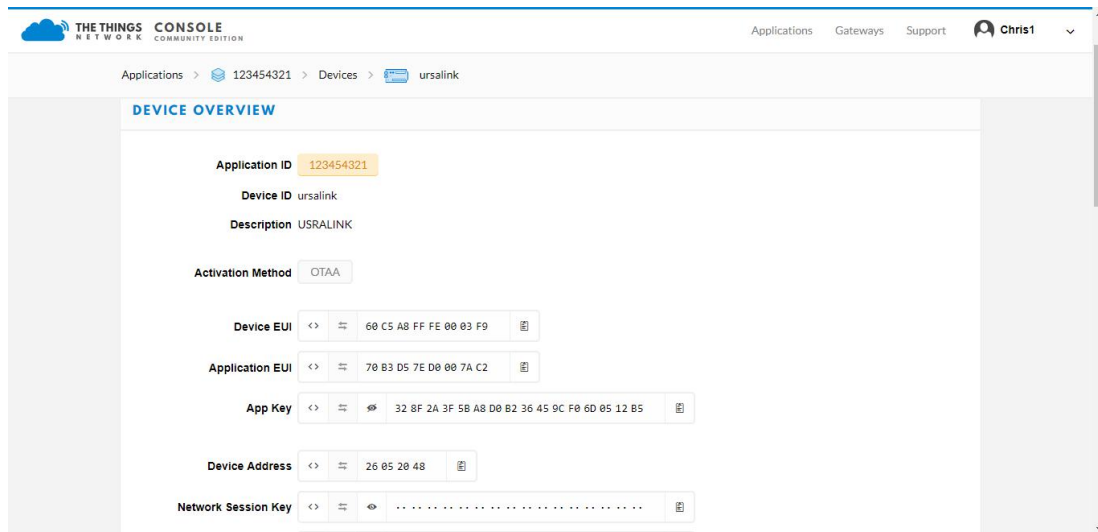
The screenshot shows the 'Gateway Settings' page for a gateway with EUI 'eui-24e124fffe0132e'. The 'GENERAL' tab is selected. The 'Description' field contains 'USRALINK'. The 'Frequency Plan' is set to 'Asia 920-923MHz'. The 'Router' is set to 'switch-router'. The 'Automatically update gateway' checkbox is checked, and the 'Beta Updates' checkbox is unchecked.

#### B. Applications Configuration



The screenshot shows the 'Applications' page. There is a table with one application entry: '123454321' with the name 'USRALINK'. The 'switch-handler' is set to '70 B3 D5 7E D0 00 7A C2'. There is a green 'add application' button in the top right corner.





