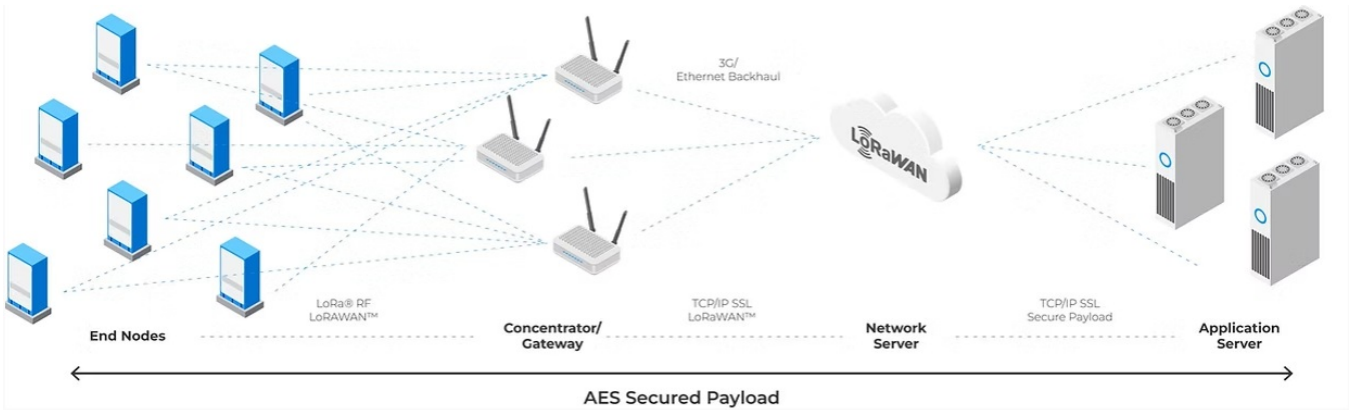


III. ADVANCE GUIDE

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.

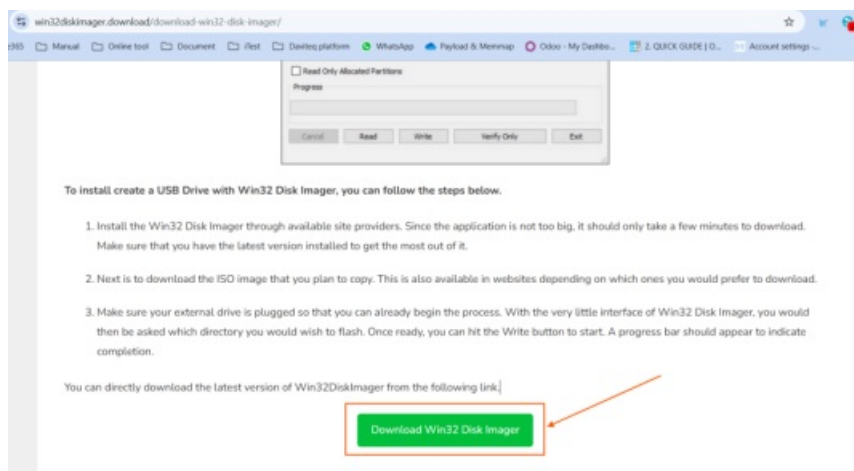
3.2 Firmware update

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](#)

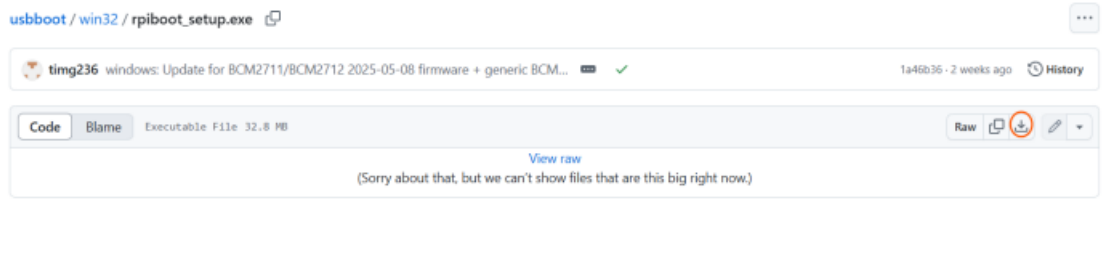


[Download & Install Raspberry USB Boot](#)

