Manual for LoRaWAN Exd Design Gateway - GWLRWEX | FW9

- I. QUICK GUIDE
- II. MAINTENANCE
- III. ADVANCE GUIDE
- IV. PRODUCT SPECIFICATIONS
- V. WARRANTY & SUPPORT

I. QUICK GUIDE

This document is applied for the following products

SKU	GWLRWEX
SKU name	LoRaWAN Exd Design Gateway
Item Code	GWLRWEX-9; GWLRWEX-9-EG25-G; GWLRWEX-8; GWLRWEX-8-EG25-G

1.1 Functions Change Log

Firmware version	Hardware version	Release Date	Function Change
9	2	28 Sep 26	1. Add Wi-Fi Configuration Mode (Access Point) on startup. 2. Change Packet Forwarder configuration. 3. Update LTE Watcher recovery mechanism. 4. Update Packet Forwarder stability issues.

1.2 Introduction

The GWLRWEX is an Exd certified LoRaWAN® gateway designed for Oil & Gas, Petrochemical, and Energy industries. It supports up to 8 channels, handling high volumes of sensor data over ranges up to 10 km. With flexible connectivity options like Ethernet and LTE, and LoRa frequencies of 863~870MHz and 902~928MHz, it ensures seamless operation. Featuring built-in Network Server and Node-RED, it integrates directly with PLC, SCADA, or DCS systems. Its low-power design allows solar or battery operation, making it ideal for remote applications like wellhead monitoring, gas metering, and refinery facilities.

1.3 Application Notes

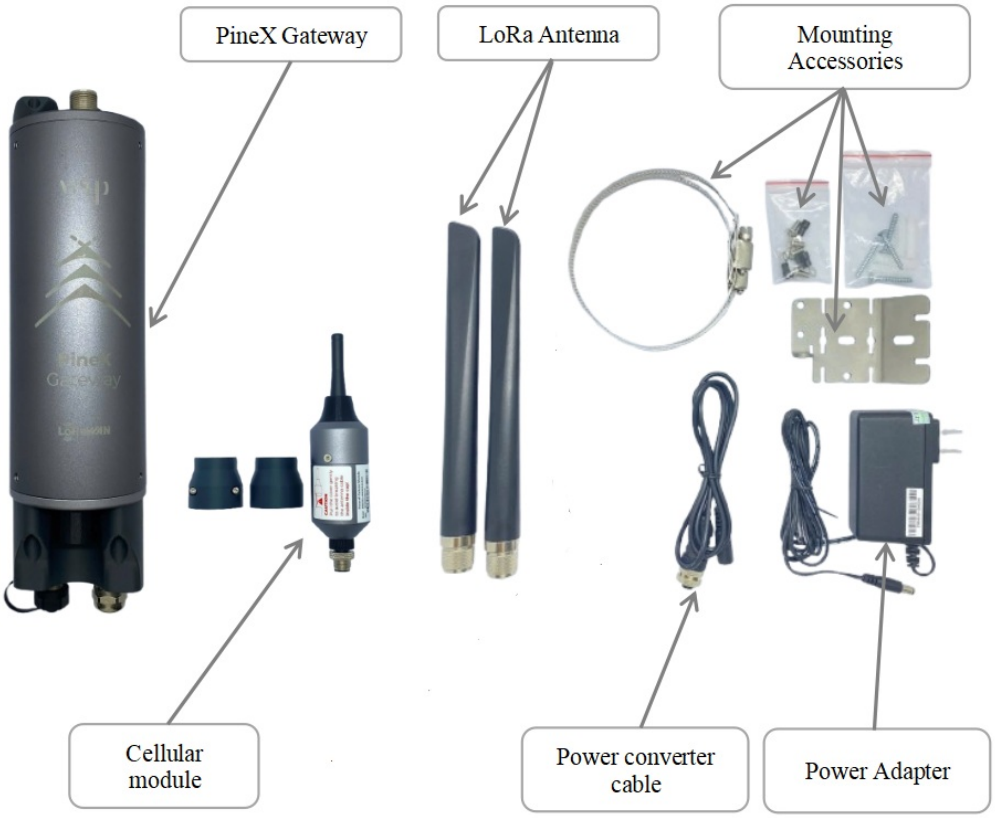
For Applications

Condition Based Monitoring, Energy Monitoring, Facility Monitoring, Gas Leakage Detection, Machine Health Monitoring, Production Monitoring, Temperature Monitoring, Vibration Monitoring

Notes

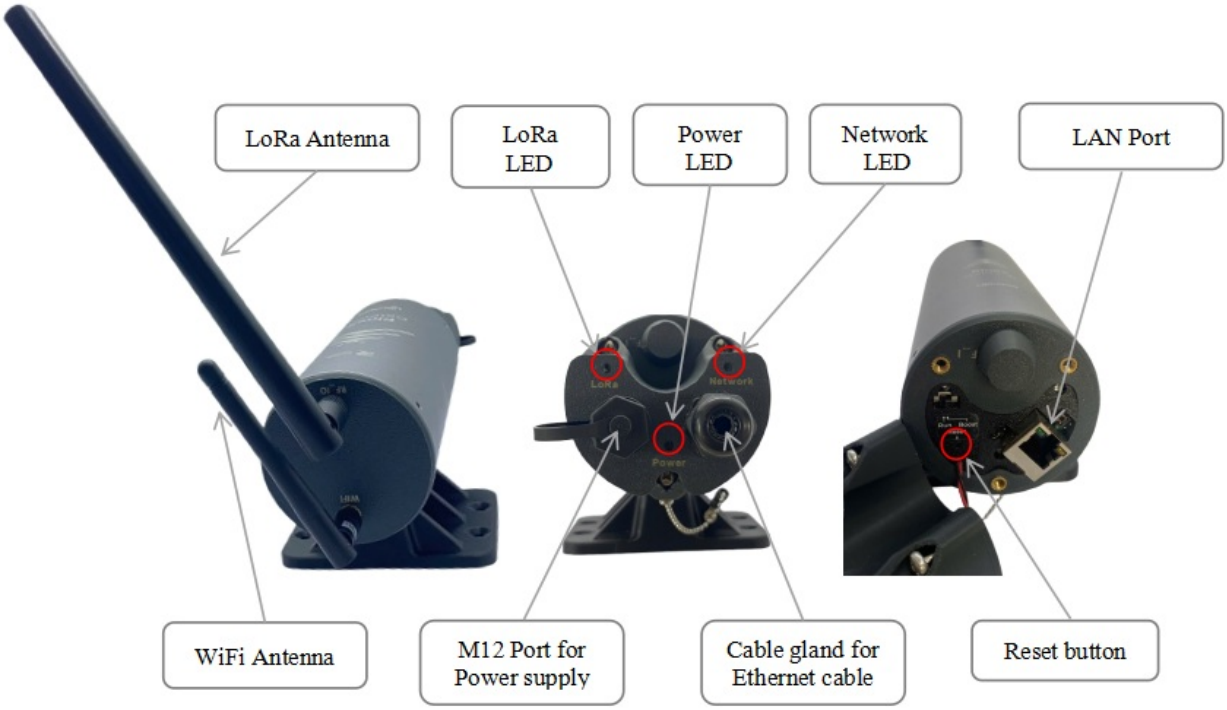
When selecting a LoRaWAN gateway, it is essential to choose the correct frequency band based on your region (e.g., 920–925 MHz or 863–870 MHz depending on local regulations). Ensure the gateway supports suitable network connectivity options such as Ethernet, Wi-Fi, or 4G/LTE, depending on the availability and reliability of internet access at the installation site. Also, consider whether the deployment is indoor or outdoor. The indoor gateways are compact and economy, while outdoor gateways should be weatherproof (e.g., IP67-rated) and capable of wider coverage. Choosing the right version ensures stable performance and long-term reliability.

1.4 What's in the Package?



The package includes:
01 x LoraWAN Exd Design Gateway
02 x Lora Antenna
01 x Cellular module (optional)
01 x Power Adapter
01 x Converter cable
01 x Mounting Accessories

1.5 Product Overview



- **LED Functions**

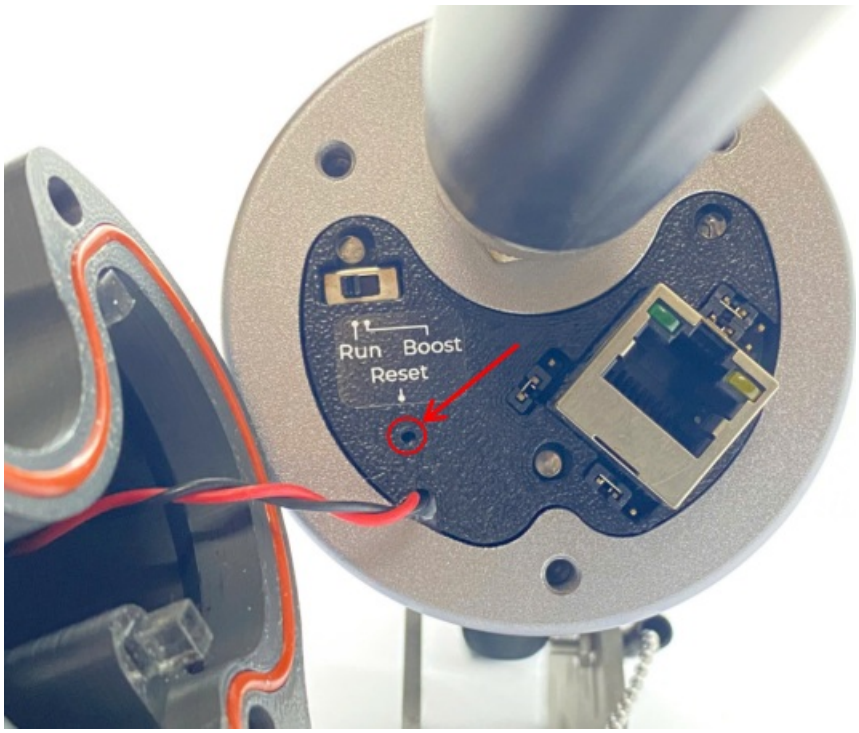
LED Functions	Constant	Flashing	Off
Power	Power On	None	OFF
Network	Initializing, High network traffic	Internet Available	Disconnected
LoRa	LoRa Working	Initializing	LoRa Not Working

- **RESET Button**

> ⚠ Some configuration such as Packet Forwarder settings, VPN settings, WAN settings will be restored to factory defaults when reset process completely taken.

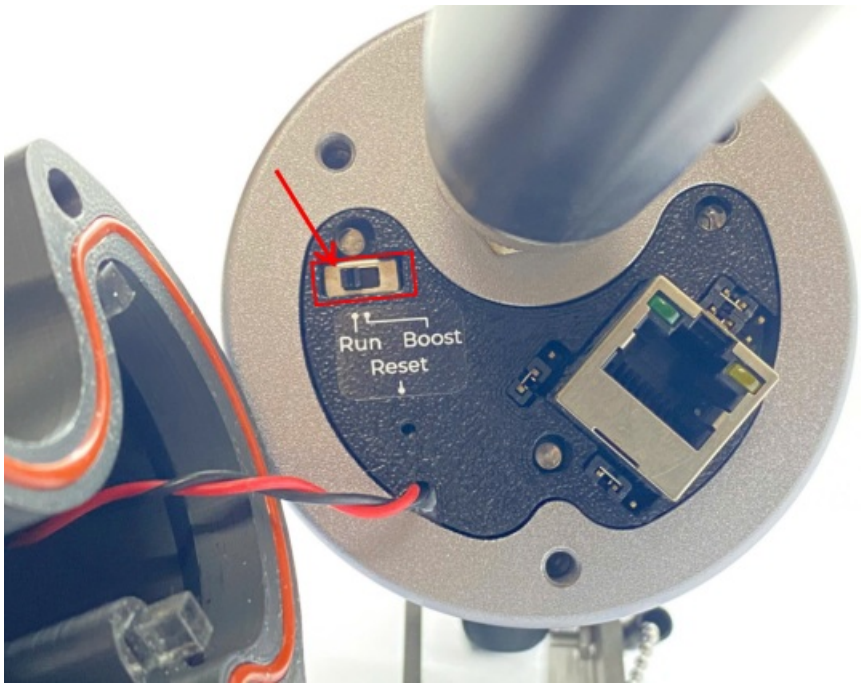
> ℹ Use a pointed stick to poke the button inside the hole and hold for 5 seconds. The gateway will automatically perform reset process. The whole process will take a few minutes.

