F8L10GW LoRaWAN Base Station User Manual	Document Version	Pages
	V2.0.1	
	Model：F8L10GW	Total: 31

F8L10GW LoRaWAN Base Station User Manual

Model	Category
F8L10GW-433	EU433
F8L10GW-470	CN470
F8L10GW-868	EU868
F8L10GW-915	US915

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F8L10GW
LoRa Gateway
厦门四信通信科技有限公司

Contents

Chapter 1 Product Introduction

1.1 Overview

F8L10GW is a wireless communication base station based on LoRaWAN protocol. It connects to LoRaWAN terminals of various applications and transmits terminal data to the cloud through 3G/4G or wired Ethernet. Support wireless configuration management and online upgrade, GPS positioning, mains power supply, optional POE power supply, optional DC power supply, etc.

F8L10GW is complied with standard LoRaWAN protocol, it's compatible with LoRaWAN devices and NS. The product has been widely used in M2M industry, smart grid, smart transportation, industrial automation, intelligent buildings, fire control, public security, environmental protection, meteorology, digital medical treatment, telemetry, military, space exploration, agriculture, forestry, water, mining, petrochemical and other fields.

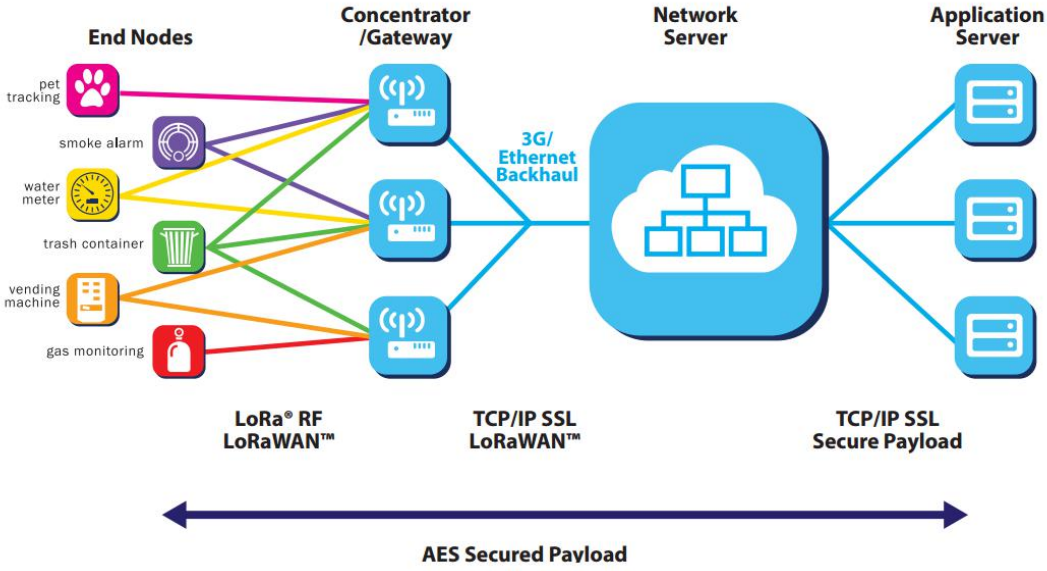


Figure 1-1 Topology Diagram

1.2 Features & Benefits

Industrial-grade Design

- High performance industrial-grade wireless communication module
- High performance industrial-grade multi-channel LoRaWAN RF chip
- Aluminum housing, IP65 metal casting

Stability & Reliability

- WDT design
- Complete anti-drop mechanism ensures device always online
- Ethernet interface with built-in 1.5KV electromagnetic isolation protection
- SIM/UIM card interface with built-in 15KV ESD protection
- Built-in reverse phase protection, over voltage protection and lightning protection
- Antenna lightning protection

1.3 Hardware Block Diagram

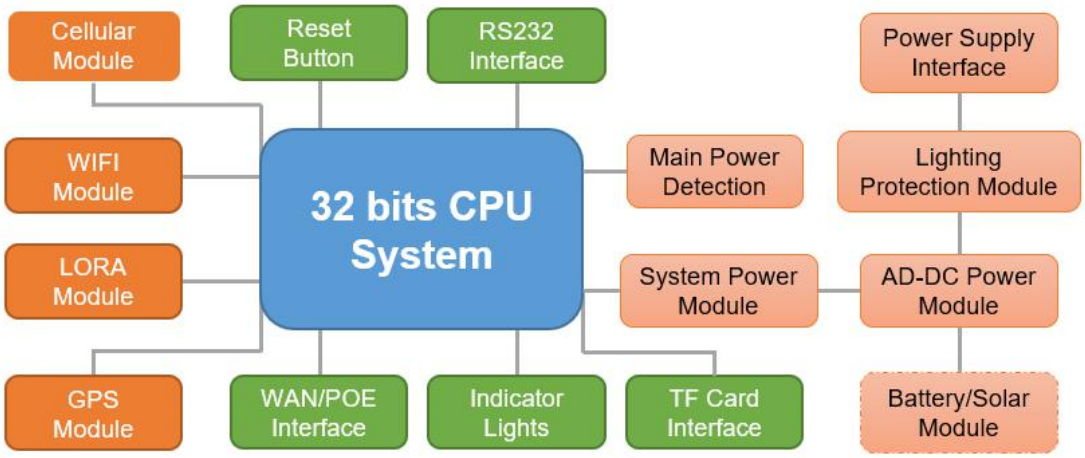


Figure 1-2 Hardware Block Diagram

1.4 Specifications

CHARACTERISTICS	
Network Structure	Simple Star Network Topology and support repeater function
LoRaWAN Protocol	Class A, Class B*, Class C
Band	EU433, CN470-510, CN779-787, EU863-870, US902-928, AU915-928, AS923, KR920-923
Outdoor	6 Km
Out Power	23±2dBm
Sensitivity	-140dbm@LoRa; -70dbm @WIFI
Bandwidth	125kHz \ 250kHz \ 500kHz
Upstream Channel	8
Downstream Channel	1
Communication Rate	ADR
Work Mode	Support receive and send at same frequency or different frequency
Location Service	GPS or Beidou

Server Report Method	3G/4G/Wired Ethernet
Local Storage	32G TF Card
ANTENNA	
LoRa	N-type female antenna, omnidirectional fiberglass antenna, 2dBi
4G Cellular	N-type female antenna, omnidirectional fiberglass antenna, 3dBi
WIFI	N-type female antenna, 2.4G omnidirectional fiberglass antenna, 3dBi
GPS	N-type female antenna, omnidirectional fiberglass antenna, 4dBi
POWER SUPPLY	
Default	Standard AC 220V
Optional-1 (DC)	9~36V
Optional-2 (POE)	10/100 Base-T, IEEE802.3af/IEEE802.3at standard
POWER CONSUMPTION	
Stand By	Average Current≤140mA@12V
Communication	TXD≤ 550mA@12V RXD≤ 420mA@12V
PHYSICAL PROPERTIES	
Dimensions	289.4x217.5x115.0 mm (excluding antennas and mountings)
Weight	2700g (excluding antennas, accessories and POE power)
Installation	Wall mount or pole mount (accessories provide)
OTHERS	
Operating Temperature	-40~+85°C (-40~+185°F)
Storage Temperature	-40~+125°C (-40~+257°F)
Relative Humidity	95% (non-condensing)
Certifications	CE & FCC

Chapter 2 Installation

2.1 General Packing List

F8L10GW must be installed correctly and the installation must be conducted by a qualified engineer recognized by Four-Faith.

➢ *Warning:*

1. Power off before installation

2. Don't remove the cover, power interface and antenna interface

Before you install the F8L10GW, please check the package contents and make sure it completely.

