

# LG308N - LoRaWAN Gateway User Manual

Last modified by Kilight Cao (/xwiki/bin/view/XWiki/Kilight) on 2023/04/26 15:56



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# 1. Introduction

## 1.1 What is the LG308N

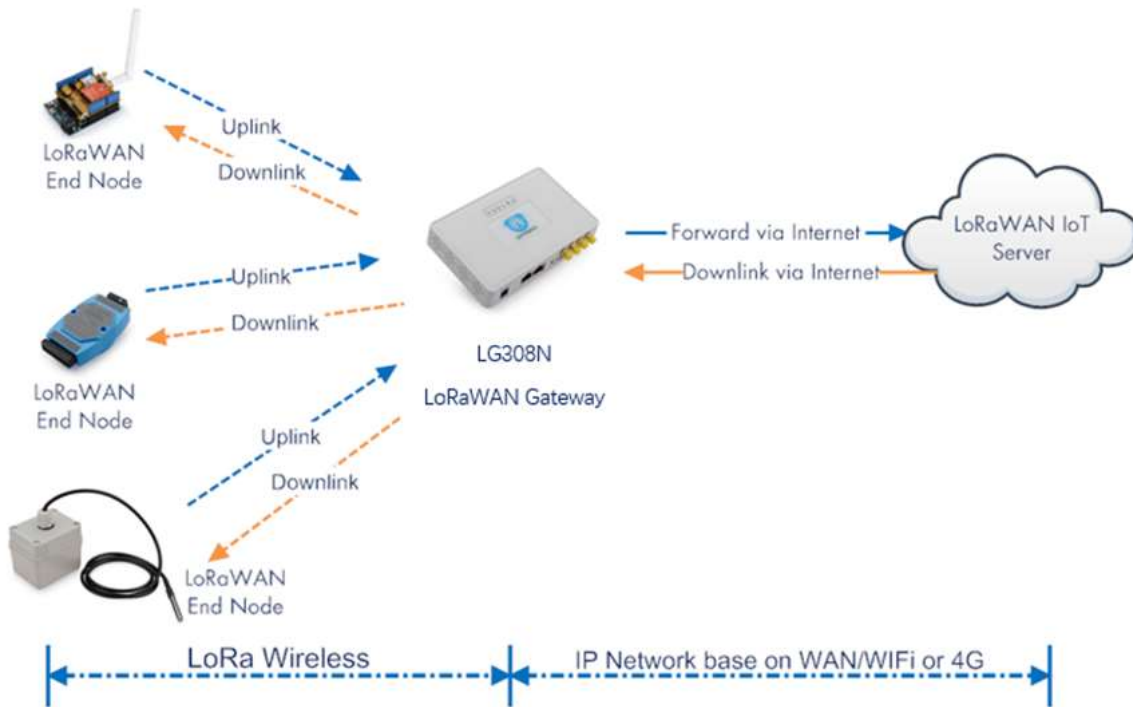
The LG308N is an open source **LoRaWAN Pico Gateway**. It lets you bridge LoRa wireless network to an IP network via WiFi, Ethernet, 3G or 4G cellular network. The L extremely long ranges at low data-rates.

The LG308N uses **Semtech packet forwarder** and fully compatible with LoRaWAN protocol. It includes a **SX1302 LoRa concentrator**, which provides 10 programmable

LG308N has **pre-configured standard LoRaWAN frequency bands** to use for different countries. User can also **customized the frequency bands** to use in their own

LG308N can communicate with ABP LoRaWAN end node without LoRaWAN server. System integrator can use it to integrate with their existing IoT Service without set up service.

## LG308N In a LoRaWAN IoT Network:



## 1.2 Specifications

### Hardware System:

Linux Part:

- 400Mhz ar9331 processor
- 64MB RAM
- 16MB Flash

### Interface:

- 10M/100M RJ45 Ports x 2
- WiFi : 802.11 b/g/n
- LoRaWAN Wireless
- Power Input: 12 V DC, 2 A
- IEEE 802.3 af compliant PoE port (DC 37 ~ 57 v)
- USB 2.0 host connector x 1
- Mini-PCI E connector x 1
- SX1302 + 2 x SX1250

### WiFi Spec:

- IEEE 802.11 b/g/n
- Frequency Band: 2.4 ~ 2.462GHz
- Tx power:
  - 11n tx power : mcs7/15: 11db    mcs0 : 17db
  - 11b tx power: 18db
  - 11g 54M tx power: 12db
  - 11g 6M tx power: 18db
- Wifi Sensitivity
  - 11g 54M : -71dbm
  - 11n 20M : -67dbm

### LoRa Spec:

- Up to -142.5 dBm sensitivity with SX1250 Tx/Rx front-end
- 70 dB CW interferer rejection at 1 MHz offset
- Able to operate with negative SNR, CCR up to 9dB
- Emulates 49 x LoRa demodulators and 1 x (G)FSK demodulator
- Dual digital TX & RX radio front-end interfaces
- 10 programmable parallel demodulation paths
- Dynamic data-rate (DDR) adaptation
- True antenna diversity or simultaneous dual-band operation

### Cellular 4G LTE (optional):

- Quectel: **EC25 LTE module** (<https://www.quectel.com/product/ec25minipcie.htm>)
- Standard Size SIM Slot
- 2 x 4G Sticker Antenna.
- Up to 150Mbps downlink and 50Mbps uplink data rates

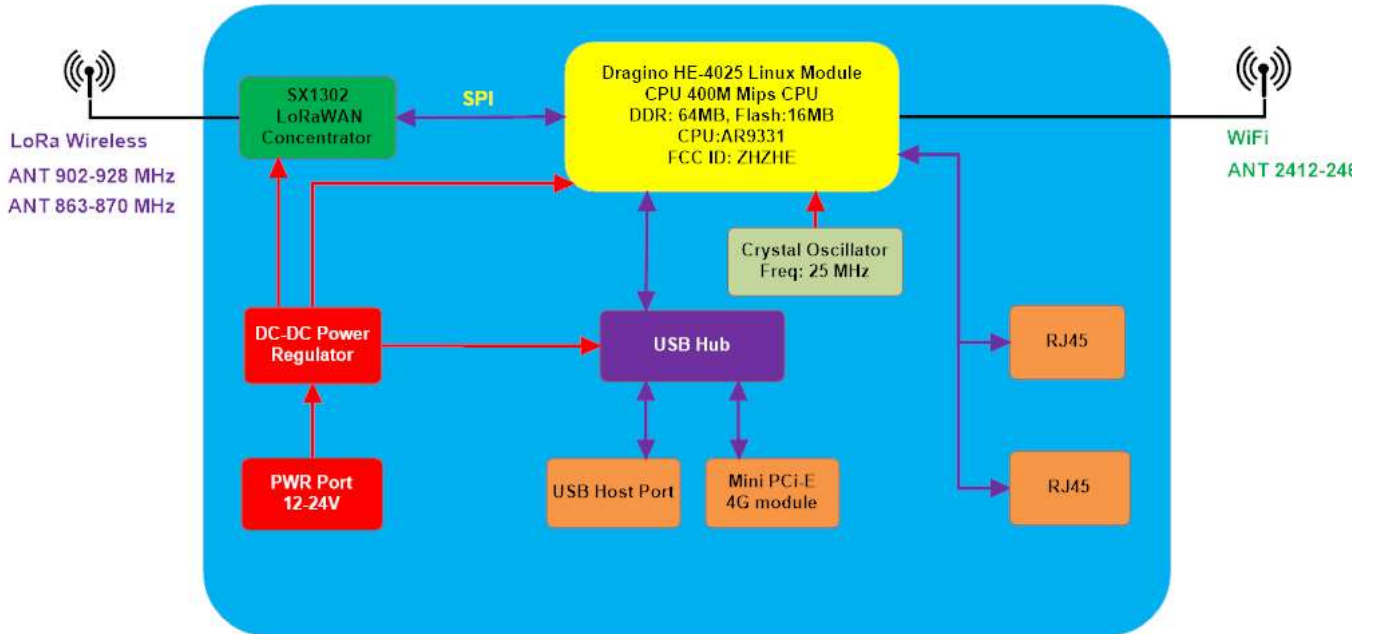
- Worldwide LTE,UMTS/HSPA+ and GSM/GPRS/EDGE coverage
- MIMO technology meets demands for data rate and link reliability in modern wireless communication systems

### 1.3 Features

- Open Source Linux system
- Managed by Web GUI, SSH via LAN or WiFi
- Emulates 49x LoRa demodulators
- LoRaWAN Gateway
- 10 programmable parallel demodulation paths

### 1.4 Hardware System Structure

#### LG308N System Overview:









### 1.5 LG308N Applications



## 1.6 LED Indicators

LG308N has totally 6 LEDs, They are:

- **Power LED**  : This LED will be **solid on** if the device is properly powered.
- **HEART LED**  : No function yet.
- **SYS LED**  : This LED will shows different colors on different state:
  - **SOLID**: Device is alive with LoRaWAN server connection.
  - **BLINKING**: a) Device has internet connection but no LoRaWAN Connection. or b) Device is in booting stage, in this stage, it will **BLINKING** for several seconds.
  - **OFF**: Device doesn't have Internet connection.
- **ETH LED**   : These two LEDs show the ETH interfaces connection status.
- **WiFi LED**  : This LED shows the WiFi interface connection status.

**Note:** Above LED indication are for firmware version > LG02\_LG08--build-v5.3.1584002217-20200312-1639

## 1.7 Button Instruction

LG308N has a black toggle button, which is:

- **Long press 4-5s:** the gateway will reload the Network and Initialize wifi configuration  
**LED status:** SYS LED will BLINKING RED Until the reload is finished.
- **Long press more than 30s:** the gateway will restart and restore factory settings.  
**LED status:** When the user releases the button, the LED will TURN OFF.

## 2. Access and Configure LG308N

The LG308N is configured as a WiFi Access Point by default. User can access and configure the LG308N after connecting to its WiFi network, or via its Ethernet port.

### 2.1 Find IP address of LG308N

#### 2.1.1 Connect via WiFi



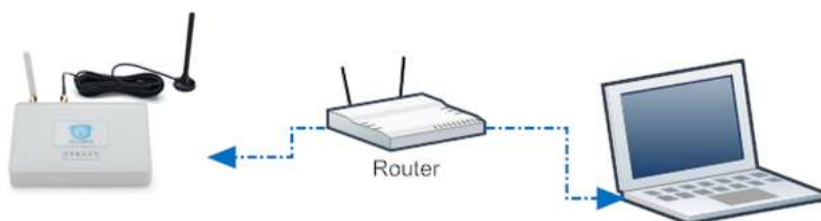
At the first boot of LG308N, it will auto generate a WiFi network called **dragino-xxxxxx** with password:

**Note:** In latest version firmware, it has been password protected and the password is: **dragino+dragino**



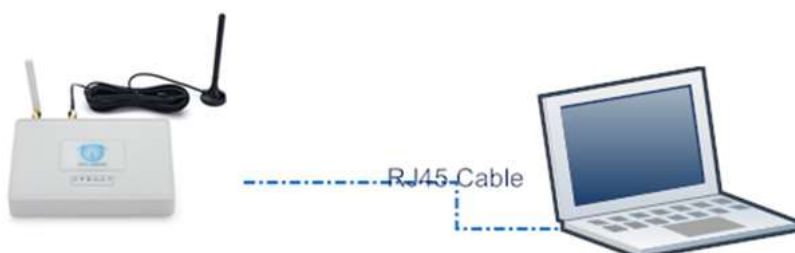
User can use a PC to connect to this WiFi network. The PC will get an IP address 10.130.1.xxx and the LG308N has the default IP **10.130.1.1**

### 2.1.2 Connect via WAN port with DHCP IP from router



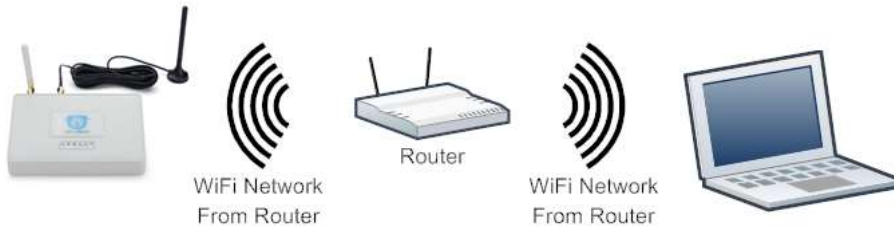
Alternatively, connect the LG308N **WAN port** to your router and LG308N will obtain an IP address from your router. In the router's management portal, you should be able to see the LG308N. You can also use this IP to connect.

### 2.1.3 Connect via LAN port with direct connection from PC



The LG308N **LAN port** is configured as DHCP router by default, user can connect the PC to LAN port and set PC to DHCP mode, it will get IP from LAN port and be able to access 10.130.1.1.

### 2.1.4 Connect WiFi with DHCP IP from router



If the LG308N already connect to the router via WiFi, use can use the WiFi IP to connect to LG308N.

## 2.1.5 Connect via LAN port by fall back ip

The **LAN port** also has a fall back ip address for access if user doesn't connect to uplink router.

