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Femto Lite Indoor Gateway User Manual

Revision History

Revision	Date	Description	Author
.001	Feb. 09, 2021	First release	Gary
.002	June. 06, 2021	● Update WEB GUI ● Power input 5V DC/2A	Jason/Joey

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Chapter 1 – Introduction

Purpose and Scope

The purpose of this document is to describe the main functions, user manual, supported features, and system architecture of the WLRRTES-106 Femto Lite Indoor Gateway based on the latest LoRaWAN specification.

Product Design

The dimension of WLRRTES-106 Femto Lite Indoor Gateway is with the dimension of 116 x 91 x 27 mm, and with one LAN port, one Micro-USB port for 5V DC/2A power input, four LED indicators, and one reset button.

Definitions, Acronyms, and Abbreviations

Item	Description
LPWAN	Low-Power Wide-Area Network
LoRaWAN™	LoRaWAN™ is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in a regional, national or global network.
ABP	Activation by Personalization
OTAA	Over-The-Air Activation
TBD	To Be Defined

Reference

Document	Author
LoRaWAN Specification v1.0.3	LoRa Alliance
RP002-1.0.1 LoRaWAN **Regional Parameters**	LoRa Alliance

Chapter 2 – Hardware Details

LED Indicators

LED sequence: Power(System), WAN, WiFi, LoRa

One Orange, Three Green

Solid LED is for static status, blanking means the system is upgrading or active devices linked to the corresponding port

	Solid On	Blinking	Off
Power System(Orange)	Power ON	Booting (ignore bootloader)	Power Off
WAN(Blue)	Ethernet Plug and got IP Addr	Connecting	Unplug
Wireless(Blue)	WiFi Station Mode and got IP Addr	Connecting	Wireless Disable
LoRa(Blue)	LoRa is work	Connecting	LoRa is not work

Table 1 LED Behaviors

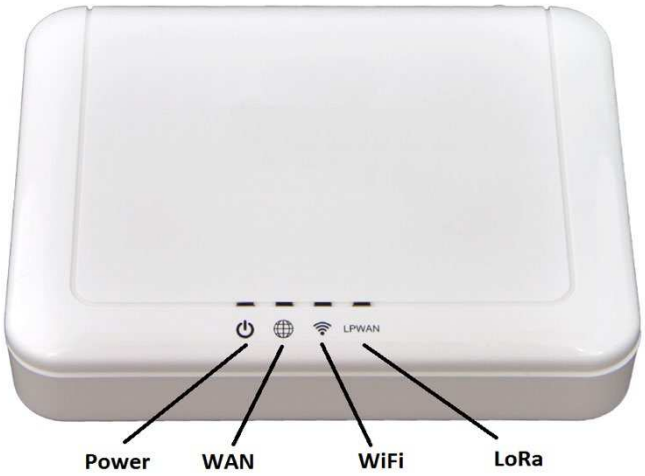

Figure 1 – IO Ports

I/O Ports

Port	Count	Description
RJ45	1	WAN port of the device
Reset	1	Reset to default (5 seconds to reset settings to factory default)
Micro USB	1	Power input via USB adaptor(5VDC/2A)

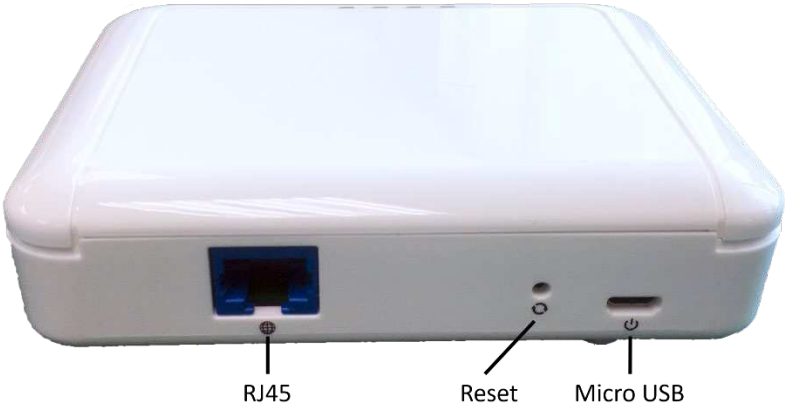

Figure 2 – IO Ports

Back Label

The marking information is located at the bottom of the apparatus.