Item		Qty	Remark
F8L10GW		1	
Y-type wrench		1	
4G fiberglass omnidirectional antenna		1	
WIFI fiberglass omnidirectional antenna		1	
GPS fiberglass omnidirectional antenna		1	
LoRa fiberglass omnidirectional antenna		1	
Wall mount	Bracket	1	Select one installation method or select all
	Swelling screw ø14mm	3	
Pole mount	Fixed Bracket	2	
Power line		1	optional
POE		1	optional
User manual CD		1	optional
QC passed card		1	
Warranty card		1	

Form 2-1 F8L10GW packing list

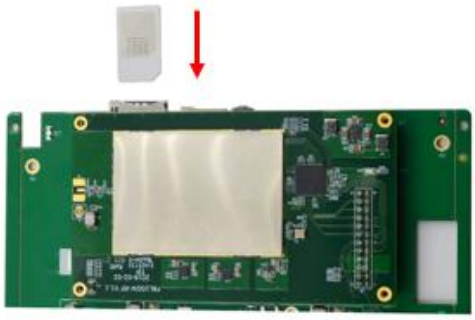
2.2 Product Overview

1. GPS fiberglass omnidirectional antenna interface
2. LoRa fiberglass omnidirectional antenna interface
3. POE
4. 4G fiberglass omnidirectional antenna interface
5. WIFI fiberglass omnidirectional antenna interface
6. AC220

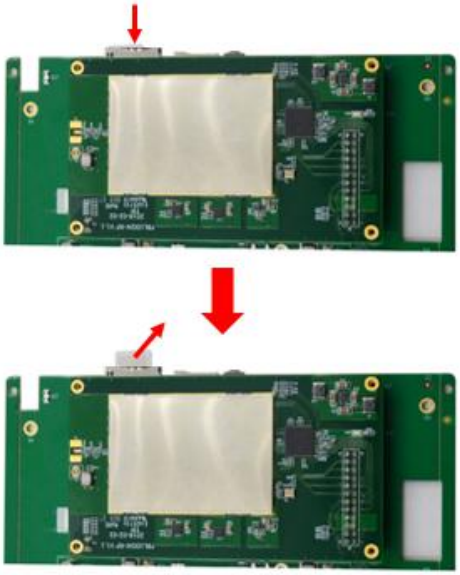
2.3 SIM/UIM Card Installation

1. Unscrew the M6 screw on F8L10GW, and then open it.

2. Put the SIM/UIM card into the card slot.



3. If you want to take out the SIM/UIM card, you can push it, and then it will popup automatically.



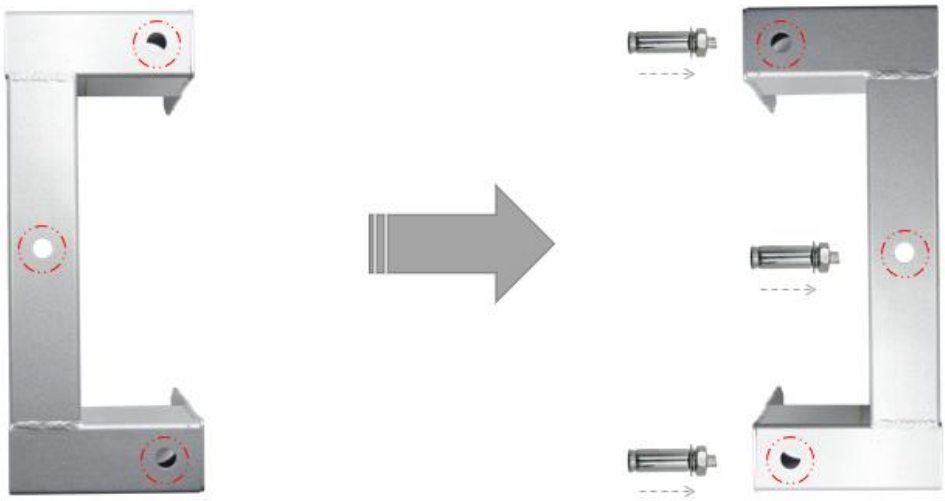
4. Close the shell, and then tighten the M6 screws.

2.4 Wall-mounted Installation

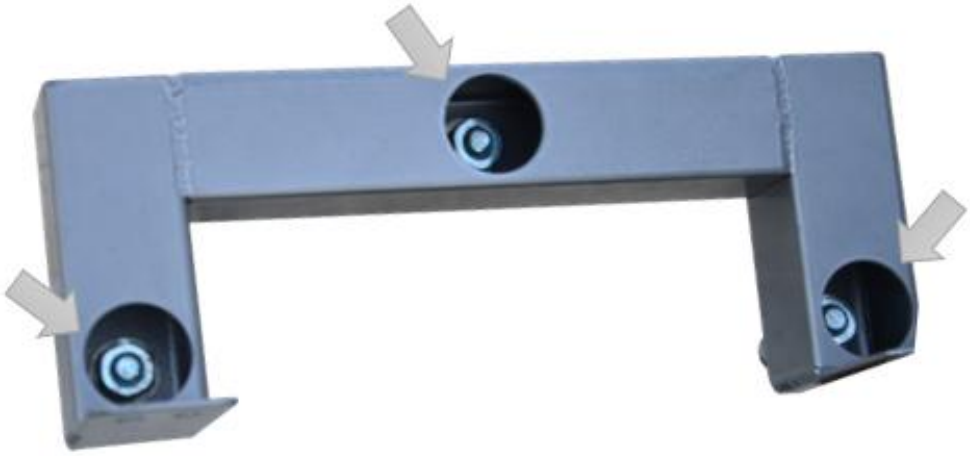
1. Drill 3 holes of ø14mm diameter, 60 mm depth according to the position of the bracket.

- *Requirement:*
  - *1. the wall should be flat;*
  - *2. must be in an open area*
  - *3. make sure no shield within 5 meters*

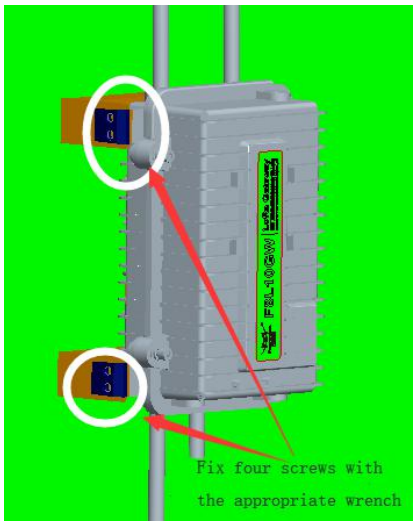
2. Fixing the swell screws in the bracket.



3. Fix the bracket on the wall and tighten the screw.



5. Tighten the four screws and fix the base station on the bracket, then install the antenna.



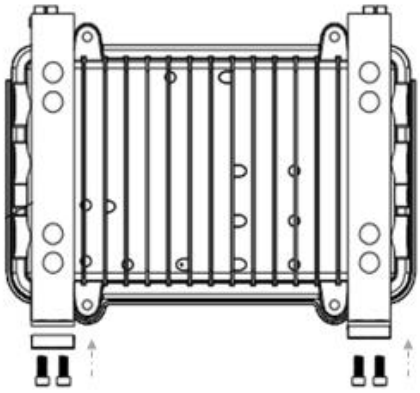
2.5 Pole-mounted Installation

1. Select the suitable pole with ø70~90mm diameter.

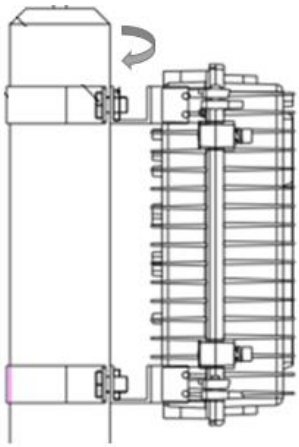
◆ *Requirement:*

1. must be in an open area

2. make sure no shield within 5 meters

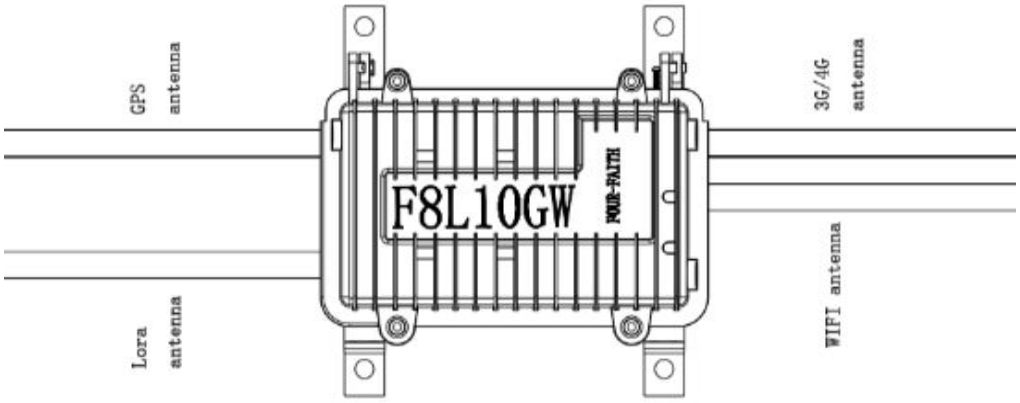


2. Put the clamp into the pole, fix the clamp in the pole with screws.



2.6 Antenna Installation

After F8L10GW is installed on the wall or pole, then install all fiberglass omnidirectional antennas (4G/WIFI/LoRa), make sure all antennas are tightened to get best signal.



