F8L10GW-L Outdoor LoRa Gateway User Manual	Version	Encryption level
	V1.0.0	
	Product:F8L10GW-L	Total 32 page

F8L10GW-L Outdoor LoRa Gateway User Manual

This manual is suitable for following:

Model	Remark
F8L10GW-L-433	Frequency:410-441MHz
F8L10GW-L-470	Frequency:470-510MHz
F8L10GW-L-868	Frequency:850-950MHz

Files Revised Record

Data	Version	Description	Author
2020.03.19	V1.0.0	Original version	PF
2020.03.19	V2.0.0	Amend some parts, and add GPS part	YSL

Copyright Notice

Trademark Notice

Pole mounting

Wall mounting

Note：Please check device received , as different model may have difference for accessories and interface.

Contents

Chapter 1 Introduction

1.1 Overview

F8L10GW-L is outdoor IoT wireless communication gateway, which uses public wireless network to provide long distance data communication for users, meanwhile it can support LoRa wireless data transmission, and support WIFI wireless configuration and upgrade. It can support AC220V by standard, POE power and DC power are optional.

This product has been widely used in the M2M industry of the IoT industrial chain, such as smart grid, intelligent transportation, smart home, finance, mobile POS gateways, supply chain automation, industrial automation, intelligent building, fire protection, public safety, environmental protection, meteorology, digital medical, telemetry, agriculture, forestry, water, coal, petrochemical and other related fields.

1.2 Product Feature

Industrial Design
◆ High performance industrial wireless communication module
◆ High performance industrial single channel LoRa chip
◆ Aluminum shell, IP67 protection
◆ AC220V, optional POE and DC 9~36V
Stable & Reliable
◆ WDT watch dog to guarantee stable system
◆ Mature anti-drop mechanism to ensure always online
◆ Ethernet port with build-in 1.5kV ESD
◆ SIM/UIM interface with build-in 15KV ESD
◆ Power interface with build -in phase-reversal, over- voltage and lighting protection
◆ Lighting protection for antenna interface

1.3 Product Parameter

◆ Business channel: Star topology, can support delay
◆ Working frequency: 433MHz、470MHz、868MHz、915MHz
◆ TX power: 5-20dBm(adjustable) or 30dBm(fixed)
◆ RX sensitivity: -142dbm @LoRa
◆ Security, reliable and low delay wireless transmission
◆ Report to server: 4G or wireless
◆ Working Temperature: -35~+75℃
◆ Size:289.4*223.62*115 mm

◆ IP Protection:IP65

◆ Wireless management: WiFi wireless management and upgrade

◆ Power supply: AC220, POE power(optional), DC 9~36V(optional)

◆ Power Consumption: <7W

◆ Electrical Performance

No.	Parameter	Technical Standard
1	Standard power input	100~240VAC
2	Standard voltage output	12V
3	Standard current input	3A
4	Under voltage protection for input	no
5	Over-current protection for output	yes
6	Over-current protection for output	yes
7	Short circuit protection	yes
8	Surge protection	6KV
9	Lighting protection	3KA
10	Cable diameter for input	5-7mm suggested
11	POE power	POE input, 10/100 Base-T auto MDI/MDIX
12	POE standard	IEEE802.3af/IEEE802.3at

◆ Power Consumption

Average working voltage（V）	Average working current（mA）	Power Consumption(W)	Remark
12.00	140	1.68	Without 4G and LoRa
12.00	≦250	3	With 4G, without LoRa
12.00	TX≦550 RX≦420	6.6	With 4G and LoRa

Chapter 2 Installation

2.1 Description

It must to be installed correctly to reach F8L10GW-L designed features. It needs to be guided by engineer which is approved by our company to install this device usually.

➢ *Note：*
1. *Please do not install F8L10GW-L when powered.*
2. *Please do not move plug, power interface, antenna interface of F8L10GW-L.*

2.2 Package List

2.2.1. Package for wall mounting

Item	Quantity	Remark
F8L10GW-L	1	
4G fiberglass antenna	1	optional
WIFI fiberglass antenna	1	
LoRa fiberglass antenna	1	
Bracket	1	
Swelling screw ø14mm	3	
Power cable	1	optional
CD	1	optional
QC passed card	1	
Warranty card	1	

2.2.2. Package for pole mounting

Item	Quantity	Remark
4G fiberglass antenna	1	optional
WIFI fiberglass antenna	1	
LoRa fiberglass antenna	1	
Fixing bracket	2	
Power cable	1	optional
CD	1	optional
QC passed card	1	
Warranty card	1	