THE THINGS NETWORK CONSOLE COMMUNITY EDITION

Applications Gateways Support Chris1

Applications > 123454321 > Devices > ursalink

### DEVICE OVERVIEW

Application ID 123454321

Device ID ursalink

Description URSALINK

Activation Method OTAA

Device EUI 60 C5 A8 FF FE 00 03 F9

Application EUI 70 B3 D5 7E D0 00 7A C2

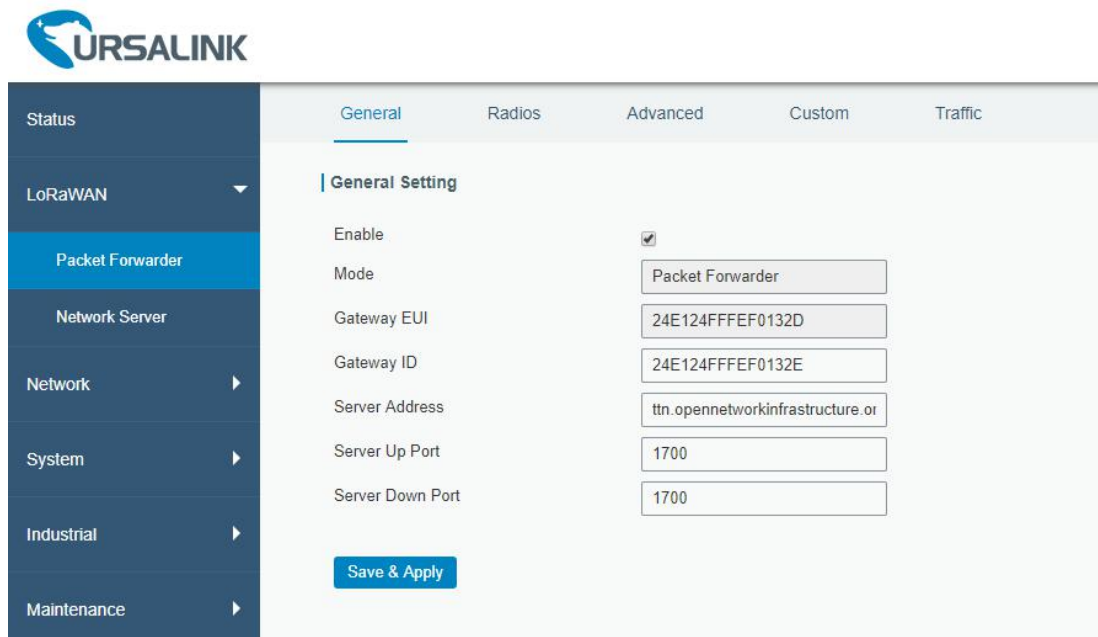
App Key 32 8F 2A 3F 5B A8 D0 B2 36 45 9C F0 6D 05 12 B5

Device Address 26 05 20 48

Network Session Key

## 6.3 Packet Forwarder Configuration

- A. Click “LoRaWAN” → “Packet Forwarder” → “General” to configure the general setting.



URSALINK

Status

LoRaWAN

Packet Forwarder

Network Server

Network

System

Industrial

Maintenance

General Radios Advanced Custom Traffic

### General Setting

Enable ☒

Mode Packet Forwarder

Gateway EUI 24E124FFFEF0132D

Gateway ID 24E124FFFEF0132E

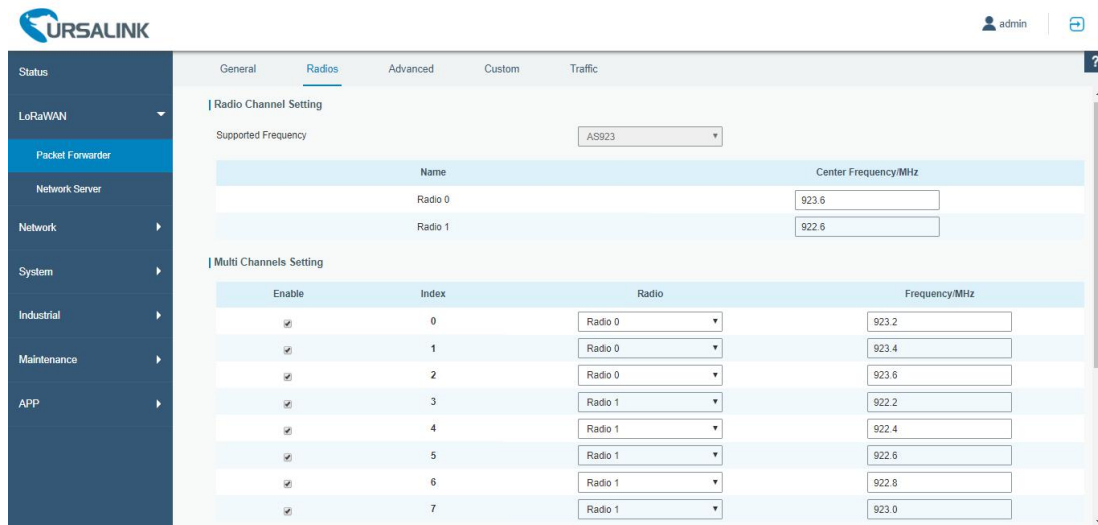
Server Address ttn.opennetworkinfrastructure.or

Server Up Port 1700

Server Down Port 1700

Save & Apply

- B. Click “Radios” to configure the center frequency and channels.