## 2.2 Access Configure Web UI

### Web Interface

Open a browser on the PC and type the LG308N ip address (depends on your connect method)

`http://10.130.1.1/` (`http://10.130.1.1/`) (Access via WiFi AP network)

or

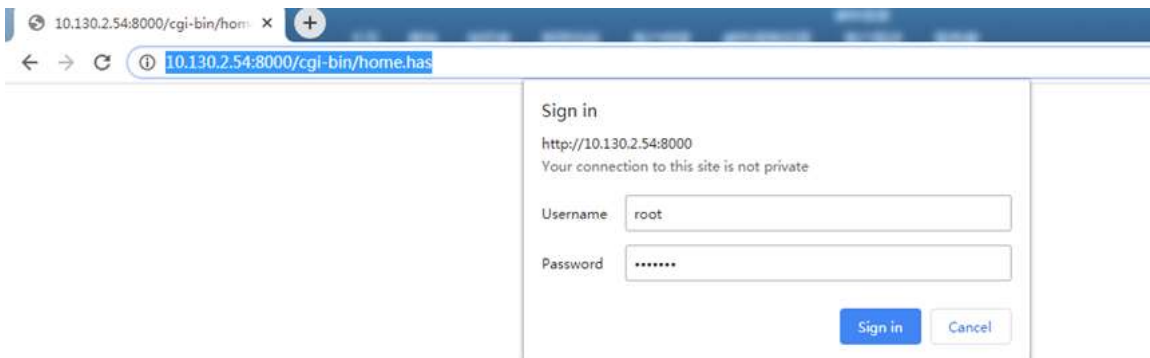
`http://IP_ADDRESS` or `http:// IP_ADDRESS:8000`

You will see the login interface of DLOS8N as shown below.

The account details for Web Login are:

**User Name:** root

**Password:** dragino



## 3. Typical Network Setup

### 3.1 Overview

LG308N supports flexible network set up for different environment. This section describes the typical network topology can be set in LG308N. The typical network set up i

- **WAN Port Internet Mode**
- **WiFi Client Mode**
- **WiFi AP Mode**
- **Cellular Mode**

### 3.2 Use WAN port to access Internet

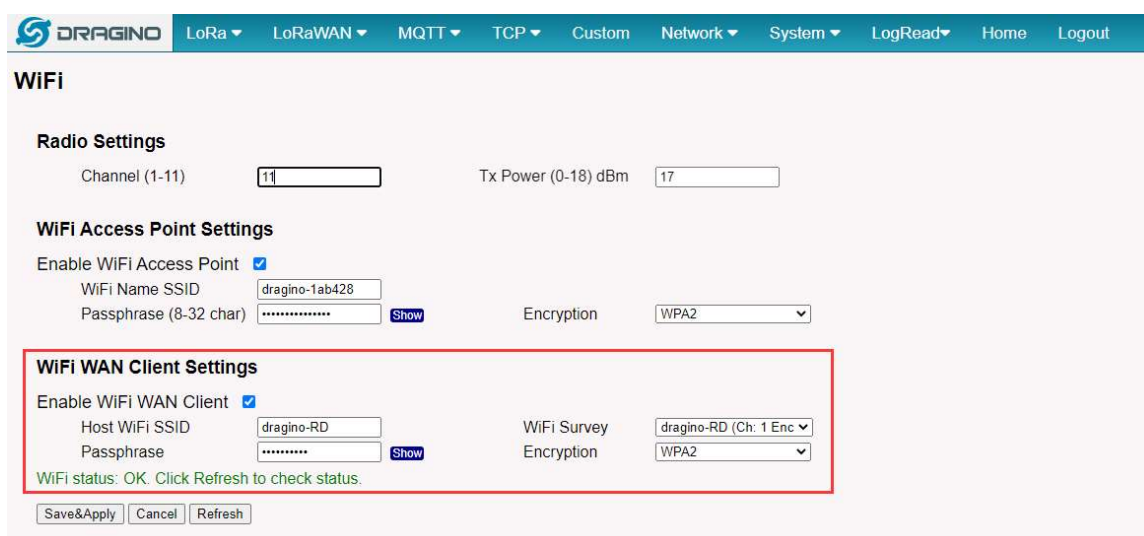
By default, the LG308N is set to use the WAN port to connect to an upstream network. When you connect the LG308N's WAN port to an upstream router, LG308N will ge access via the upstream router. The network status can be checked in the **home page**:



### 3.3 Access the Internet as a WiFi Client

In the WiFi Client Mode, LG308N acts as a WiFi client and gets DHCP from an upstream router via WiFi.

The settings for WiFi Client is under page **System--> WiFi --> WiFi WAN Client Settings**



In the WiFi Survey Choose the WiFi AP, and input the Passphrase then click **Save & Apply** to connect.

### 3.4 Use built-in 4G modem for internet access

If the LG308N has 3G/4G Cellular modem, user can use it as main internet connection or back up.

First, install the Micro SIM card as below direction

Second, Power off/ ON LG308N to let it detect the SIM card.



The set up page is **System --> Cellular**

While use the cellular as Backup WAN, device will use Cellular for internet connection while WAN port or WiFi is not valid and switch back to WAN port or WiFi after they



### Cellular Settings

Cellular device not detected

APN

Service

Dial Number




Pincode

Username

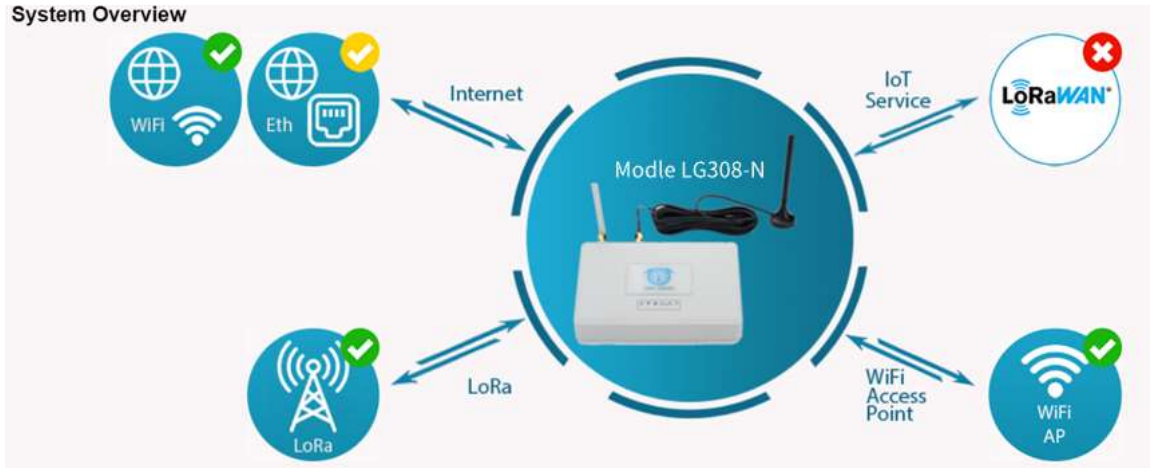
Password  [Show](#)

### 3.5 Check Internet connection

In the **home** page, we can check the Internet connection.

- GREEN Tick  : This interface has Internet connection.
- Yellow Tick  : This interface has IP address but don't use it for internet connection.
- RED Cross  : This interface doesn't connected.

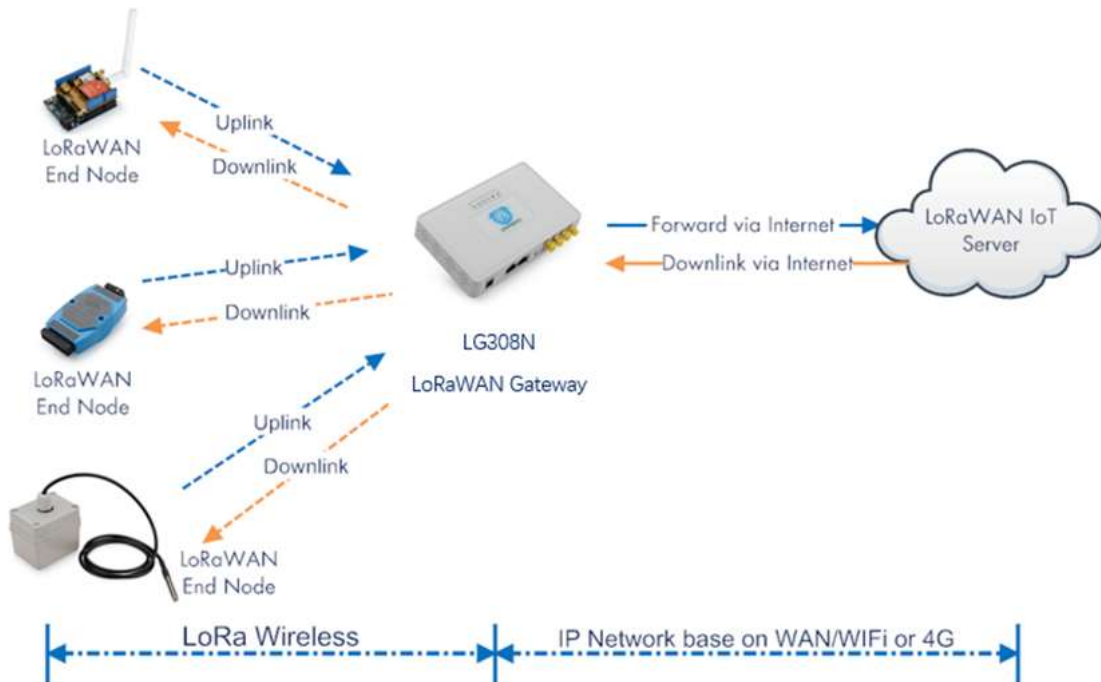
#### System Overview



### 4. Example: Configure as a LoRaWAN gateway

LG308N is fully compatible with LoRaWAN protocol. It uses the legacy Semtech Packet forwarder to forward the LoRaWAN packets to server. The structure is as below.

## LG308N In a LoRaWAN IoT Network:

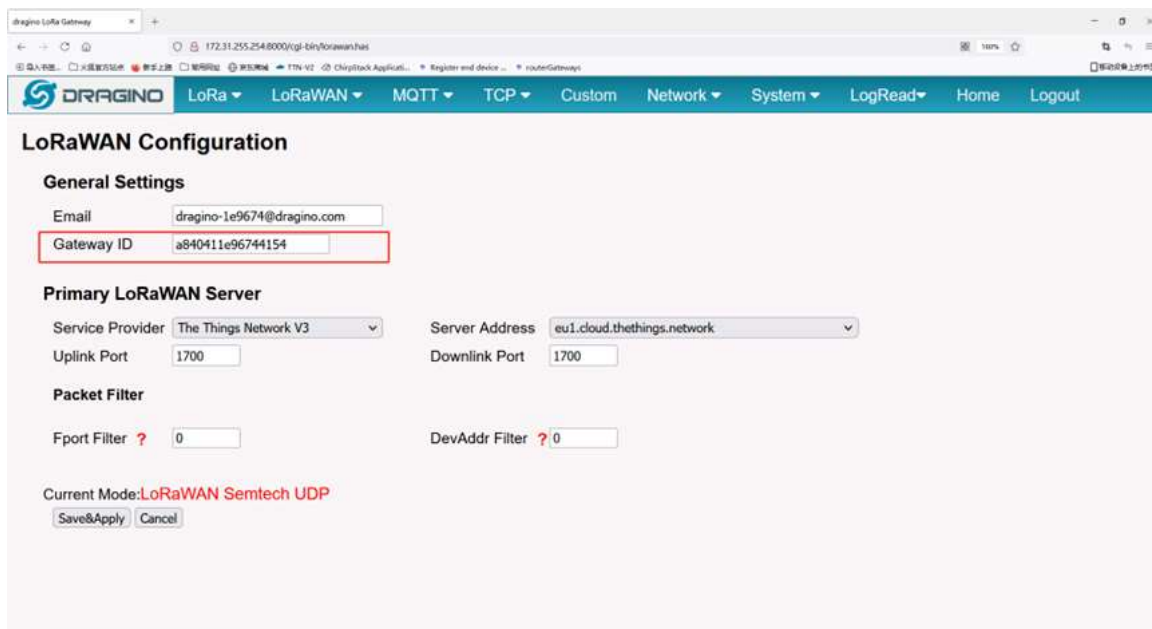


This chapter describes how to use the LG308N to work with(TTN v3) LoRaWAN Server (<https://www.thethingsnetwork.org/>) ([www.thethingsnetwork.org](http://www.thethingsnetwork.org) (<http://www.thethingsnetwork.org>))

## 4.1 Create a gateway in TTN V3 Server

### Step 1: Get a Unique gateway ID.

Every LG308N has a unique gateway id. The ID can be found at LoRaWAN page:



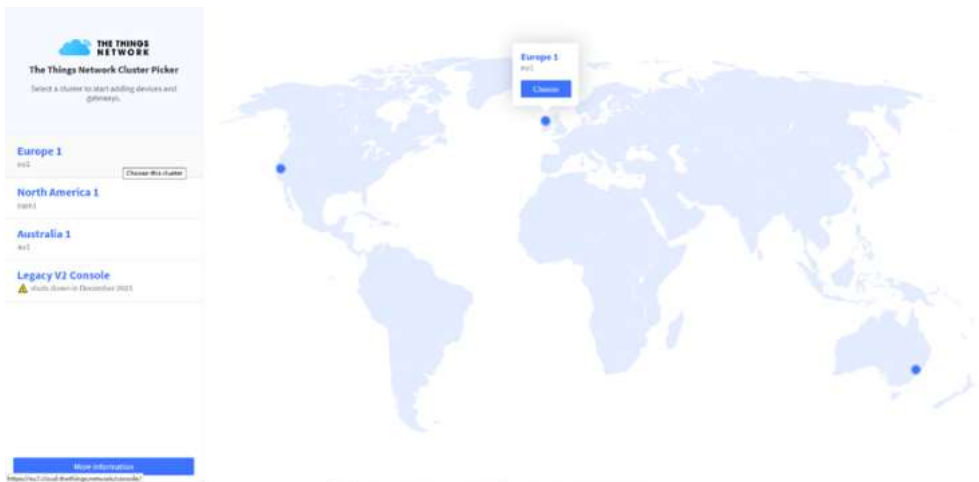
The example gateway id is: **a840411e96744154**