2.7 LED Indicators

The F8L10GW provides the following led indicators: including PWR, Sys, Online, SIM, LoRa, WAN, WIFI, Signal Strength. LED indicators description are as below:

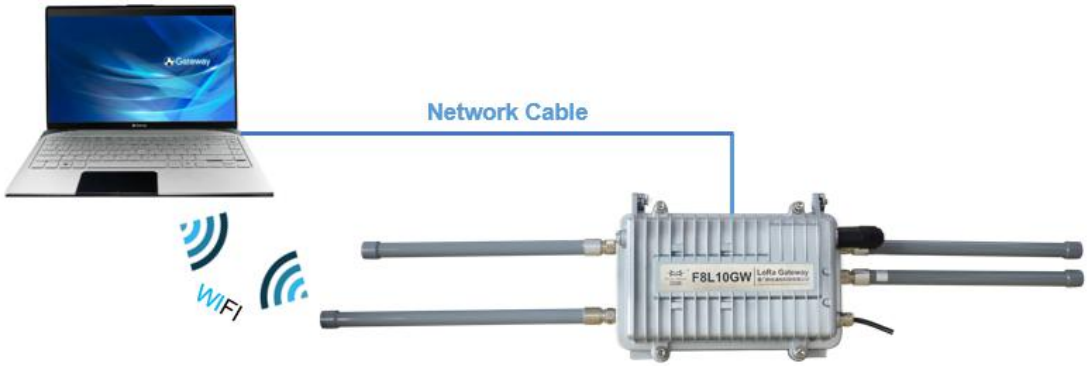
LED	Indication	Status	Description
PWR	Power Status	Red light on	Power on
		Red light off	Power off
SYS	System Status	Yellow light flash	System work properly
		Yellow light off	System work improperly
WIFI	WIFI Status	Blue light on	WIFI on
		Blue light off	WIFI off
LORA	LoRa Status	Green light on	LoRa connect normal
		Green light off	LoRa connect abnormal
		Green light flash	LoRa data communicating
3G/4G Signal Strength	Signal 1/2/3	Turn on one light	Weak (less than -90db)
		Turn on two lights	Medium (-70db~-90db)
		Turn on three lights	Good (greater than -70db)
Online	Online Status	Green light on	Online
		Green light off	Offline

Chapter 3 Configuration

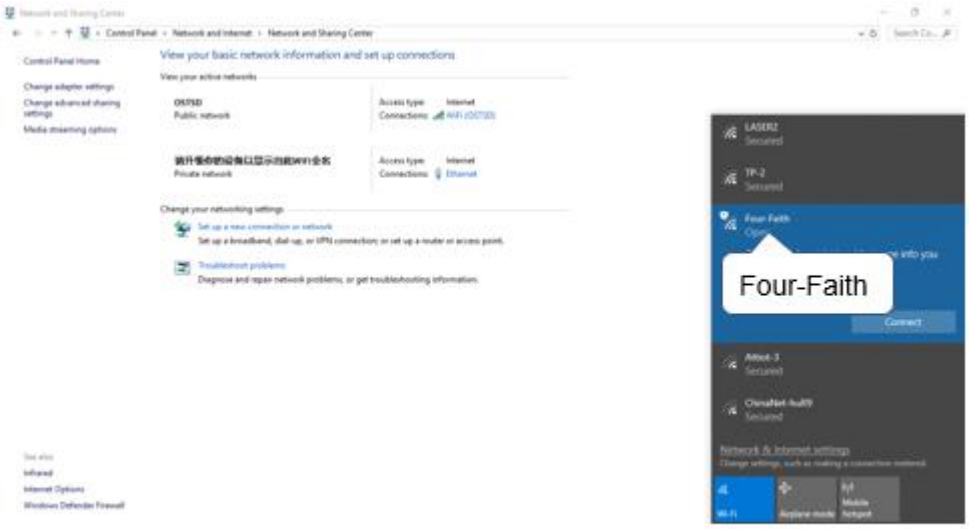
This chapter explains how to access to Web GUI of F8L10GW to complete device configuration.

3.1 Connect with the F8L10GW

Before configuration, you can connect the base station with a PC by WIFI or network cable.

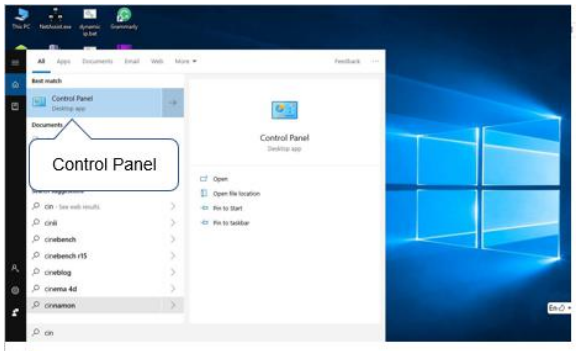


◆ Connect the base station by **WIFI** (based on WIN10 operator system);

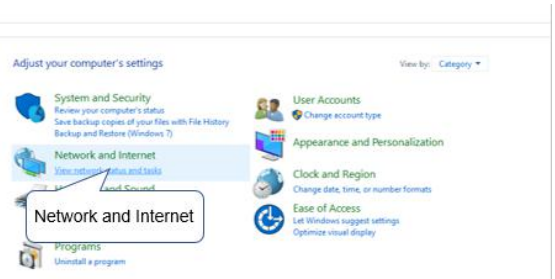


1 Connect the open hotspot “Four-Faith”, and then click the “Connect” button to connect it.

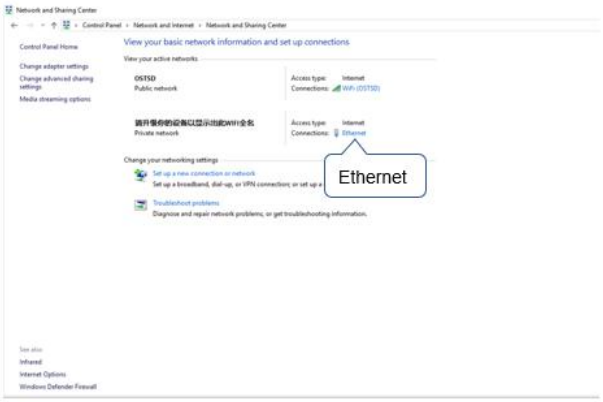
◆ Connect the base station by **network cable** (based on WIN10 operator system)



1 Click the "Search Box" to search "Control Panel", and then open it

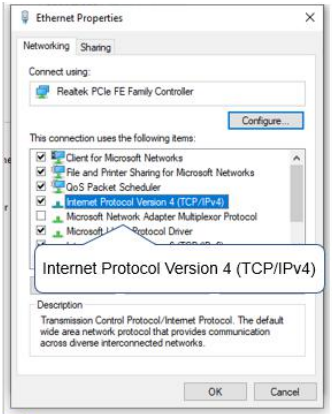


2 Find the "Network and Internet" item, and then click the "View network status and tasks"

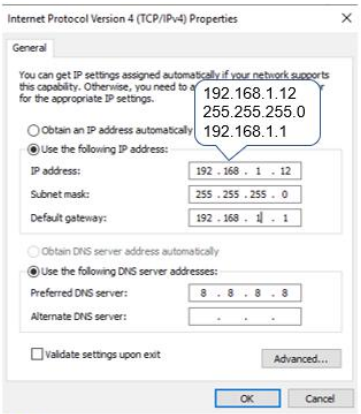


3 Jump to this page, and click the "Ethernet"

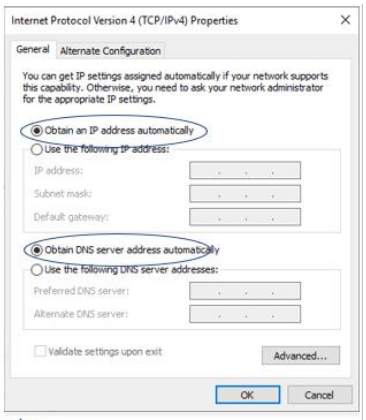
4 Click "Properties" to enter into IP configure UI