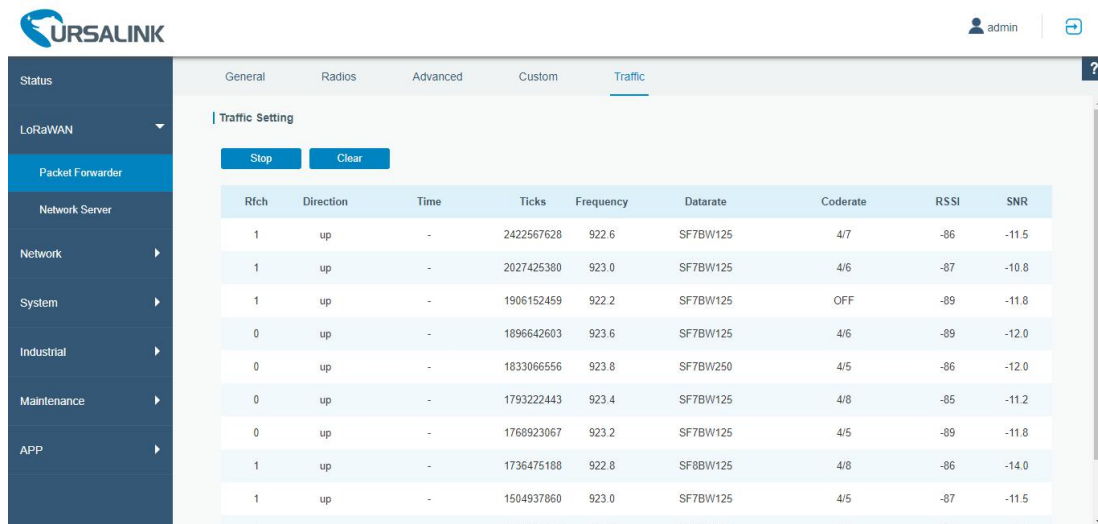


Name	Center Frequency/MHz
Radio 0	923.6
Radio 1	922.6

Enable	Index	Radio	Frequency/MHz
<input checked="" type="checkbox"/>	0	Radio 0	923.2
<input checked="" type="checkbox"/>	1	Radio 0	923.4
<input checked="" type="checkbox"/>	2	Radio 0	923.6
<input checked="" type="checkbox"/>	3	Radio 1	922.2
<input checked="" type="checkbox"/>	4	Radio 1	922.4
<input checked="" type="checkbox"/>	5	Radio 1	922.6
<input checked="" type="checkbox"/>	6	Radio 1	922.8
<input checked="" type="checkbox"/>	7	Radio 1	923.0

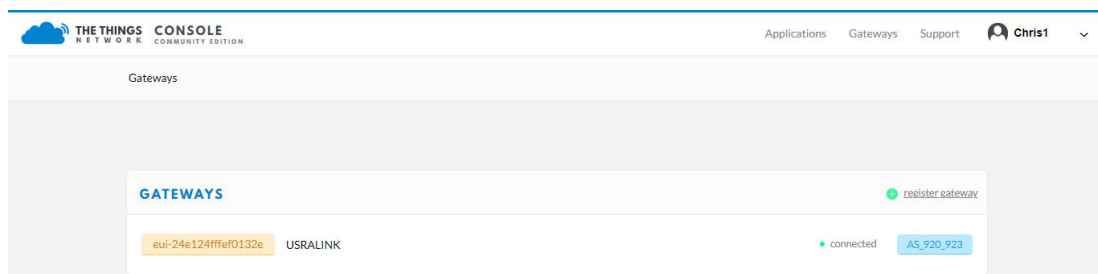
C. Click “Traffic” to view the data communication of UG85.