### Step 2: Sign up a user account in TTN server

<https://account.thethingsnetwork.org/register> (<https://account.thethingsnetwork.org/register>)



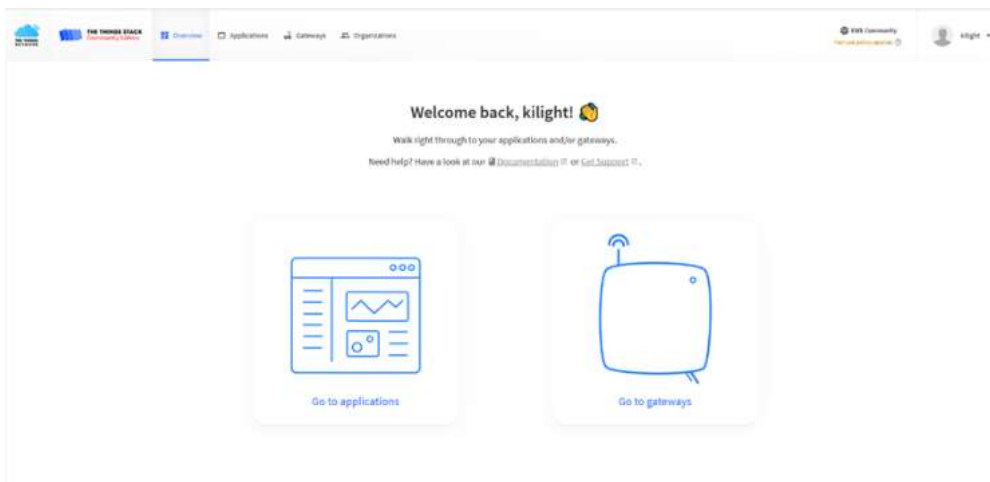
**Step 3: Choose the TTNv3 Cluster Picker**



**Note: Choose the cluster corresponds to a specific Gateway server address**

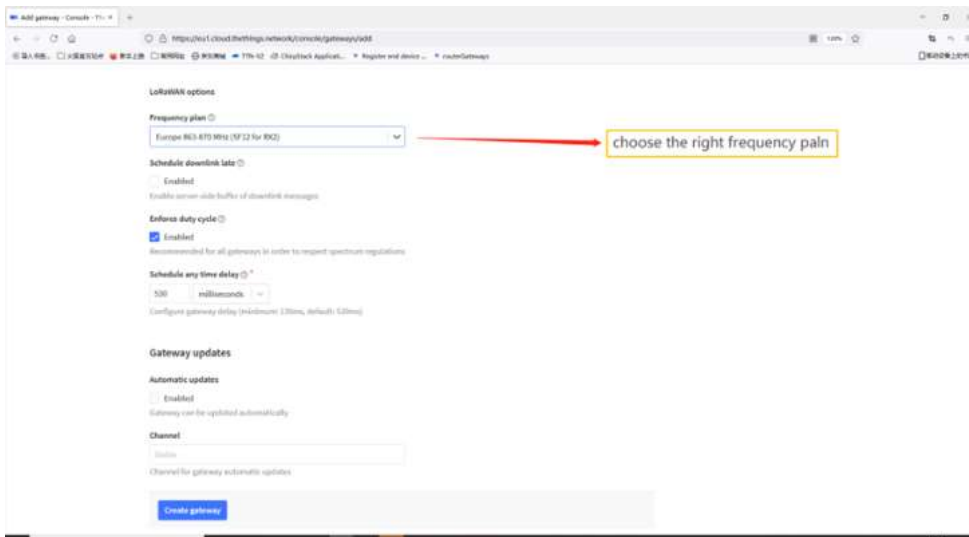
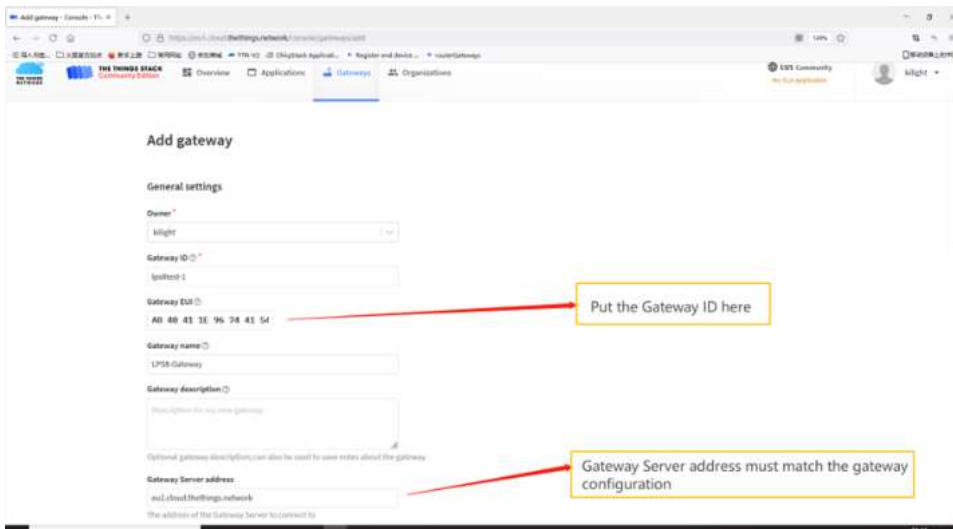
- Europe 1 corresponding Gateway server address: eu1.cloud.thethings.network
- North America 1 corresponding Gateway server address: nam1.cloud.thethings.network
- Australia 1 corresponding Gateway server address: au1.cloud.thethings.network
- Legacy V2 Console : TTN v2 shuts down in December 2021

**Step 4: Create a Gateway**



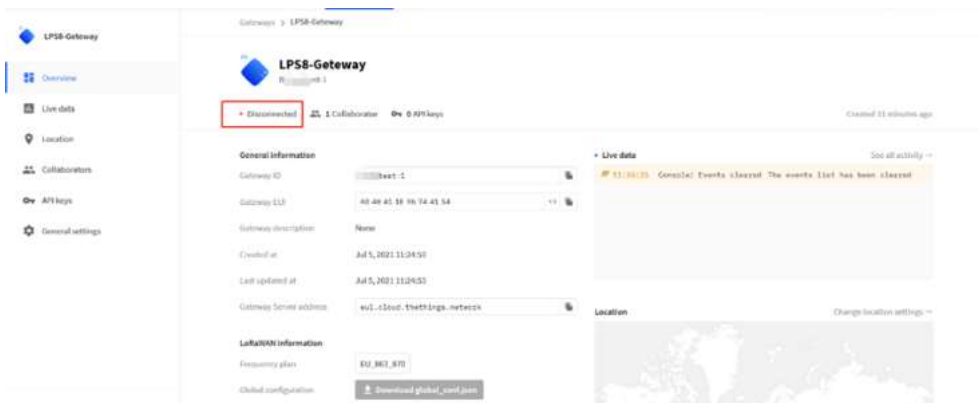
Click the Gateway icon and then click Add gateway.

Open the following page:



**Notice:** Gateway Server address must match the gateway configuration, otherwise you will have problem for End Node to join the network.

After creating the gateway, you can see the gateway info, as below.



## 4.2 Configure LG308N to connect to TTN v3

You can now configure the LG308N to let it connect to TTN network V3.

Make sure your LG308N has a working Internet Connection first.

Choose the right server provider and click **Save&Apply**.

**LoRaWAN Configuration**

**General Settings**

Email: dragino-1e9674@dragino.com  
 Gateway ID: a840411e96744154

**Primary LoRaWAN Server**

Service Provider: The Things Network V3  
 Server Address: eu1.cloud.thethings.network  
 Uplink Port: 1700  
 Downlink Port: 1700

**Packet Filter**

Fport Filter: 0  
 DevAddr Filter: 0

Current Mode: LoRaWAN Semtech UDP  
 Save & Apply | Cancel

Note: The server address must match the Gateway server address you choose in TTN V3.

In the home page, we can see the LoRaWAN connection is ready now.



In TTN v3 portal, we can also see the gateway is connected.

**THE THINGS STACK Community Edition**

Overview | Applications | Gateways | Organizations

EVN Community | Allright

Gateways > LPS8-Gateway

**LPS8-Gateway**  
 ID: a840411e96744154

Last seen: 3 seconds ago | 1 Collaborator | 0 API keys

**General information**

Gateway ID	a840411e96744154
Gateway EUI	A8 40 41 1E 96 74 41 54
Gateway description	Name
Created at	Jul 5, 2021 12:34:53
Last updated at	Jul 5, 2021 12:34:53
Gateway Server address	eu1.cloud.thethings.network

**LoRaWAN information**

Frequency plan	EU_863_870
----------------	------------

**Live data**

12:28:38	Receive gateway status	NetEUI: A840411E96744154, TxNwkID: 4, TxNwkID: 4
12:25:00	Receive uplink message	DevAddr: 40 00 00 00, FPort: 1500
12:27:55	Receive uplink message	DevAddr: 40 00 00 00, FPort: 1606
12:27:47	Receive uplink message	DevAddr: 40 00 00 00, FPort: 1695
12:27:42	Receive uplink message	DevAddr: 40 00 00 00, FPort: 1694
12:27:40	Receive gateway status	NetEUI: A840411E96744154, TxNwkID: 4, TxNwkID: 4

**Location**

### 4.3 Configure frequency

We also need to set the frequency plan in LG308N to match the end node we use, so to receive the LoRaWAN packets from the LoRaWAN sensor.

DRAGINO LoRa LoRaWAN MQTT TCP HTTP Custom System

## LoRa Configuration

Debug Level

### Radio Settings

Keep Alive Period (sec)

Frequency Plan

Save&Apply Disable Cancel

- EU868 Europe 868Mhz (863-870)
- EU868 Europe 868Mhz (863-870)
- CN470 China 470MHz (470-510)
- US915 United States 915Mhz (902-928)
- AU915 Australia 915Mhz (915-928)
- IN865 India 865MHz (865-867)
- KR920 Korea 920MHz (920-923)
- AS923 Asia 923MHz (920-923)
- AS923 Asia 923MHz (923-925)
- RU864 Russia 864MHz (864-870)
- Customized Bands

In logread page, user can check the frequency actually used.

Click to go Back, hold to see history LoRaWAN MQTT TCP HTTP Custom System LogRead

## LogRead

**FreqINFO:**

SX1301 Channels frequency

chan\_multSF\_0  
Lora MAC, 125kHz, all SF, 868.1 MHz

chan\_multSF\_1  
Lora MAC, 125kHz, all SF, 868.3 MHz

chan\_multSF\_2  
Lora MAC, 125kHz, all SF, 868.5 MHz

chan\_multSF\_3  
Lora MAC, 125kHz, all SF, 867.1 MHz

chan\_multSF\_4  
Lora MAC, 125kHz, all SF, 867.3 MHz

chan\_multSF\_5  
Lora MAC, 125kHz, all SF, 867.5 MHz

chan\_multSF\_6  
Lora MAC, 125kHz, all SF, 867.7 MHz

chan\_multSF\_7  
Lora MAC, 125kHz, all SF, 867.9 MHz

chan\_Lora\_std  
Lora MAC, 250kHz, SF7, 868.3 MHz

## 4.4 Add a LoRaWAN End Device

This section shows how to add a LoRaWAN End device to a LoRaWAN network and see the data from TTN web site.

We use LT-22222-L (<http://www.dragino.com/products/lora-lorawan-end-node/item/156-lt-22222-l.html>) IO Controller as a reference device - the setup for other LoRaW



**Step 1:** Create a Device definition in TTN v3 with the OTAA keys from the example LT-22222-L IO Controller device.

Three codes are required to define the device in TTN v3:

- DEV EUI - Unique ID code for a particular device.
- APP EUI - ID code for an Application defined in TTN v3.
- APP Key - Unique key to secure communications with a particular device.

A set of these codes are stored in each device by the manufacturer as the default codes for that particular device. Each device is shipped with a sticker with the default D

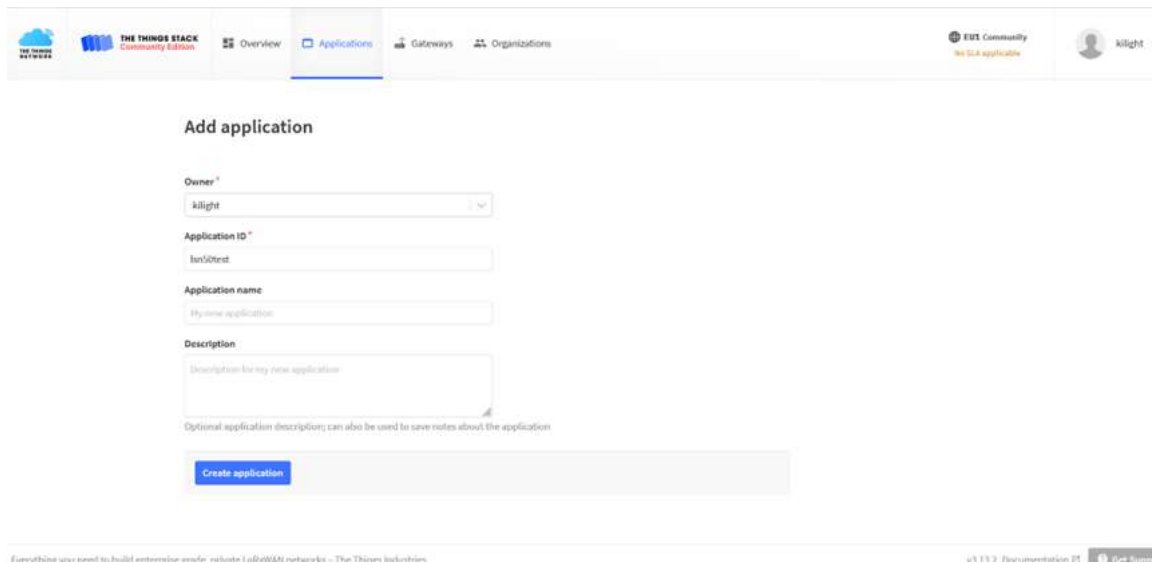




**Note:** You may be able to change these codes in a device by using a configuration facility on the device e.g. the LT-22222 uses a serial port access and a serial terminal necessary in the case where you have to use codes assigned by a LoRa WAN server.