2.3 Installation Size
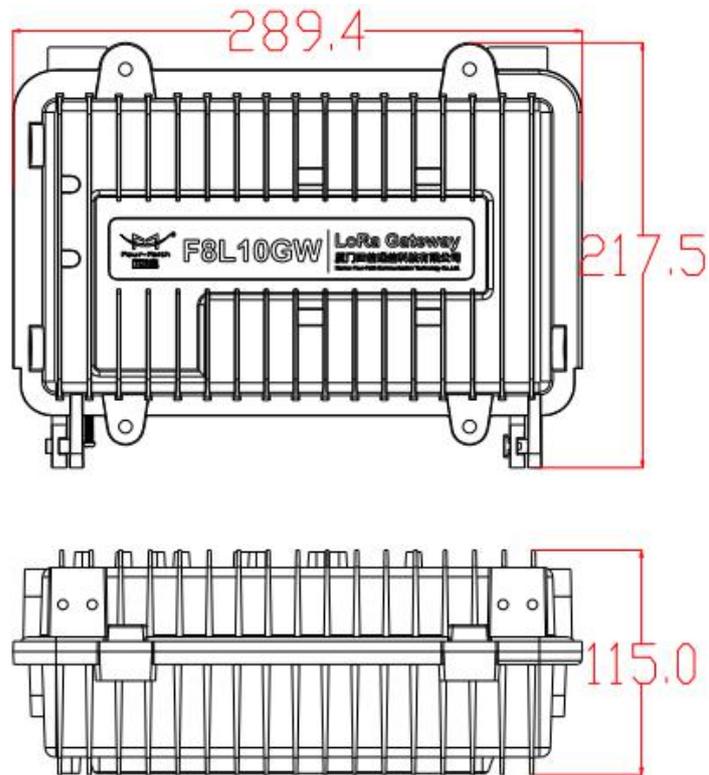
F8L10GW-L Size

2.3.1 SIM/UIM Card

1.Power off device

2.Unscrew M6 screws, check Image 2.3.1

3.Insert SIM card like Image 2.3.2, please take care of SIM/UIM direction when install it.

4. It will auto pop up if   push SIM/UIM when uninstall SIM/UIM.

5.Screw M6 screws until cannot screw it

Note:Please do no install SIM/UIM when powered.
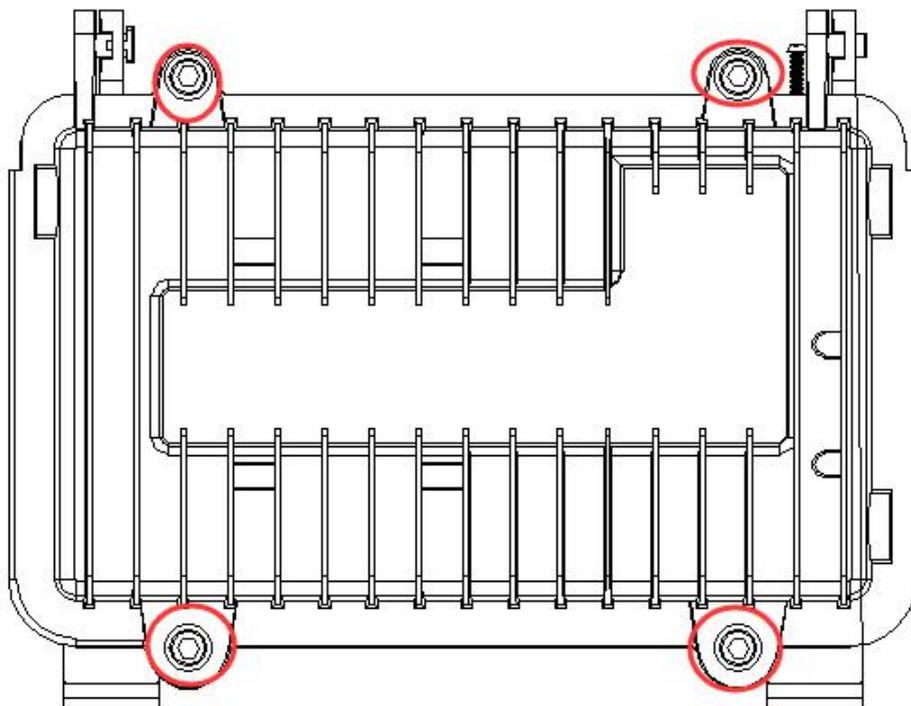
Image 2.3.1
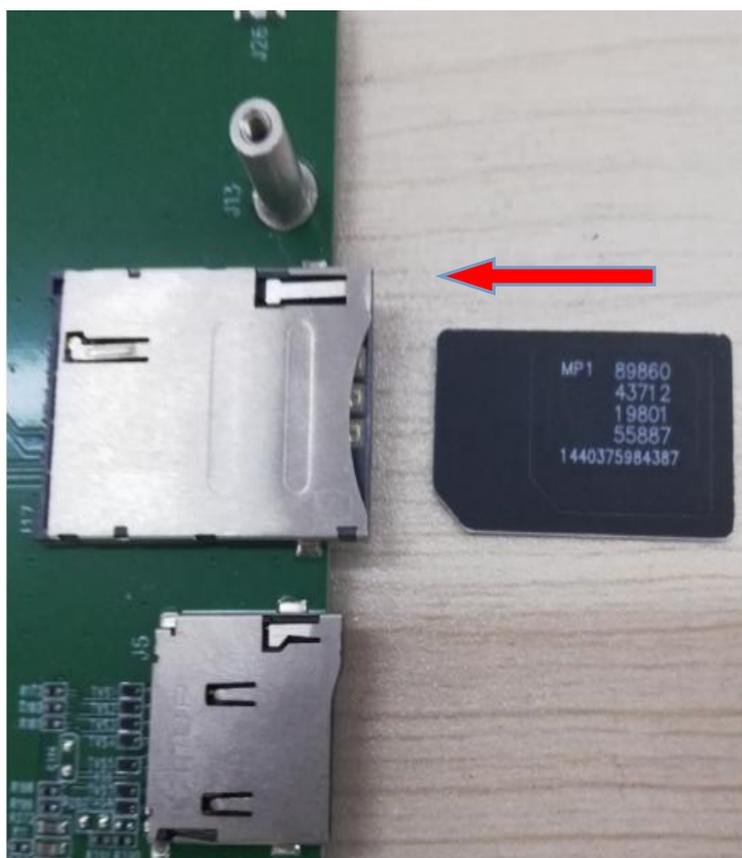
Image2.3.2