5 Double click the "Internet Protocol Version 4(TCP/IPv4)" to configure IP information



6 Method 1: assign a static IP address manually within the subnet of F8L10GW

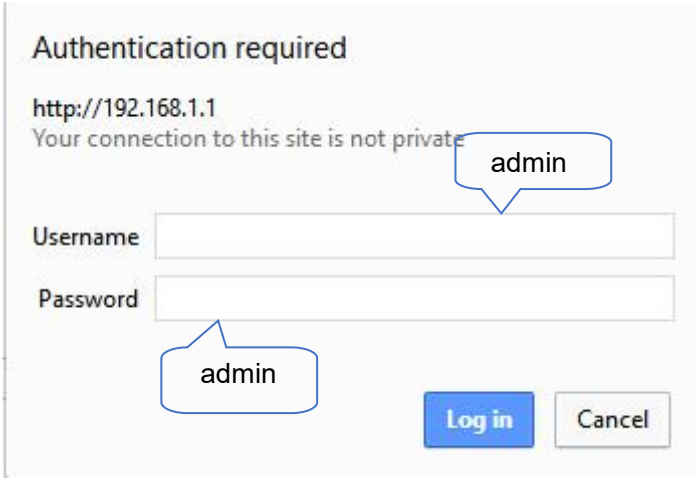


7 Method 2: click the "obtain an IP address automatically" to assign an IP address automatically

3.2 Access to configuration pages

Four-Faith LoRaWAN base station provides web configuration management. You can access to the configuration pages follow these steps:

1. Open browser (such as google, IE or others)
2. Input "**192.168.1.1**" in the search bar, and then it will enter into the configuration login page when connect F8L10GW correctly. If you are the first time configure the base station, please use the default settings by Four-Faith.
   IP: 192.168.1.1
   Username: admin
   Password: admin



3. Click the **"Log in"** button, and then you can access to device configuration management

3.3 Web Configuration

There are 11 main pages in the web configuration tool, include Settings, Wireless, Service, VPN, Security, Access Restrictions, NAT, QoS Settings, Applications, Management and Status.

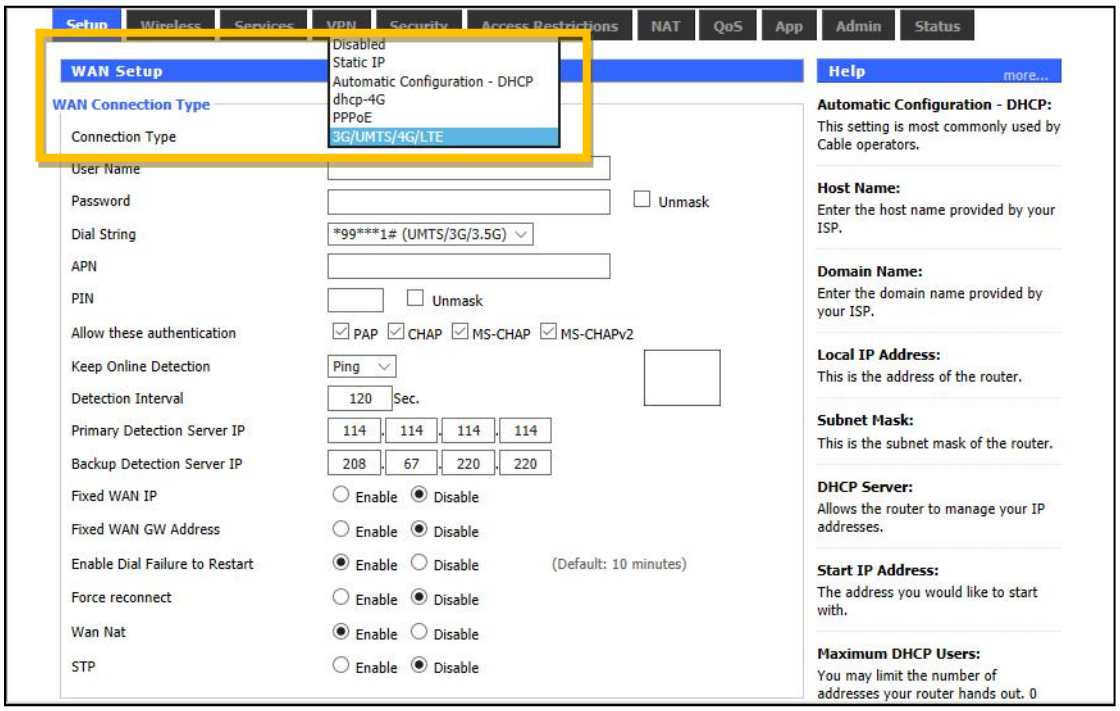
3.3.1 Setup

In this module, you can according system directions to change the basic settings of F8L10GW.

Warning: Click the "Save" button only save current settings, you need click the "Apply Settings" to make it effect. And if you don't want save changes, click the "Cancel Changes" will realize it.

3.3.1.1 Basic Setup

◆ **WAN Setup**



There are 6 WAN connection types, include: Disable, Static IP, Automatic Configuration - DHCP, DHCP-4G, PPPOE and 3G/UMTS/4G/LTE. And F8L10GW provides wired ethernet (only support LAN port) and dhcp-4G(default) connection types.

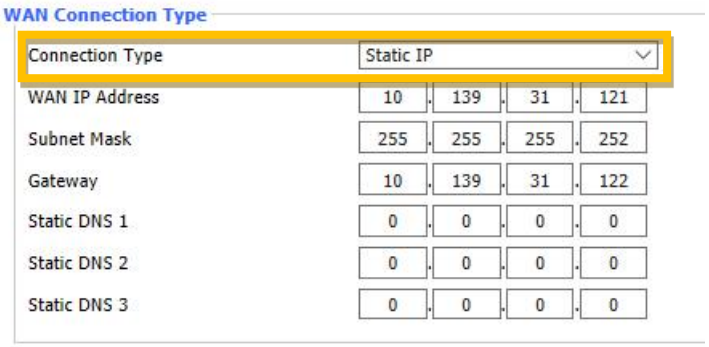
Wired ethernet connection type

There have two configuration modes when you connect F8L10GW by network cable.

Mode 1: Static IP connection

Select the **"Static IP"** connection type, this page will auto refresh and then show the configuration parameters as follow:

Warning: you need prepare a public IP address.

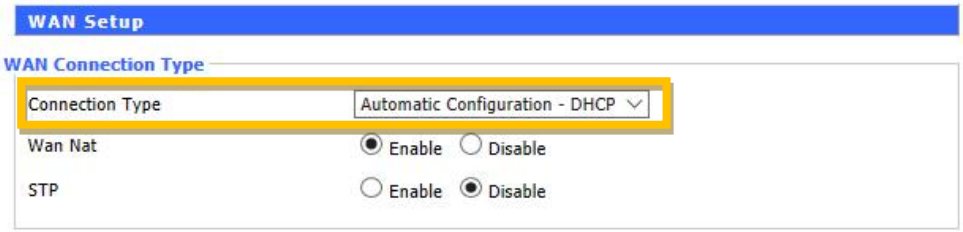


Parameters	Option	Description
WAN IP Address	-	Public IP address
Subnet Mask	-	Subnet mask parameter
Gateway	-	Gateway parameter
Static DNS1	-	Static domain name server 1
Static DNS2	-	Static domain name server 2
Static DNS3	-	Static domain name server 3

Mode 2: Automatic Configuration – DHCP connection

Select the **"Automatic Configuration - DHCP"** connection type, this page will auto refresh and then show the configuration parameters as follow:

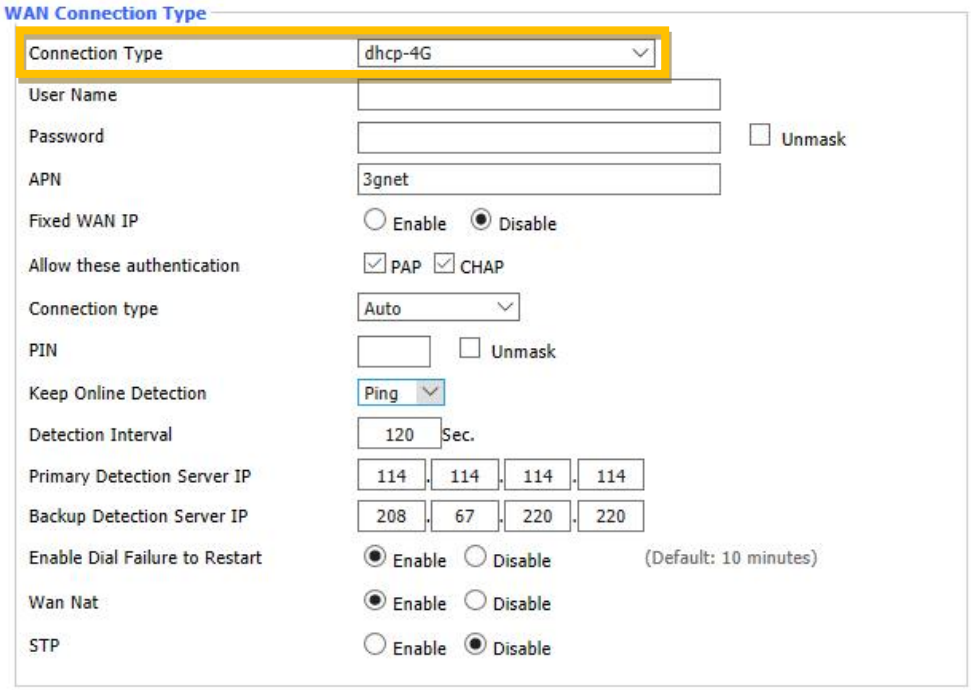
Warning: device will dynamic assignment the IP address to WAN port in this mode.



DHCP-4G connection type

Select the **"dhcp-4G"** connection type, this page will auto refresh and then show the configuration parameters as follow:

Warning: In this mode, the IP address of WAN port assigned by dhcp-4G (default).

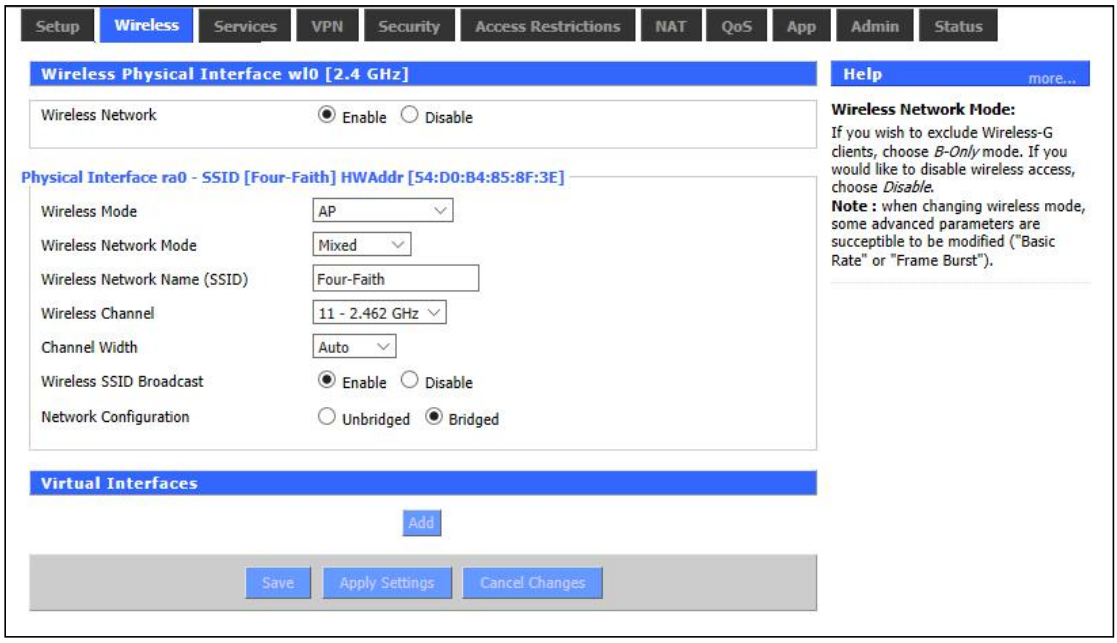


Parameters	Option	Description
User Name	-	Sim card account assigned by operator
Password	-	Sim card account assigned by operator
APN	-	APN number assigned by operator
Fixed WAN IP	Enable	Turn on fixed WAN IP address function. And then fill in the WAN IP address Fixed WAN IP ◉ Enable ○ Disable WAN IP Address 0 . 0 . 0 . 0
	Disable	Turn off this function
Allow these authentication	PAP	PAP authentication
	CHAP	CHAP authentication
Connection type	Auto	Automatically select operator network according deployment position
	Force-4G	Only works on 4G network
	Force-3G	Only works on 3G network
	Force-2G	Only works on 2G network
	Prefer-3G	3G network prefer select
	Prefer-2G	2G network prefer select
	Only 3G/2G	Support 2G/3G network
	Only 4G/3G/2G	Support 2G/3G/4G network
PIN	-	Sim card pin number
Keep Online Detection	None	Disable keep online detection function
	Ping	Send ping packets to detect whether connection is normal. In this mode, the “Detection Interval”, “Primary Detection Server IP” and “Backup Detection Server IP”

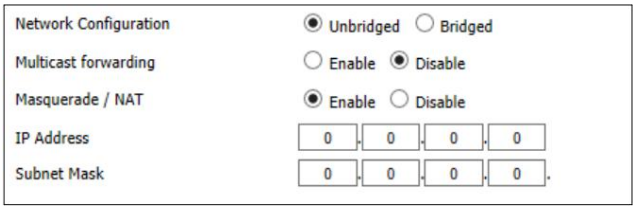
		must be configured correctly
	Router	Use router method to detect whether connection is normal. In this mode, the “Detection Interval”, “Primary Detection Server IP” and “Backup Detection Server IP” must be configured correctly
Detection Interval	-	Time interval between two detection, unit is second
Primary Detection Server IP	-	Response the primary detection server IP address of F8L10GW when detect data packets online. This configuration item takes effect when “**Keep Online Detection**” set **“Ping”** or **“Router”** mode
Backup Detection Server IP	-	Response the backup detection server IP address of F8L10GW when detect data packets online. This configuration item takes effect when “**Keep Online Detection**” set **“Ping”** or **“Router”** mode
Enable Dial Failure to Restart	Enable	Turn on restart the device when dial-up failure function
	Disable	Turn off restart the device when dial-up failure function
Wan Nat	Enable	Turn on NAT forwarding of WAN port function
	Disable	Turn off NAT forwarding of WAN port function
STP	Enable	Turn on STP protocol. STP (Spanning Tree Protocol) can be applied to the loop network
	Disable	Turn off STP protocol

3.3.2 Wireless

You can configure WIFI parameters here. WIFI mainly used to upgrade device firmware.