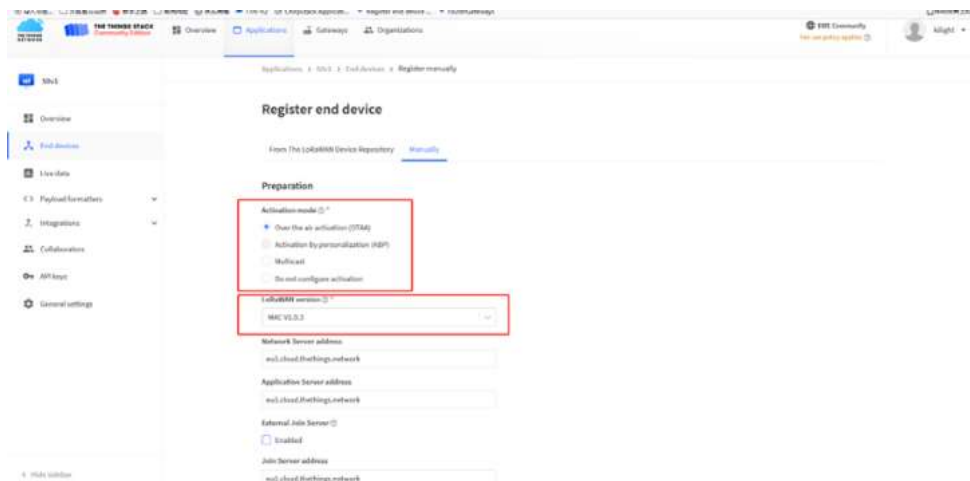
For the TTN v3 server, you can use the codes set in the device as in the following example.

Select **Add Application** to open the screen below.



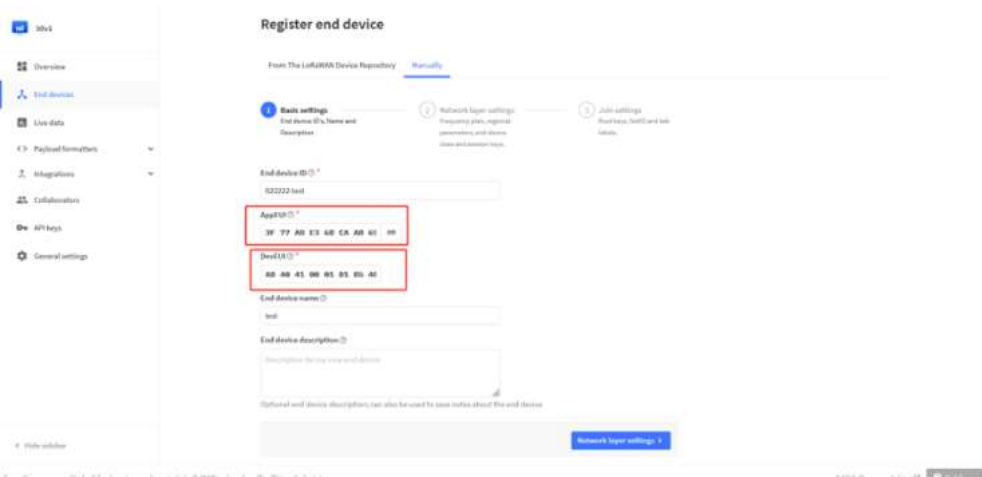
Open the **Application** select **Add end device**

Start Register the end device

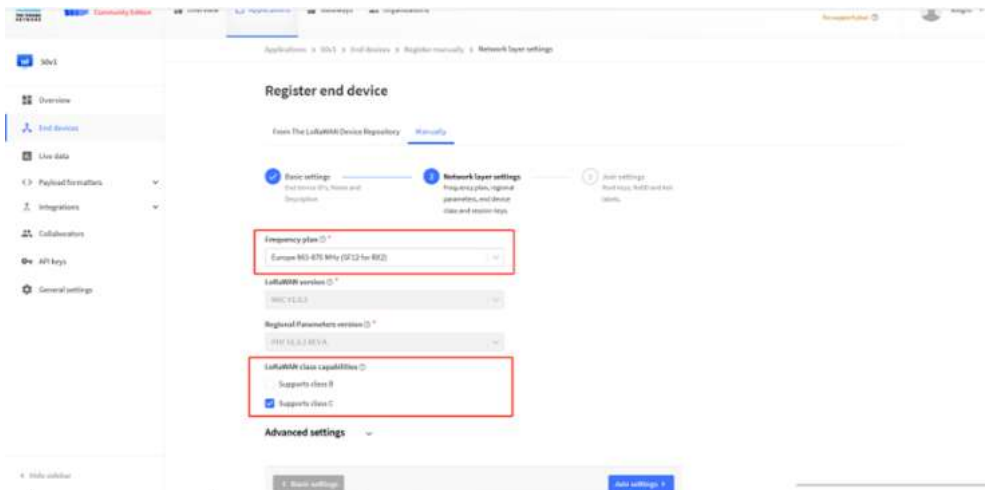


Select OTAA activation mode

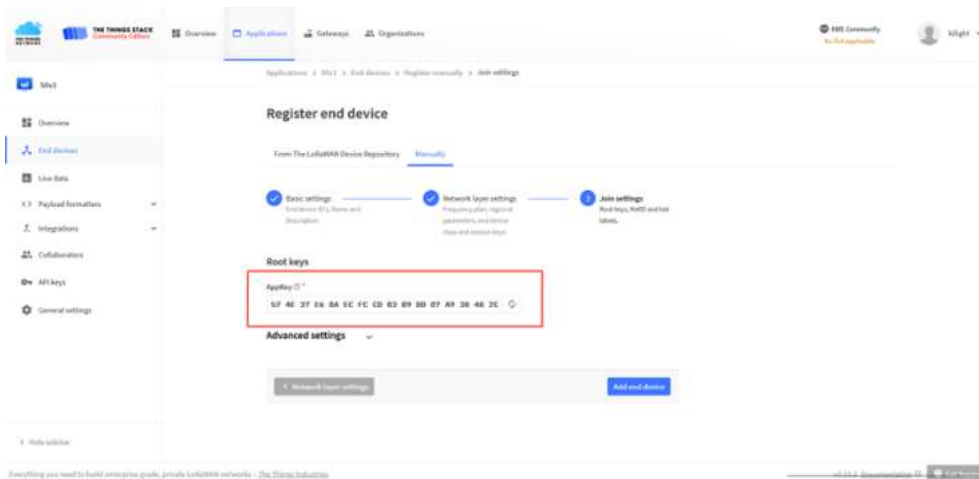
The LoRaWAN version for your device should be provided by the manufacturer in a datasheet as LoRaWAN version or LoRaWAN specification. The most commonly use



First, input the End device ID, AppEUI and DevEUI.



Secondly, choose the corresponding frequency and LoRaWAN class capabilities.

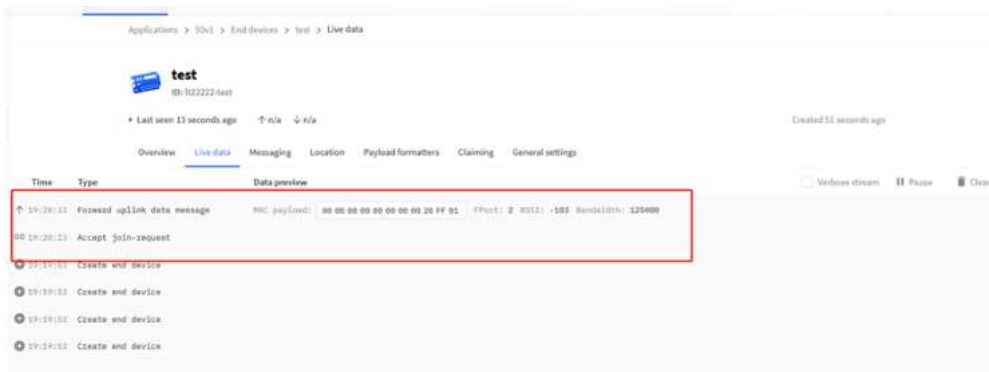


Finally, Application layer settings input the corresponding AppKey. Before saving the configuration, check that the data matches the device.

**Step 2:** Power on LT-22222-L device and it will automatically join the TTN network. After joining successfully, it will start to upload messages to the TTN v3. Select the Liv panel.

**Note that it may take some time for the device data to appear in the TTN v3 display.**

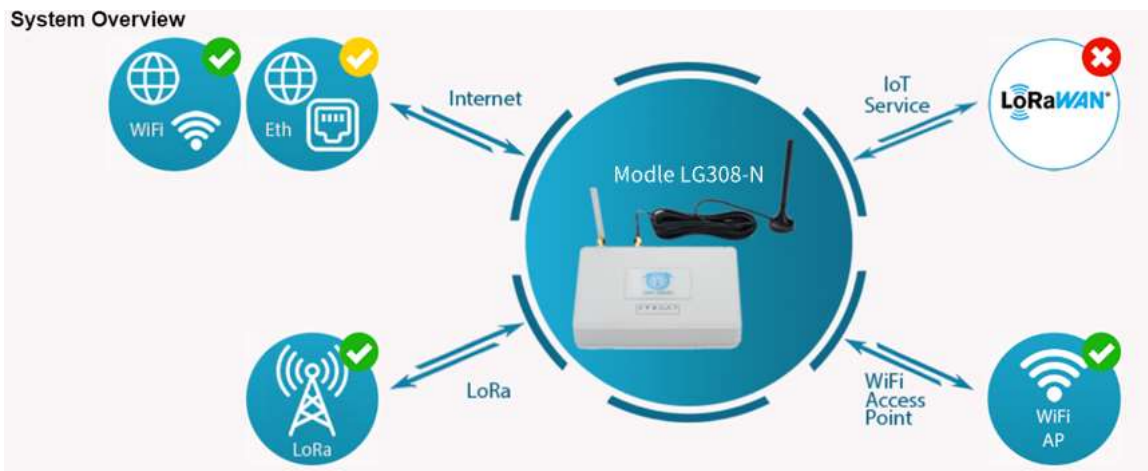




## 5. Web Configure Pages

### 5.1 Home

Shows the system running status.



### 5.2 LoRa Settings

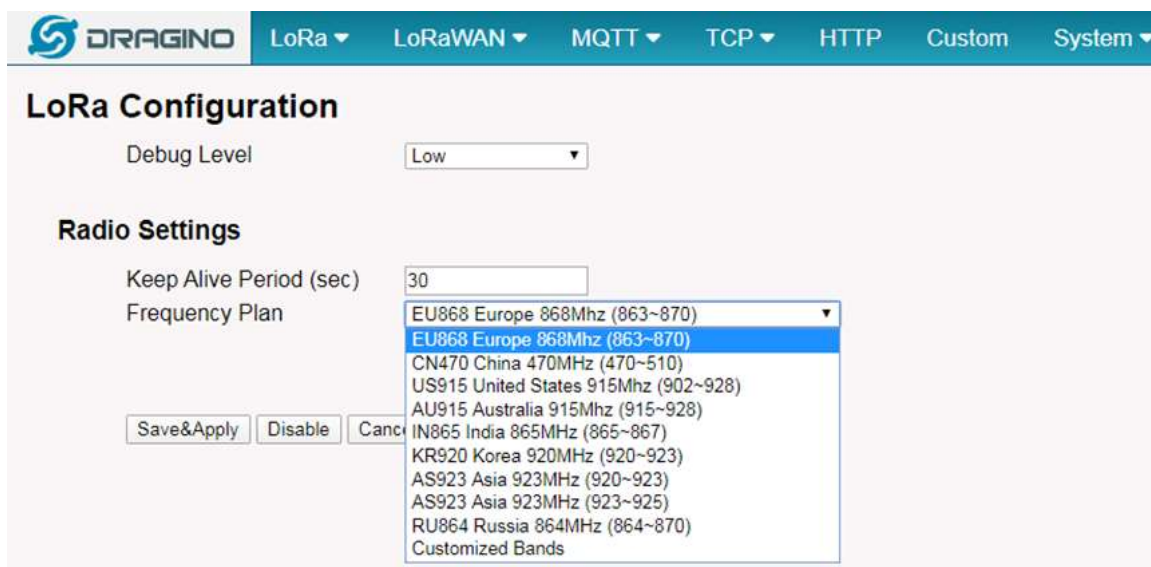
#### 5.2.1 LoRa --> LoRa

This page shows the LoRa Radio Settings. There are a set of default frequency band according to LoRaWAN protocol, and user can customized the band\* as well.