2.3.2 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.
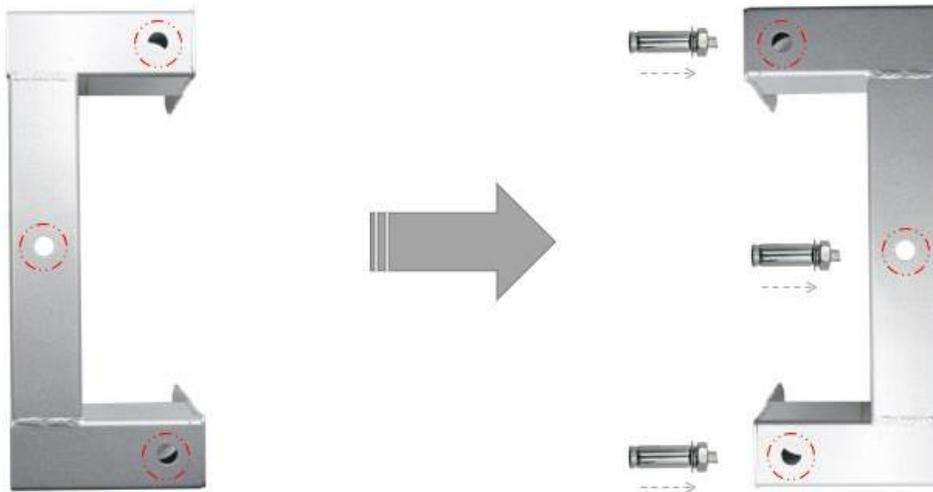
3. Fix the bracket on the wall and tighten the screw.

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

Fix four screws with
the appropriate wrench
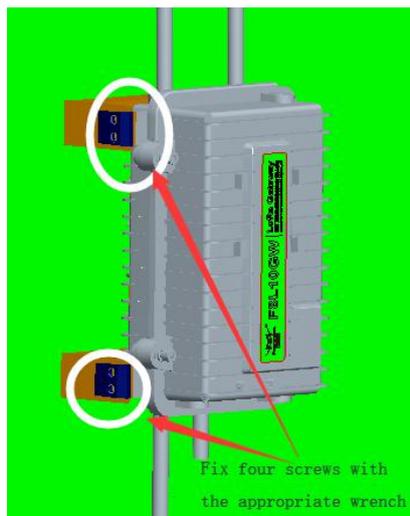
2.4 Pole-mounted Installation

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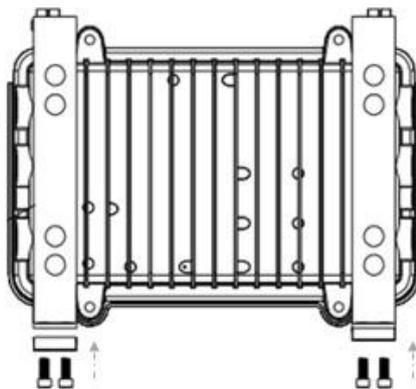
2. Put the clamp into the pole, fix the clamp in the pole with screws.
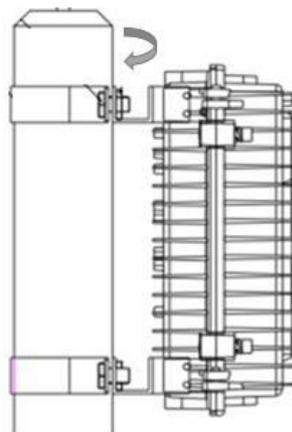
2.5 Antenna Installation

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.
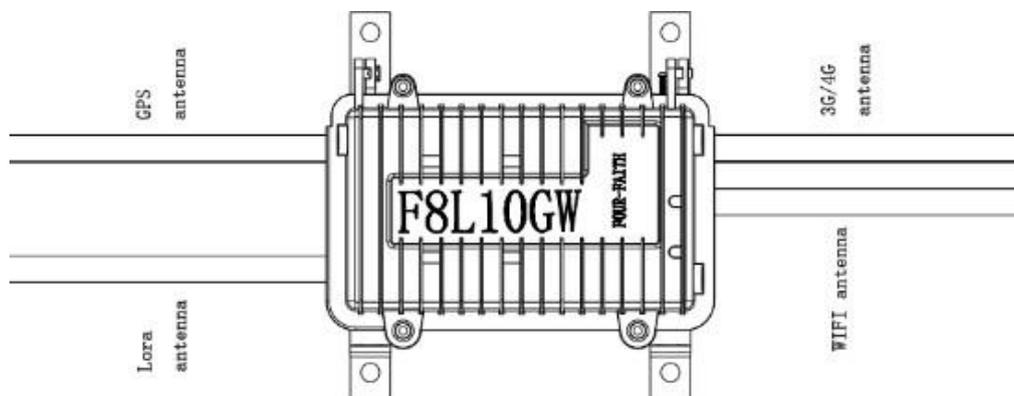
2.6 LED Indicators