Visit [the link](#) and download *rpiboot_setup.exe*. Then, install Raspberry USB Boot in the PC

usbboot / win32 /

Name	Last commit message	Last commit date
..		
redist	Merge in win32 installer from Wren2991	8 years ago
LICENSE.txt	Merge in win32 installer from Wren2991	8 years ago
Raspberry_PI_Logo.ico	Merge in win32 installer from Wren2991	8 years ago
Readme.md	Merge in win32 installer from Wren2991	8 years ago
cygusb-1.0.dll	win32: Switch to 64-bit Cygwin and update to latest 2711/2712 firmware	9 months ago
cygwin1.dll	win32: Switch to 64-bit Cygwin and update to latest 2711/2712 firmware	9 months ago
install_script.nsi	win32: Include product names in rpiboot shortcut links	7 months ago
rp4-mass-storage-gadget04.bat	win32: Add a help message to the mass-storage-gadget batch file	7 months ago
rpiboot_setup.exe	windows: Update for BCM2711/BCM2712 2025-05-08 firmware + generic BCM...	2 weeks ago

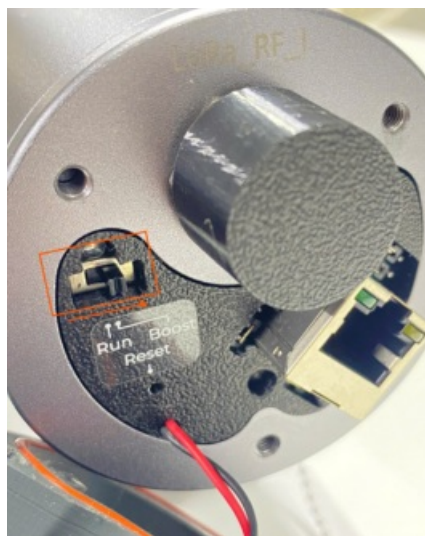


3.2.3 Flashing Firmware to PineX Gateway

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.



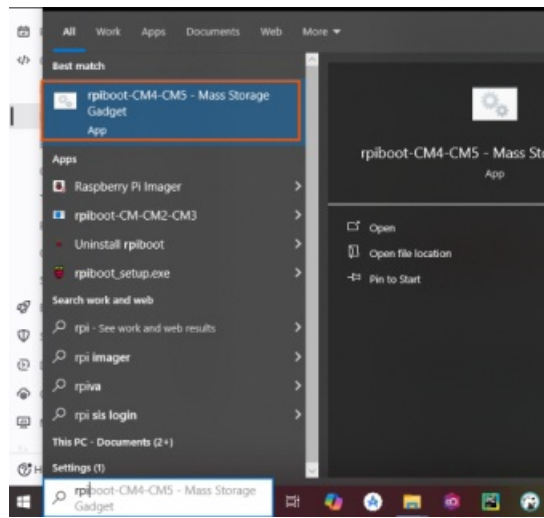
Step 2: Change the switch mode from **Run** to **Boost** as shown in the picture.



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**.



```
rpiboot-CM4-CM5 - Mass Sto x + -
Using mass-storage-gadget64/bootfiles.bin
Waiting for BCM2835/6/7/2711/2712...

Sending bootcode.bin
Successful read 4 bytes
Waiting for BCM2835/6/7/2711/2712...

Second stage boot server
File read: mcb.bin
File read: memsys00.bin
File read: memsys01.bin
File read: memsys02.bin
File read: memsys03.bin
File read: memsys04.bin
File read: memsys05.bin
File read: memsys06.bin
File read: memsys07.bin
File read: memsys08.bin
File read: bootmain
Loading: mass-storage-gadget64/config.txt
File read: config.txt
Loading: mass-storage-gadget64/boot.img
File read: boot.img
Second stage boot server done

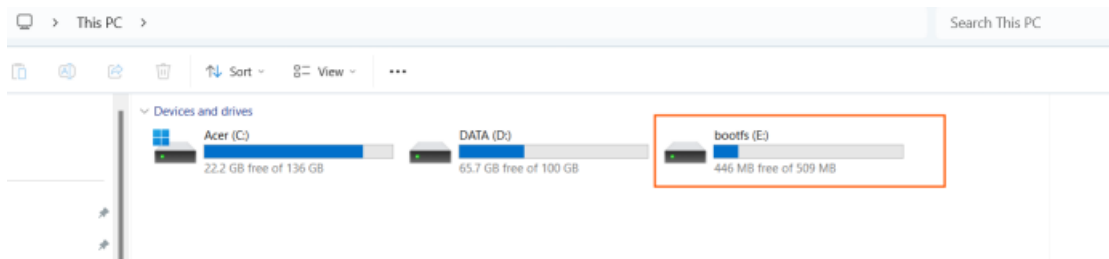
Raspberry Pi Mass Storage Gadget started
EMMC/NVMe devices should be visible in the Raspberry Pi Imager in a few seconds.
For debug, you can login to the device using the USB serial gadget - see COM ports in Device Manager.
Press a key to close this window.
```