Different LG308N hardware version can support different frequency range:

- **868**: valid frequency: 863Mhz ~ 870Mhz. for bands EU868, RU864, IN865 or KZ865.
- **915**: valid frequency: 902Mhz ~ 928Mhz. for bands US915, AU915, AS923 or KR920

After user choose the frequency plan, he can see the actually frequency in used by checking the page **LogRead --> LoRa Log**



Note \*: See this instruction for how to customize frequency band (/xwiki/bin/view/Main/How%20to%20customize%20LoRaWAN%20frequency%20band/)

## 5.2.2 LoRa --> ABP Decryption

The LG308N can communicate with LoRaWAN ABP End Node without the need of LoRaWAN server. It can be used in some cases such as:

- No internet connection.
- User wants to get data forward in gateway and forward to their server based on MQTT/HTTP, etc. (Combine ABP communication method and MQTT forward together (/xwiki/bin/view/Main/MQTT%20Forward%20Instruction/)).

Detail of this feature: **Communication with ABP End Node** (/xwiki/bin/view/Main/Communicate%20with%20ABP%20End%20Node%20without%20LoRaWAN%20

The screenshot shows the 'Decrypt ABP End Node Packets' configuration page. At the top, there is a navigation bar with the Dragino logo and menu items: LoRa, LoRaWAN, MQTT, TCP, Custom, Network, System, LogRead, Home, and Logout. The main heading is 'Decrypt ABP End Node Packets'. Below this, there is a checkbox for 'Enable ABP Decryption' which is checked, and a 'SAVE' button. The 'Add Key' section contains four input fields: 'Dev ADDR' (MSB, 4 Bytes), 'APP Session Key' (MSB, 16 Bytes), 'Network Session Key' (MSB, 16 Bytes), and 'Decoder' (ASCII String). There is an 'ADD\_KEY' button below these fields. The 'Delete Key' section has a 'Dev ADDR' dropdown menu and a 'DELETE' button. At the bottom, there is a section for 'ABP Keys:' with a list of keys showing 'Dev ADDR', 'APP Session Key', 'Network Session Key', and 'Decoder'.

## 5.3 LoRaWAN Settings

### 5.3.1 LoRaWAN --> LoRaWAN

This page is for the connection set up to a general LoRaWAN Network server such as: TTN (<http://www.thethingsnetwork.org/>) , ChirpStack (<https://www.chirpstack.io/>)

The screenshot shows the 'LoRaWAN Configuration' page. At the top, there is a navigation bar with the Dragino logo and menu items: LoRa, LoRaWAN, MQTT, TCP, Custom, Network, System, LogRead, Home, and Logout. The main heading is 'LoRaWAN Configuration'. Below this, there is a section for 'General Settings' with 'Email' (dragino-1ab428@dragino.com) and 'Gateway EUI' (a84041ffff1ab428). The 'Primary LoRaWAN Server' section has 'Service Provider' (The Things Network V3), 'Server Address' (eu1.cloud.thethings.network), 'Uplink Port' (1700), and 'Downlink Port' (1700). The 'Secondary LoRaWAN Server' section has the same settings. The 'Packet Filter' section has 'Primary server Fport Filter' (Level 0), 'Secondary server Fport Filter' (Level 0), 'DevAddr Filter' (Level 0), and 'DevAddr Filter' (Level 0). The 'Add Filter' section has 'Server Name', 'Filter type', 'Filter Value' (1,2,3 or 018229B), and an 'ADD\_FILTER' button. Below this is a large empty text area. At the bottom, there is a 'DELET Filter' section with a dropdown menu and a 'DELETE' button. At the very bottom, there is a 'Current Mode: LoRaWAN Semtech UDP' and 'Save&Apply' and 'Cancel' buttons.

**Note:**

\*: User can ignore the latitude and longitude settings here, LG308N will use the actually value from GPS module.

\*\*: Packet filter is to drop the unwanted LoRaWAN packet, instruction see here:

See: [Filter unwanted LoRaWAN packets \(/xwiki/bin/view/Main/Filter%20unwanted%20LoRaWAN%20packets/\)](#)

### 5.3.2 LoRaWAN --> LoRaWAN -- Basic Station

The screenshot shows the Dragino web interface for LoRaWAN configuration. The top navigation bar includes 'LoRa', 'LoRaWAN', 'MQTT', 'TCP', 'Custom', 'Network', 'System', 'LogRead', and 'Home'. The main heading is 'LoRaWAN -- Basic Station'. A dropdown menu is open, showing options: 'LoRaWAN -- Semtech UDP', 'LoRaWAN -- Basic Station' (highlighted in red), 'Helium IoT', and 'LORIOT'. Below the menu, the 'General Settings' section includes 'Email' (dragino-21d648@) and 'Gateway ID' (a84041fff21d648), with a 'Restore\_Configuration' button. The 'Primary LoRaWAN Server' section shows 'Service Provider' set to 'The Things Network -- Basic Station'. Fields for 'CUPS Server URI', 'CUPS Authorization Key', and 'LNS Authentication Key' contain example values. A red error message states 'CUPS Certificate Authority ? Not Found CUPS Certificate Authority'. At the bottom, a status bar indicates 'Current Mode: LoRaWAN Semtech UDP' and 'Click Save & Apply will change to mode: LoRaWAN Basic Station', with 'Save&Apply' and 'Cancel' buttons.

The basic station mode support **TTN/AWS/Chirpstack/ThingPark/Senet** Platform.

Instruction:

The Thing Network (<http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20TTN/#H3.A0GatewayRegistrationforBasicsStation>)

AWS-IoT LoRaWAN Core (<http://wiki.dragino.com/xwiki/bin/view/Main/AWS%20IoT%20Core%20for%20LoRaWAN/>)

Chirpstack (<http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20ChirpStack/#H3.A0GatewayRegistrationforBasicsStation>)

ThingPark

Senet (<http://wiki.dragino.com/xwiki/bin/view/Main/Connection%20to%20Senet/#H3.A0SemtechBasicStation>)

### 5.3.3 LoRaWAN --> LORIOT

Settings to communicate to LORIOT LoRaWAN Network Server: <https://www.loriot.io/> (<https://www.loriot.io/>)

Instruction: [Notes for LORIOT \(/xwiki/bin/view/Main/Notes%20for%20LORIOT/\)](#)

**DRAGINO** LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### LORIIOT Client Configuration

Server Address:  Server Port:

Client Certificate:  Client Key:

CA File:

eth0 MAC Address: A8:40:41:1A:B4:2B

[Certificate Management](#)

Current Mode: **LoRaWAN Semtech UDP** Click Save & Apply will change to mode **:LoRIOT**

## 5.4 MQTT Settings

If end nodes works in ABP mode, user can configure LG308N to transfer the data to MQTT broker,

Instruction: [MQTT Forward Instruction \(/xwiki/bin/view/Main/MQTT%20Forward%20Instruction/\)](#)

**DRAGINO** LoRa LoRaWAN MQTT TCP HTTP Custom System LogRead Home

### MQTT Client Configuration

MQTT Server Profile:  **MQTT Client**  
 Channels  
 Certificates

Broker Address [-h]:  Broker Port [-p]:

User ID [-u]:  Password [-P]:

Certificate [--cert]:  Key [--key]:

CA File [--cafile]:

Client ID [-i]:

**Publish**

Enable Publish  Quality of Service [-q]:  Topic Format [-t]:   
 Data Format [-m]:

**Subscribe**

Enable Subscribe  Quality of Service [-q]:  Topic Format [-t]:

## 5.5 System


### 5.5.1 System --> System Overview


Shows the system info:

DRAGINO LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### System Overview

**Device Model:** LG308N  
**Hostname:** dragino-1ab428  
**Firmware:** lgw-5.4.1661909863  
**Build Time:** Build Wed 31 Aug 2022 09:37:43 AM CST  
**FWD version:** Release 2022-07-23 02:29:28, Version 2.0.6  
**Cellular :** Not Detected  
**System Time:** Fri Sep 16 03:57:29 UTC 2022  
**Uptime:** 5 days  
**Load Avg:** 29, load average  
**Memory:** Free Memory: 15616 / Total Memory: 60192kB  
**IoT Service:** lorawan  
**ETH0 MAC:** A8:40:41:1A:B4:2B  
**ETH1 MAC:** A8:40:41:1A:B4:2A  
**WIFI MAC:** AA:40:41:1A:B4:28

Internet Connection OK 

LoRaWAN Connection OK 

## 5.5.2 System --> General ( login settings)

DRAGINO LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### System General

**System Password**

Password    Login: admin

**TimeZone**

Timezone

**Port Forwarding**

Enable HTTP Forward

Enable SSH Forward

**Keepalive\_Script**

Interval setting

**Logread Level**

Logread level

#### **System Password:**

There are two login for DLOS8: **root /dragino** or **admin /dragino**. Both root and admin has the same right for WEB access. But root user has also the right to access via WEB interface.

This page can be used to set the password for them.

**Timezone:** Set device timezone.

**Port forwarding:** Enable/Disable the HTTP and SSH access via WAN interface.

## 5.5.3 System --> Network

**DRAGINO** LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### Network

**LAN Settings**

IP Address  Gateway

Netmask  DNS

**WAN Settings**

Enable DHCP

**WiFi WAN Settings**

Enable DHCP

**LAN Settings:** When the LG308N has the AP enable, LAN settings specify the network info for LG308N's own network.

**WAN Settings:** Setting for LG308N WAN port

**WiFi Settings:** Setting for LG308N WiFi IP when use it as WiFi Client

## 5.5.4 System --> WiFi

LG308N WiFi Settings.

**DRAGINO** LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### WiFi

**Radio Settings**

Channel (1-11)  Tx Power (0-18) dBm

**WiFi Access Point Settings**

Enable WiFi Access Point

WiFi Name SSID

Passphrase (8-32 char)

Encryption

**WiFi WAN Client Settings**

Enable WiFi WAN Client

Host WiFi SSID

Passphrase

WiFi Survey

Encryption

WiFi status: OK. Click Refresh to check status.

## 5.5.5 System --> Cellular

While use the cellular as Backup WAN, device will use Cellular for internet connection while WAN port or WiFi is not valid and switch back to WAN port or WiFi after they

**DRAGINO** LoRa LoRaWAN MQTT TCP Custom Network System LogRead Home Logout

### Cellular Settings

**Cellular device not detected**

APN

Service

Dial Number

Pincode

Username

Password



Note \*: For LG308N which doesn't have the cellular module, this page will shows Cellular not detected.

### 5.5.6 System --> Network Status

The screenshot shows the DRAGINO web interface with the following menu items: LoRa, LoRaWAN, MQTT, TCP, Custom, Network, System, LogRead, Home, Logout. The main content area is titled "System Status" and contains a sub-section "Network / WiFi Status".

```
Network
-----
Lan IP Address:
  inet addr:10.130.1.1 Bcast:10.130.1.255 Mask:255.255.255.0

Eth WAN IP Address:
  inet addr:10.130.2.57 Bcast:10.130.2.255 Mask:255.255.255.0
  inet addr:172.31.255.254 Bcast:172.31.255.255 Mask:255.255.255.252

WiFi WAN IP Address:
Cellular:

Bridge:
bridge name      bridge id          STP enabled      interfaces
br-lan          7fff.a840411ab42b no                eth0
                                                wlan0

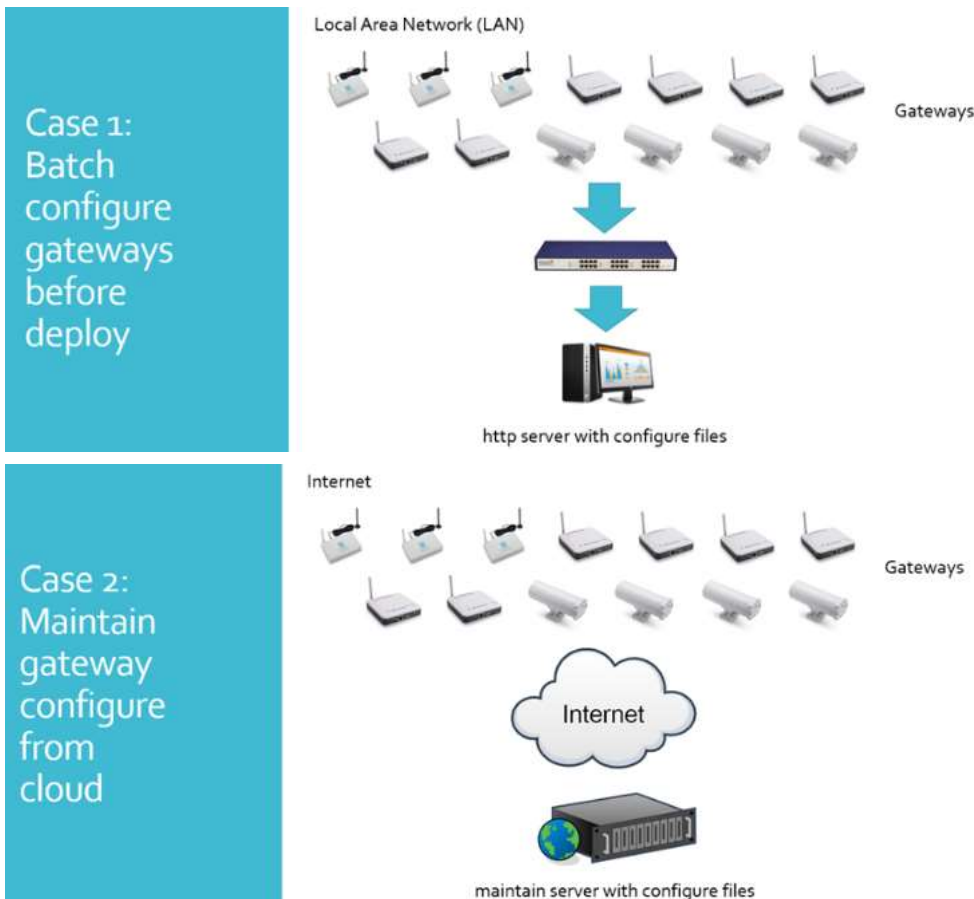
WiFi
-----
wlan0  ESSID: "dragino-lab428"
      Access Point: AA:40:41:1A:B4:28
      Mode: Master Channel: 13 (2.472 GHz)
      Tx-Power: 17 dBm Link Quality: unknown/70
      Signal: unknown Noise: -90 dBm
      Bit Rate: unknown
      Encryption: WPA2 PSK (CCMP)
      Type: nl80211 HW Mode(s): 802.11bgn

wlan0-2 ESSID: unknown
      Access Point: 00:00:00:00:00:00
      Mode: Client Channel: unknown (unknown)
      Tx-Power: 17 dBm Link Quality: unknown/70
      Signal: unknown Noise: -90 dBm
      Bit Rate: unknown
      Encryption: unknown
      Type: nl80211 HW Mode(s): 802.11bgn
```