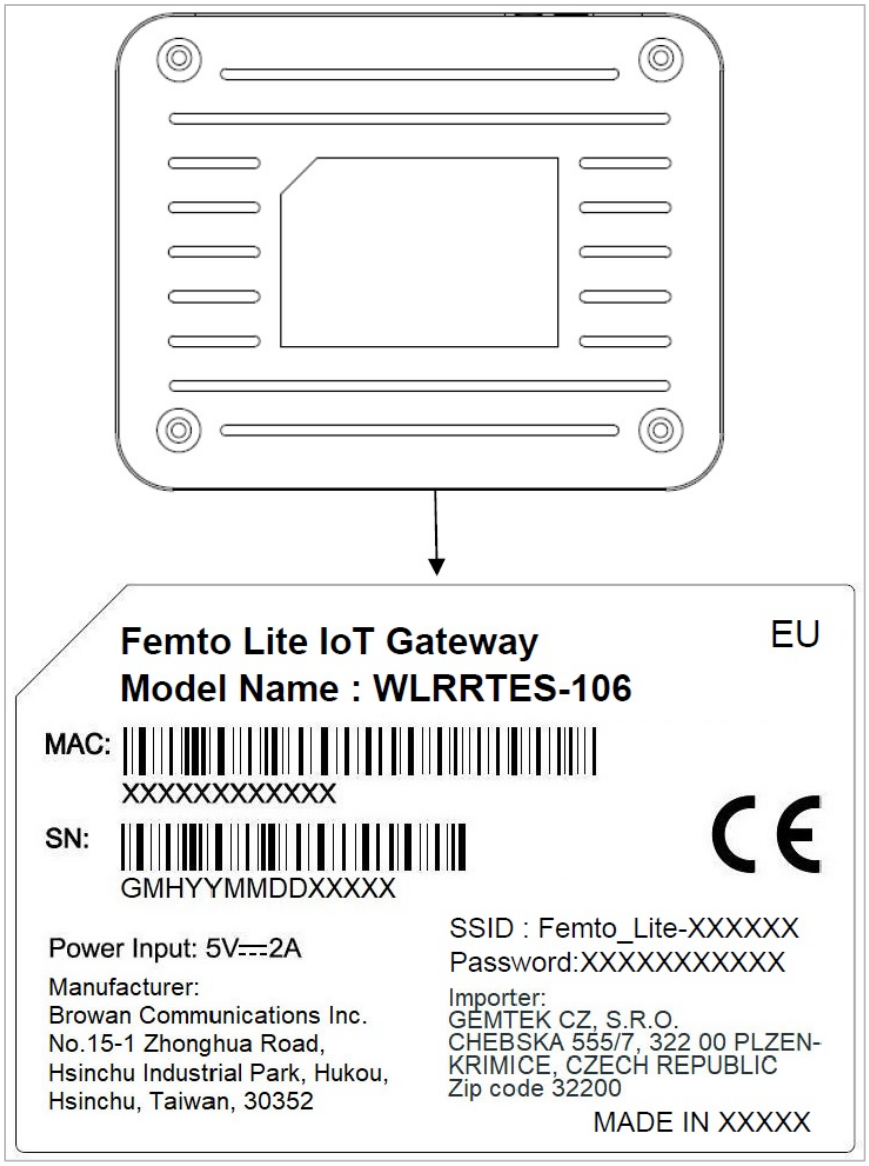

Figure 3 – Back Label

Package Label

No.	Item	Description
1	Product BOX	Brown Box
2	Labeling	Model/ MAC/ Serial Number/ Type Approval

Package Content

No.	Description	Quantity
1	Femto Lite IoT Gateway	1
2	Power adapter (100-240VAC 50/60Hz to 5VDC/2A)	1
3	Ethernet Cable 1 meter (UTP)	1

Chapter 3 – User Manual

3.1 Connect Femto Lite

You can connect to the gateway via WiFi interface which the SSID and password are printed on the back label by default.

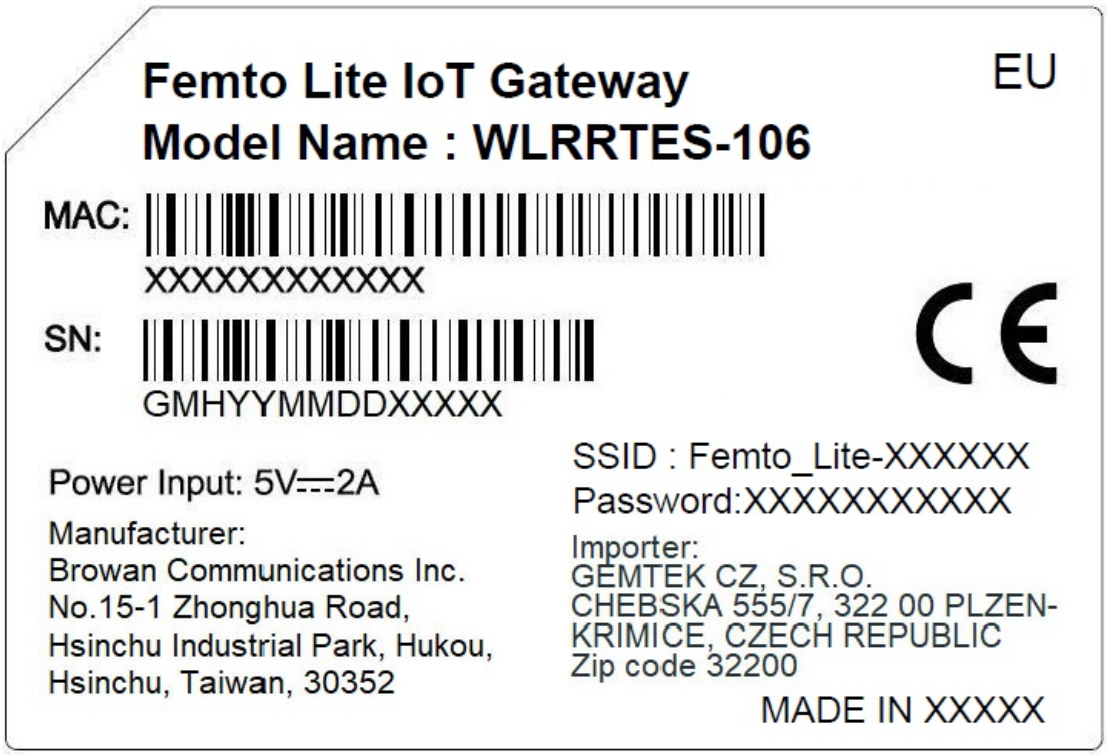

Figure 4 – Back Label

The rule of gateway SSID is Femto_Lite-xxxxxx where the last digits are the last 6 digits of the MAC address

The PC will fetch the IP address of range 192.168.4.x except 192.168.4.1 assigned by the AP.

3.2 Femto Lite Setting

Open the web browser(ex: Chrome) after connecting to the gateway via IP address “192.168.4.1”