> ⚠ Reset the device only when absolutely necessary



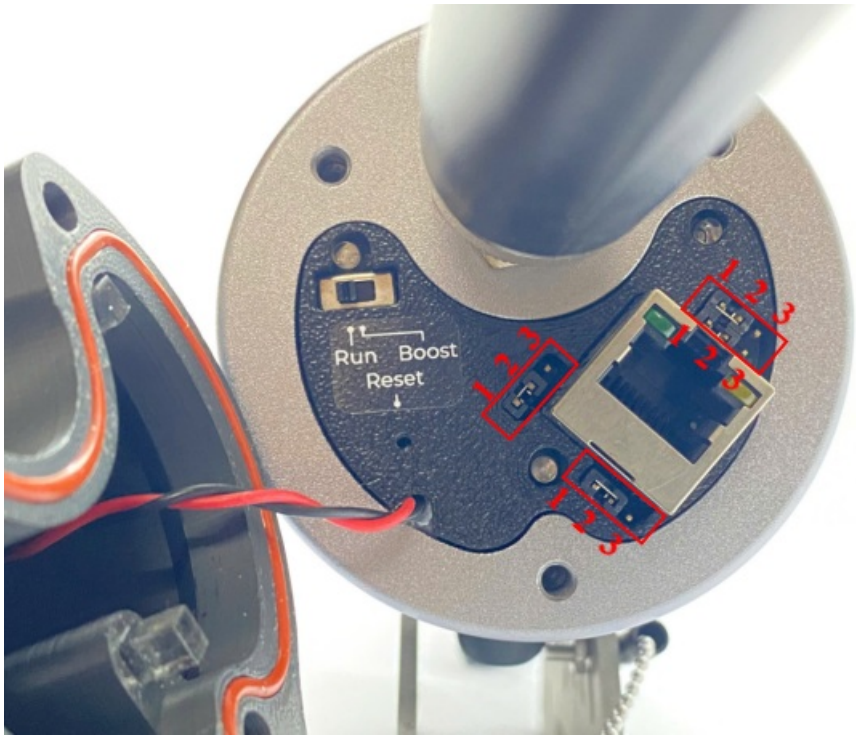
- **Function switch**

> The switch have to be in **Run** position in normal operation. **Boost** mode uses for firmware update.



- **Jumpers**

> There are four jumpers. Default position of four is connecting pin 1 and pin 2.



1.6 Power Supply

> There are two ways to power the PineX Gateway. It is recommended to use the included power adapter (12VDC@2A) to power the gateway.

- **Power the PineX gateway through the M12 Port**



1.7 Guide for Quick Test

Startup the LoraWAN Gateway through the following steps

Step 1: Install the antenna of the LoRaWAN Gateway

Install the Lora antenna and WiFi antenna (optional) in the correct position. Make sure the antenna and Gateway are tightly connected.

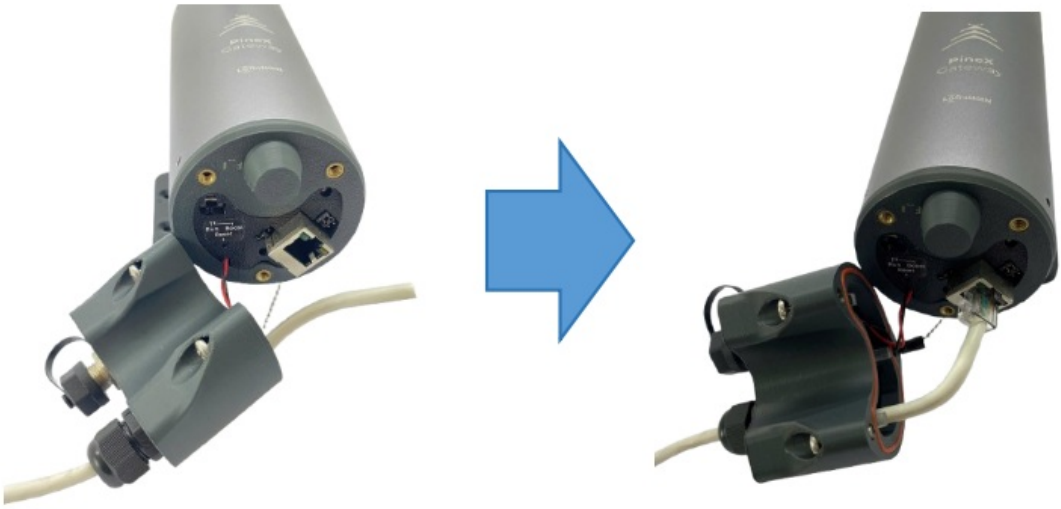


Step 2 :Use the screw driver to remove the three screws, then open the gateway cover.



Step 3: Connect the Ethernet cable to the Gateway

Connect the Ethernet cable into LAN port.



Step 4: Close the gateway's cover, then use the screw driver to lock the 3 screws.

Step 5: Install the SIM card to Cellular module (optional)

- Use the screw driver to remove the screw in the module, then carefully open the cap



- Insert the SIM card into the slot, pay attention to the direction of the Sim card

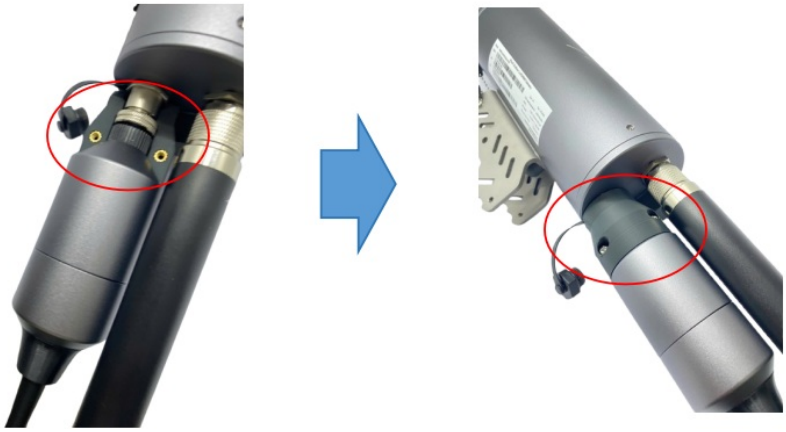


Step 6: Install the Cellular module to the gateway (optional)

Plug the Cellular module to the M12-FM port at the top of the gateway, then tighten the connector



- Install the connection protection accessories



Step 7 : Power up the Gateway through M12 port



Step 8 : Access Gateway's GUI for configuration

There are two ways to access Gateway's GUI for configuration: via Wifi network or via Ethernet port

Access Gateway's GUI via Ethernet port

Default mode of Daviteq Gateway is DHCP. Once gateway is turned on through plugging in the DC adapter, it will automatically link to available servers. Gateway's IP address can be found from the DHCP server. Access Gateway Web UI via the DHCP IP on browser. The default username is "admin", and the password can be found on the inside label.

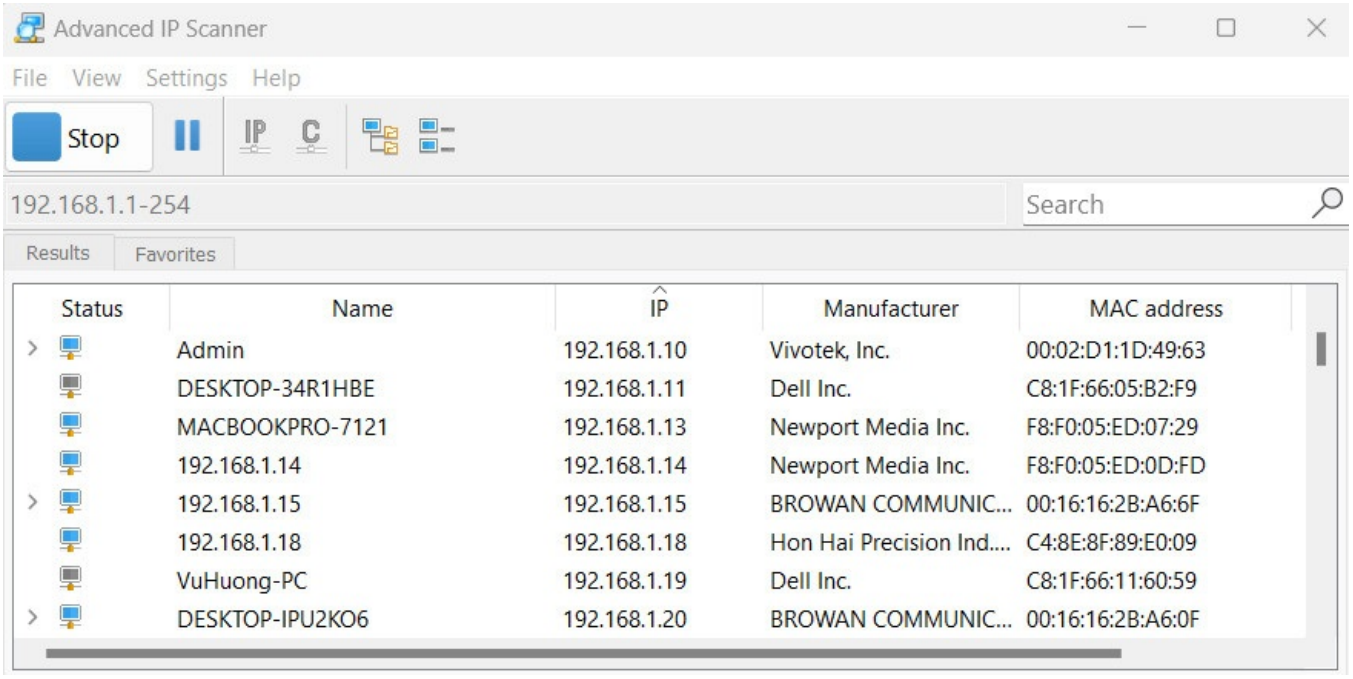
> ⚠ By default, the gateway is configured to use DHCP. Therefore, it must be connected to a network with an active DHCP server in order to access the Web GUI.

> ⚠ If the gateway is to be used in a static IP network without DHCP, it must firstly be connected to another active DHCP server to access the configuration interface to configure static IP for the gateway. Once the initial configuration is complete, the gateway can then be moved to the static IP network. Details of static IP configuration for the gateway are in sub-section of **WAN SETTINGS** in section of **2.2.6.2 Network WAN configuration**

> ⚠ In some company with strict IT regulations, the gateway MAC address must be added to company network white list for proper connection.

- Use a computer to connect to the network that the gateway is connected. The computer can connect to that network via Ethernet.
- Use the IP scanning software to find the **IP address** of the gateway based on its **Mac address** that can be found on the back label.