Refresh

### 5.5.7 System --> Remote Mgmt & Auto Provision


Auto Provision is the feature for batch configure and remote management. It can be used in below two cases:



## How it works



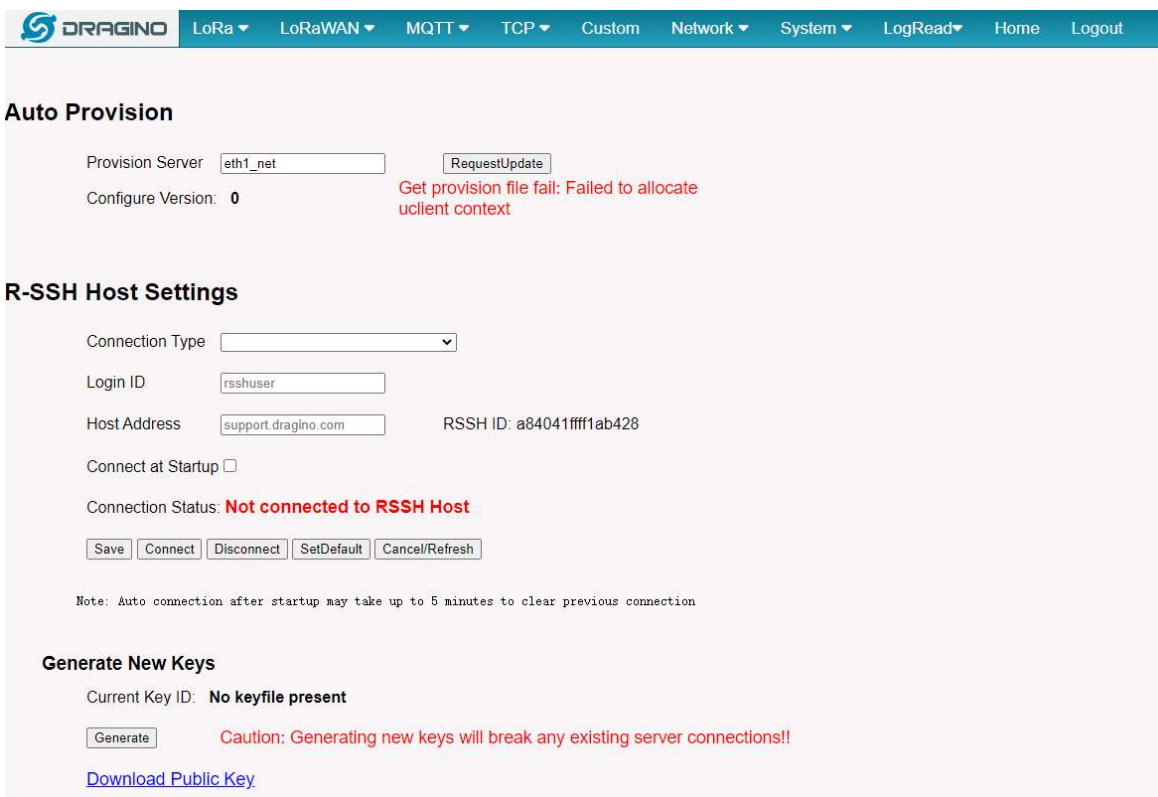
1. Gateways search (on every boot or 23:00 every day) the provision URL to get configure files or script files.
2. Gateways compare version number of the configure file, and process update if configure files has higher version.



Please see this document for detail:

[http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG308N/Firmware/Application\\_Note/&file=Auto-update-feature.pdf](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG308N/Firmware/Application_Note/&file=Auto-update-feature.pdf) ([http://www.dragino.com/downloads/dir=LoRa\\_Gateway/LPS8/Firmware/Application\\_Note/&file=Auto-update-feature.pdf](http://www.dragino.com/downloads/dir=LoRa_Gateway/LPS8/Firmware/Application_Note/&file=Auto-update-feature.pdf))

R-SSH is for remote access device and management, introduction for how to use: [Remote Access Gateway \(/xwiki/bin/view/Main/Monitor%20%26%20Remote%20A](#)



**Auto Provision**

Provision Server:

Configure Version: 0

Get provision file fail: Failed to allocate uclient context

**R-SSH Host Settings**

Connection Type:

Login ID:

Host Address:  RSSH ID: a84041ffff1ab428

Connect at Startup

Connection Status: **Not connected to RSSH Host**

Note: Auto connection after startup may take up to 5 minutes to clear previous connection

**Generate New Keys**

Current Key ID: **No keyfile present**

Caution: Generating new keys will break any existing server connections!!

[Download Public Key](#)

## 5.5.8 System --> Firmware Upgrade

We keep improving the DLOS8N Linux side firmware for new features and bug fixes. Below are the links for reference.

- **Latest firmware:** LoRa Gateway Firmware ([http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG02-OLG02/Firmware/](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG02-OLG02/Firmware/)) ,  
( [http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG02-OLG02/Firmware](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG02-OLG02/Firmware) ([http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG02-OLG02/Firmware](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG02-OLG02/Firmware))
- **Change Log:** Firmware Change Log ([http://www.dragino.com/downloads/downloads/LoRa\\_Gateway/LG02-OLG02/Firmware/ChangeLog](http://www.dragino.com/downloads/downloads/LoRa_Gateway/LG02-OLG02/Firmware/ChangeLog)) .  
( [http://www.dragino.com/downloads/downloads/LoRa\\_Gateway/LG02-OLG02/Firmware/ChangeLog](http://www.dragino.com/downloads/downloads/LoRa_Gateway/LG02-OLG02/Firmware/ChangeLog) ([http://www.dragino.com/downloads/downloads/LoRa\\_Gateway/LG02-OLG02/Firmware/ChangeLog](http://www.dragino.com/downloads/downloads/LoRa_Gateway/LG02-OLG02/Firmware/ChangeLog))

The file named as **xxxxx-xxxxx-squashfs-sysupgrade.bin** is the upgrade Image. There are different methods to upgrade, as below.

**Web--> System--> Firmware Upgrade**

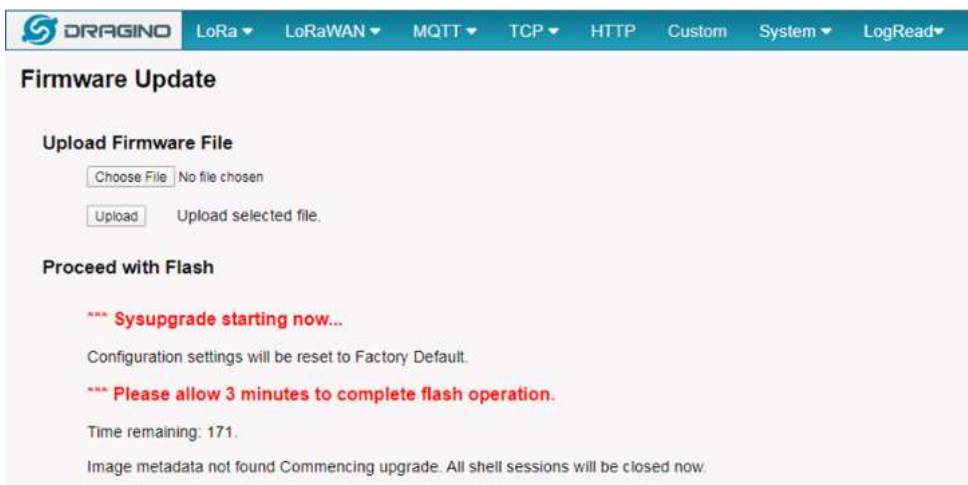




Select the required image and click **Flash Image**. The image will be uploaded to the device, and then click **Process Update** to upgrade.

**NOTE:** You normally need to **uncheck** the **Preserve Settings** checkbox when doing an upgrade to ensure that there is no conflict between the old settings and the new default settings.

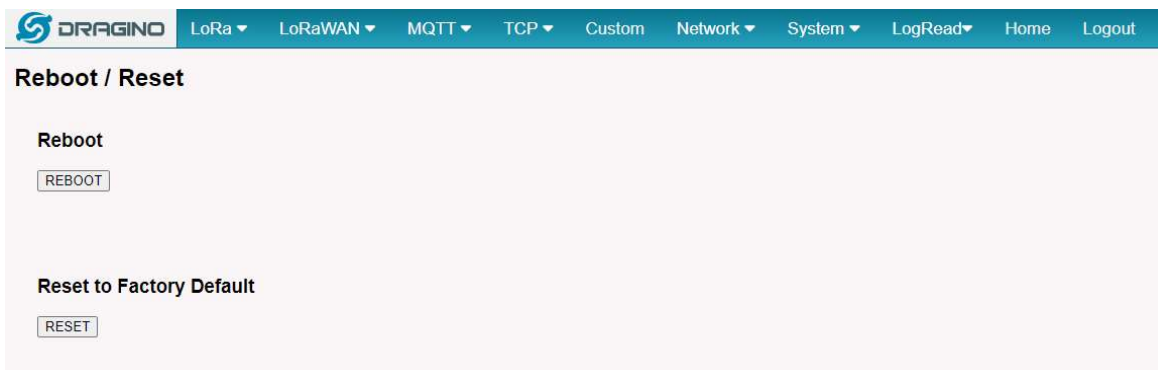
The system will automatically boot into the new firmware after upgrade.



**NOTE\*:** User can also upgrade firmware via Linux console  
SCP the firmware to the system/**var** directory and then run  
`root@OpenWrt:~# /sbin/sysupgrade -n /var/Your_Image`

**NOTE :** it is important to transfer the image in the /var directory, otherwise it may exceed the available flash size.

## 5.5.9 System --> Reboot/Reset



## 5.5.10 System --> Package Maintain

## Package Management

### Package List

Package data is not loaded. Click on Reload to download package data.

Click Reload to download package list. This will take a while.

### Installed Package List

```

atftp - 0.7.1-5
base-files - 190-r18-253b1fc
blkid - 2.32-2
block-mount - 2018-04-16-e2436836-1
busybox - 1.28.3-4
ca-bundle - 20210119-1
ca-certificates - 20210119-1
chat - 2.4.7-12
conft - 0.32-30
-----
    
```

### Install Package

Package Name:

### Core Packages

PACKAGE	Cur Version	Remote version	Action
lg02_pkt_fwd :	1.2.1-1		<input type="button" value="Upgrade_lg02_pkt_fwd"/>
lora-gateway :	1.2.7-3		<input type="button" value="Upgrade_lora-gateway"/>
haserl-ui :	1.2.1-2		<input type="button" value="Upgrade_haserl-ui"/>
dragino_gw_fwd :	2.6.0-1		<input type="button" value="Upgrade_dragino_gw_fwd"/>

### Installation Progress

Place to show what package has installed and possible to upgrade packages.

## 5.6 LogRead

### 5.6.1 LogRead --> LoRa Log

Show the frequency for LoRa Radio and traffics.