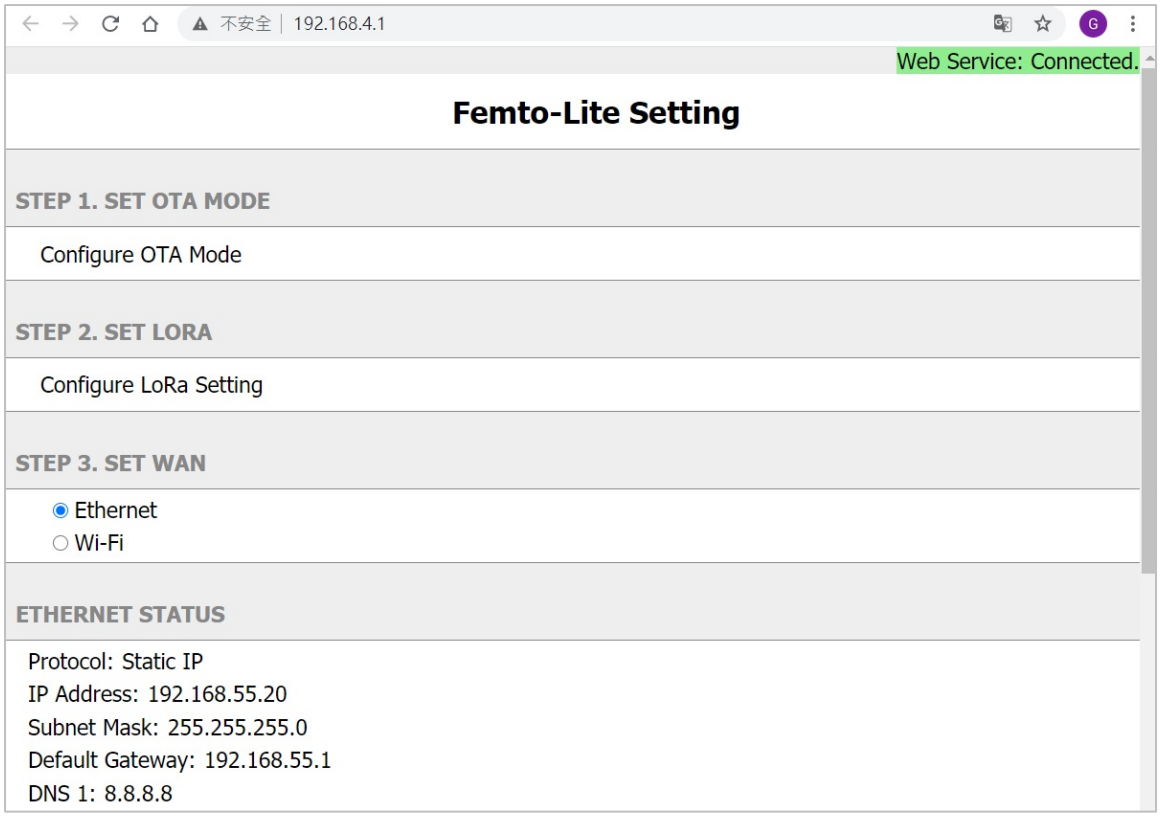

Figure 5 – WEB UI-1

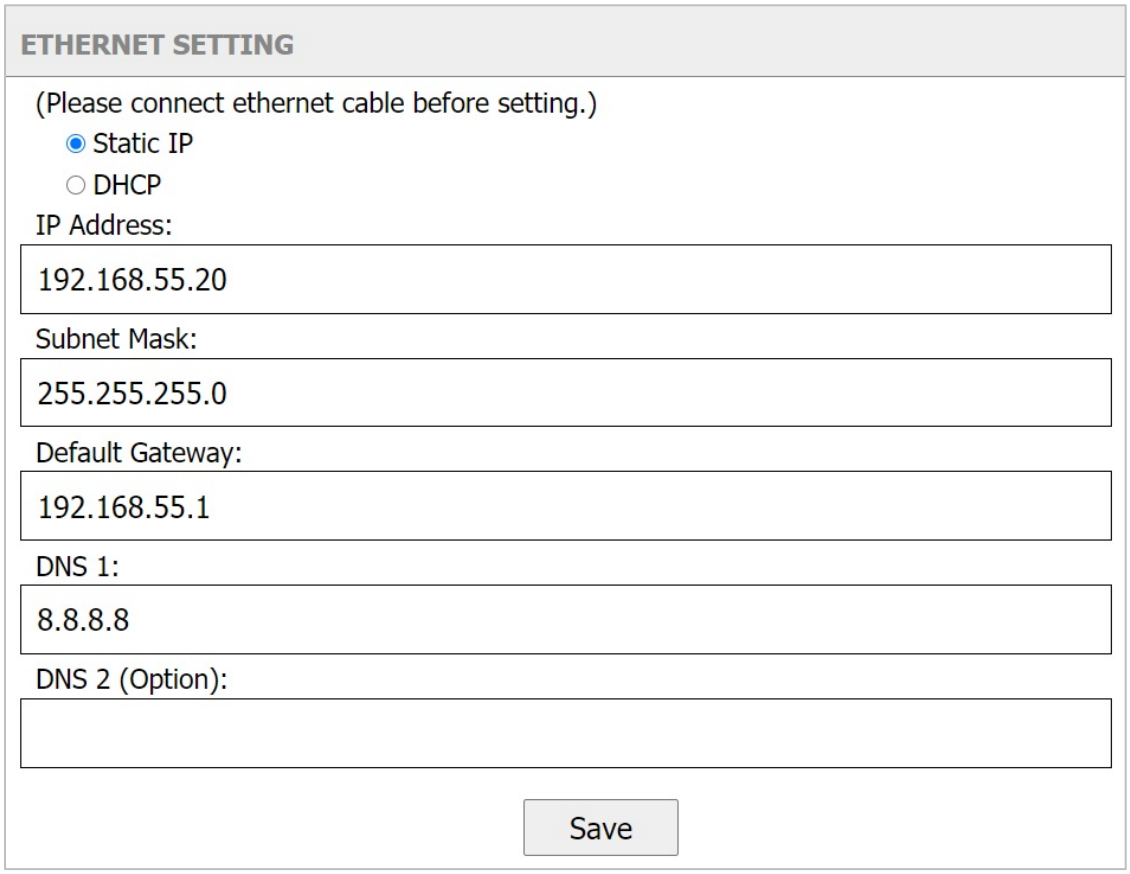

Figure 6 – WEB UI-2

Now you can configure the gateway through the WEB UI.

STEP 1 : Firmware Upgrade

The gateway support firmware upgrade through the OTA method.

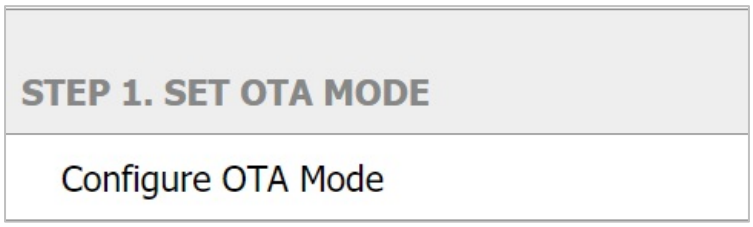

Figure 7 – Configure OTA Mode

Click the “Configure OTA Mode”.

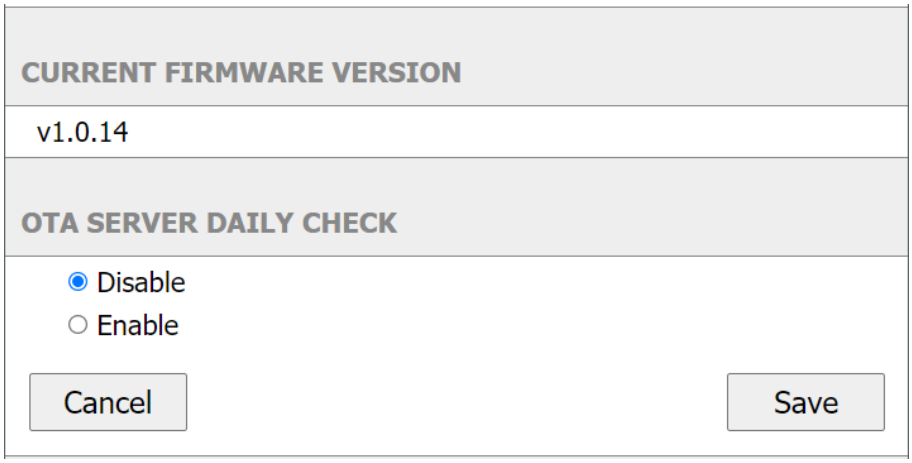

Figure 8 – Configure OTA Mode

CURRENT FIRMWARE VERSION – display the current firmware version.