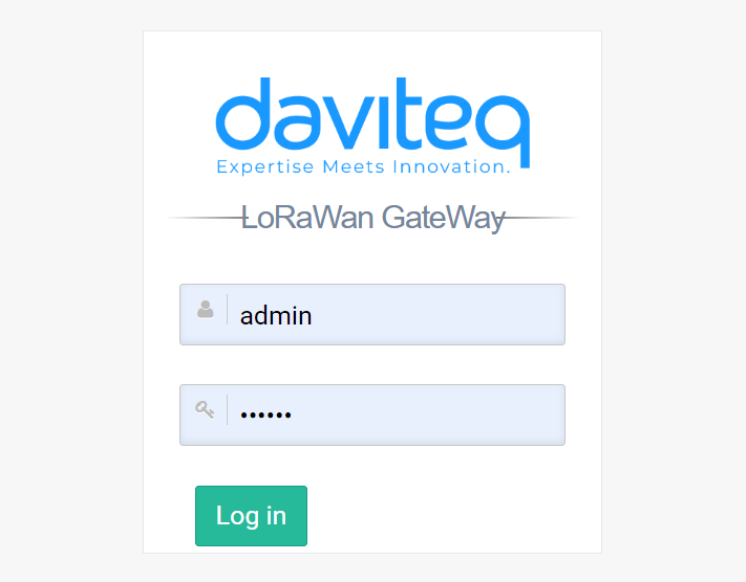
> ℹ Access this link to get a free IP scanning software on the internet



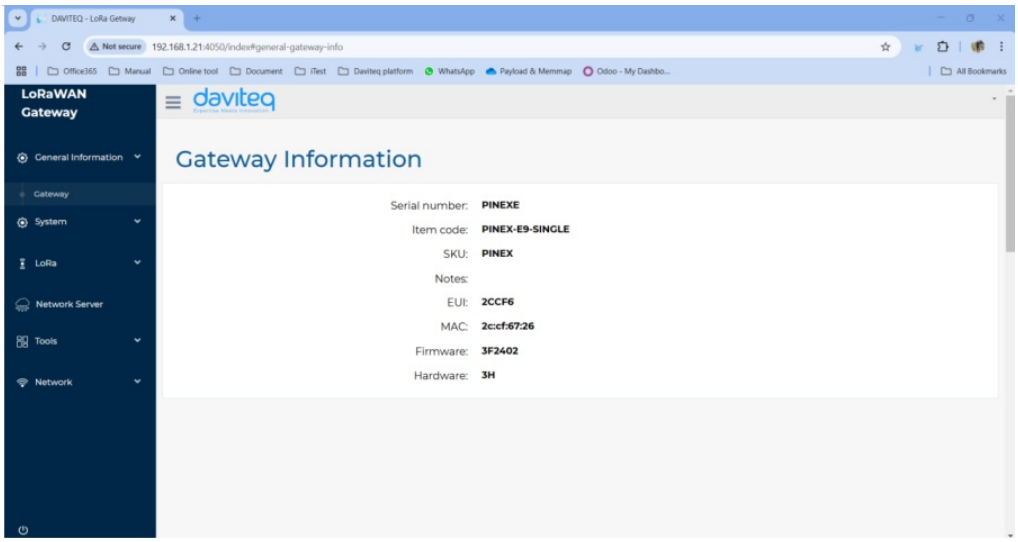
- Enter the **IP address** of the gateway in the web browser to access the configuration interface.

> ⚠ Must add port 4050 after the IP address. For example, If the IP address of the Gateway is **192.168.1.21** , you have to enter **192.168.1.21:4050** in web browser, then the GUI will be displayed.

> ℹ The default username is admin and default password is public. Please check updated username and password on the gateway label.



After login successfully, the general information of the gateway will be display at **general information** tab.



Access Gateway's GUI via gateway Wifi network

After the gateway is started up, the gateway will become the Wifi access point during 15 minutes (configurable). User'PC could connect to this Wifi network with Wifi name of PINEX_EUI (example: PINEX_123456789ABCDEF for gateway with EUI 123456789ABCDEF) and password of 123456789 (default password). Then user could access the gateway GUI with below URL, user and password:
http://192.168.50.1:4050
User GUI: admin
Password GUI: public

The gateway Wifi access point will be off automatically when user's PC has disconnect from this Wifi network

Step 9: Lora Settings

The LoRa menu consists of the following categories: Package Forwarder and Logs. Configure some basic fields for the gateway operation.

Package Forwarder

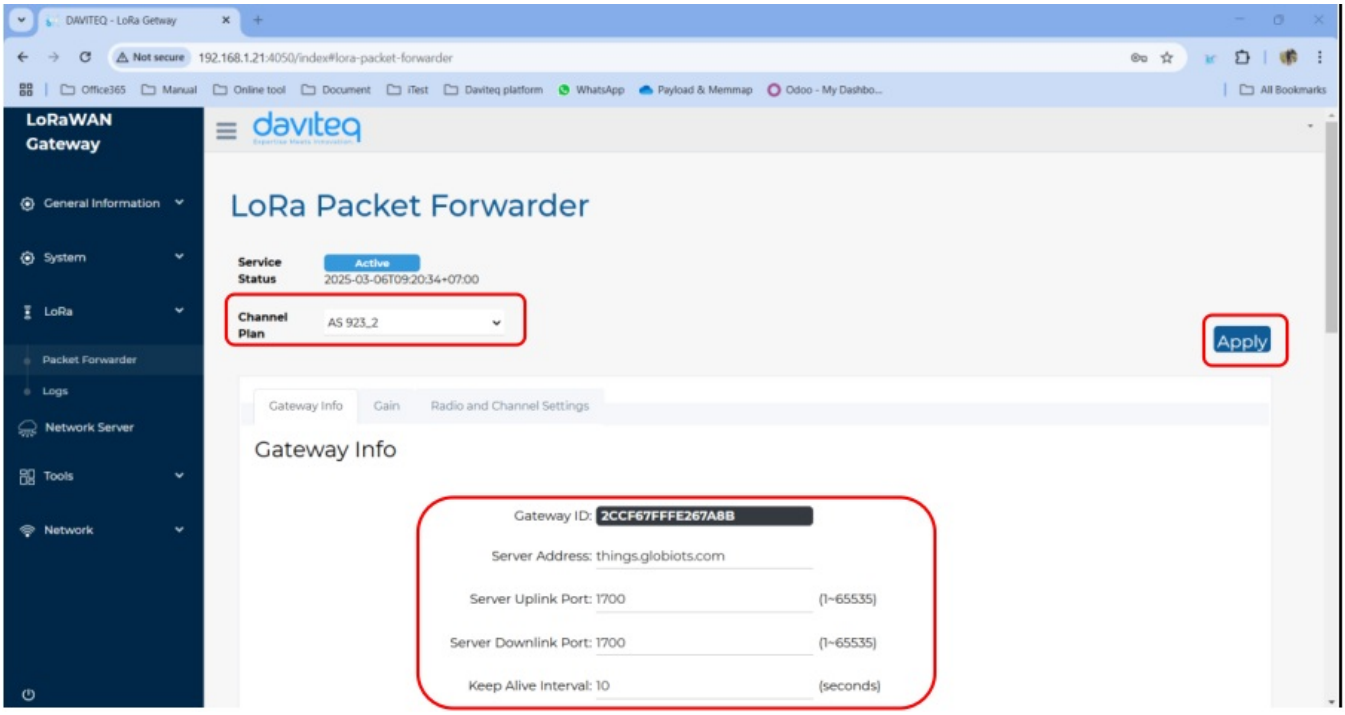
Select Packet Forwarder in the left menu, then choose Gateway Info. This page is for setting up the LoRa configuration including Channel Plan, Gateway ID, Server Address, Server Uplink Port, Server Downlink Port, Keep-Alive Interval,

Statistics Display Interval, and Push Timeout

> ⚠ Need to properly configure the Server Address, Server Uplink Port, and Server Downlink Port fields. These information depend on the Network server.

Choose the channel plan for the gateway, then choose the**Apply button** at the bottom right to save the current configuration.

Parameter name	Description	Default value
Channel Plan	The region refers to the specific geographical area where the gateway operates, following the LoRaWAN Regional Parameters defined by the LoRa Alliance	EU868
Gateway ID	The Gateway ID (also known as DevEUI) is a unique identifier assigned to a LoRaWAN gateway.	Unique value
Server Address	The server address in a LoRaWAN gateway refers to the network server's IP address or domain name that the gateway connects to for data transmission and management	localhost
Server Uplink Port	The server uplink port in a LoRaWAN gateway refers to the port number used to send uplink packets	1680
Server Downlink Port	The server downlink port in a LoRaWAN gateway is the port number used for receiving downlink packets	1680
Keep alive interval	The keep-alive interval is the time interval at which a LoRaWAN gateway sends periodic status messages (heartbeats) to the network server to indicate that it is active and connected.	30



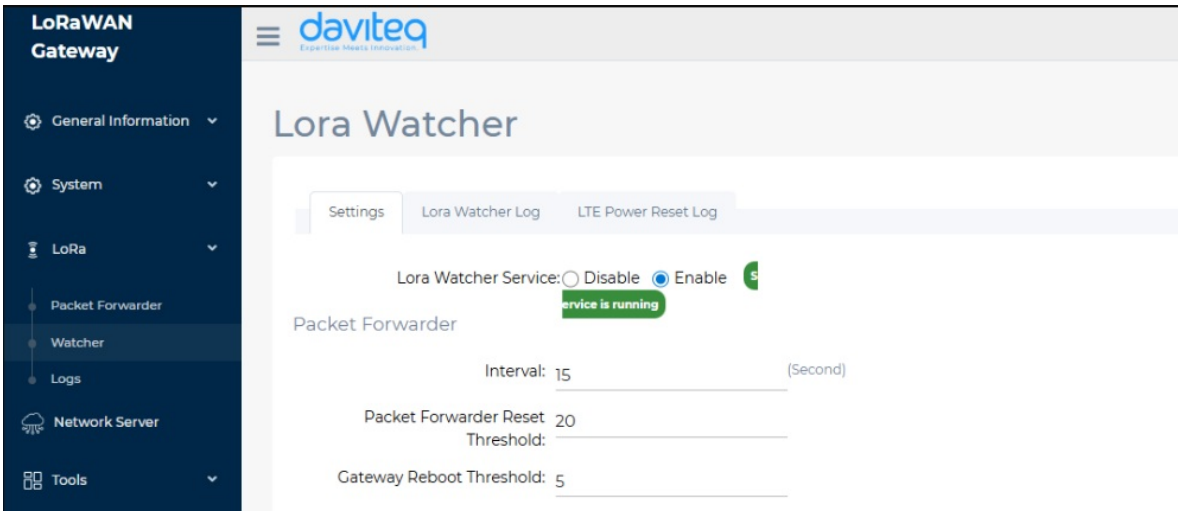
Watcher

- **Packet Forwarder:**

- Interval: Interval for checking the system log to verify successful uplink to the network server.

- Packet Forwarder Reset Threshold: Number of consecutive uplink failures before resetting the packet forwarder

- Gateway Reboot Threshold: Number of packet forwarder resets before resetting the gateway.

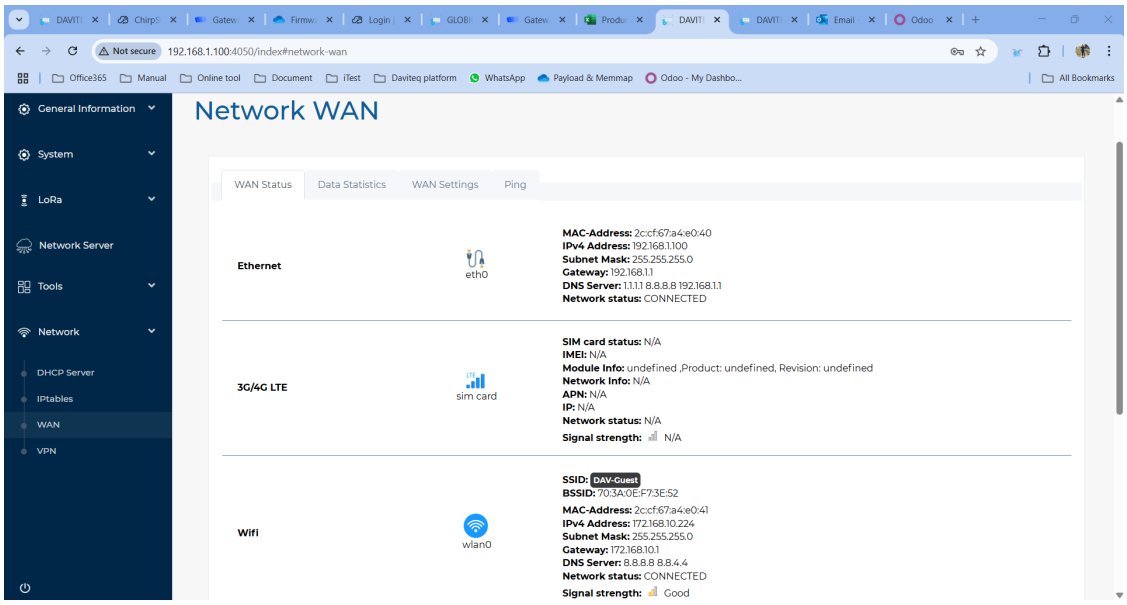


Step 10: Network WAN configuration

This category shows current WAN settings. This category is further divided into three sectors: WAN Status, Data Statistics and WAN Settings.