Rfch	Direction	Time	Ticks	Frequency	Datarate	Coderate	RSSI	SNR
1	up	-	2422567628	922.6	SF7BW125	4/7	-86	-11.5
1	up	-	2027425380	923.0	SF7BW125	4/6	-87	-10.8
1	up	-	1906152459	922.2	SF7BW125	OFF	-89	-11.8
0	up	-	1896642603	923.6	SF7BW125	4/6	-89	-12.0
0	up	-	1833066556	923.8	SF7BW250	4/5	-86	-12.0
0	up	-	1793222443	923.4	SF7BW125	4/8	-85	-11.2
0	up	-	1768923067	923.2	SF7BW125	4/5	-89	-11.8
1	up	-	1736475188	922.8	SF8BW125	4/8	-86	-14.0
1	up	-	1504937860	923.0	SF7BW125	4/5	-87	-11.5


## 6.4 Check Data Transmission on The Things Network

A. Click “Gateways”, you can check the Gateways status.




EUI	NAME	STATUS
eui-24e124ffef0132e	URSALINK	connected

B. Click “Applications” and select the Applications, then go to “Data”, you can find the data from the Node.


**THE THINGS NETWORK**

**CONSOLE**  
COMMUNITY EDITION

[Applications](#)
[Gateways](#)
[Support](#)


**Chris1**

Applications

APPLICATIONS

123454321

URSALINK

switch-handler

78 B3 D5 7E D8 00 7A C2

add application

THE THINGS NETWORK

CONSOLE

COMMUNITY EDITION

[Applications](#)
[Gateways](#)
[Support](#)


**Chris1**

Applications &gt; 123454321 &gt; Data

Overview

Devices

Payload Formats

Integrations

Data

Settings

APPLICATION DATA

pause

clear

uplink

downlink

activation

ack

error

Filters

## 7. Network Server Testing

**Note** that only gateway with activated built-in Network Server version supports this function.

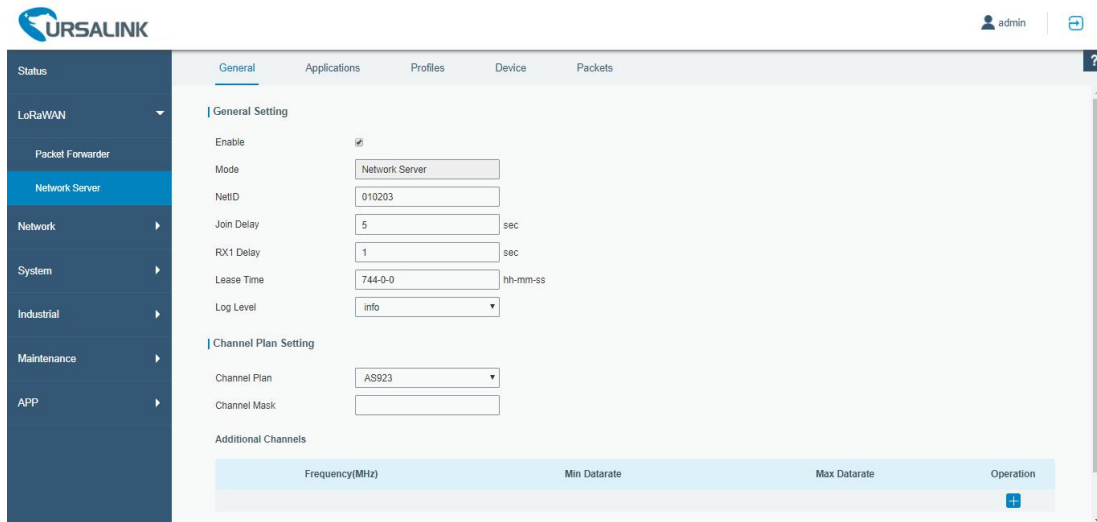
### 7.1 Node Parameters

Channel Plan	AS923
Frequency	923.4MHZ, 923.2MHZ
Join Type	OTAA
Device EUI	60C5A8FFFE0003F9
Application EUI	70B3D57ED0007AC2
App Key	1A98A25536993A882154B81551F18A76