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);
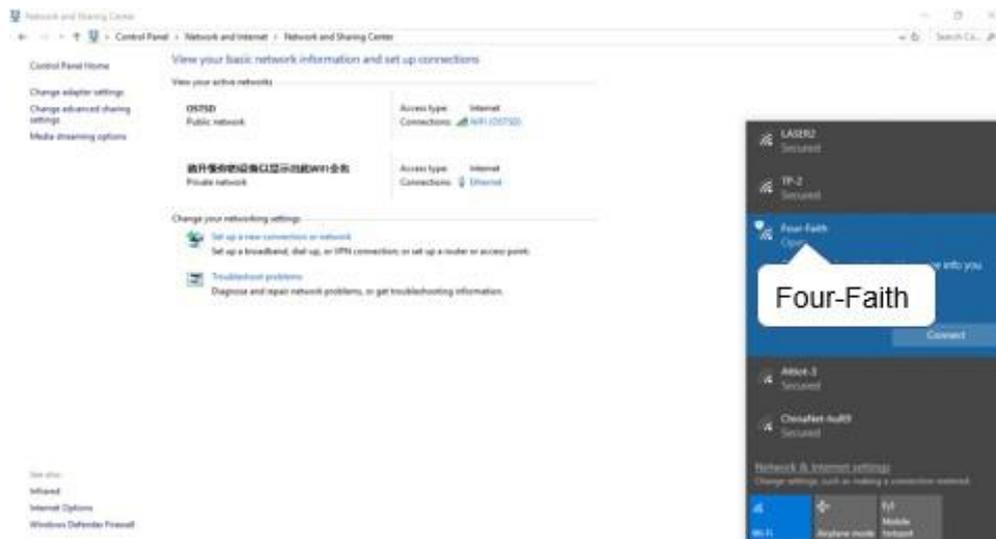
Connect the open hotspot "Four-Faith", and then click the "Connect" button to connect it.
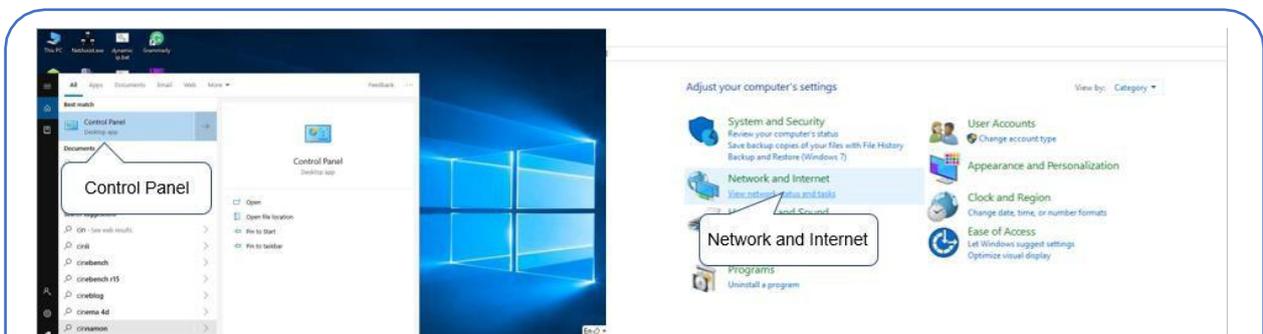
◆ Connect the base station by network cable(based on WIN10 operator system)

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

    Userame:admin

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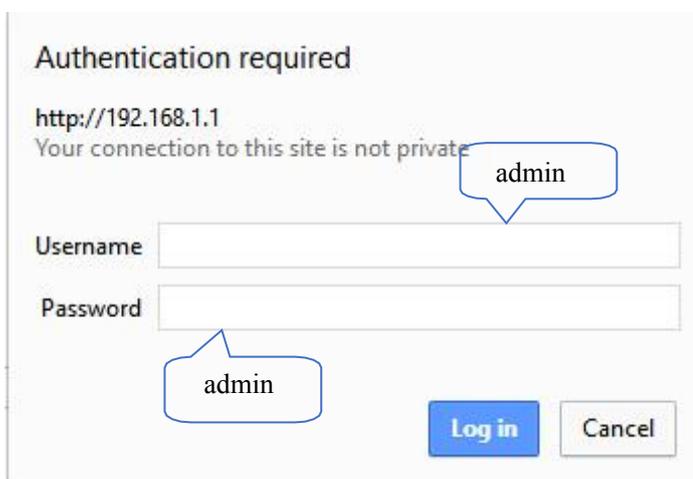
    3.Click the "Log in" button, and then you can access to device configuration management