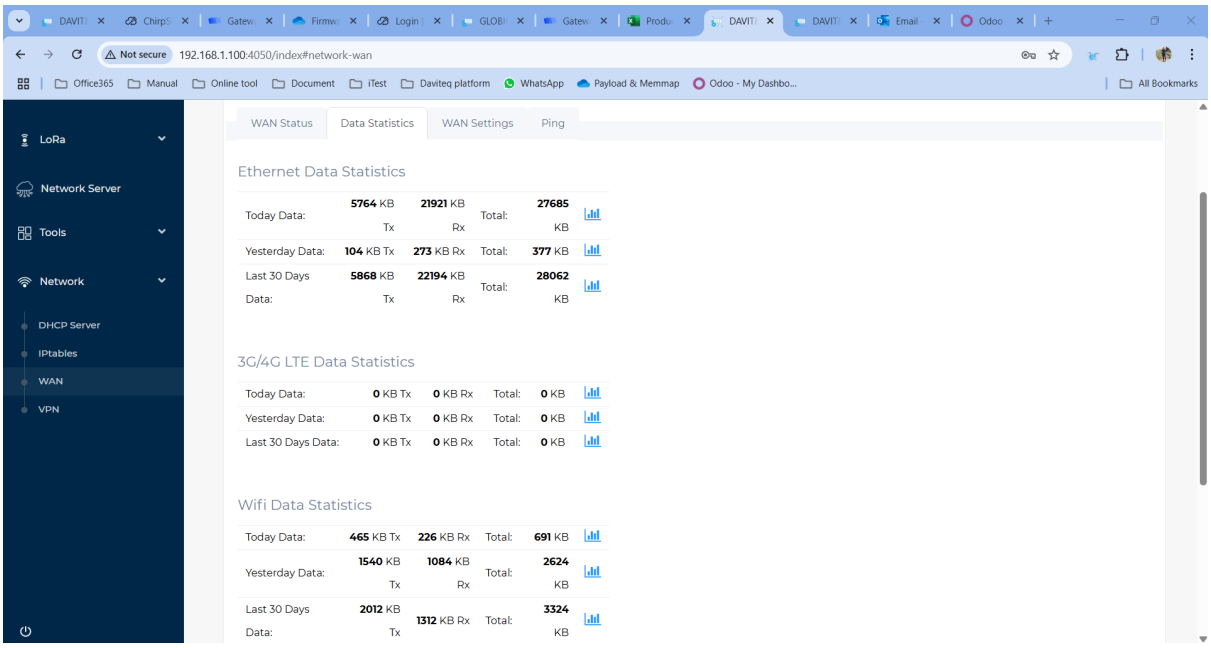
- **WAN Status**

The current network status will be shown on this page.



- **WAN Statistics**

Statistics on the gateway's used data capacity are shown in this section



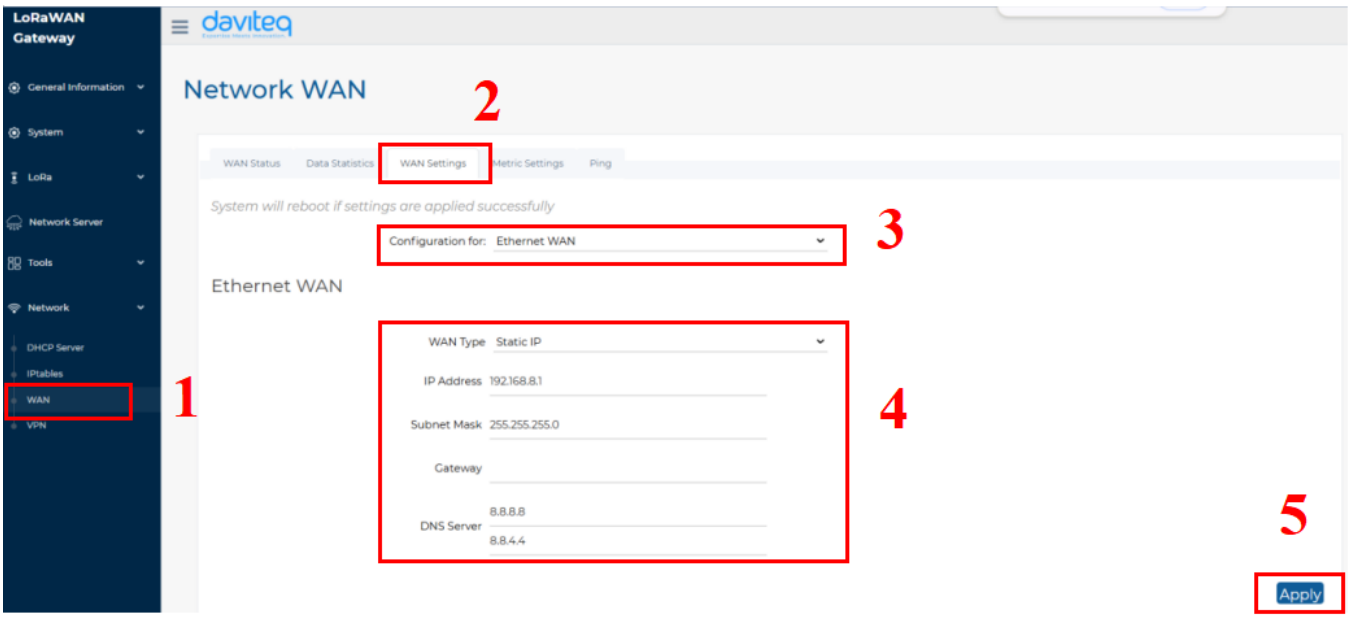
- **WAN Settings**

Daviteq Gateway supports internet connectivity via both Ethernet , Wi-Fi (optional) or Cellular (optional).

> The default Ethernet mode is DHCP.

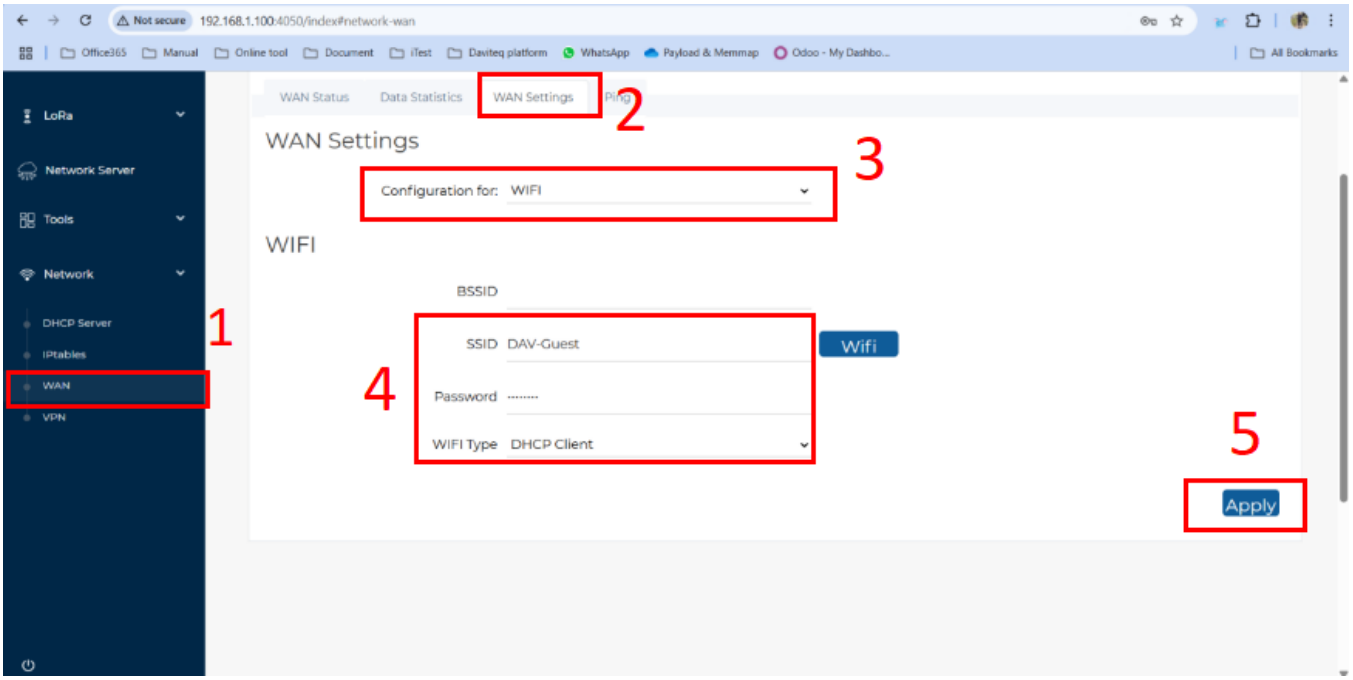
- **Follow the steps below to set up the Ethernet network to static mode.**

> **Step 1:** In the Network section, select WAN.
> **Step 2:** Click on the WAN Settings tab at the top.
> **Step 3:** In the Configuration field, select Ethernet WAN
> **Step 4:** Enter the Ethernet WAN information, including WAN Type, IP address, Subnet Mask, Gateway and DNS server
> **Step 5:** Click the Apply button to save and apply the new configuration.



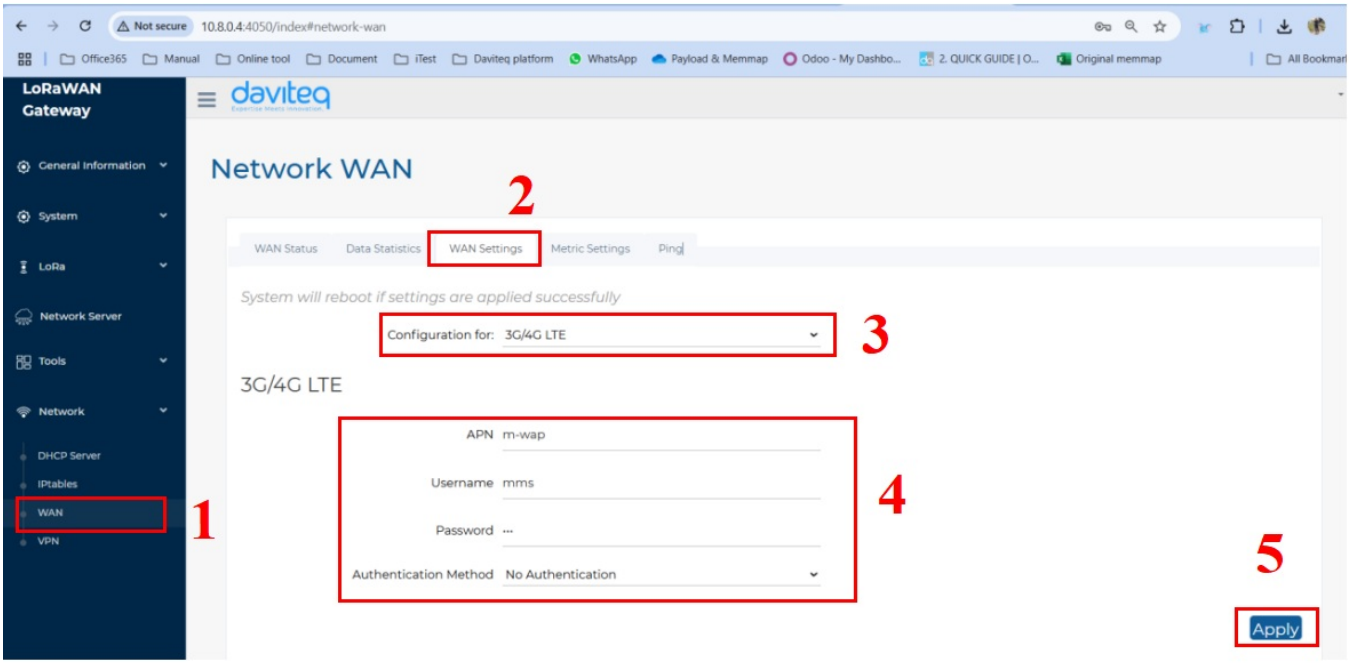
- **Follow the steps below to set up the Wi-Fi network for the gateway:**

> **Step 1:** In the Network section, select WAN.
> **Step 2:** Click on the WAN Settings tab at the top.
> **Step 3:** In the Configuration field, select Wi-Fi.
> **Step 4:** Enter the Wi-Fi information, including SSID (Wi-Fi name), Password, and Wi-Fi Type (default: DHCP Client).
> **Step 5:** Click the Apply button to save and apply the new configuration.