### 7.2 Network Server Configuration

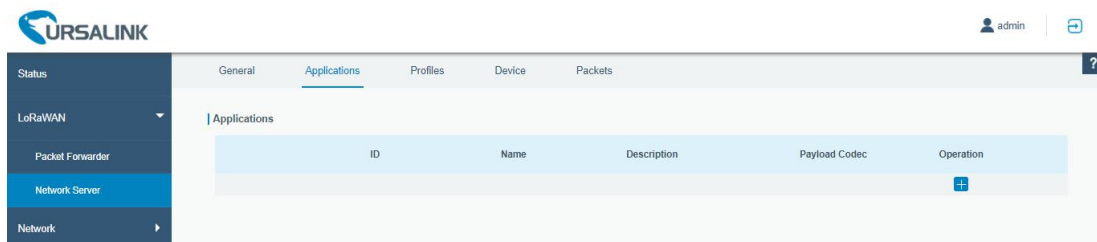
A. Click “LoRaWAN” → “Network Server” → “General” to configure the general setting.

**Note** that the channel plan of the nodes and network server need to be the same.

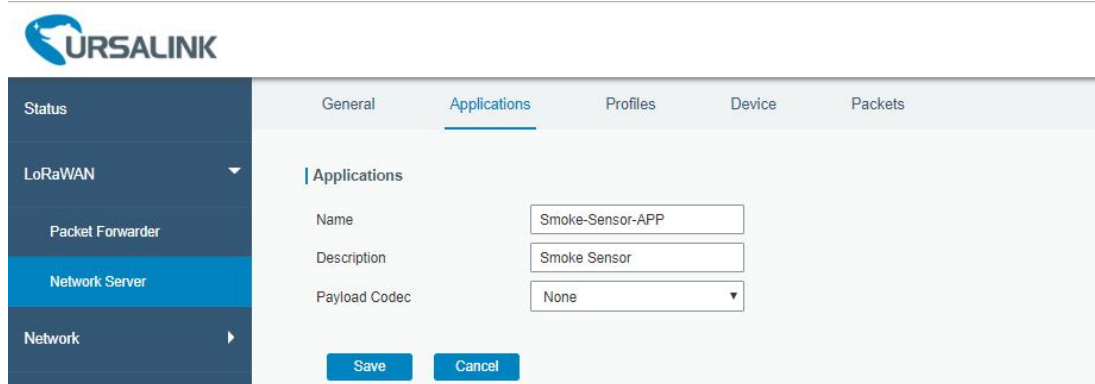


The screenshot shows the 'General Setting' page for the Network Server. The left sidebar contains a menu with 'Status', 'LoRaWAN', 'Packet Forwarder', 'Network Server' (selected), 'Network', 'System', 'Industrial', 'Maintenance', and 'APP'. The main content area has tabs for 'General', 'Applications', 'Profiles', 'Device', and 'Packets'. Under 'General Setting', there are fields for 'Enable' (checked), 'Mode' (Network Server), 'NetID' (010203), 'Join Delay' (5 sec), 'RX1 Delay' (1 sec), 'Lease Time' (744-0-0 h:m-m:ss), and 'Log Level' (info). Below this is the 'Channel Plan Setting' section with 'Channel Plan' (AS923) and 'Channel Mask'. At the bottom, there is a table for 'Additional Channels' with columns: Frequency(MHz), Min Datarate, Max Datarate, and Operation.

B. Add a new Application and choose HTTP or MQTT protocol to send data to another server.



The screenshot shows the 'Applications' page. The left sidebar is the same as in the previous screenshot. The main content area has tabs for 'General', 'Applications' (selected), 'Profiles', 'Device', and 'Packets'. Under 'Applications', there is a table with columns: ID, Name, Description, Payload Codec, and Operation. The table is currently empty, and there is a '+' button to add a new application.