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

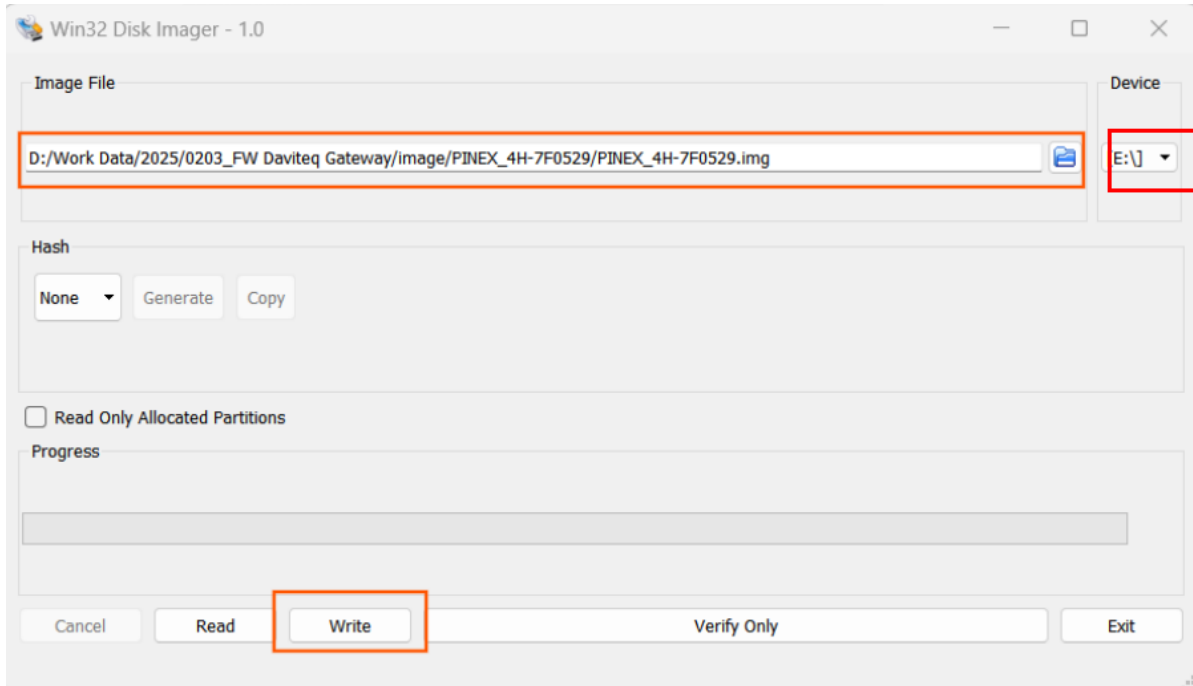
If **"bootfs"** appears as shown in the image below, the connection is successful.