- **Follow the steps below to set up the Cellular network for the gateway:**

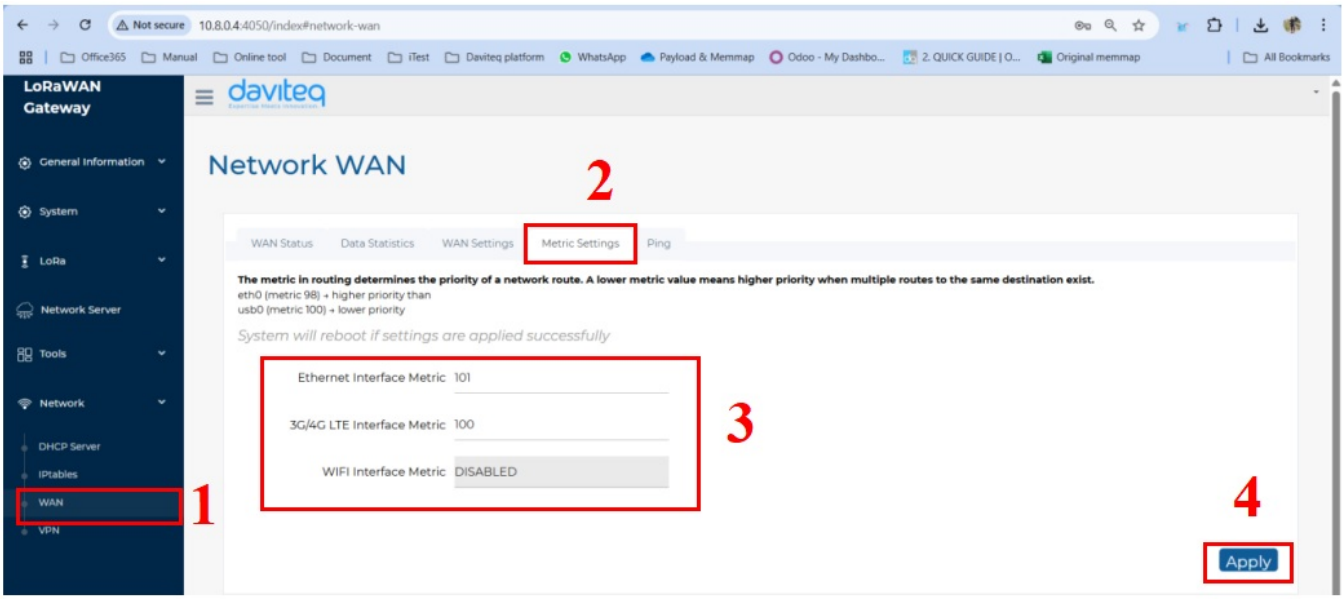
> **Step 1:** In the Network section, select WAN.
> **Step 2:** Click on the WAN Settings tab at the top.
> **Step 3:** In the Configuration field, select 3G/4G LTE
> **Step 4:** Enter the 3G/4G LTE information, including APN, Username, Password, and Authentication Method (base on the SIM card provider).
> **Step 5:** Click the Apply button to save and apply the new configuration.



- **Follow the steps below to set up network priority**

> The metric in routing determines the priority of a network route. A lower metric value means higher priority when multiple routes to the same destination exist. For example, 100 is higher priority than 101.

> **Step 1:** In the **Network** section, select **WAN**.
> **Step 2:** Click on the **Metric settings** tab at the top.
> **Step 3:** Enter the the metric factor for available network.
> **Step 4:** Click the **Apply** button to save and apply the new configuration.



1.8 Gateway Communication

1.8.1 Gateway communication to LoRaWAN device

1.8.2 Gateway communication to Network Server

1.8.2.1 Add the LoraWAN Gateway to Embedded Chirp Stack Network Server

Please follow instruction at link:

Instruction to configu... | Online Product Manuals & Datasheets

1.8.2.2 Add the LoraWAN Gateway to External LoRaWAN Network Server

To give an example, please follow the instructions in**this link** to add LoraWAN gateway to The things Stack network server

1.8.3 Activate and configure the embedded Node RED development tool

Prerequisite:

The Embedded Chirp Stack Network Server in the PINEX gateway must be active and configured properly to forward data to embedded Node RED development tool. Details to activate and configure embedded Chirp Stack are at the link:

https://daviteq.com/en/manuals/books/manual-for-lorawan-sensor/page/instruction-to-configure-embedded-chirpstack-network-server-in-pinex-firmware-6

Please refer the below link for instruction to add the embedded Node RED development tool:

Instructions to config... | Online Product Manuals & Datasheets

To give an example, please follow the instructions in**this link** to add LoraWAN gateway to The things Stack network server

1.9 Default Communication

Configuration	Default value
Time zone	UTC
LoRaWAN Frequency plan	EU868
Network Server host	localhost
NS uplink port	1700
NS downlink port	1700
Network Server Settings description	OFF
NS integration descriptions	OFF
NodeRED Settings descriptions	OFF
IP forwarding	OFF
WAN Ethernet Settings	DHCP Client
VPN setting	OFF
Ethernet Interface Metric	100
3G/4G LTE Interface Metric	101
WIFI Interface Metric	DISABLED
Lora Watcher Service	ENABLE
Packet Forwarder Interval	15
Packet Forwarder Reset Threshold	20
Gateway Reboot Threshold	5

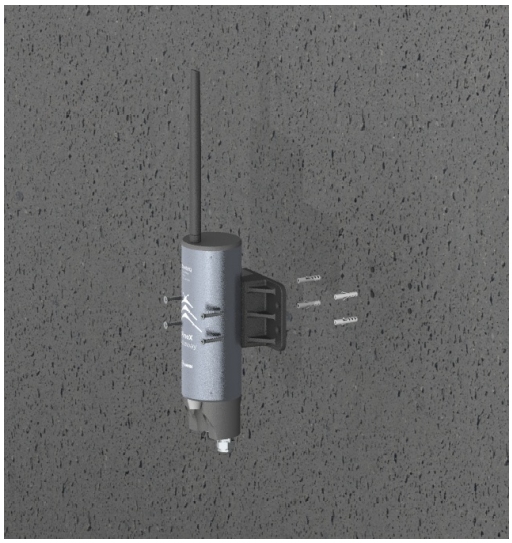
1.10 Installation and Wiring

- **Economy version**

Step 1: Select the installation location. The surface must be flat.

Step 2: Based on the dimensions of the gateway's base, drill four holes into the wall. Then, insert wall anchors into the drilled holes.

Step 3: Use screws to secure the gateway onto the drilled surface.



- **Advanced version**

> **There are two methods for mounting the gateway**
> 1. Mount the gateway to the steel pole with a hose clamp
> 2. Attach the bracket to the wall, then mount the gateway on the bracket.





II. MAINTENANCE

2.1 Maintenance

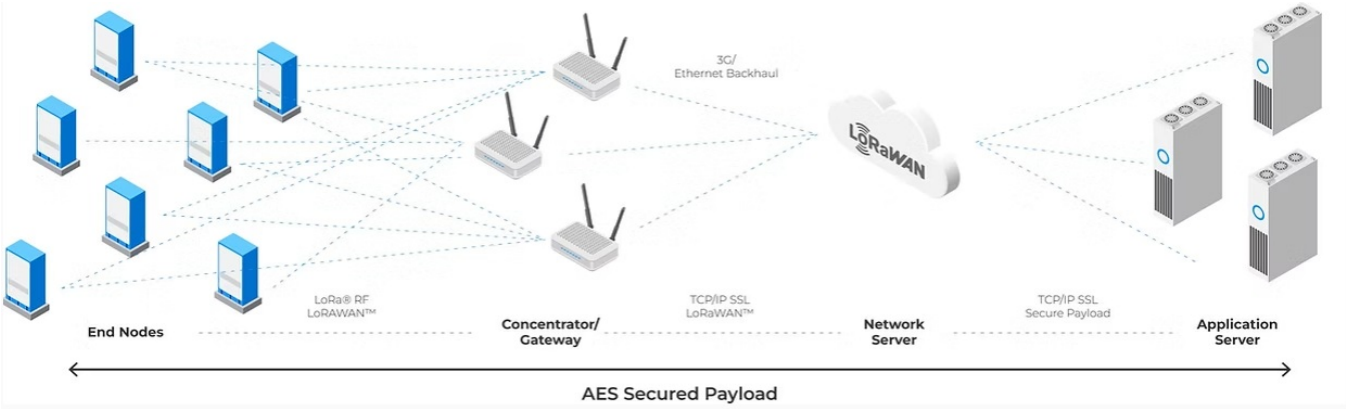
There is no requirement for maintenance of the Hardware of LoRaWAN Gateway.

2.2 Troubleshooting

Problem	**Possible causes**	**Solution**
The Ethernet port's LED is not lighting up	Gateway is in boost mode	Turn off the power supply, wait until all the gateway's LEDs are off, then change the switch from **Boost** to **Run.** After that, Power on the gateway.
Can not scan the gateway's IP address	1. The computer and the gateway are not on the same network 2. The network does not support DHCP. 3. The gateway was configured to use static IP mode	1. Check network of computer and gateway. 2. Use another active DHCP server network to access the configuration interface. 3. Press & hold the reset button within 5 seconds, then wait for 5 minutes before trying again.
The gateway is not online on Network Server	Wrong configuration	Check the Package Forwarder configuration on the gateway and gateway register configuration on Network Server.

III. ADVANCE GUIDE

3.1 Operation Principle



A LoRaWAN gateway functions as a transparent bridge between LoRa end devices and the LoRaWAN network server. It receives uplink packets from end devices via LoRa radio signals and forwards them to the network server over an IP-based backhaul (e.g., Ethernet, Wi-Fi, or cellular).
The gateway also receives downlink messages from the network server and transmits them to the appropriate end devices. It does not process or modify the payload data, ensuring secure and efficient communication between devices and the server.

3.2 Firmware update

3.2.1 Preparation

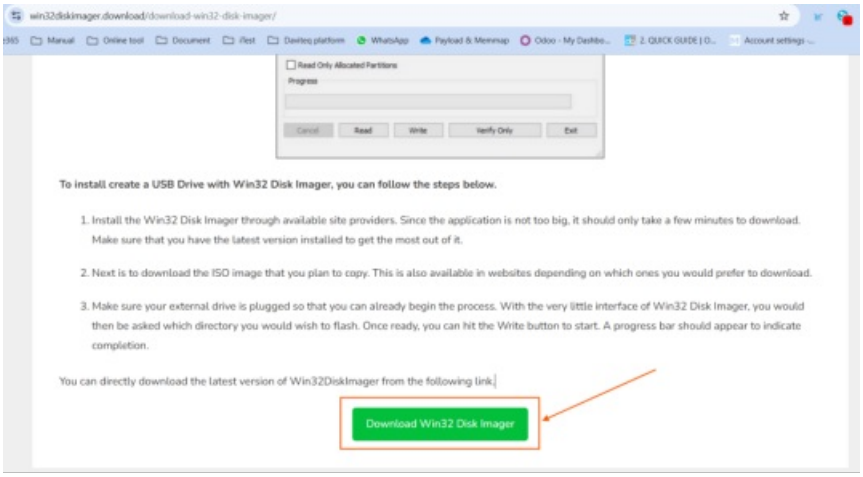
- Prepare a Windows PC.