OTA SERVER DAILY CHECK – Enable or Disable the firmware upgrade through OTA mode. The gateway will check the OTA server every 24 hours interval. It will upgrade automatically if there is the latest firmware on the OTA server.

i	The OTA server has to be configured by the python tool. Please contact BROWAN for any support.

Click the “Enable” and “Save” buttons to enable the OTA or “Disable” function.

Figure 9 – Enable OTA

STEP 2 : SET LORA

Click “Configure LoRa Setting” to configure the LoRa function/parameters.

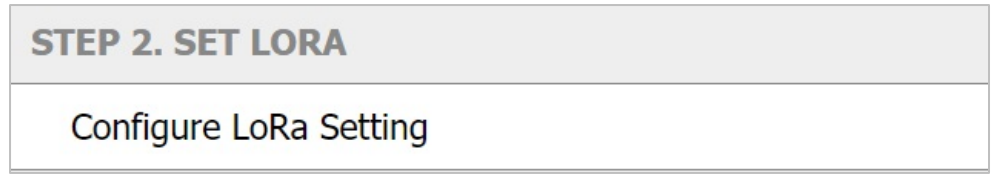

Figure 10 – Configure LoRa Setting

There are two modes for the LoRa configuration.[Basic Station and Packet Forwarder]

Figure 11 – LoRa Mode

STEP 2.1 Basic Station mode

Select the “LoRa Basics Station” mode. The CUPS server and LNS server have to be configured when the gateway is in the Basic Station mode.

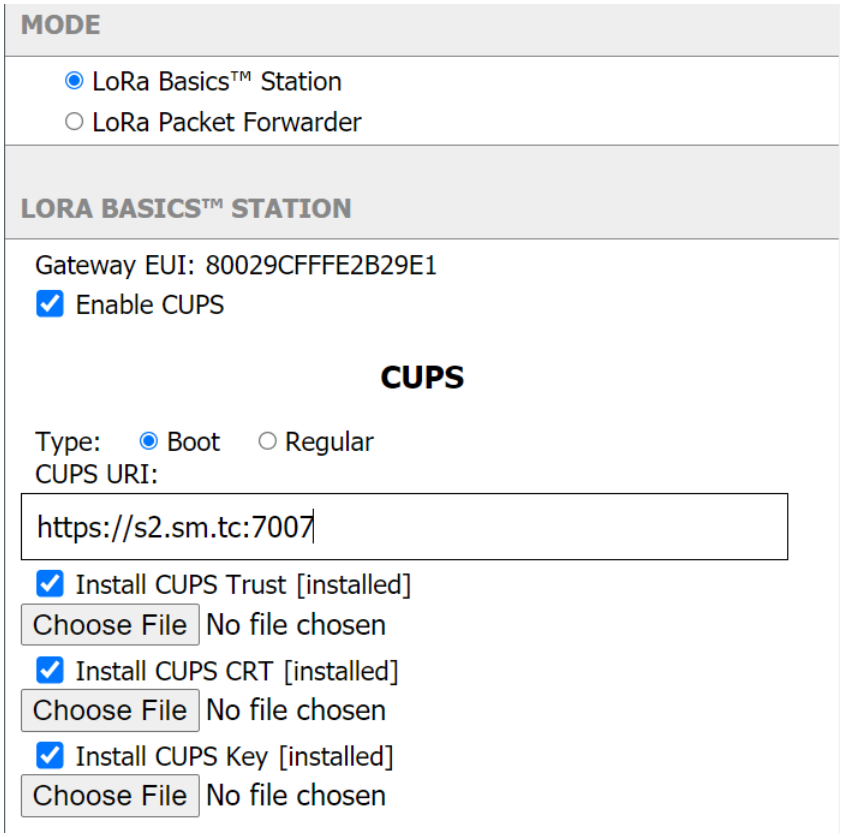

Figure 12 –Basic Station mode

Enable CUPS – The CUPS server is a configuration and update server. Enable or Disable the CUPS server according to the network architecture.

Enable the CUPS server if it is necessary for the network.

Type – The certificate type of the CUPS.[Boot/Regular]

ℹ	The gateway will search “Regular” type of certificate for the priority if you select the “Boot” type. It will search “Boot” type of certificate if the gateway can not find the “Regular” type of certificate then.

CUPS URI – The CUPS server address. Enable and install the CUPS trust/CRT/Key if the CUPS server needs a certificate.

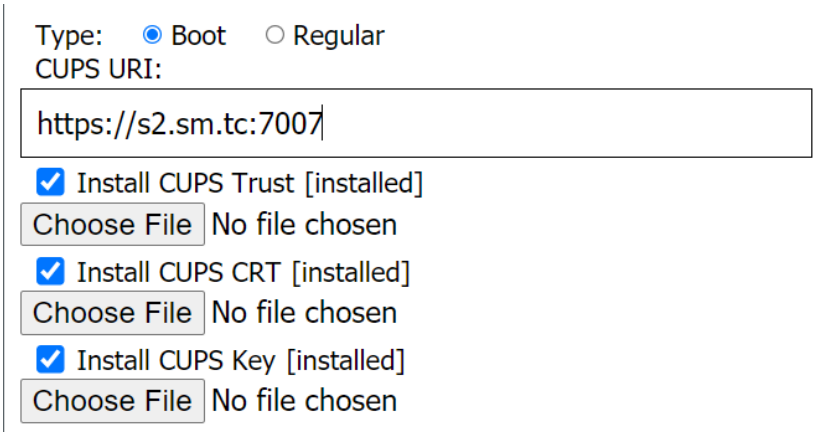

Figure 13 – Install CUPS certificates

LNS Server – The LNS server is the LoRaWAN® Network Server. LNS establishes a data connection between a LoRa Basics™ Station and a LoRaWAN® network server.

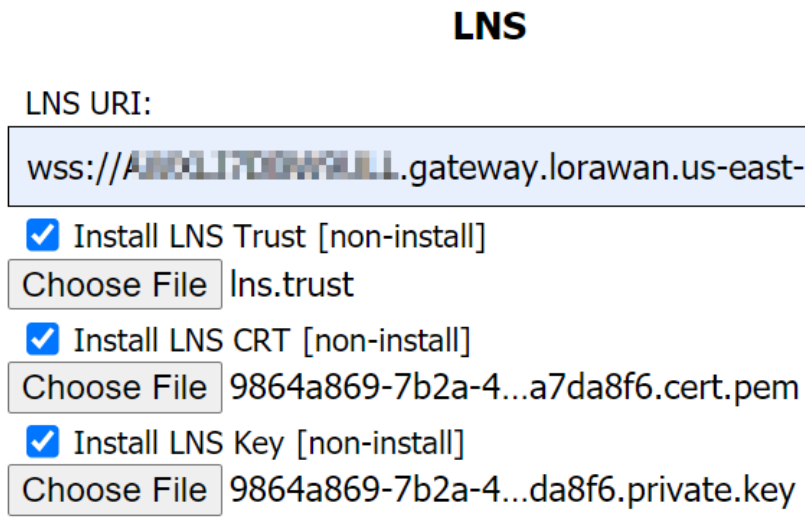

Figure 14 – LNS server/certificates

LNS URI – The LNS server address. Enable and install the LNS server trust/CRT/Key if the certificate is necessary for the LNS server.