## LogRead

### FreqINFO:

---

#### Gateway Channels frequency

chan\_multSF\_0  
Lora MAC, 125kHz, all SF, 903.9 MHz

chan\_multSF\_1  
Lora MAC, 125kHz, all SF, 904.1 MHz

chan\_multSF\_2  
Lora MAC, 125kHz, all SF, 904.3 MHz

chan\_multSF\_3  
Lora MAC, 125kHz, all SF, 904.5 MHz

chan\_multSF\_4  
Lora MAC, 125kHz, all SF, 904.7 MHz

chan\_multSF\_5  
Lora MAC, 125kHz, all SF, 904.9 MHz

chan\_multSF\_6  
Lora MAC, 125kHz, all SF, 905.1 MHz

chan\_multSF\_7  
Lora MAC, 125kHz, all SF, 905.3 MHz

chan\_Lora\_std  
Lora MAC, 500kHz, SF8, 904.6 MHz

chan\_FSK

---

### IoT Server Connection Cstate:

---

Sat Sep 10 09:30:52 UTC 2022: switch to online

Tue Sep 13 02:43:23 UTC 2022: switch to offline

Tue Sep 13 02:43:39 UTC 2022: switch to online

Fri Sep 16 02:18:58 UTC 2022: switch to offline

## 5.6.2 LogRead --> System Log

Show the system log

## System Log

### USB Devices:

```
Bus 001 Device 002: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

### Boot Info:

```
br-lan: port 2(wlan0) entered disabled state
br-lan: port 2(wlan0) entered blocking state
br-lan: port 2(wlan0) entered forwarding state
wlan0-2: authenticate with 20:76:93:26:45:20
br-lan: port 2(wlan0) entered disabled state
br-lan: port 2(wlan0) entered blocking state
br-lan: port 2(wlan0) entered forwarding state
wlan0-2: authenticate with 20:76:93:26:45:20
br-lan: port 2(wlan0) entered disabled state
br-lan: port 2(wlan0) entered blocking state
```

### Previous Log: lorawan

```
Fri Sep 16 05:56:41 2022 daemon.info fwd[4849]: JOIN_REQ: [{"Size":23,"Rssi":-87,"snr":9,"AppEUI":"A000000000000100","DevEUI":"A84041234181BA7D"}]
Fri Sep 16 05:56:41 2022 daemon.info helium_gateway[2634]: WARN ignoring failed uplink Service(Rpc(Status { code: Unknown, message: "unmapped_eui",
metadata: MetadataMap { headers: {"user-agent": "grpc-erlang/0.1.0", "content-type": "application/grpc-proto", "grpc-encoding": "identity"} }, source: None
})), oui: 9, uri: http://44.238.156.97:8080/, pubkey: 11w77QLhgU48HJrMtntGGr97RyXnotlofs5Ct2ELmbFoYs0a, module: router
Fri Sep 16 05:56:41 2022 daemon.info helium_gateway[2634]: WARN ignoring failed uplink Service(Rpc(Status { code: Unknown, message: "unmapped_eui",
metadata: MetadataMap { headers: {"user-agent": "grpc-erlang/0.1.0", "content-type": "application/grpc-proto", "grpc-encoding": "identity"} }, source: None
})), oui: 16, uri: http://13.37.13.24:8080/, pubkey: 11afu5rsk52mgxLu91AdtDXbJ9mqWBUx3hvjejoKxEzfPvT, module: router
Fri Sep 16 05:56:42 2022 daemon.info fwd[4849]: INFO [server-down] PULL_ACK received in 0 ms
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: lgw_receive:1310: INFO: RSSI temperature offset applied: 1.746 dB (current temperature 38.8 C)
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: lgw_receive:1313: INFO: nb pkt found:1 left:0
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: INFO [server-up] received packages from mote: 26012563 (fcnt=43174)
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: PKTUP [server] JSON: [{"rxpk":{"jver":1,"tst":168015229,"time":"2022-09-16T05:56:44.072816Z","chan":6,"rfch":1,"freq":905.100000,"mid":8,"stat":1,"modu":"LORA","dadr":{"SF10BW125"},"codr":"4/5","rssi":-118,"lsnr":-10.5,"foff":-2659,"rssi":-108,"size":24,"data":"QGMIASApqgCPisat0iI35tRqKdZgEh"}]}]
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: INFO [server-up] PUSH_ACK received in 0 ms
Fri Sep 16 05:56:44 2022 daemon.info helium_gateway[2634]: INFO uplink @168015229 us, 905.10 MHz, Ok(DataRate(SF10, BW125)), snr: -10.5, rssi: -118, len: 24 from A8:40:41:FF:FF:1A:B4:28, module: gateway
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: INFO [server2-up] received packages from mote: 26012563 (fcnt=43174)
Fri Sep 16 05:56:44 2022 daemon.info fwd[4849]: PKTUP [server2] JSON: [{"rxpk":{"jver":1,"tst":168015229,"time":"2022-09-16T05:56:44.072816Z","chan":6,"rfch":1,"freq":905.100000,"mid":8,"stat":1,"modu":"LORA","dadr":{"SF10BW125"},"codr":"4/5","rssi":-118,"lsnr":-10.5,"foff":-2659,"rssi":-108,"size":24,"data":"QGMIASApqgCPisat0iI35tRqKdZgEh"}]}]
```

### Network State:

## 6. More features

### 6.1 Packet Filtering

Drop unwanted packets.

See: <http://wiki.dragino.com/xwiki/bin/view/Main/Filter%20unwanted%20LoRaWAN%20packets/> (<http://wiki.dragino.com/xwiki/bin/view/Main/Filter%20unwanted%20LoRa>)

### 6.2 Remote Access

Remote Access Devices for management.

Instruction: <http://wiki.dragino.com/xwiki/bin/view/Main/Monitor%20%26%20Remote%20Access%20Gateway/?Remote%20Access>  
(<http://wiki.dragino.com/xwiki/bin/view/Main/Monitor%20%26%20Remote%20Access%20Gateway/?Remote%20Access>)

### 6.3 How to decode ABP LoRaWAN node

Decode ABP:

<http://wiki.dragino.com/xwiki/bin/view/Main/Communicate%20with%20ABP%20End%20Node%20without%20LoRaWAN%20Network%20Server%20---%20LG308/>  
(<http://wiki.dragino.com/xwiki/bin/view/Main/Communicate%20with%20ABP%20End%20Node%20without%20LoRaWAN%20Network%20Server%20---%20LG308/>)

### 6.4 How to set data to MQTT broker

Only support ABP LoRaWAN End Node

Instruction: <http://wiki.dragino.com/xwiki/bin/view/Main/MQTT%20Forward%20Instruction/> (<http://wiki.dragino.com/xwiki/bin/view/Main/MQTT%20Forward%20Instruction/>)

### 6.5 How the gateway connects to Chirpstack v3/v4 via gateway-bridge

For Chirpstack v3 Gateway-bridge:

The corresponding gateway firmware must be used :

Chirpstack-gateway-bridge/Chirpstack-Bridge-V3.14.6-Bridge--build-v5.4.1679487778-20230322-2024/ ([https://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/Chirpstack-Bridge-V3.14.6-Bridge--build-v5.4.1679487778-20230322-2024/](https://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/Chirpstack-Bridge-V3.14.6-Bridge--build-v5.4.1679487778-20230322-2024/))

Chirpstack v3 via gateway-bridge Instruction: <http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20ChirpStack/#H4.A0A0HowthegatewayconnectstoChirpstackv3> (<http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20ChirpStack/#H4.A0A0HowthegatewayconnectstoChirpstackv3viagateway-bridge>)

#### For Chirpstack v4 Gateway-bridge:

The corresponding gateway firmware must be used :

Chirpstack-gateway-bridge/Chirpstack-Bridge-V4--build-v5.4.1670655072-20221210-1452/ ([https://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LPS8/Firmware/Chirpstack-Bridge-V4--build-v5.4.1670655072-20221210-1452/](https://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LPS8/Firmware/Chirpstack-Bridge-V4--build-v5.4.1670655072-20221210-1452/))

Chirpstack v4 via gateway-bridge Instruction: <http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20ChirpStack/#H4.A0HowthegatewayconnectstoChirpstackv4via> (<http://wiki.dragino.com/xwiki/bin/view/Main/Notes%20for%20ChirpStack/#H4.A0HowthegatewayconnectstoChirpstackv4viagateway-bridge>)

**NOTE\***: Different chirpstack versions use different gateway-bridge configurations.

After updating the Chirpstack gateway-bridge firmware, there is no need to re-download and install the Chirpstack gateway-bridge package

## 6.6 How to extend the gateway size of memory with USB device (SD/TF card, USB flash drive)

USB card reader plugged into the USB port of the gateway

Access the gateway Linux Command Line

Check the USB device

```
br-lan: port 2(wlan0) entered forwarding state
eth1: link down
eth1: link up (10Mbps/Full duplex)
usb 1-1.3: new high-speed USB device number 4 using ehci-platform
usb-storage 1-1.3:1.0: USB Mass Storage device detected
scsi host0: usb-storage 1-1.3:1.0
scsi 0:0:0:0: Direct-Access                      MassStorageClass          PQ: 0 ANSI: 6
sd 0:0:0:0: [sda] 122138624 512-byte logical blocks: (62.5 GB/58.2 GiB)
sd 0:0:0:0: [sda] write Protect is off
sd 0:0:0:0: [sda] Mode sense: 23 00 00 00
scsi 0:0:0:1: Direct-Access                      MassStorageClass          PQ: 0 ANSI: 6
sd 0:0:0:0: [sda] write cache: disabled, read cache: enabled, doesn't support DPO or FUA
sd 0:0:0:1: [sdb] Attached SCSI removable disk
sda: sda1
sd 0:0:0:0: [sda] Attached SCSI removable disk
root@dragino-2500d8:~# lsusb
Bus 001 Device 003: ID 2c7c:0125
Bus 001 Device 004: ID 2537:1081
Bus 001 Device 002: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@dragino-2500d8:~# ls /dev/sda*
/dev/sda /dev/sda1
root@dragino-2500d8:~#
```

#### Mount the USB device

```
mount /dev/sda1 /mnt/
```

```
root@dragino-2500d8:~# lsusb
Bus 001 Device 003: ID 2c7c:0125
Bus 001 Device 008: ID 2537:1081
Bus 001 Device 002: ID 1a40:0101 Terminus Technology Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@dragino-2500d8:~# mount /dev/sda1 /mnt/
root@dragino-2500d8:~# df -h /mnt/
```

#### Set up the automatic mount on boot

```
sed -i '3cmount /dev/sda1 /mnt/' /etc/rc.local
```

```
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
root@dragino-2500d8:~# mount /dev/sda1 /mnt/
root@dragino-2500d8:~# df -h /mnt/
Filesystem      size      used available use% mounted on
/dev/sda1       29.7G     32.0K    29.7G   0% /mnt
root@dragino-2500d8:~#
```

## 6.7 More instructions

LoRaWAN Gateway Instruction ([/xwiki/bin/view/Main/](http://wiki.dragino.com/xwiki/bin/view/Main/))(LoRaWAN Gateway)

## 7. Linux System

The LG308N is based on the OpenWrt Linux system. It is open source, and users are free to configure and modify the Linux settings.

## 7.1 SSH Access for Linux console

User can access the Linux console via the SSH protocol. Make sure your PC and the LG308N are connected to the same network, then use a SSH tool (such as putty (<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>) in Windows) to access it.

IP address: IP address of LG308N

Port: 22 (via WiFi AP mode) or 2222 (via WAN Interface)

User Name: **root**

Password: **dragino** (default)

After logging in, you will be in the Linux console and can enter commands as shown below.



```
10130.21 - PuTTY
login as: root
root@10.130.2.1's password:

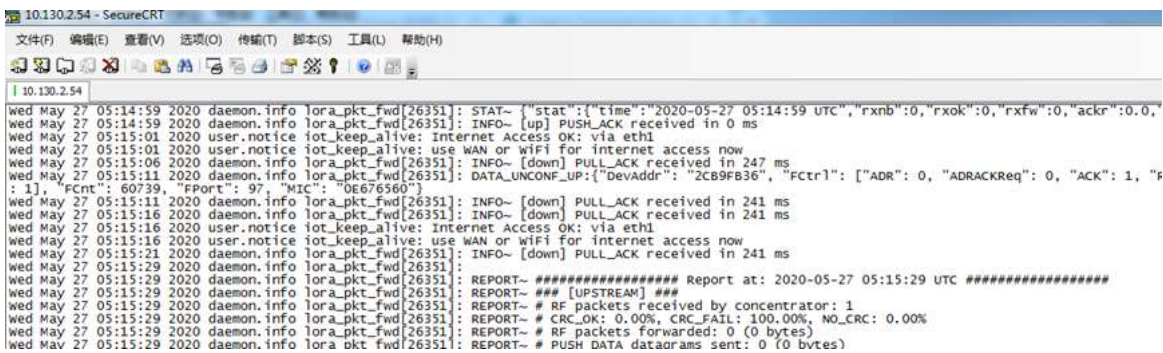
BusyBox v1.22.1 (2016-10-09 21:13:07 CST) built-in shell (ash)
Enter 'help' for a list of built-in commands.

DRAGINO
WiFi, Linux, MCU, Embedded

OpenWRT BARRIER BREAKER 14.07
Version: Dragino-v2 IoT-3.4.0
Build Mon Oct 10 08:53:00 CST 2016

www.dragino.com
-----
root@dragino-1347dc:~#
```

The "**logread -f**" command can be used to debug how system runs.



```
10.130.2.54 - SecureCRT
文件(F) 编辑(E) 查看(V) 选项(O) 传输(T) 脚本(S) 工具(L) 帮助(H)