- Prepare a USB-C cable for connecting the PC and the gateway.

- Download and unzip the firmware file

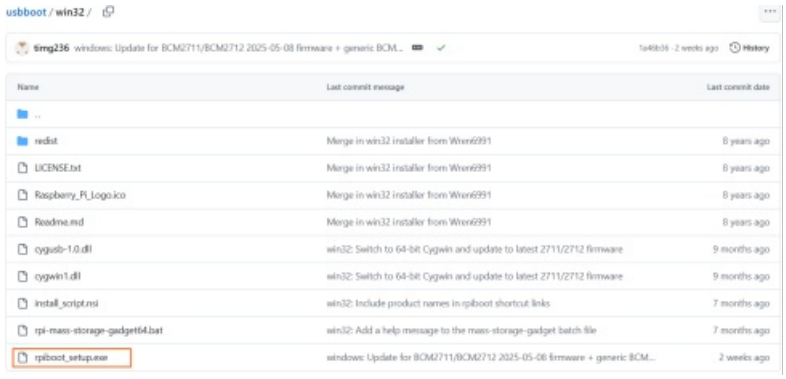
3.2.2 Download and Install Software

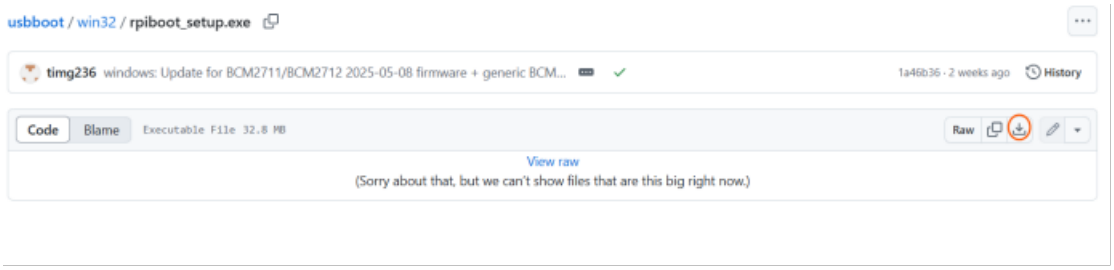
> Download & Install Win32DiskImage from **the link**



> Download & Install Raspberry USB Boot

Visit **the link** and download ***rpiboot_setup.exe.*** *Then, install Raspberry USB Boot in the PC*

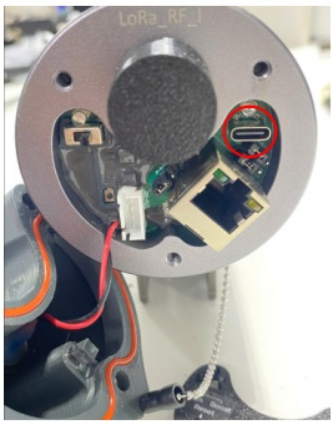




3.2.3 Flashing Firmware to PineX Gateway

Step 1: Make sure the gateway is completely powered off (all three LEDs are off).Use a screwdriver to remove the three screws and open the gateway cover. Then, remove the plastic cover to access the USB-C port.

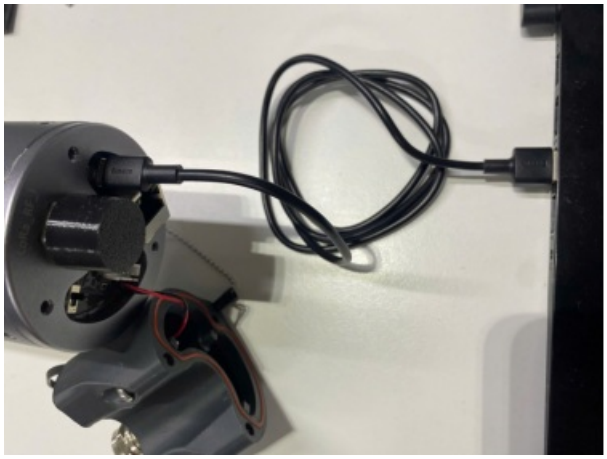




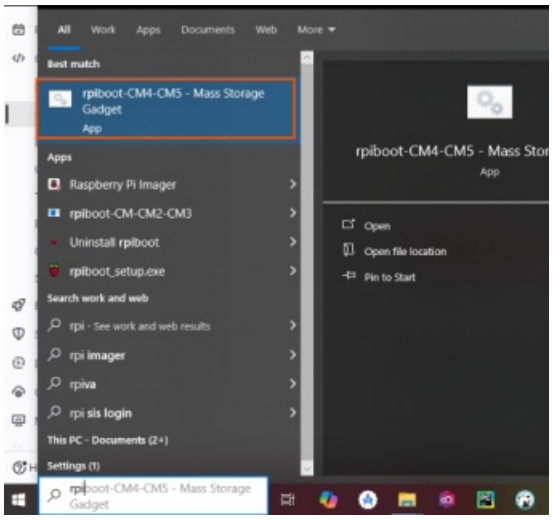
Step 2: Change the switch mode from **Run** to **Boost** as shown in the picture.

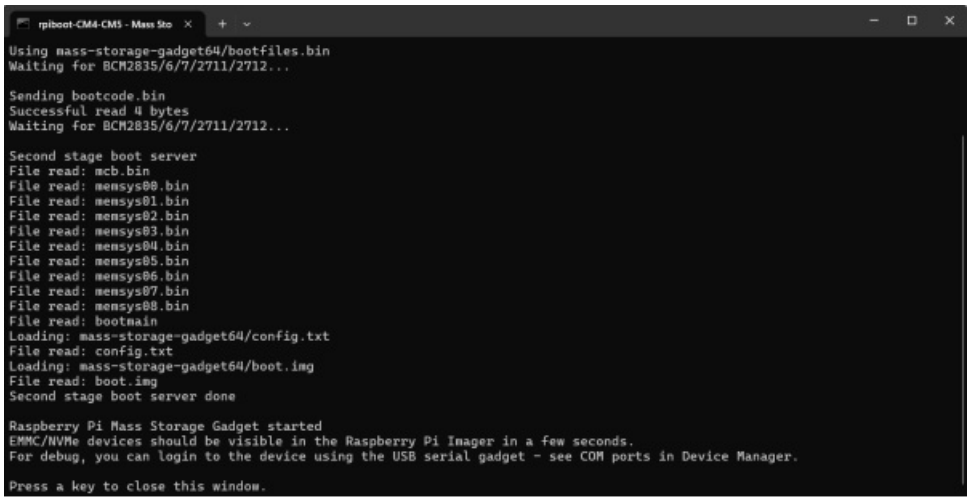


Step 3: Power on the gateway and wait for about 15 seconds. Then, connect the gateway to the PC via the USB-C cable.



Step 4: Open **rpiboot-CM4-CM5-Mass Storage Gadget**.



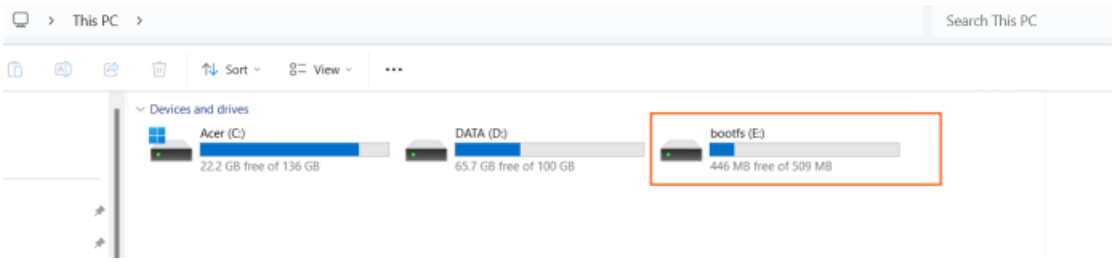


Open **This PC** on the PC and check whether a new drive named "**bootfs**" appears.

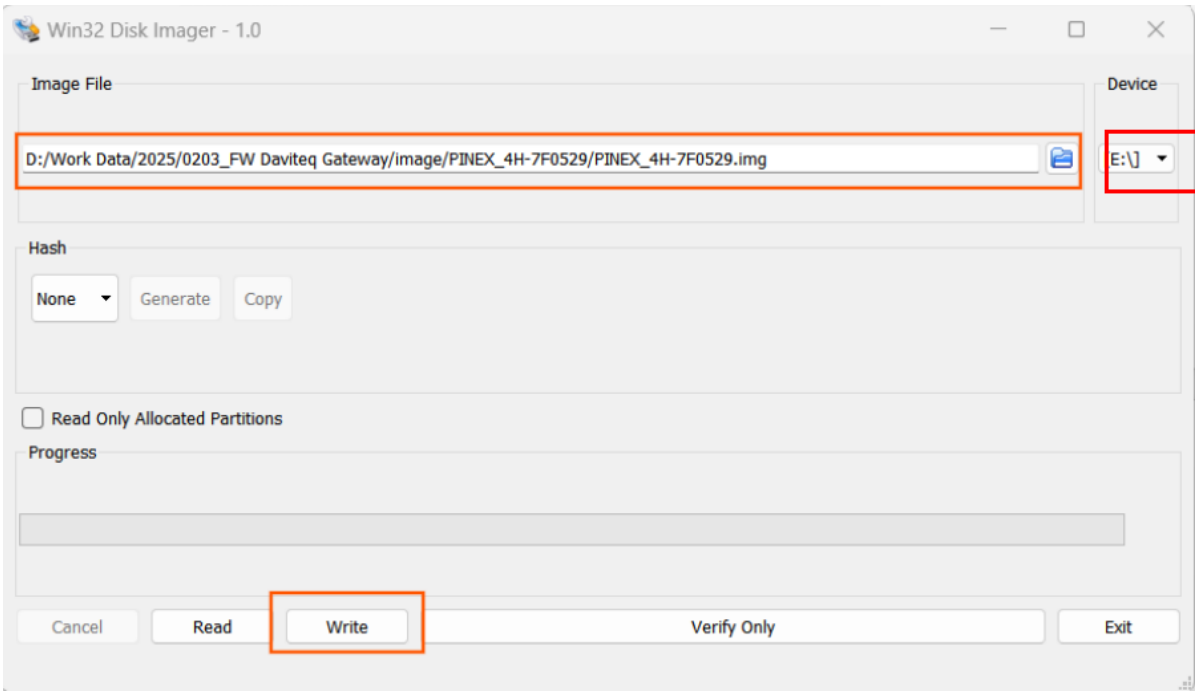
If "bootfs" appears as shown in the image below, the connection is successful.

If "bootfs" does not appear, go back and repeat the process from Step 1.