STEP 2.2 LoRa Packet Forwarder mode

Select the “LoRa Packet Forwarder” mode.

Figure 15 – LoRa Packet Forwarder mode

Configure the **Gateway Info/Radio setting/Channel Assignment/LBT Settings** for the packet forwarder mode.

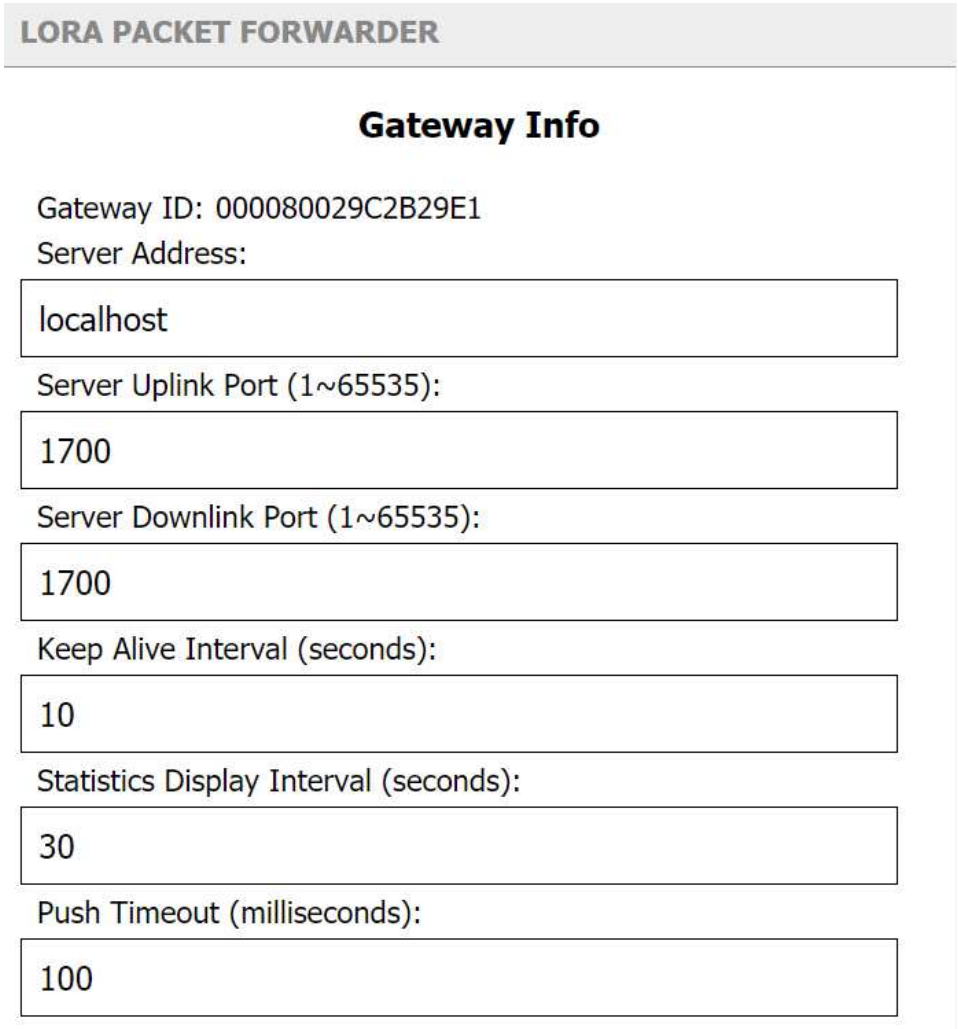

Figure 16 – Gateway settings

Radio Settings – configure the central frequency in Hz.

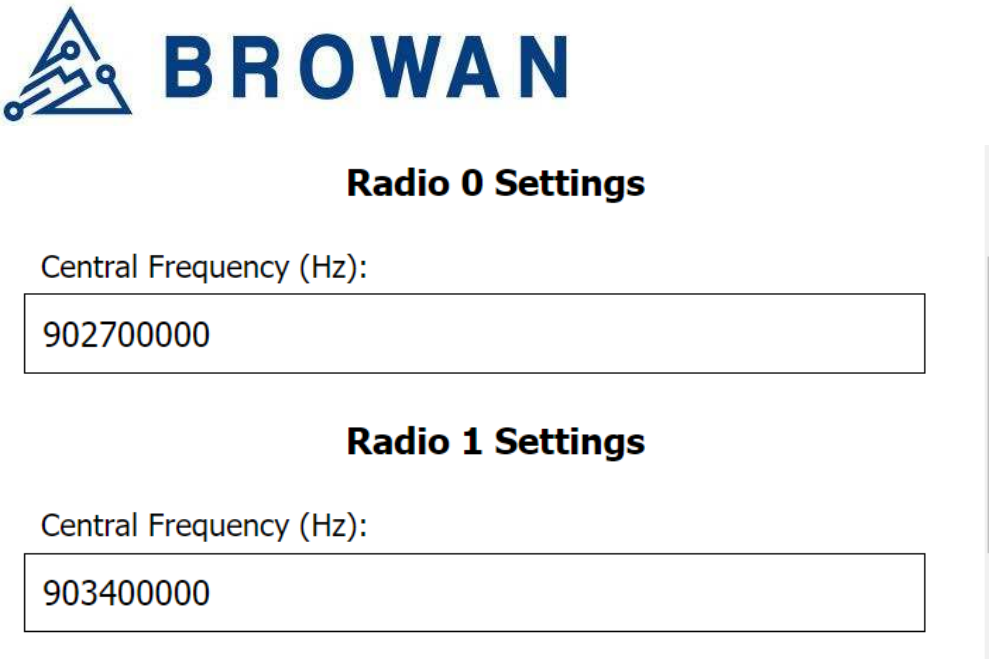

Figure 17 – Radio settings

Channel Assignment – configure the center frequency offset of each channel.