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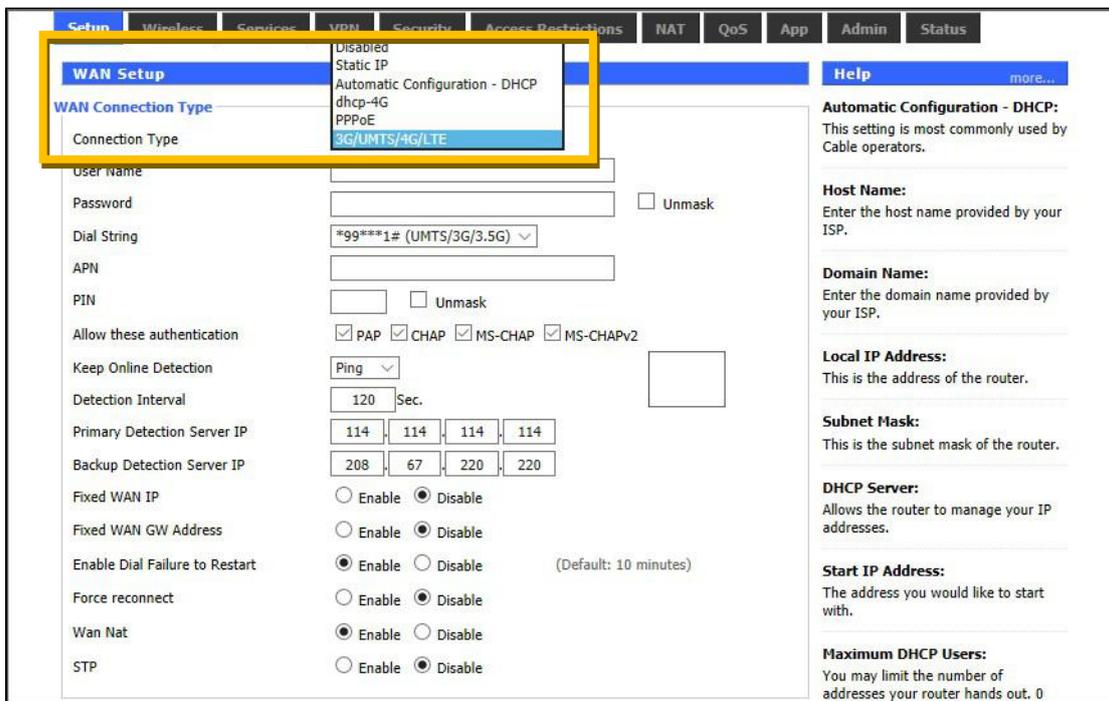
There are 6 WAN connection types, include: Disable, Static IP, Automatic Configuration - DHCP, DHCP-4G, PPPOE and 3G/UMTS/4G/LTE. And F8L10GW-L provides wired ethernet (only support LAN port) and dhcp-4G(default) connection types.

🔸 **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**

Add：Floor 11,A06 building, No.370,Chengyi Street,Jimei District, Xiamen,China.
http：//en.four-faith.com   Hotline：400-8838-199   Fax：(+86)0592-5912735
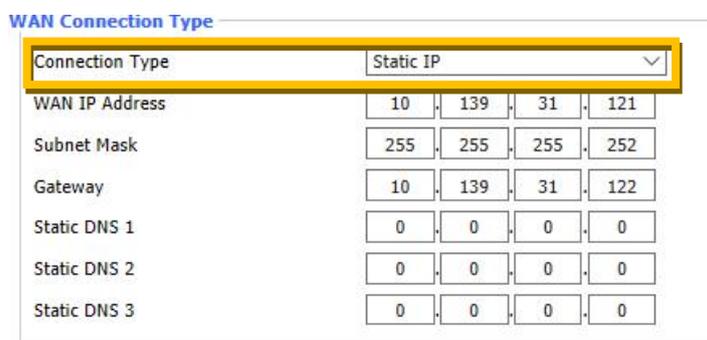
WAN IP Address	-	Public IP address
Subnet Mask	-	Subnet mask parameter
Gateway	-	Gateway parameter
Static DNS1	-	Static domain name server 1
Static DNS2	-	Static domain name server 2
Static DNS3	-	Static domain name server 3

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.
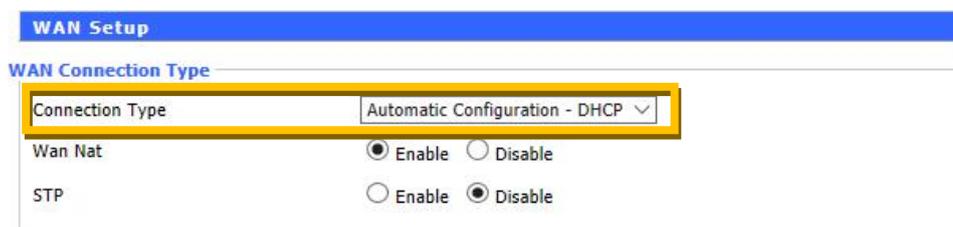
➕ **DHCP-4G connection type**