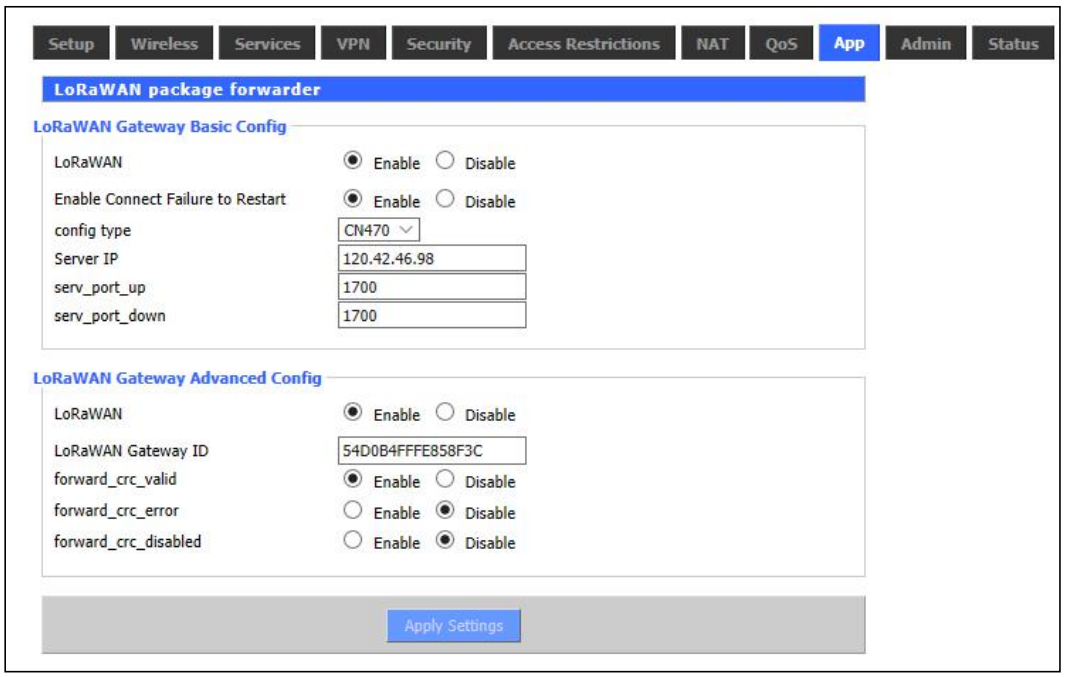
Parameters	Option	Description
Wireless Network	Enable	Turn on wifi
	Disable	Turn off wifi
Wireless Mode	AP	Convert wired network into wireless signal
	client	Receive wireless signal from other wireless routers and then convert it into wired network. PC only connect it through network cable
	ad-hoc	P2P connection, as virtual AP, and other PC can directly connect and share the network through it
	relay	Relay is a transmission path between two switching centers
	relay bridge	Wireless transmission can bridge the communication between two or more networks
Wireless Network Mode	Hybrid	Support 802.11b/g/n standard devices
	Bg-mix	Support 802.11b and 802.11g standard devices
	NG-mix	Support 802.11g and 802.11n standard devices
	B Only	Only support 802.11b standard devices
	G Only	Only support 802.11g standard devices
	Only N	Only support 802.11n standard devices
Wireless Network Name (SSID)	-	You can edit wireless network name here
Wireless Channel	-	There are 1-13 channels available. In the environment of multiple wireless devices, please try to avoid using the same channels as other devices
Channel	-	20MHZ and 40MHZ are available

Width		
Wireless SSID Broadcast	Enable	Broadcast SSID
	Disable	Hide SSID
Network Configuration	Bridged	In general, select bridged. The bridge is connected to F8L10GW
	Unbridged	when no bridge is connected to F8L10GW, and the IP address needs to be manually configured: 

Click the “Add” button in “**Virtual Interfaces**” bar to add virtual interface, as fellow:

3.3.3 LoRaWAN Application

You can configure lora parameters of base station here.



◆ LoRaWAN Gateway Basic Config

Parameters	Options	Description
LoRaWAN	Enable	Turn on lora
	Disable	Turn off lora
Enable Connect Failure to Restart	Enable	
	Disable	
Server IP	-	The IP address of LoRaWAN data service center
Serv_port_up	-	LoRaWAN data service center program uplink port. Value range is 0-65535 and the default value is 1700.
Serv_port_down	-	LoRaWAN data service center program downlink port. Value range is 0-65535 and the default value is 1700

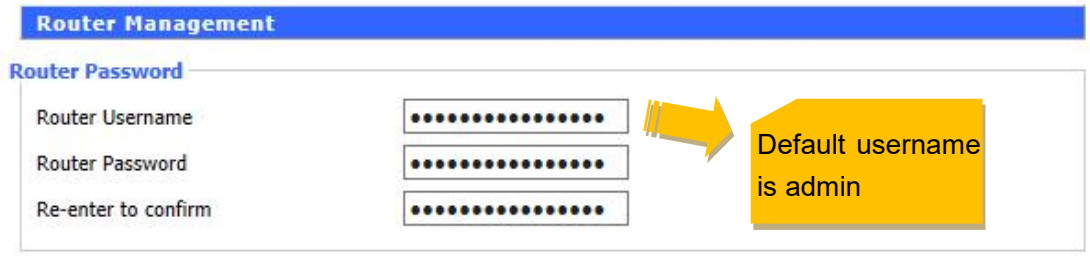
◆ LoRaWAN Gateway Advanced Config

Parameters	Options	Description
LoRaWAN	Enable	Turn on lora
	Disable	Turn off lora
LoRaWAN Gateway ID	-	the unique identity of the base station, which the server can distinguish different LoRaWAN base station
Forward_crc_valid	Enable	Turn on CRC for validation (default)
	Disable	Turn off CRC for validation
Forward_crc_error	Enable	Turn on CRC for validation error function
	Disable	Turn off CRC for validation error function (default)
Forward_crc_disabled	Enable	Turn on CRC validation
	Disable	Turn off CRC validation (default)

3.3.4 Admin

3.3.4.1 Management

This page allows network administrators to manage specific F8L10GW functions to ensure access and security.



New password shall not exceed 32 characters length and shall not contain any space. Make sure the password is the same as the one you set, or the system will prompt an error.

We strongly recommend that modify the default password to ensure system security.

◆ **Web Access**

You can manage the base station by HTTP or HTTPS protocol, and if you select to disable this function, it should be root manually.

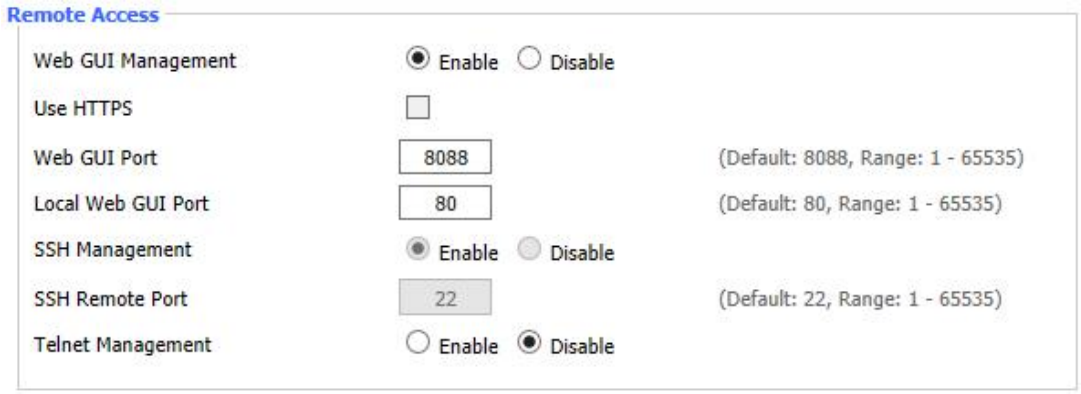
Also, you can enable or disable the information pages of F8L10GW, so that you can protect it by password (input correctly username and password to open it).

Parameters	Options	Description
Protocol	HTTP	Web access by http
	HTTPS	Web access by https
Auto-Refresh (in seconds)	-	The time interval for automatic refresh the web page. If you set 0, it means turn off this function
Enable Info Site	Enable	Enable display system information page before login
	Disable	Disable display system information page before login
Info Site Password Protection	Enabled	Enable the system information page password protection function
	None	Disable the system information page password protection function

◆ **Remote Access**

It allows remote manage the device through the internet.

Warning：If the remote access function is turn on, anyone who get the correctly IP address and password will change the device settings.



Parameters	Options	Description
Web GUI Management	Enable	Enable remote web management function. If you don't check the https protocol, you can input http://xxx.xxx.xxx.xxx:8088 to remote manage F8L10GW, else you need input https://xxx.xxx.xxx.xxx:8088 (x means the access IP address, and 8088 means the web access port),
	Disable	Disable remote web management function
Use HTTPS	-	Whether using https protocol access device. It will take effect when you check it
Web GUI Port	-	Specify the web access port, default 8088
Local Web GUI Port	-	Specify the local access port, default 80
SSH Management	Enable	Turn on SSH remote management function. You can get more information about SSH daemon settings in service pages
	Disable	Turn off SSH remote management function
SSH Remote Port	-	Specify the SSH remote port, default 22
Telnet Management	Enable	Turn on telnet management function
	Disable	Turn off telnet management function

◆ **Cron**

Cron can execute the Linux commands what you plan. You can set the command lines or scripts in that.