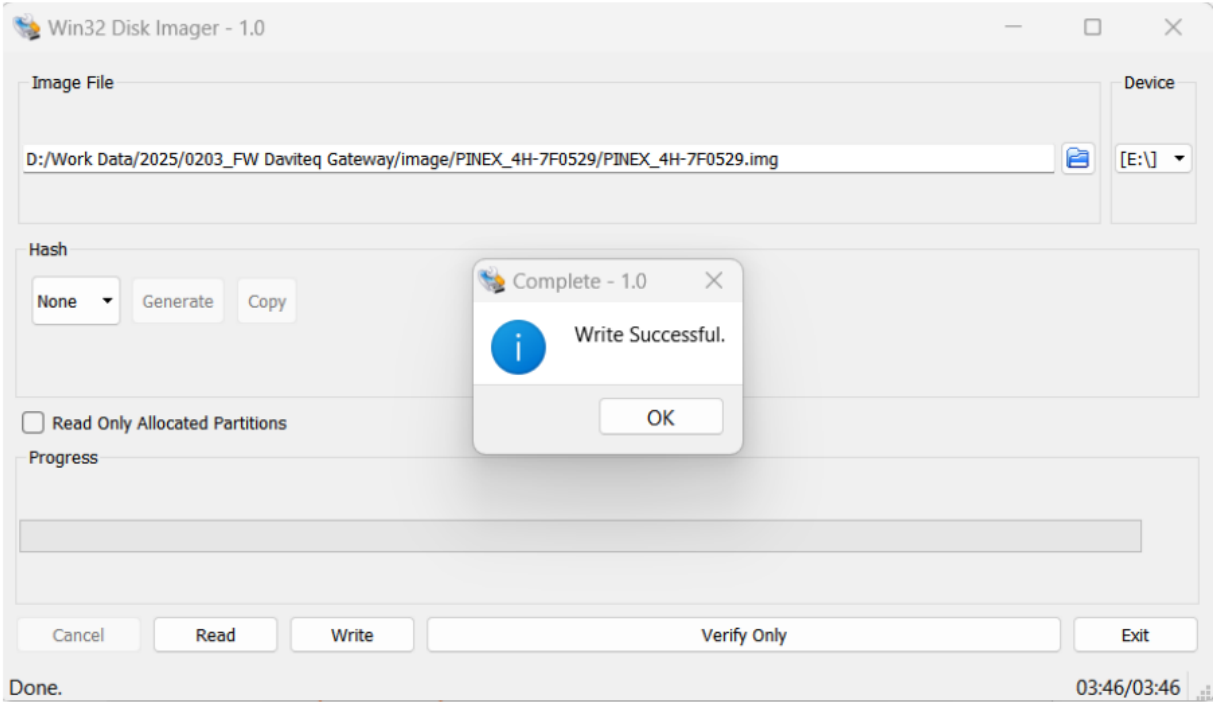
> ⚠ Take note of the drive letter assigned to "bootfs" — for example, Drive E:



Step 5: Open **Win32DiskImage** software. Browse to the firmware file and select correct Device (the drive letter assigned to "bootfs" in step 4**).** Then click the Write button to flash the firmware to the gateway.



Wait a few minutes until a "Write successful" message is displayed. This means the firmware flashing process has completed successfully.



3.3 Connect directly from window PC to

gateway through ethernet cable for configuration

3.3.1 PREPARATION

Hareware

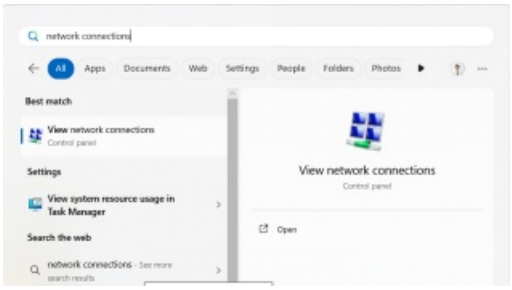
- A Daviteq gateway
- A window laptop
- A USB-to-LAN adapter (if the laptop does not have ethernet port)
- A traight ethernet cable

Software

Download and Install **Tftdp64** software (attached file)

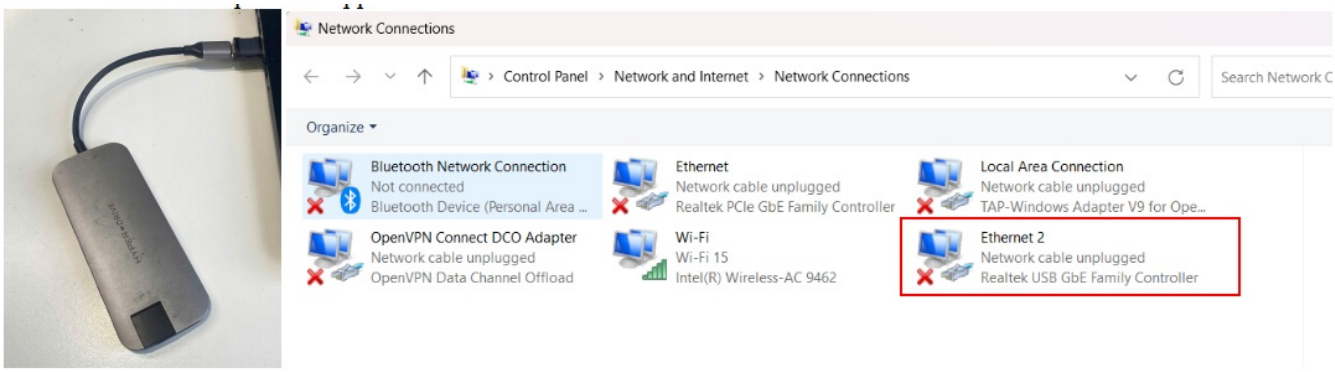
3.3.2 DETAILED INSTRUCTIONS

Step 1: Type "**Network Connections**" in the search bar, then select "**View network connections**."

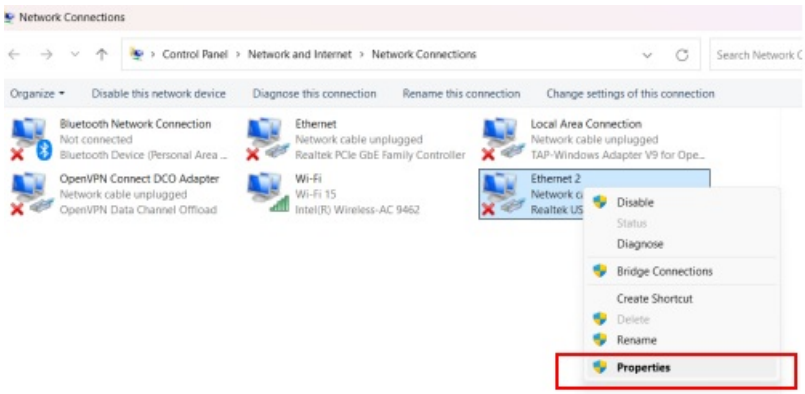




Step 2: Plug the USB-to-LAN adapter into the laptop. Wait for a few seconds, and the Ethernet connection of the adapter will appear.



Step 3: Right click the Ethernet connection of the adapter, then select**Properties**



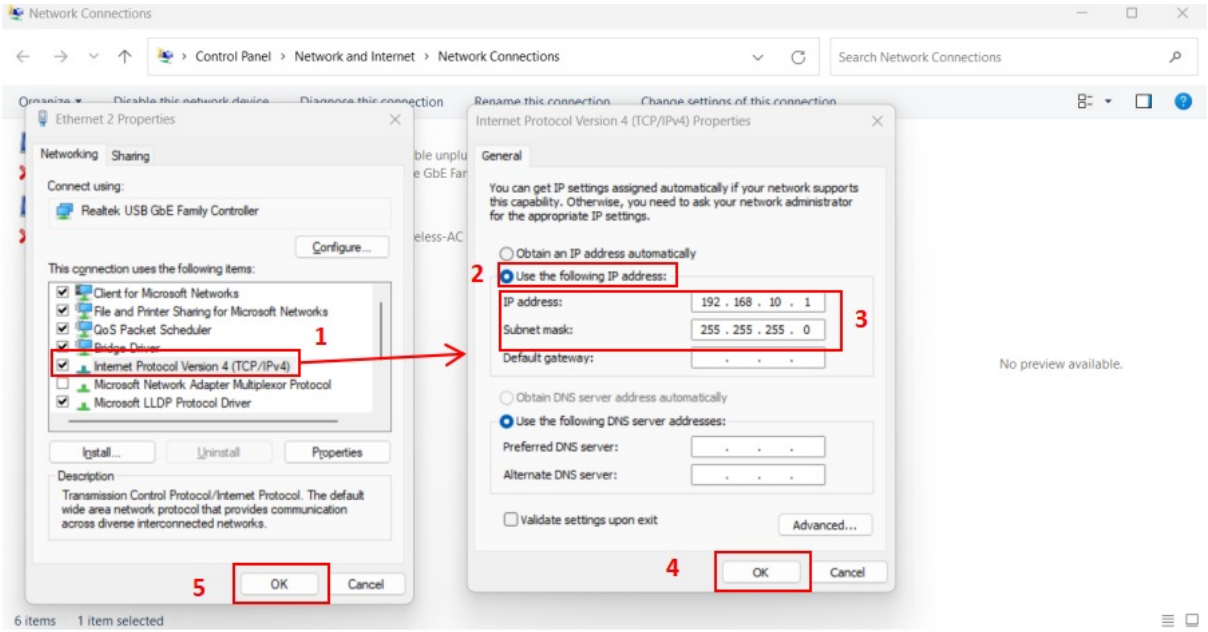
Step 4: In the **Networking** tab, select **Internet Protocol Version 4(TCP/IPv4).**

Then, select **Use the following IP address** and input the imformation as shown in the picture below