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).
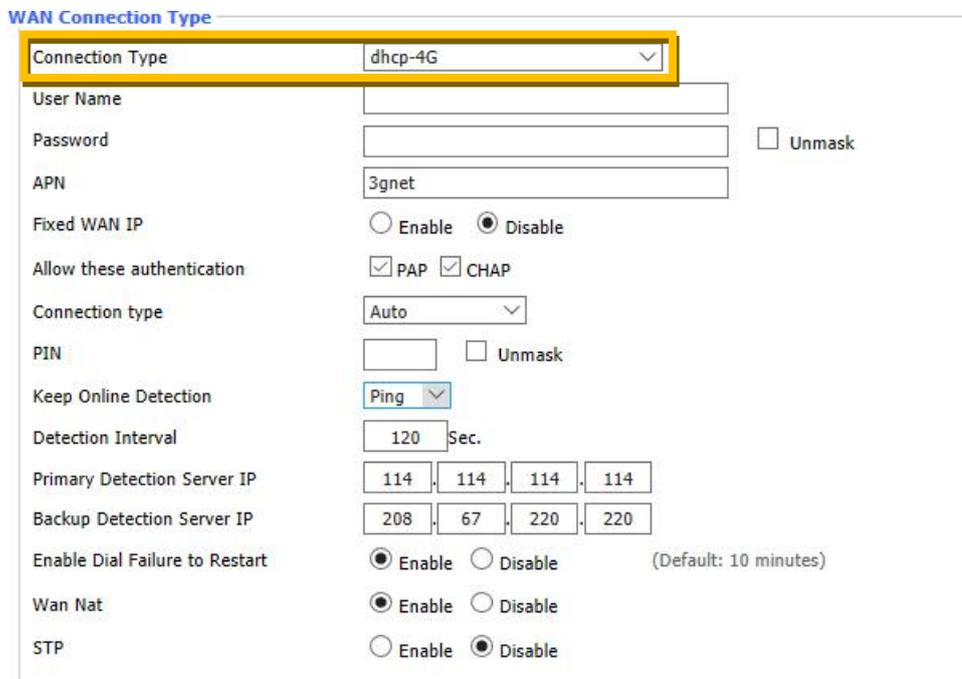
Parameters	**Option**	**Description**

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 Setting

For F8L10GW-l ,the wifi function are mainly used to configure the web settings and firmware upgrade

3.3.2.1 Basic setting

Wireless Physical Interface wl0 [2.4 GHz]

| Wireless Network | ● Enable ○ Disable |

Physical Interface ra0 - SSID [Four-Faith] HWAddr [54:D0:B4:0C:19:C4]

Wireless Mode	AP ▼
Wireless Network Mode	Mixed ▼
Wireless Network Name (SSID)	Four-Faith
Wireless Channel	Auto ▼
Channel Width	Auto ▼
Wireless SSID Broadcast	● Enable ○ Disable
Network Configuration	○ Unbridged ● Bridged

Virtual Interfaces

Add

Save   Apply Settings   Cancel Changes

Enable：enable WIFI。
Disable：disable WIFI。
Wireless mode：AP、Client mode、Ad-hoc、relay、Bridge work mode
Wireless network mode：

Mixed ：Support 802.11b, 802.11g, 802.11n wifi standard at the same time
BG-Mixed：Support 802.11b, 802.11g wireless devices.
B-Only：Only supports the 802.11b standard wireless devices.
G-only：Only supports the 802.11g standard wireless devices.
NG-Mixed：Support 802.11g, 802.11n wireless devices.
N-only： only Support 802.11n wireless devices.
8021.11n Transmission mode：In the wireless network mode to "N-only" choose to transfer its transmission mode.

Greenfiled：When you determine the surrounding environment, there is no other 802.11a/b/g devices use the same channel, use this mode to increase throughput. Other 802.11a/b/g devices use the same channel in the environment, the information you send may generate an error, re-issued.

Mixed：This mode is contrary to the green mode, but will reduce the throughput.

Wireless Network Name(SSID):The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character. Make sure this setting is the same for all devices in your wireless network

Wireless channel：A total of 1-13 channels to choose more than one wireless device environment, please try to avoid using the same channel with other devices.

Frequency width：20MHZ and 40MHZ available

Extension Channel：Channel for 40MHZ, you can choose upper or lower.

Wireless SSID Broadcast：

    enable：broadcast SSID。

    disable：hide SSID。

Network configuration：

    Bridged：Bridge to the Router, under normal circumstances, please select the bridge

    Unbridge：There is no bridge to the Router, IP addresses need to manually configure.

Network Configuration	◉ Unbridged ◯ Bridged
Multicast forwarding	◯ Enable ◉ Disable
Masquerade / NAT	◉ Enable ◯ Disable
IP Address	0 . 0 . 0 . 0
Subnet Mask	0 . 0 . 0 . 0 .

    Virtual Interfaces：Click Add to add a virtual interface. Add successfully, click on the remove, you can remove the virtual interface

Virtual Interfaces ra1 SSID [ff_vap]

Wireless Network Name (SSID)	ff_vap
Wireless SSID Broadcast	◉ Enable ◯ Disable
AP Isolation	◯ Enable ◉ Disable
Network Configuration	◯ Unbridged ◉ Bridged

Add   Remove

    AP Isolation：This setting isolates wireless clients so access to and from other wireless clients are stopped.

    Note：Save your changes, after changing the "Wireless Mode", "Wireless Network Mode", "wireless width", "broadband" option, please click on this button, and then configure the other options

3.3.3 LoRa Application

Users can config the parameters according to the specific applications

Enable Lora ：Enable or disable lora function

Work Mode: 2 kinds, TRNS、PRO,if using PRO mode, pls refer to the API user manual

Through Address：lora Transmission node number of the target device, the operating mode to the broadcast 65535. if operating mode is set to the API set,this setting will be invalid, the transfer destination address is determined by custom packet

Carrier Frequency：The physical frequency of the module. The band-width of LoRa are 410MHz to 441MHz, 470MHz to 510MHz and 850MHz to 950MHz. The bit error rate is different from each channel.Asuitable channel should be selected according to the application.