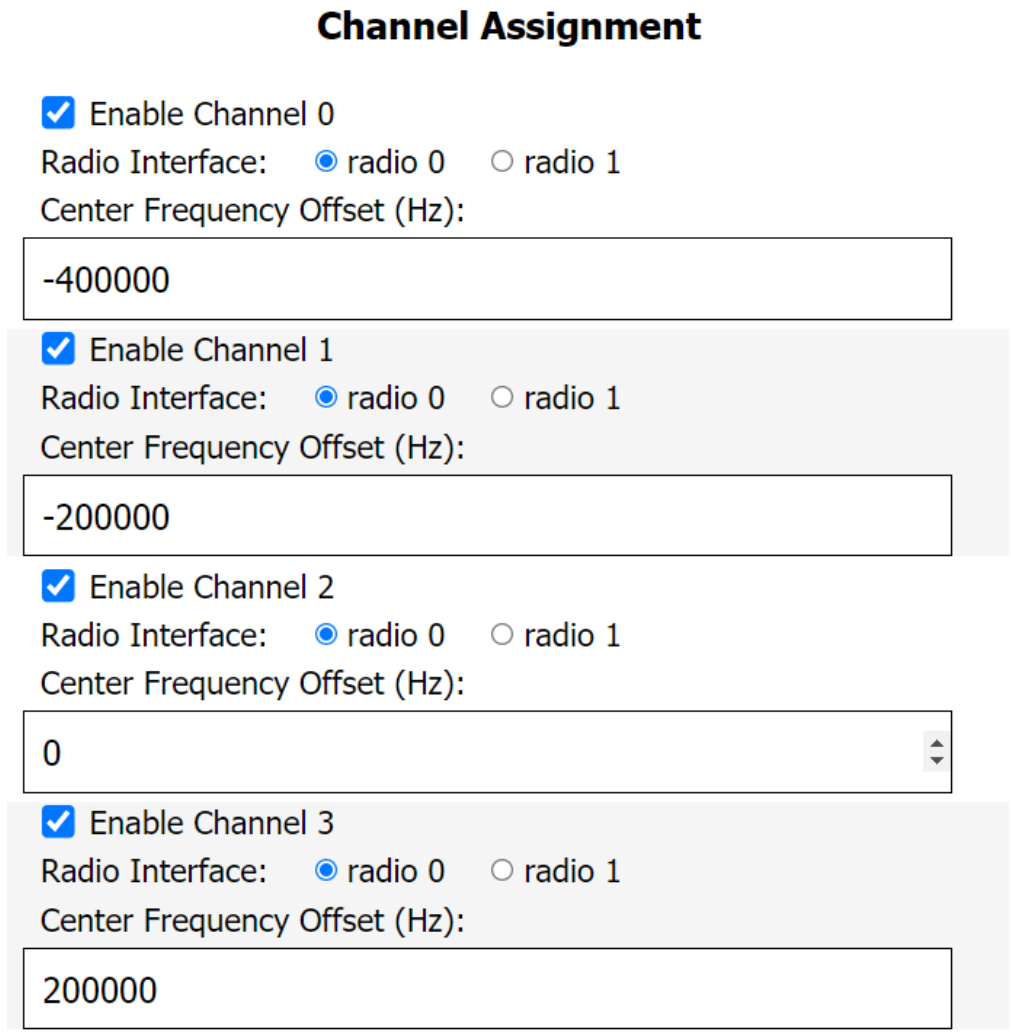

Figure 18 – Channel Assignment-1

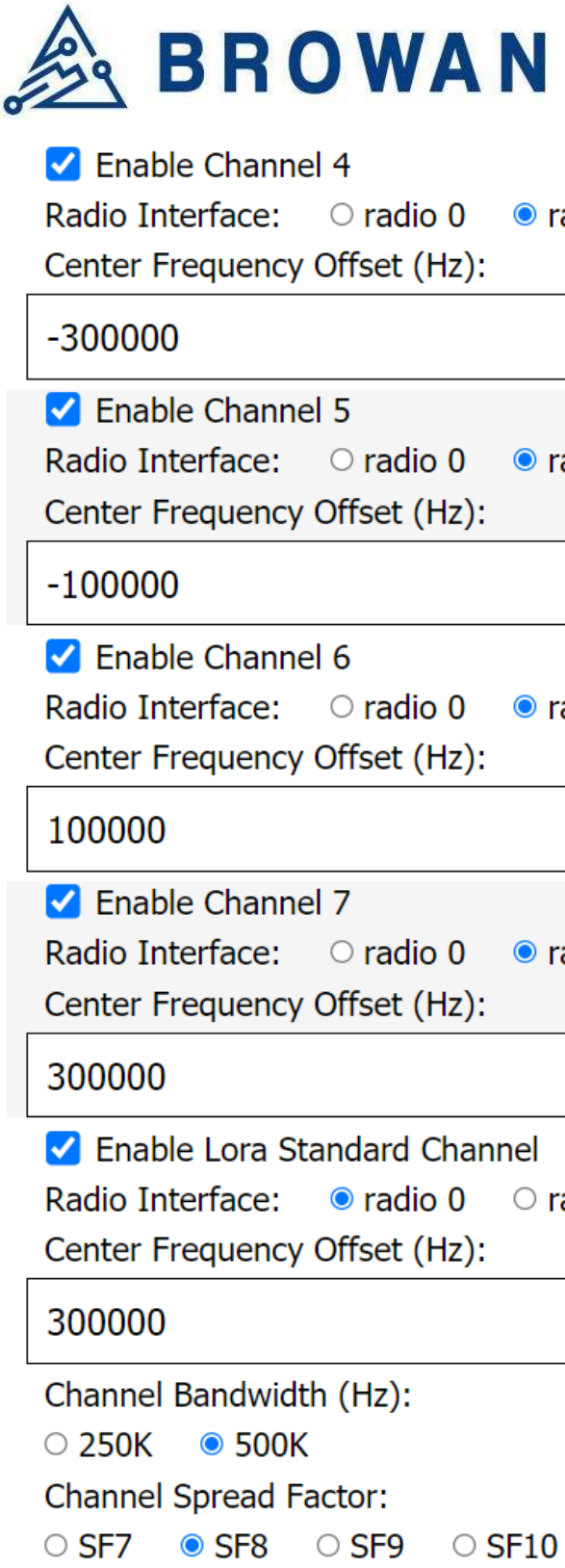

Figure 19 – Channel Assignment-2

Check “Enable LBT” to enable the LBT setting or uncheck to disable.