URSALINK

Status

LoRaWAN

Packet Forwarder

Network Server

Network

General Applications Profiles Device Packets

Applications

Name: Smoke-Sensor-APP

Description: Smoke Sensor

Payload Codec: None

Save Cancel

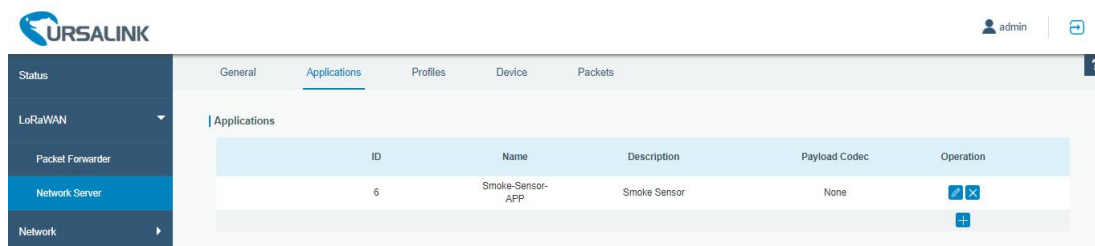


Data Transmission

Type

HTTP

MQTT



URSALINK

Status

LoRaWAN



Packet Forwarder


Network Server

Network

General Applications Profiles Device Packets

Applications

ID	Name	Description	Payload Codec	Operation
6	Smoke-Sensor-APP	Smoke Sensor	None	 



### C. Add a new Profiles for the device.



URSALINK

Status

LoRaWAN

Packet Forwarder

Network Server

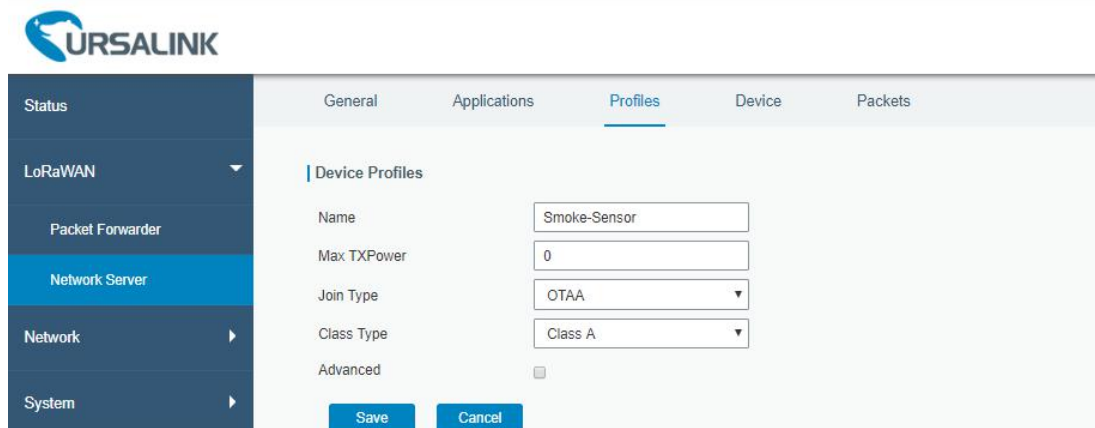
Network

General Applications Profiles Device Packets

Device Profiles

Name	Max TXPower	Join Type	Class Type	Operation
------	-------------	-----------	------------	-----------