Received Interval： Each time it receives a packet by LoRa, the longest wait for the timeout, in milliseconds, the input value must be in the range 1 to 999

Received data timeout：if the time exceed,the lora will restart itself

Communicate Mode: Equipment transmission conversion: to support communication between lora and serial port, network forwarding combination; Notice: about the serial's communicate parameter setting must trun on "serial applicaion" web page setting

RSPD ：The Bit Rate is the speed of data transferring. The bigger the Bit Rate, the faster of the data transfer data speed,6 speed levels are available , unit Kbps

Protocal type :

UDP(DTU)： Data transmit with UDP protocol , work as a DTU which has application protocol

and customized application protocal

TCP(DTU)：Data transmit with TCP protocol , work as a DTU which has application protocol and customized application protocal

Pure TCP ：Data transmit with standard TCP protocol

TCP Server：Data transmit with standard TCP protocol, router is the server.

TCST：Data transmit with TCP protocol, Using a custom data

Server Address：The data service center's IP Address or domain name.

Server port：The data service center's listening port.

Device Id: The router's identity ID.，the data string with 11 characters,only used when the protocal is defined as TCP(DTU) or UDP(DTU)

或

Heartbeat time interval：only used when the protocal is defined as TCP(DTU) or UDP(DTU)

Customized heartbeat packet：only used when the protocal is defined as TCST protocal

Customized registered packet：only used when the protocal is defined as TCST protocal

Serial Settings：

Control Serial Setting

Baudrate	115200 ▼
Databit	8 ▼
Stopbit	1 ▼
Parity	None ▼
Flow Control	None ▼

Baudrate: The serial port's baudrate

Databit: The serial port's databit

Parity: The serial port's parity

Stopbit: The serial port's stopbit

Flow Control: The serial port's flow control type.。

LoRa Mode Upgrade : after click [LORA Module Upgrade] button，setup into fllow setting

interface, choose you want to upgrade lora mode file，and now goto upgrade process，notice in the upgrade processing don't power off router or press the reset button

Lora module upgrade

please choose a lora upgrade file: 选择文件 未选择任何文件

Upgrade   Cancel Changes

3.3.4 Management

3.3.4.1 Management

The Management screen allows you to change the Router's settings.

Router Management

Router Password

Router Username	••••••••••••••••
Router Password	••••••••••••••••
Re-enter to confirm	••••••••••••••••

The new password must not exceed 32 characters in length and must not include any spaces. Enter the new password a second time to confirm it.

Note ：Default username is admin.

It is strongly recommended that you change the factory default password of the Router, which is admin. All users who try to access the Router's web-based utility or Setup Wizard will be prompted for the Router's password.

Web Access

This feature allows you to manage the Router using either HTTP protocol or the HTTPS protocol. If you choose to disable this feature, a manual reboot will be required.You can also activate or not the Router information web page. It's now possible to password protect this page (same username and password than above)

Web Access

Protocol	☑ HTTP ☐ HTTPS
Auto-Refresh (in seconds)	3
Enable Info Site	⦿ Enable ○ Disable
Info Site Password Protection	☐ Enabled

Protocal：This feature allows you to manage the Router using either HTTP protocol or the HTTPS protoco

Auto-Refresh（s）：Adjusts the Web GUI automatic refresh interval. 0 disables this feature

Completely

Enable info site：Enable or disable the login system information page

Info site password protection：Enable or disable the password protection feature of the system information page

Remote Access ：This feature allows you to manage the Router from a remote location, via the Internet. To disable this feature, keep the default setting, Disable. To enable this feature, select Enable, and use the specified port (default is 8080) on your PC to remotely manage the Router. You must also change the Router's default password to one of your own, if you haven't already

To remotely manage the Router, enter http://xxx.xxx.xxx.xxx:8080 (the x's represent the Router's Internet IP address, and 8080 represents the specified port) in your web browser's address field. You will be asked for the Router's password.

If you use https you need to specify the url as https://xxx.xxx.xxx.xxx:8080 (not all firmwares does support this without rebuilding with SSL support).

SSH Management：You can also enable SSH to remotely access the Router by Secure Shell. Note that SSH daemon needs to be enable in Services page

Telnet Management：Enable or disable remote Telnet function

Cron：The cron subsystem schedules execution of Linux commands. You'll need to use the command line or startup scripts to actually use this.

Device management: you can monitor&manage,configure parameters by using Four-faith remote management systems

3.3.4.2 Factory Defaults

Reset Router settings ：Click the Yes button to reset all configuration settings to their default values. Then click the Apply Settings button.
Note ：
Any settings you have saved will be lost when the default settings are restored. After restoring the Router is accessible under the default IP address 192.168.1.1 and the default password admin.

3.3.4.3 Firmware Update

Firmware Update：update the new firmware to the F8L10GW.New firmware will be released on en.four-faith.com ,you can download it for free.
Note：you can backup the F8L10GW settings before you factory the gateway in case of losing all the configuration.and pls don't restart or pressing the reset button on the gateway in the process of upgrading

3.3.4.4 Backup

Backup Settings ：You may backup your current configuration in case you need to reset the gateway back to its factory default settings.Click the Backup button to backup your current configuration.

Restore Settings ：Click the Browse... button to browse for a configuration file that is currently saved on your PC.Click the Restore button to overwrite all current configurations with the ones in the configuration file.