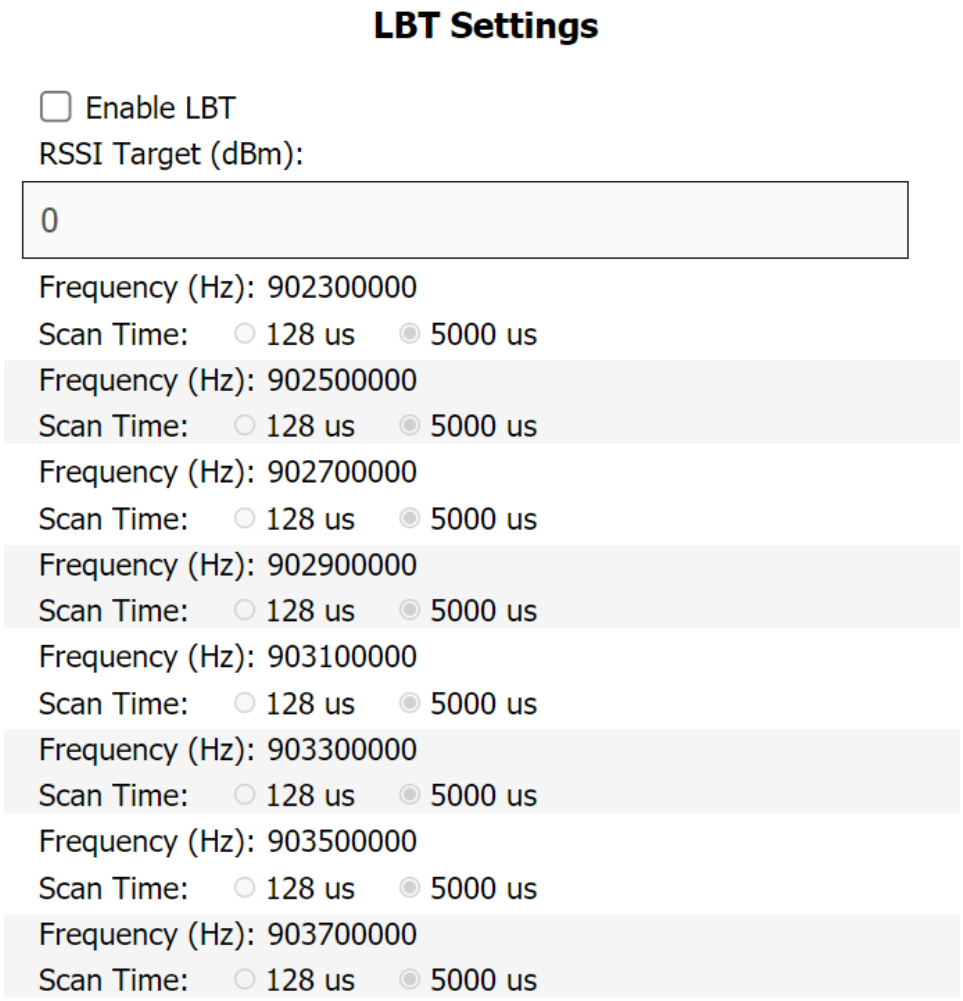

Figure 20 – LBT Settings

Click **“Save”** to accept or **“Cancel”** to abort.

STEP 3 : SET WAN

The gateway support either “Ethernet” or “Wi-Fi” connection as the internet backhaul.

Figure 21 – WAN connection

STEP 3.1 Ethernet Setting

Configure the IP address of WAN.[Static IP/DHCP client]

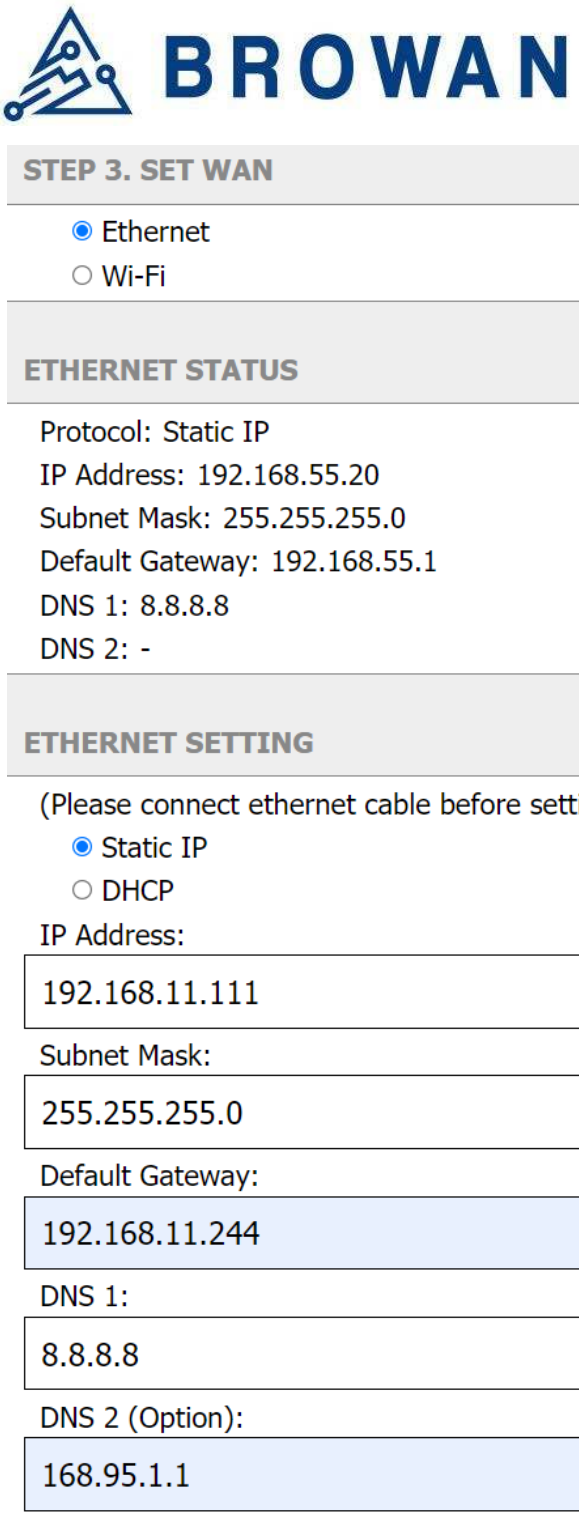

Figure 22 – WAN connection

ETHERNET STATUS – The information of IP address/Subnet Mask/Gateway/DNS.

ETHERNET SETTING - Configure the IP address of WAN.[Static IP/DHCP client]

Static IP – Setup the IP address/Subnet Mask/Default Gateway/DNS of the static IP.

	Contact the network administrator for the static IP address information.

DHCP – The IP address/Subnet Mask/Default Gateway/DNS will be assigned by the DHCP server.