URSALINK

Status

LoRaWAN

Packet Forwarder

Network Server

Network

System

General Applications Profiles Device Packets

Device Profiles

Name: Smoke-Sensor

Max TXPower: 0

Join Type: OTAA

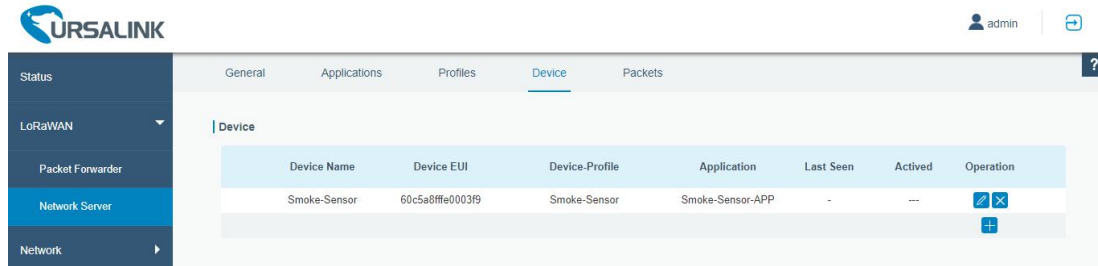
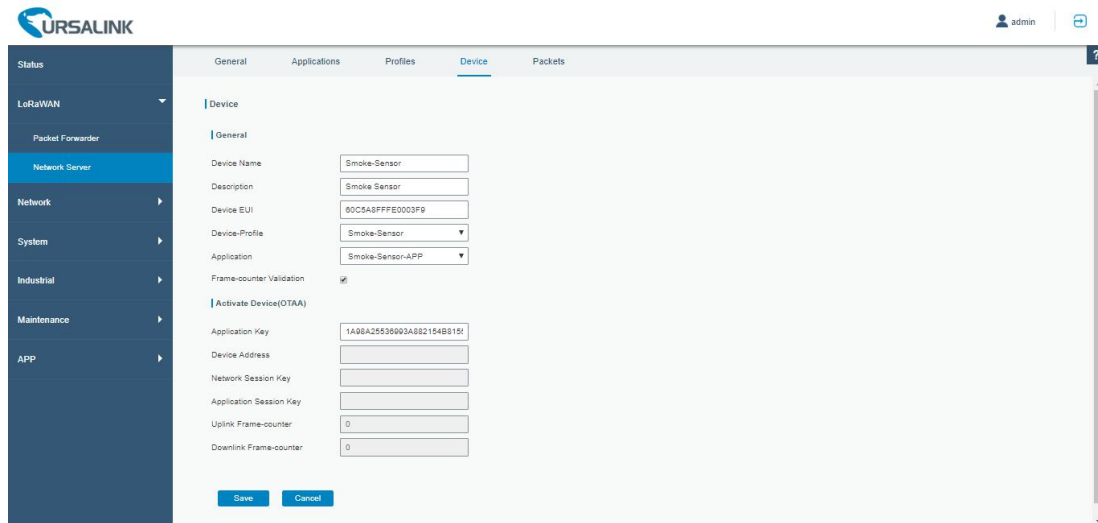
Class Type: Class A

Advanced: ☐

Save Cancel



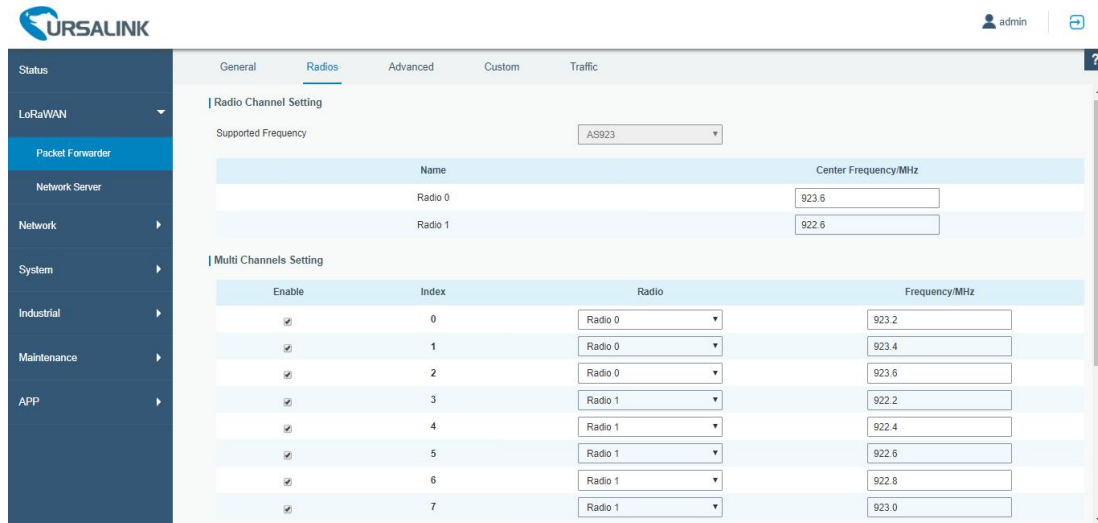
## D. Add device



## 7.3 Package Forwarder Configuration

Click “LoRaWAN” → “Packet Forwarder” → “Radios” to configure the center frequency and channels