10.130.2.54
wed May 27 05:14:59 2020 daemon.info lora_pkt_fwd[26351]: STAT- [{"stat":{"time":"2020-05-27 05:14:59 UTC","rxnb":0,"rxok":0,"rxfw":0,"ackr":0.0,
wed May 27 05:14:59 2020 daemon.info lora_pkt_fwd[26351]: INFO- [up] PUSH_ACK received in 0 ms
wed May 27 05:15:01 2020 user.notice iot_keep_alive: Internet Access OK: via eth1
wed May 27 05:15:01 2020 user.notice iot_keep_alive: use WAN or WiFi for internet access now
wed May 27 05:15:06 2020 daemon.info lora_pkt_fwd[26351]: INFO- [down] PULL_ACK received in 247 ms
wed May 27 05:15:11 2020 daemon.info lora_pkt_fwd[26351]: DATA_UNCONF_UP:{"DevAddr":"2CB9FB36","FCtrl":["ADR":0,"ADRACKReq":0,"ACK":1,"f
:1],"FCnt":60739,"FPort":97,"MIC":"0E676560"}
wed May 27 05:15:11 2020 daemon.info lora_pkt_fwd[26351]: INFO- [down] PULL_ACK received in 241 ms
wed May 27 05:15:16 2020 daemon.info lora_pkt_fwd[26351]: INFO- [down] PULL_ACK received in 241 ms
wed May 27 05:15:16 2020 user.notice iot_keep_alive: Internet Access OK: via eth1
wed May 27 05:15:16 2020 user.notice iot_keep_alive: use WAN or WiFi for internet access now
wed May 27 05:15:21 2020 daemon.info lora_pkt_fwd[26351]: INFO- [down] PULL_ACK received in 241 ms
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- ##### Report at: 2020-05-27 05:15:29 UTC #####
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- ### [UPSTREAM] ###
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- # RF packets received by concentrator: 1
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- # CRC_OK: 0.00%, CRC_FAIL: 100.00%, NO_CRC: 0.00%
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- # RF packets forwarded: 0 (0 bytes)
wed May 27 05:15:29 2020 daemon.info lora_pkt_fwd[26351]: REPORT- # PUSH DATA datagrams sent: 0 (0 bytes)
```

## 7.2 Edit and Transfer files

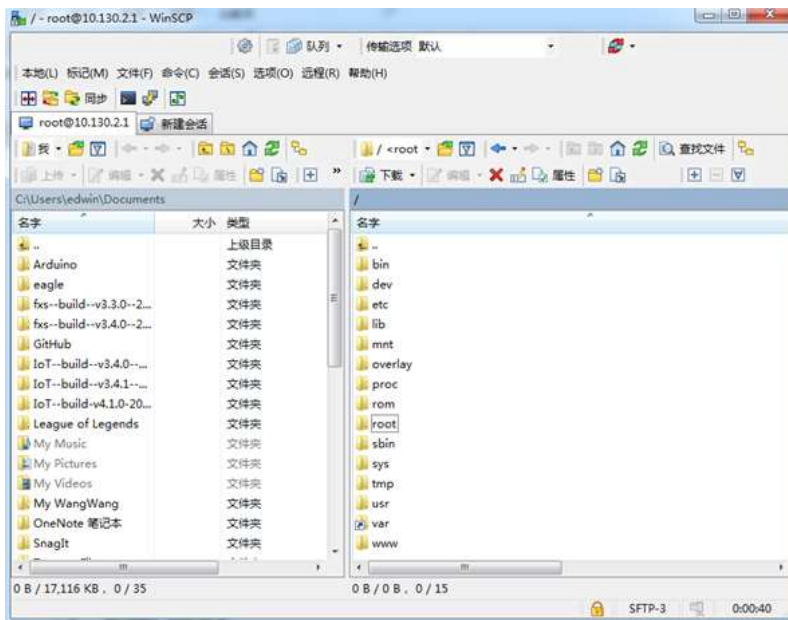
The LG308N supports the **SCP protocol** and has a built-in **SFTP server**. There are many ways to edit and transfer files using these protocols.

In Windows, one of the easiest methods is using the WinSCP (<https://winscp.net/eng/index.php>) utility.

After establishing access via WinSCP to the device, you can use an FTP style window to drag / drop files to the LG308N, or edit the files directly in the windows.

Screenshot is as below:





## 7.3 File System

The LG308N has a 16MB flash and a 64MB RAM. The /var and /tmp directory are in the RAM, contents stored in /tmp and /var will be erased after reboot the device. Other reboot.

The Linux system uses around 8MB ~10MB flash size which means there is not much room for user to store data in the LG308N flash. User can use an external USB flash.

## 7.4 Package maintenance system

LG308N uses the OpenWrt **OPKG package maintenance system** (<https://oldwiki.archive.openwrt.org/doc/techref/opkg>). There are more than 3000+ packages available applications. For example, if you want to add the **iperf** tool, you can install the related packages and configure LG308N to use **iperf**.

Below are some example **opkg** commands. For more information please refer to the OPKG package maintenance system (<https://oldwiki.archive.openwrt.org/doc/techref/opkg>) (<https://oldwiki.archive.openwrt.org/doc/techref/opkg>) (<https://oldwiki.archive.openwrt.org/doc/techref/opkg>)

**In Linux Console run:**

```
root@dragino-169d30:~# opkg update // to get the latest packages list
```

```
root@dragino-169d30:~# opkg list //shows the available packages
```

```
root@dragino-169d30:~# opkg install iperf // install iperf
```

The system will automatically install the required packages as shown below.

```
root@dragino-169d30:/etc/opkg# opkg install iperf
```

Installing iperf (2.0.12-1) to root...

Downloading [http://downloads.openwrt.org/snapshots/packages/mips\\_24kc/base/iperf\\_2.0.12-1\\_mips\\_24kc.ipk](http://downloads.openwrt.org/snapshots/packages/mips_24kc/base/iperf_2.0.12-1_mips_24kc.ipk) ([http://downloads.openwrt.org/snapshots/packages/mips\\_24kc/base/iperf\\_2.0.12-1\\_mips\\_24kc.ipk](http://downloads.openwrt.org/snapshots/packages/mips_24kc/base/iperf_2.0.12-1_mips_24kc.ipk))

Installing uclibcxx (0.2.4-3) to root...

Downloading [http://downloads.openwrt.org/snapshots/packages/mips\\_24kc/base/uclibcxx\\_0.2.4-3\\_mips\\_24kc.ipk](http://downloads.openwrt.org/snapshots/packages/mips_24kc/base/uclibcxx_0.2.4-3_mips_24kc.ipk) ([http://downloads.openwrt.org/snapshots/packages/mips\\_24kc/base/uclibcxx\\_0.2.4-3\\_mips\\_24kc.ipk](http://downloads.openwrt.org/snapshots/packages/mips_24kc/base/uclibcxx_0.2.4-3_mips_24kc.ipk))

Configuring uclibcxx.

Configuring iperf.

## 8. Upgrade Linux Firmware

## 9. OTA System Update

LG308N supports system auto update via OTA, please see [this URL \(http://wiki.dragino.com/xwiki/bin/view/OTA%20Update/\)](http://wiki.dragino.com/xwiki/bin/view/OTA%20Update/) for the detail of this feature.

## 10. FAQ

### 10.1 How can I configure for a customized frequency band?

See below link for how to customize frequency band: [How to customized LoRaWAN frequency band \(/xwiki/bin/view/Main/How%20to%20customize%20LoRaWA](#)

## 10.2 Can I connect LG308N to LORIoT?

Yes, the set up instruction is here: [Notes for LORIoT \(/xwiki/bin/view/Main/Notes%20for%20LORIoT/\)](#)

## 10.3 Can I make my own firmware for the gateway, where can I find the source code?

Yes, You can make your own firmware for the LG308N for branding purposes or to add customized applications.

The source code and compile instructions can be found at: [https://github.com/dragino/openwrt\\_lede-18.06](https://github.com/dragino/openwrt_lede-18.06) ([https://github.com/dragino/openwrt\\_lede-18.06](https://github.com/dragino/openwrt_lede-18.06))

## 10.4 Can I use 868Mhz version for 915Mhz bands?

It is possible but the distance will be very short, you can select US915 frequency band in 868Mhz version hardware. It will work but you will see the performance is greatly filter for band 863–870Mhz, all other frequencies will have high attenuation.

## 10.5 Can I control the LEDs?

Except the PWR LED is controlled by +3v3 power directly. All other LEDs can be controlled by developer.

### Control Globe LED:

ON: `echo 1 > /sys/class/leds/dragino2:red:wlan/brightness`

OFF: `echo 0 > /sys/class/leds/dragino2:red:wlan/brightness`

### Control HEART LED:

First export the `gpio27` and set to out

`echo 27 > /sys/class/gpio/export`

`echo out > /sys/class/gpio/gpio27/direction`

ON: `echo 0 > /sys/class/gpio/gpio27/value`

OFF: `echo 1 > /sys/class/gpio/gpio27/value`

## 11. Trouble Shooting

### 11.1 I get kernel error when install new package, how to fix?

In some cases, when installing a package with **opkg**, it will generate a kernel error such as below due to a mismatch I the kernel ID:

```
root@dragino-16c538:~# opkg install kmod-dragino2-si3217x_3.10.49+0.2-1_ar71xx.ipk
```

Installing kmod-dragino2-si3217x (3.10.49+0.2-1) to root...

Collected errors:

\* `satisfy_dependencies_for`: Cannot satisfy the following dependencies for kmod-dragino2-si3217x:

\* `kernel (= 3.10.49-1-4917516478a753314254643facdf360a) *`

\* `opkg_install_cmd`: Cannot install package kmod-dragino2-si3217x.

In this case, you can use the `-force-depends` option to install such package as long as the actual kernel version is the same.

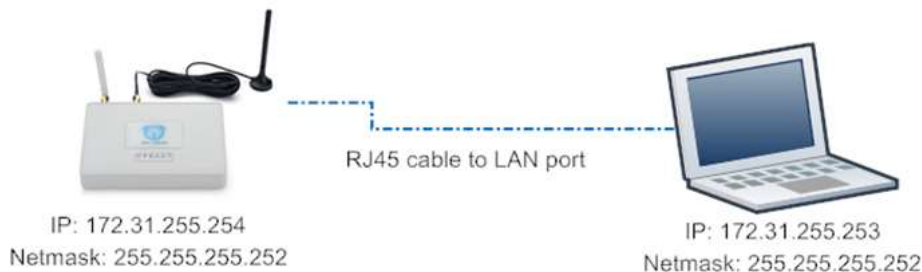
```
Opkg install kmod-dragino2-si3217x_3.10.49+0.2-1_ar71xx.ipk -force-depends
```

### 11.2 How to recover the LG308N if the firmware crashes

Please follow this instruction to recover your gateway: [Recover Gateway \(/xwiki/bin/view/Main/How%20to%20Recover%20Gateway%20if%20can%27t%20access%20the%20gateway\)](#)

### 11.3 I configured LG308N for WiFi access and lost its IP. What to do now?





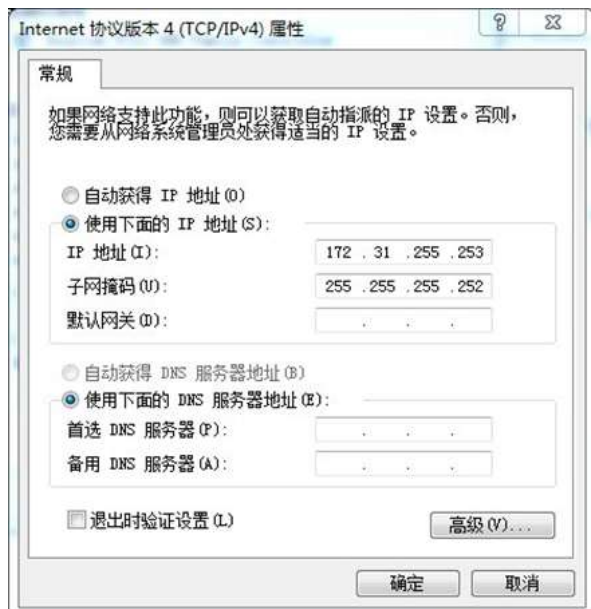
The LG308N has a fall-back IP address on its WAN port. This IP is always enabled so you can use the fall-back IP to access LG308N no matter what the WiFi IP is. The 1 unit.

**Note: fallback IP can be disabled in the WAN and DHCP page.**

**Steps to connect via fall back IP:**

1. Connect PC's Ethernet port to LG01's LAN port
2. Configure PC's Ethernet port has IP: 172.31.255.253 and Netmask: 255.255.255.252

As below photo:



3. In PC, use 172.31.255.254 to access LG308N via Web or Console.

## 12. Order Info

**PART: DLOS8N-XXX-YYY:**

**XXX: Frequency Band**

- **868** : valid frequency: 863Mhz ~ 870Mhz. for bands EU868, RU864, IN865 or KZ865.
- **915**: valid frequency: 902Mhz ~ 928Mhz. for bands US915, AU915, AS923 or KR920

**YYY: 4G Cellular Option**

- **EC25-E**: EMEA, Korea, Thailand, India.
- **EC25-A**: North America/ Rogers/AT&T/T-Mobile.
- **EC25-AU**: Latin America, New Zealand, Taiwan
- **EC25-J**: Japan, DOCOMO/SoftBank/ KDDI

More info about valid bands, please see EC25-E product page (<https://www.quectel.com/product/ec25.htm>) .

## 13. Packing Info

**Package Includes:**

- LG308N or LG08 LoRa Gateway x 1
- Stick Antenna for LoRa RF part. Frequency is one of 433 or 868 or 915Mhz depends the model ordered
- Power Adapter: EU/AU/US type power adapter depends on country to be used
- Packaging with environmental protection paper box

#### Dimension and weight:

- Device Size: 26 x 9 x 8.5 cm
- Weight: 450g
- Package Size: 49 x 19.5 x 19Package Size: 4912 cm
- Weight: 2.5kg

## 14. Support

- Try to see if your questions already answered in the wiki (/xwiki/bin/view/Main/).
- Support is provided Monday to Friday, from 09:00 to 18:00 GMT+8.  
Due to different timezones we cannot offer live support. However, your questions will be answered as soon as possible in the before mentioned schedule.
- Provide as much information as possible regarding your enquiry (product models, accurately describe your problem and steps to replicate it etc) and send a mail to (file:///C:/Users/11315/Documents/D:/Projects/LoRa%20Product%20Line/LG308%20Picocell%20Gateway/LG308/LG308%20%25E8%25AF%25B4%25E6%2598%

## 15. Reference

- Source code for LG08 LoRa Gateway: [https://github.com/dragino/openwrt\\_lede-18.06](https://github.com/dragino/openwrt_lede-18.06) ([https://github.com/dragino/openwrt\\_lede-18.06](https://github.com/dragino/openwrt_lede-18.06))
- OpenWrt official Wiki: <http://www.openwrt.org/> (<http://www.openwrt.org/>)
- Firmware: [http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG308N-OLG308N/Firmware/](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG308N-OLG308N/Firmware/) ([http://www.dragino.com/downloads/index.php?dir=LoRa\\_Gateway/LG308N-OLG308N/Firmware/](http://www.dragino.com/downloads/index.php?dir=LoRa_Gateway/LG308N-OLG308N/Firmware/))
- Hardware Source code: <https://github.com/dragino/motherboard-hardware/tree/master/LG308N> (<https://github.com/dragino/motherboard-hardware/tree/master/LG308N>)



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