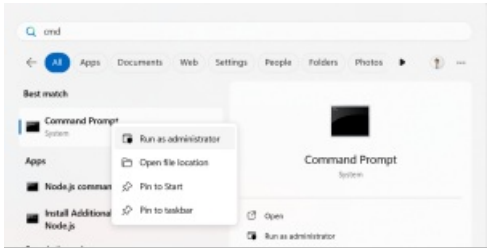
IP address : 192.168.10.1

Subnet mask: 255.255.255.0

Press **OK** button to save the configuration

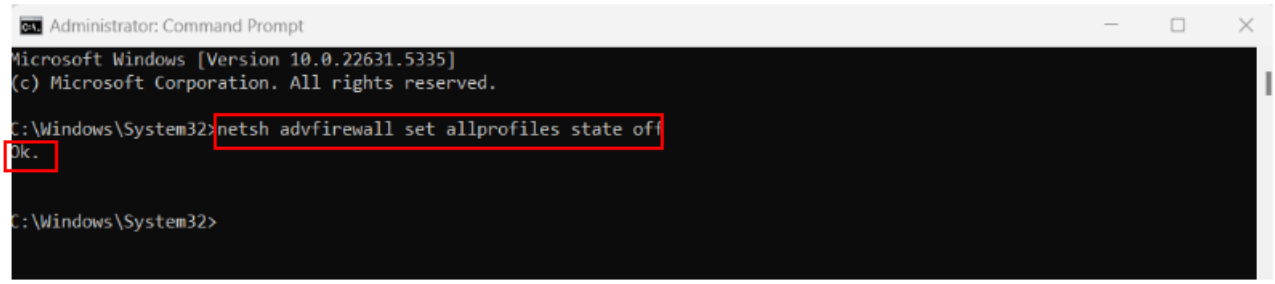


Step 5: Run **Command Prompt** as administrator



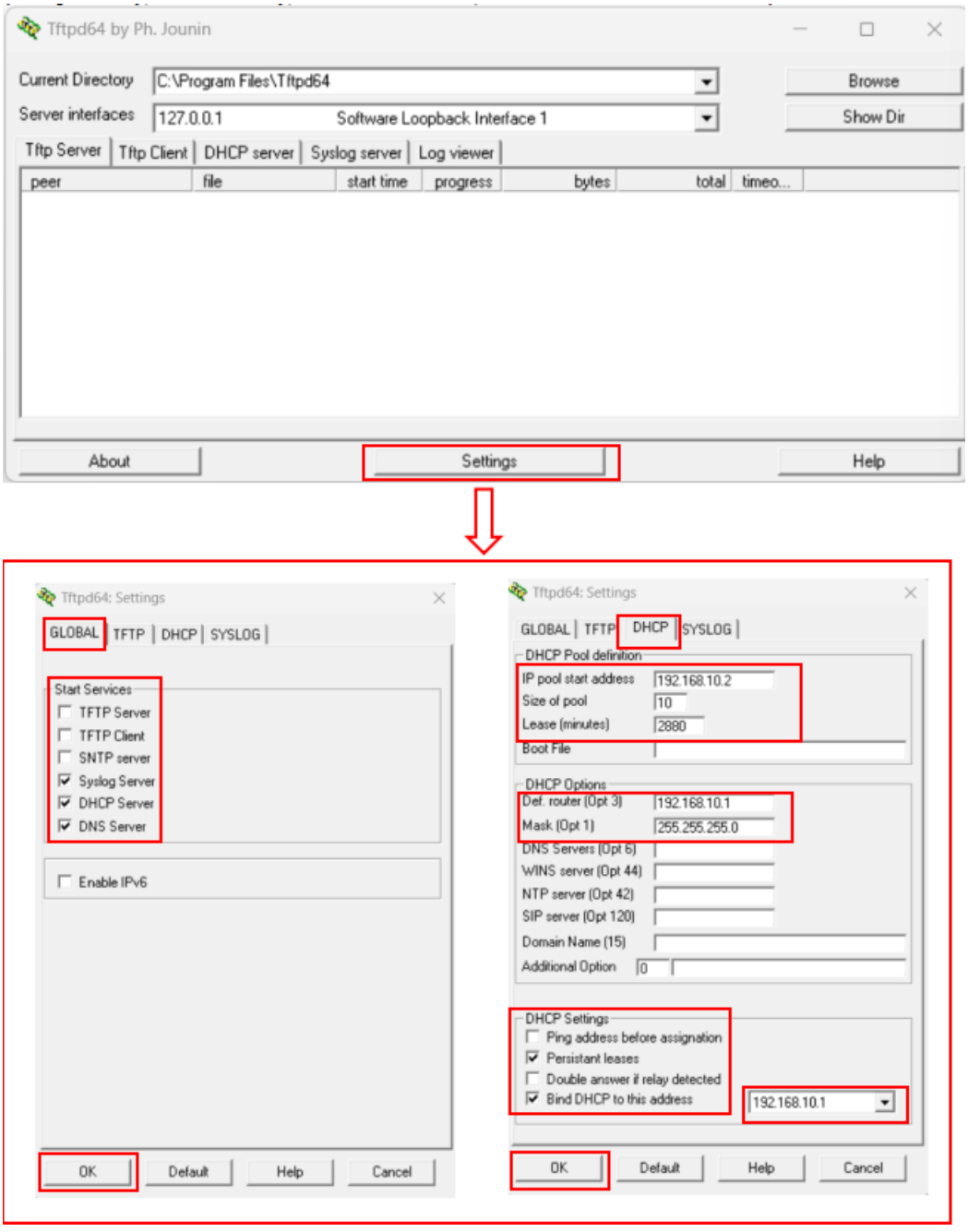
Copy and paste command below to the Command Promt to temporarily turn off the Firewall

netsh advfirewall set allprofiles state off



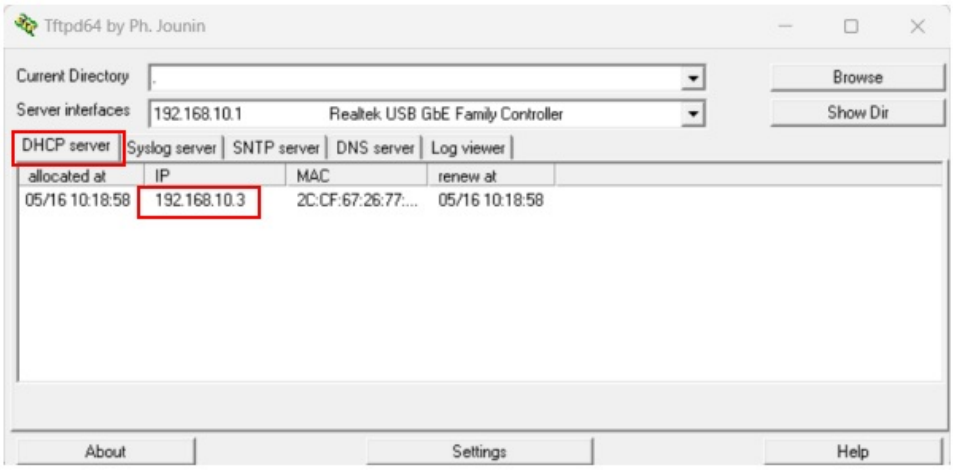
Step 6: Open the **Tftpd64** Software, click the **Settings** button, then configure it as shown in the pictures below. After that, click OK to save the new settings.

(Only change the settings in the red box, leave the rest as default)

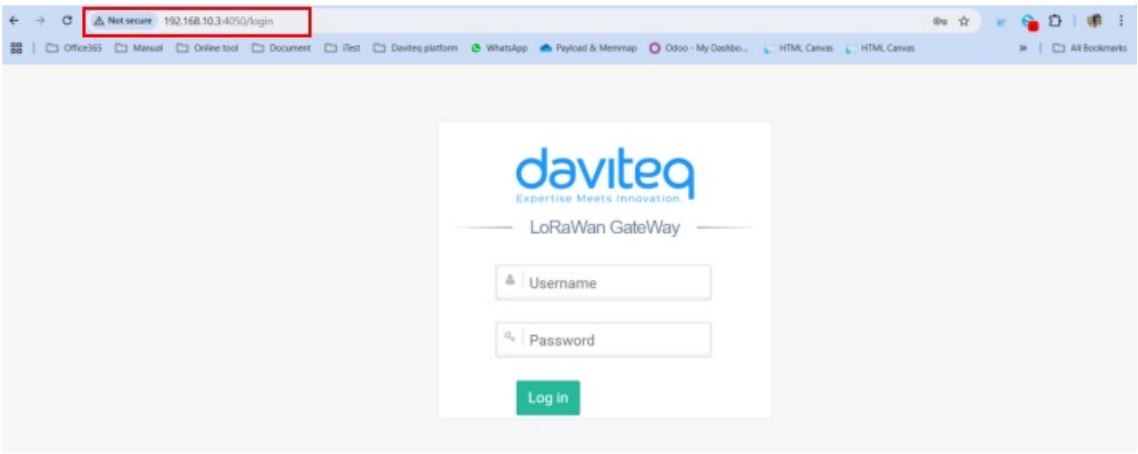


Step 7: Power on the gateway, then connect the Ethernet cabble from the gateway to the laptop through the adapter. Wait for a few seconds, the IP address of the gateway will be displayed in **DHCP server** tab of the Tftpd64 software





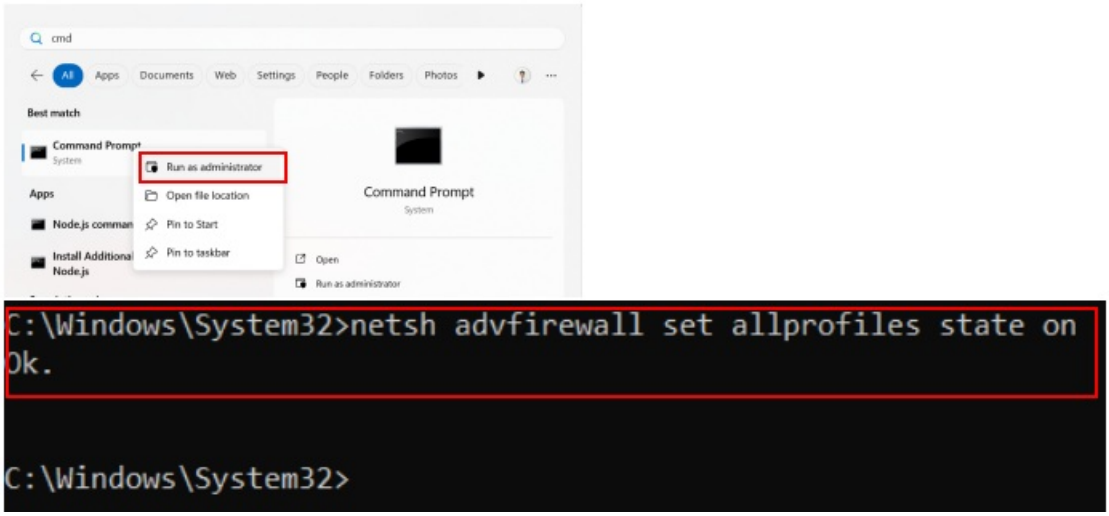
Step 8: Access the gateway's GUI via the IP address and port 4050 (e.g., 192.168.10.3:4050).
If the web browser displays as shown in the image below, it means you have successfully accessed the gateway. Next, refer to the user guide to configure the Wi-Fi and the LoRaWAN Package Forwarder for the gateway.



Step 9: After finishing the configuration, please turn the firewall back on for your computer.

Run **Command Prompt** as administrator, then copy and paste the command below to the Command Promt

netsh advfirewall set allprofiles state on



IV. PRODUCT SPECIFICATIONS

LoRaWAN Specification	LoRaWAN 1.0.3, support for LoRaWAN Class A, Class C protocols
Frequency Band	Select 863~870MHz or 902~928MHz
Number of Channels	Up to 8 concurrent channels for LoRa transmission
LoRa Transmit Power	0.5W (up to 27 dBm)
LoRa Receive Sensitivity	Down to -139dBm@SF12, BW 125 kHz.
Features	Dynamic data-rate adaptation (ADR)
Software	LoRa Package forwarder, Chirpstack, OpenVPN, Node-red, SSH root access
COMMUNICATION	
Standard communication	Ethernet 100Mbps, via outdoor RJ45 connector
Optional 4G LTE	LTE Cat 4, Global bands
	LTE FDD: B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B25, B26, B28
	LTE TDD: B38, B39, B40, B41
	UMTS: B1, B2, B4, B5, B6, B8, B19
	GSM: B2, B3, B5, B8
Antenna Type	1 x external LoRa antenna via N-type connector, 1 x External antenna for LTE via SMA connector
Housinng	Aluminum alloy, powder coated, IP67, Wall mount installation
Certified Ex d	FTZU 03 ATEX 0207U, TÜV CY 18 ATEX 0206158 X, and IECEx FTZU 12.0017U, IECEx MSC 19.0001X
Hazard Protection Label	ATEX II 2G Ex db IIC T5/T6 Gb and ATEX II 2D Ex tb IIIC T100/T85℃ Db
Standard	IEC-EN60079-0 IEC-EN60079-1 IEC-EN60079-31
Areas of application	Zones 1 & 2 gas hazardous areas, Zones 21 & 22 hazardous areas containing flammable dust
Working temperature	-40 ~ 85℃
Size | Net weight	H202xW126xD128 (not including antenna)/ ≈1500g

V. WARRANTY & SUPPORT

Below terms and conditions are applied for products manufactured and supplied by Daviteq Technologies Inc.

5.1 Warranty

- Free Warranty Conditions:

1. The manufacturer undertakes to guarantee within 12 months from shipment date.
2. Product failed due to defects in material or workmanship.
3. Serial number, label, warranty stamp remains intact (not purged, detected, edited, scraped, tore, blurry, spotty, or pasted on top by certain items).
4. During the warranty period, if any problem of damage occurs due to technical manufacturing, please notify our Support Center for free warranty consultancy. Unauthorized treatments and modifications are not allowed.
5. Product failed due to the defects from the manufacturer, depending on the actual situation, Daviteq will consider replacement or repairs.

> ⚠ Note: One way was shipping costs to the Return center shall be paid by Customers.

- Paid Warranty

1. The warranty period has expired.
2. The product is not manufactured by Daviteq.
3. Product failed due to damage caused by disasters such as fire, flood, lightning or explosion, etc.
4. Product damaged during shipment.
5. Product damaged due to faulty installation, usage, or power supply.
6. Product damage caused by the customer.
7. Product rusted, stained by effects of the environment or due to vandalism, liquid (acids, chemicals, etc.)
8. Product damage is caused by unauthorized treatments and modifications.

> ⚠ **Notes:**
> * Customers will be subjected to all repairing expenses and 2-way shipping costs.
> * If arises disagreement with the company's determining faults, both parties will have a third party inspection appraise such damage and its decision be and is the final decision.

5.2 Support

If you need our support for Daviteq device's installation, configuration, test, and decode, please email us at: support@daviteq.com OR input support request at link: https://forms.office.com/r/XWHbYG7yy7 .Our support engineer will contact you via email or the support ticket system.

If you have any questions about the product, you can search for information on our web (https://www.iot.daviteq.com/). If you can't find the right information, please register an account and send us a request at link Contact us | Daviteq Technologies . We will respond within 24 hours.