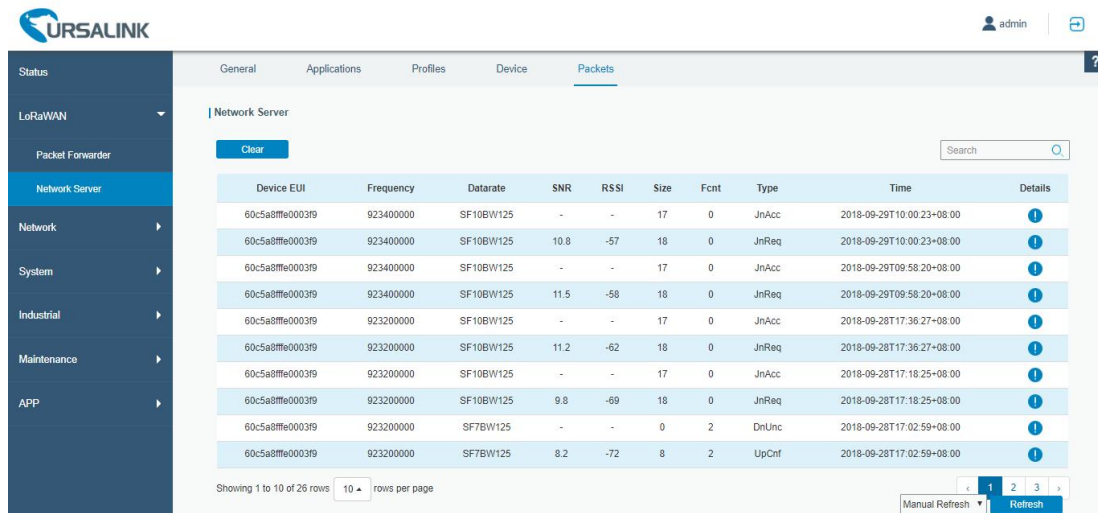
**Note** that node frequency needs to be included in the channels frequency.



Enable	Index	Radio	Frequency/MHz
<input checked="" type="checkbox"/>	0	Radio 0	923.2
<input checked="" type="checkbox"/>	1	Radio 0	923.4
<input checked="" type="checkbox"/>	2	Radio 0	923.6
<input checked="" type="checkbox"/>	3	Radio 1	922.2
<input checked="" type="checkbox"/>	4	Radio 1	922.4
<input checked="" type="checkbox"/>	5	Radio 1	922.6
<input checked="" type="checkbox"/>	6	Radio 1	922.8
<input checked="" type="checkbox"/>	7	Radio 1	923.0

## 7.4 Check the Packets

Click “LoRaWAN” → “Network Server” → “Packets” to check the packets from the node on network server.



Device EUI	Frequency	Datarate	SNR	RSSI	Size	Fcnt	Type	Time	Details
60c5a8f0e0003f9	923400000	SF10BW125	-	-	17	0	JnAcc	2018-09-29T10:00:23+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923400000	SF10BW125	10.8	-57	18	0	JnReq	2018-09-29T10:00:23+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923400000	SF10BW125	-	-	17	0	JnAcc	2018-09-29T09:58:20+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923400000	SF10BW125	11.5	-58	18	0	JnReq	2018-09-29T09:58:20+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF10BW125	-	-	17	0	JnAcc	2018-09-28T17:36:27+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF10BW125	11.2	-62	18	0	JnReq	2018-09-28T17:36:27+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF10BW125	-	-	17	0	JnAcc	2018-09-28T17:18:25+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF10BW125	9.8	-69	18	0	JnReq	2018-09-28T17:18:25+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF7BW125	-	-	0	2	DnUnc	2018-09-28T17:02:59+08:00	<a href="#">Details</a>
60c5a8f0e0003f9	923200000	SF7BW125	8.2	-72	8	2	UpCnt	2018-09-28T17:02:59+08:00	<a href="#">Details</a>

[END]