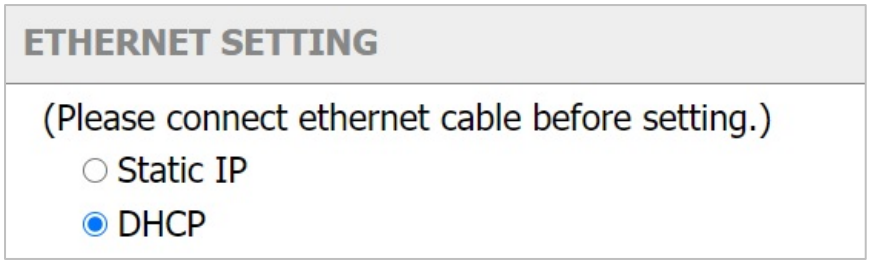

Figure 23 – DHCP client

STEP 3.2 Wi-Fi

Select “Wi-Fi” to be the internet backhaul connection.

	The gateway WiFi interface is the Access Point by default which SSID is “Femto_Lite-XXXXXX” printed on the back label. The administrator can only access the WEB UI through the Access Point mode to configure the gateway. The gateway will be the WiFi client and will not be able to access the WEB UI after enabling the WiFi interface as the internet backhaul connection.

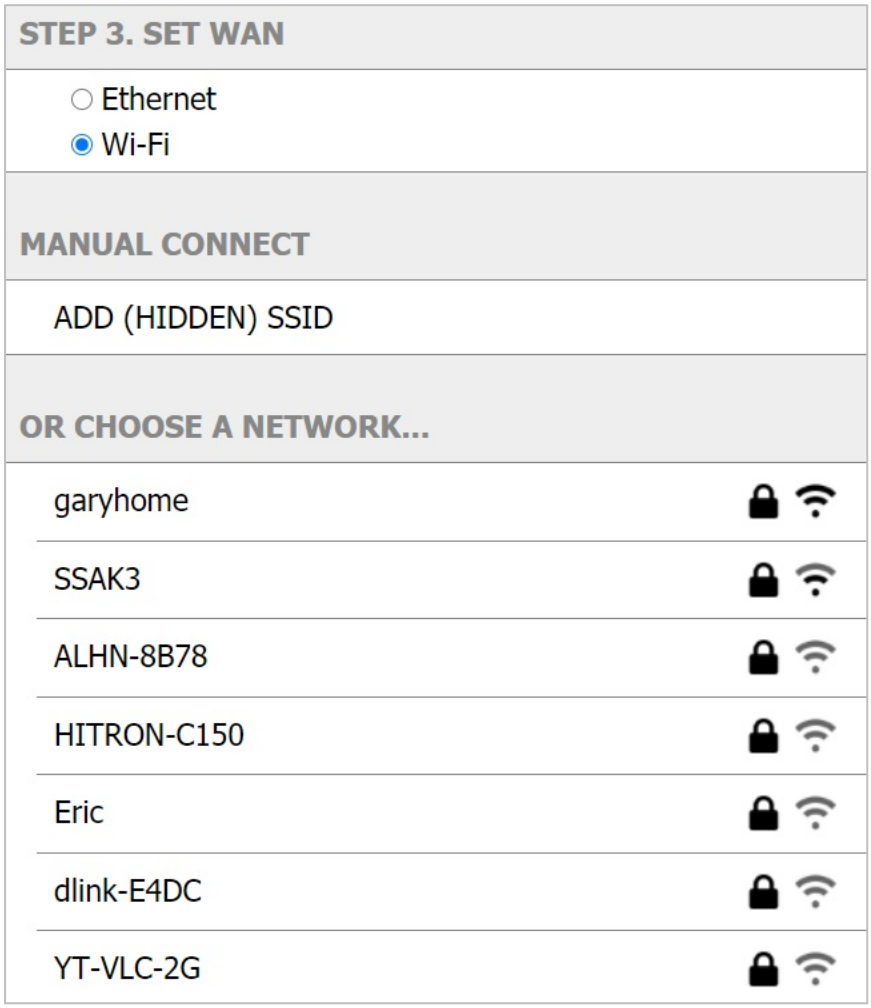

Figure 24 – Wi-Fi connection

MANUAL CONNECT – Specify the remote AP SSID and enter the password if necessary.

Click **“Join”** to accept or **“Cancel”** to abort.

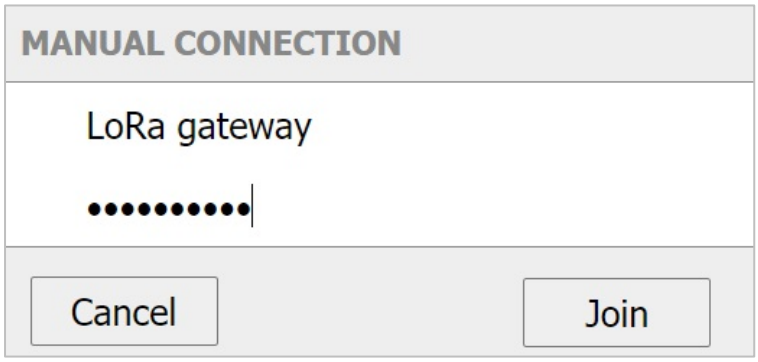

Figure 25 – Wi-Fi manual connection

The gateway will scan the nearby access point automatically. Just click the SSID for the WiFi connection.

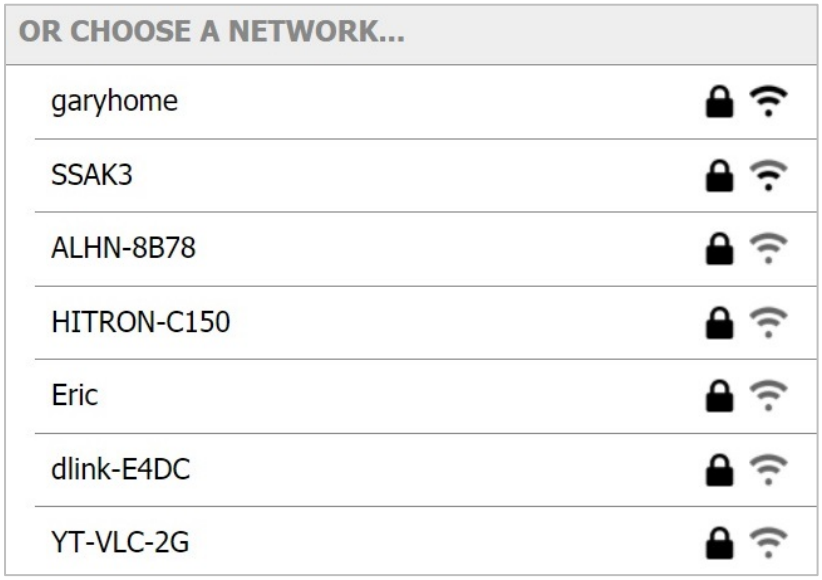

Figure 26 – Wi-Fi manual connection

Enter a WiFi password if it is necessary for the connection.

Figure 27 – Wi-Fi password

Click **“Join”** to accept or **“Cancel”** to abort.