Note ：

Only restore configurations with files backed up using the same firmware and the same model of gateway.

Appendix

The following steps describe how to setup Windows XP Hyper Terminal.

1. Press "Start" "Programs" "Accessories" "Communications" "Hyper Terminal"
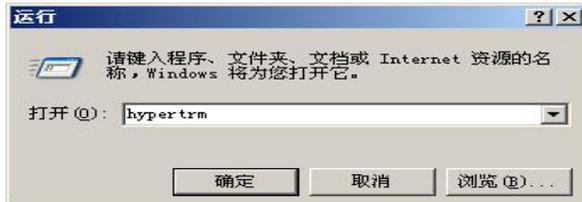
2、Input connection name, choose "OK"
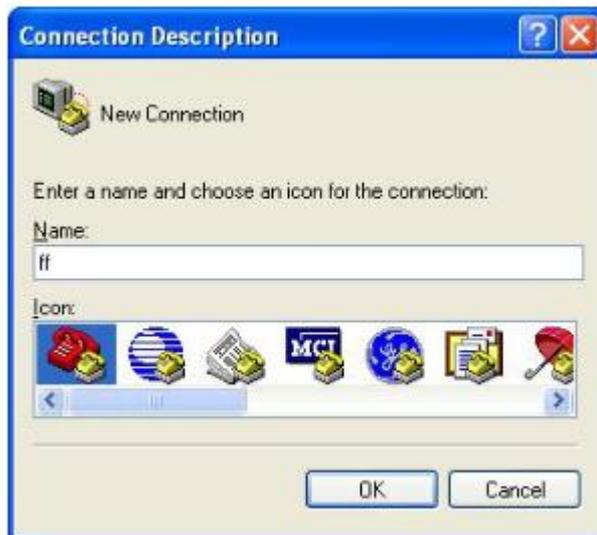
3. Choose the correct COM port which connects to modem, choose "OK"

4. Configure the serial port parameters as following, choose "OK"

  Bits per second: 115200

  Data bits: 8

  Parity: None

  Stop bits: 1

  Flow control: None
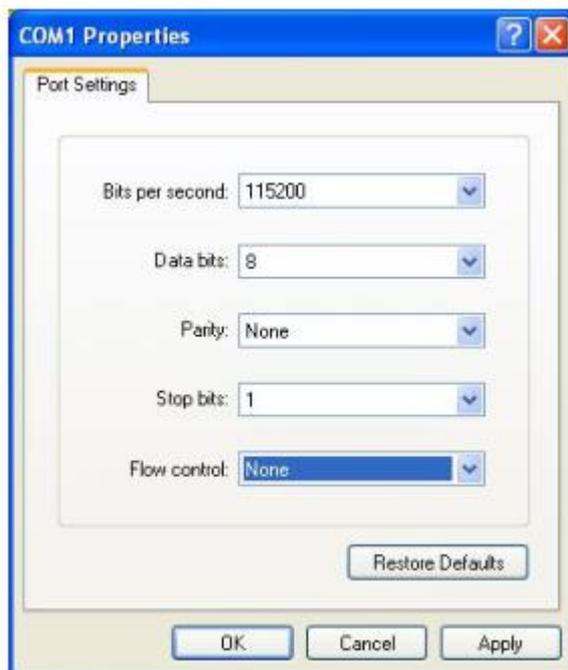
5. Complete Hyper Terminal operation, It runs as following
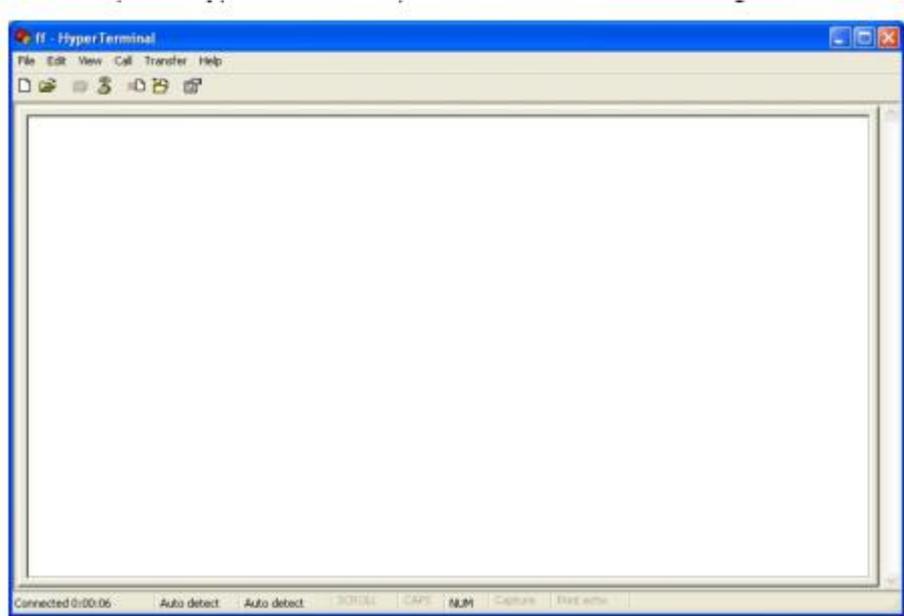
Note : If the user is using the win7 system, you can download a win7 super terminal on the internet. Universal serial interface or other similar software.