Parameters	Options	Description
Cron	Enable	Turn on Cron server
	Disable	Turn off Cron server

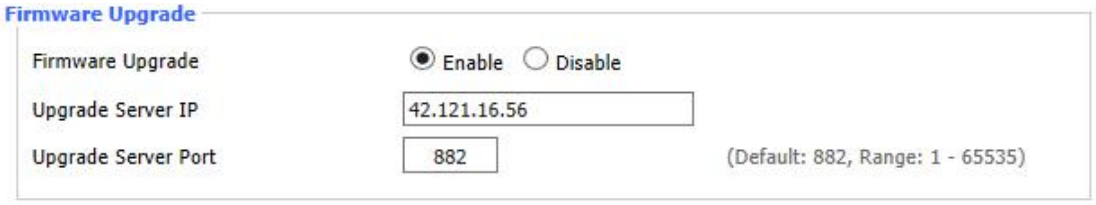
Additional Cron Jobs	-	Linux command lines or scripts

◆ **Remote Management**

This function is used for server configurations with device platform, such as device monitoring platform, WIFI advertising system, device flow monitoring and so on. To get more details can contact with our technical support.

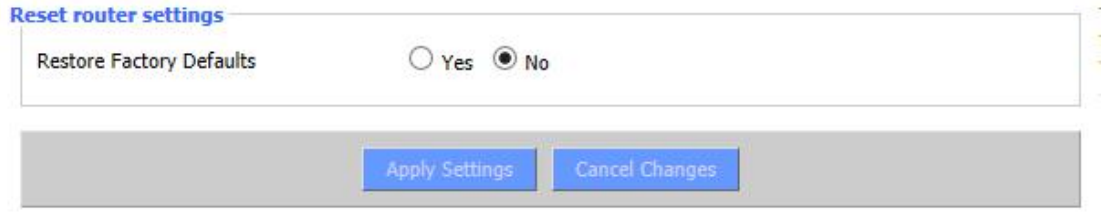
◆ **Firmware Upgrade**

Remote firmware upgrade configuration.



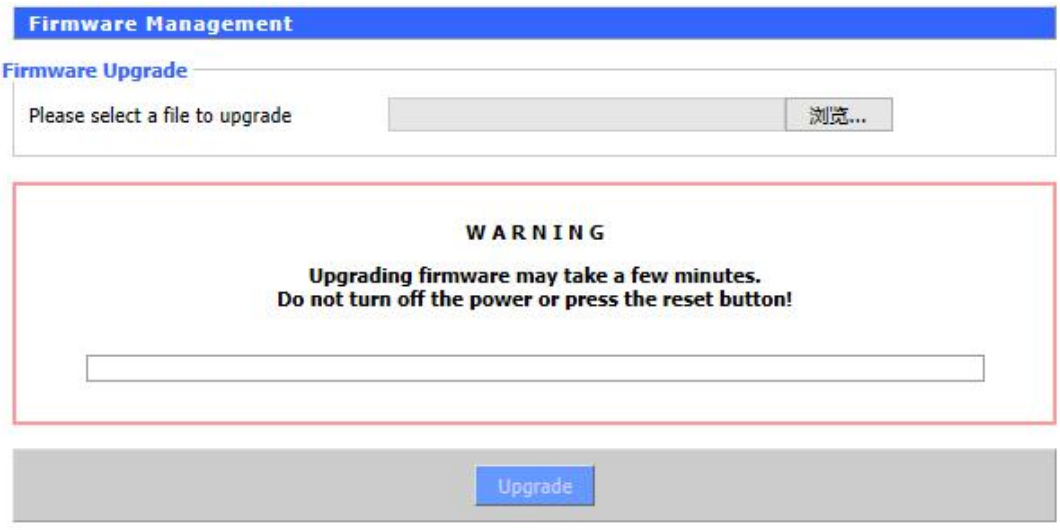
Parameters	Options	Description
Firmware Upgrade	Enable	Turn on remote firmware upgrade function
	Disable	Turn off remote firmware upgrade function
Upgrade Server IP	-	Configure upgrade server IP address
Upgrade Server Port		Configure upgrade server port

3.3.4.2 Factory Defaults



In this page, you can restore device configurations. If you select **"yes"** and then click the **"Apply Setting"** button, all configurations will be cleared and restored to factory settings.

3.3.4.3 Firmware Upgrade



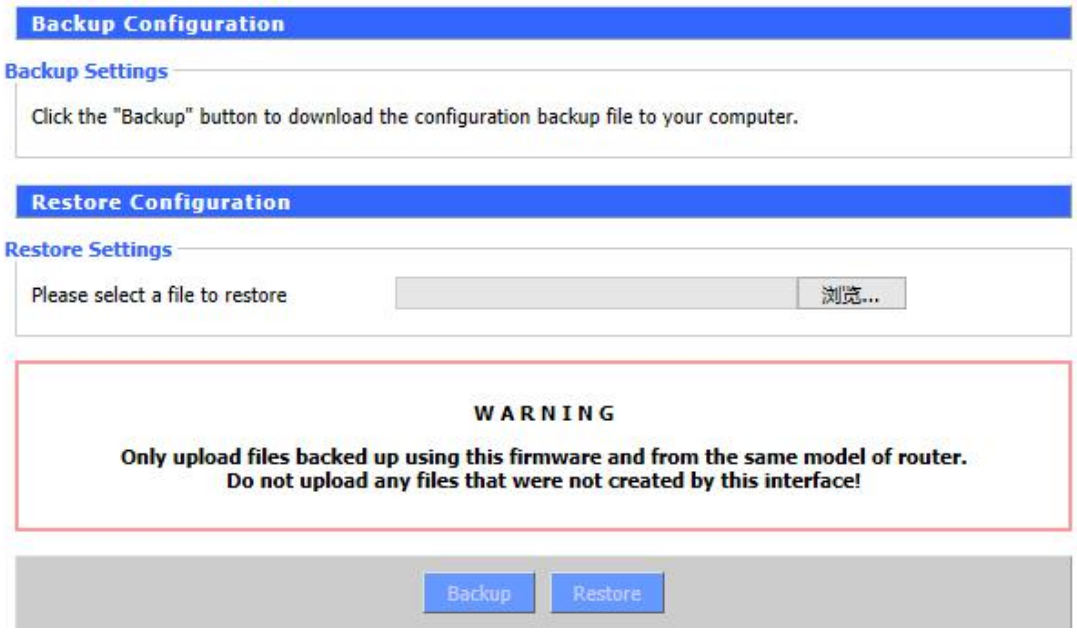
New firmware version can be found in en.four-faith.com, you can download it free, and then loading it into F8L10GW. If the device can work normally, there is no need download and upgrade new firmware version, unless new firmware version includes what new features you want.

Click the **"browse"** button and then choose the firmware file and then click the **"upgrade"** button, the device starting upgrade. It may take a few minutes, please don't power off or reset the device.

Warning: It may be lost configurations when upgrade firmware, so you need backup current configurations before upgrade it.

3.3.4.4 Backup

This module is used to backup or restore the device configuration file.

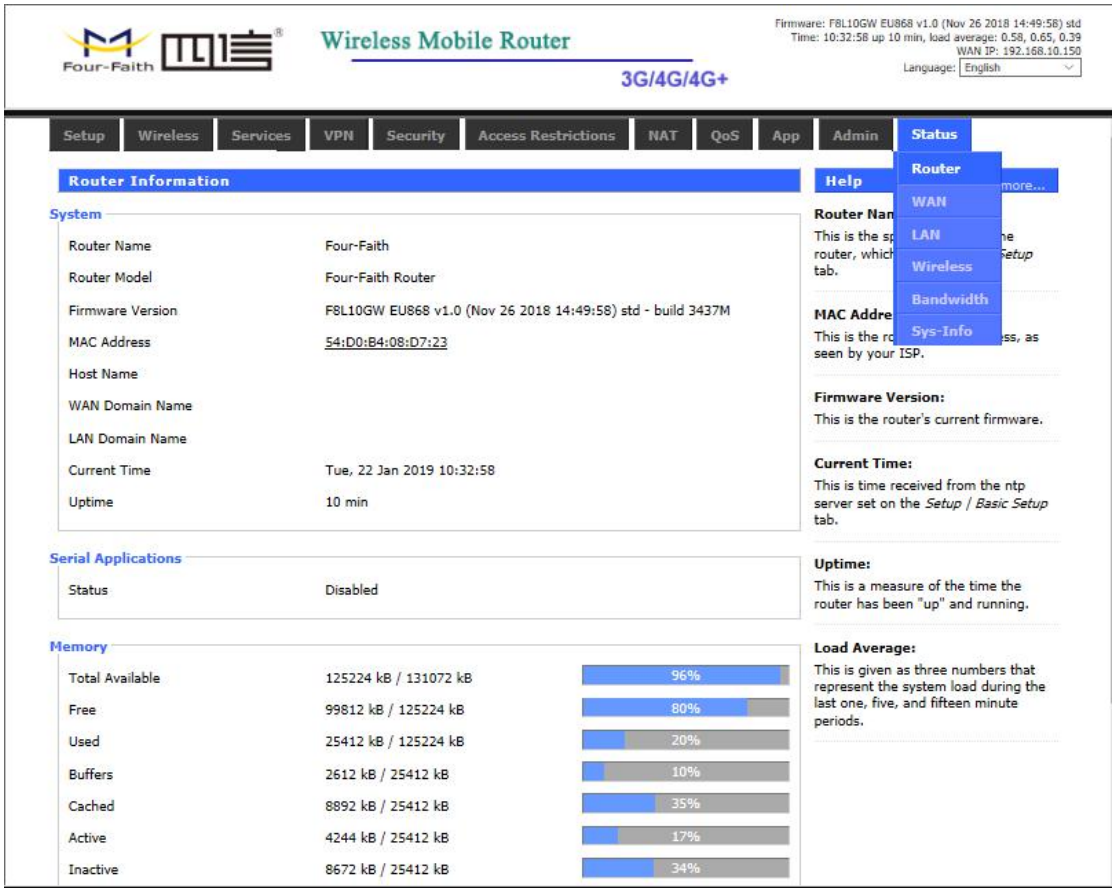


If you want to backup configuration file, please click the **"Backup"** button and then follow the system directions step by step.

If you want to restore configuration file, please click the **"Browse"** button select the backup configuration file and then follow the system directions step by step. And click the **"Restore"** button to upload it.

3.3.5 Status

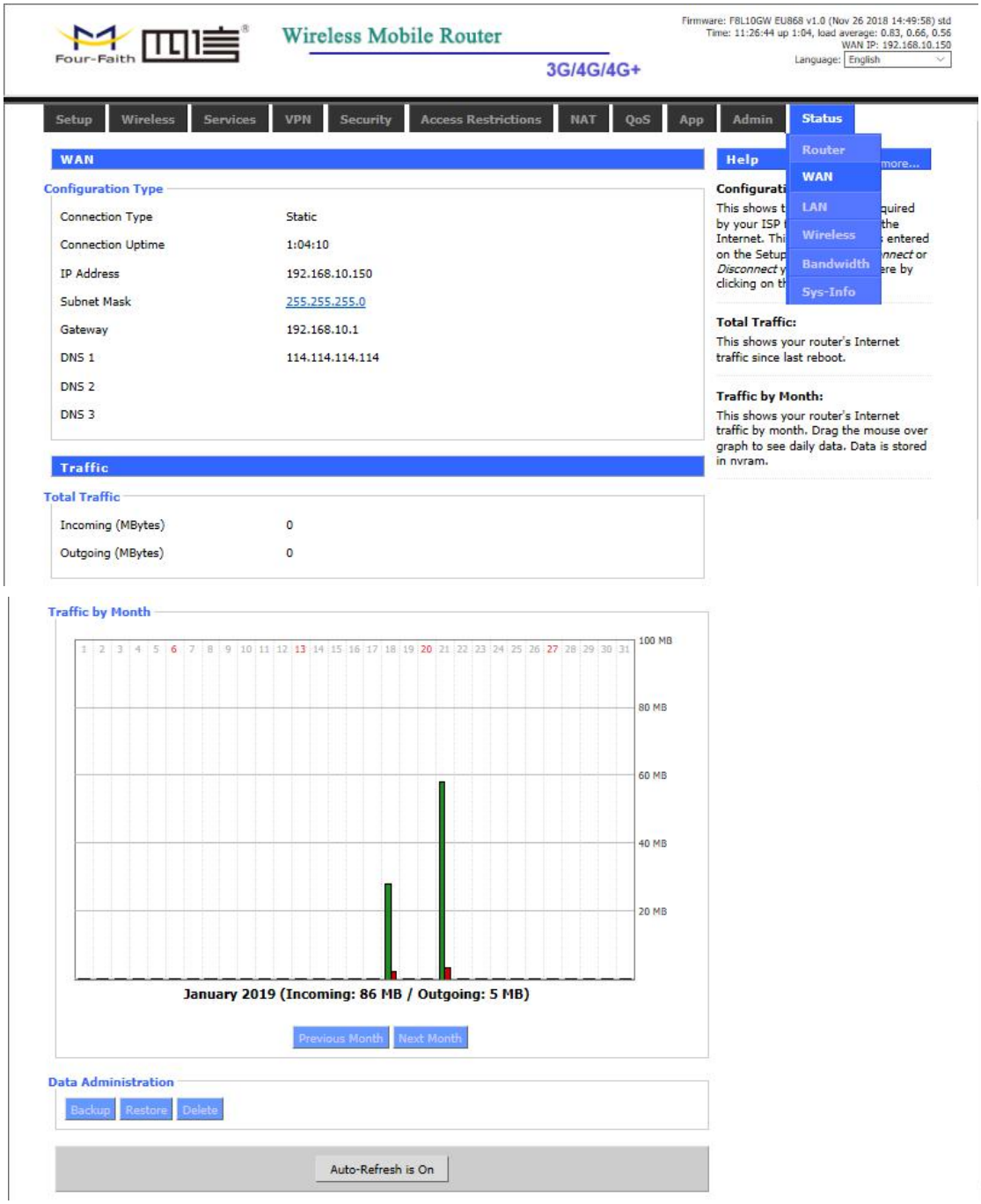
3.3.5.1 Router



Item	Field	Description
System	Router Name	Show the router name of base station
	Router Model	Show the router model name of base station
	Firmware version	Show the current firmware version of base station
	MAC Address	Show the MAC address of base station
	Host Name	Show the host name of base station
	WAN Domain Name	Show the WAN port domain name of base station
	LAN Domain Name	Show the LAN port domain name of base station
	Current Time	Show the system current time of base station
	Uptime	Show the system run time of base station
Serial Application	Status	Show the serial application status of base station
Memory	Total Available	Show the available memory size of base station
	Free	Show the free memory size of base station
	Used	Show the used memory size of base station

	Buffers	Show the available buffer of base station
	Cached	Show the number of cache data
	Active	Show the active memory size of base station
	Inactive	Show the inactive memory size of base station
Network	IP Filter Max Connections	Show the IP Filter connections of base station
	Active IP Connections	Show the active IP connections of base station, if you click this link, it will show all active IP details

3.3.5.2 WAN



Item	Parameters	Description
Configuration Type	Configuration Type	Show current connect type of base station
	Connection Uptime	Show current duration online of base station
	IP Address	Show the IP address of WAN port
	Subnet Mask	Show the subnet mask of WAN port
	Gateway	Show the gateway of WAN port
	DNS1	Show the DNS1 of WAN port
	DNS2	Show the DNS2 of WAN port
	DNS3	Show the DNS3 of WAN port
Total Traffic	Incoming	Show the incoming total traffic
	Outgoing	Show the outgoing total traffic
Data Administration	Backup	Backup the data administration configuration
	Restore	Restore the data administration configuration
	Delete	Delete the data administration configuration

3.3.5.3 System Info

Item	Parameters	Description
Server status	-	Show the LoRaWAN server connection status
Mac	-	The device Mac address
GPS status	-	Show the GPS status
Longitude	-	Show current longitude of F8L10GW
Latitude	-	Show current latitude of F8L10GW
Altitude	-	Show current altitude of F8L10GW