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

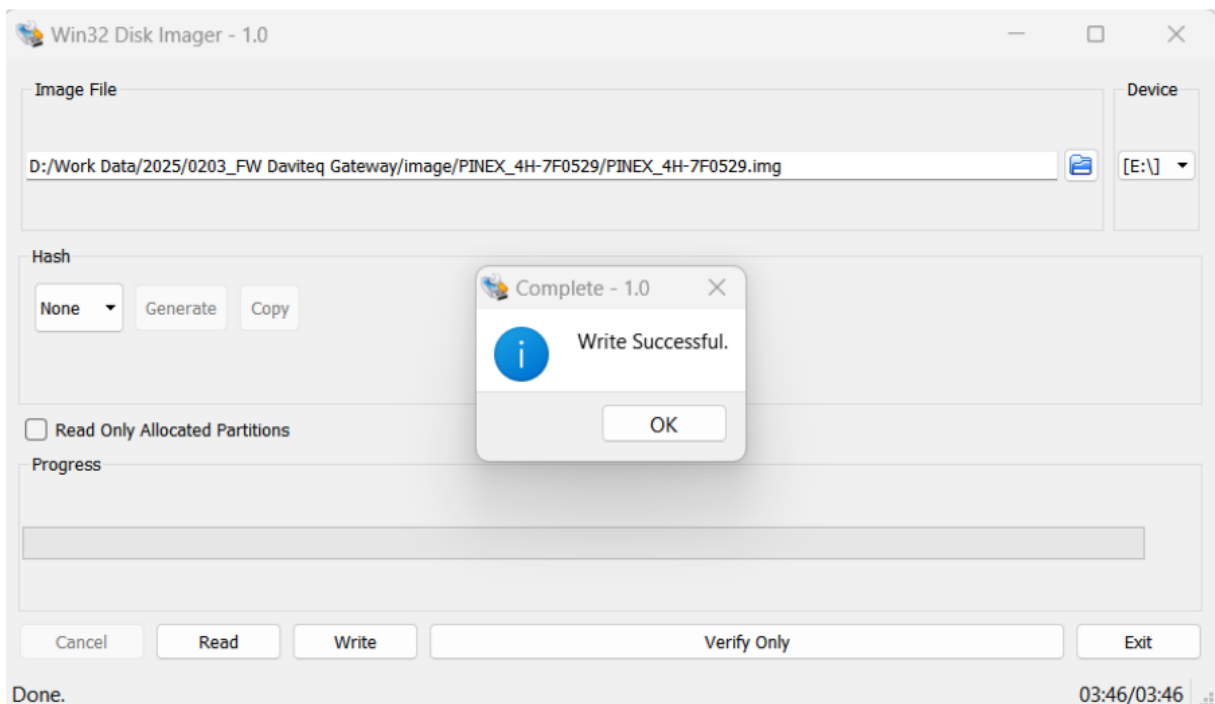
⚠ Take note of the drive letter assigned to **"bootfs"** — for example, Drive E:



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

Hardware

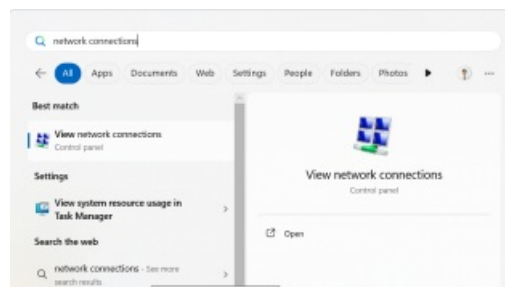
- A Daviteq gateway
- A window laptop
- A USB-to-LAN adapter (if the laptop does not have ethernet port)
- A traight ethernet cable

Software

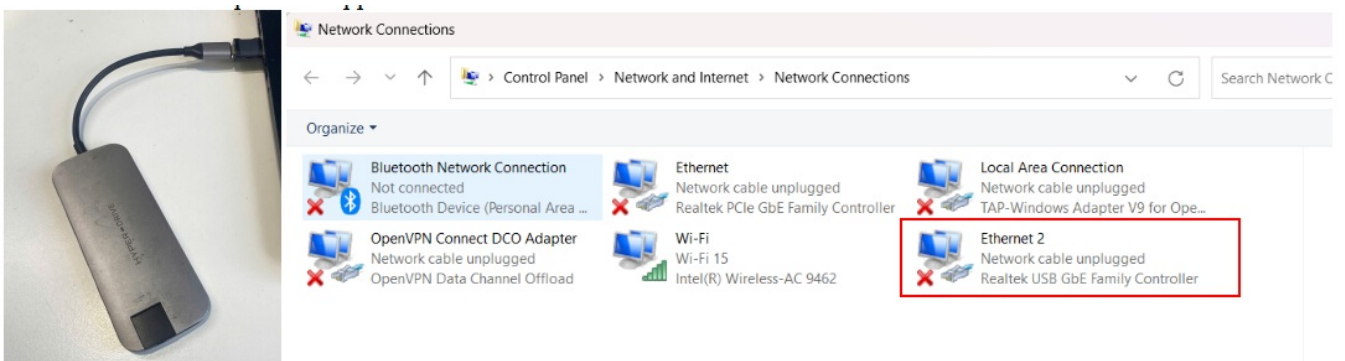
Download and Install **Tftdp64** software (attached file)

3.3.2 DETAILED INSTRUCTIONS

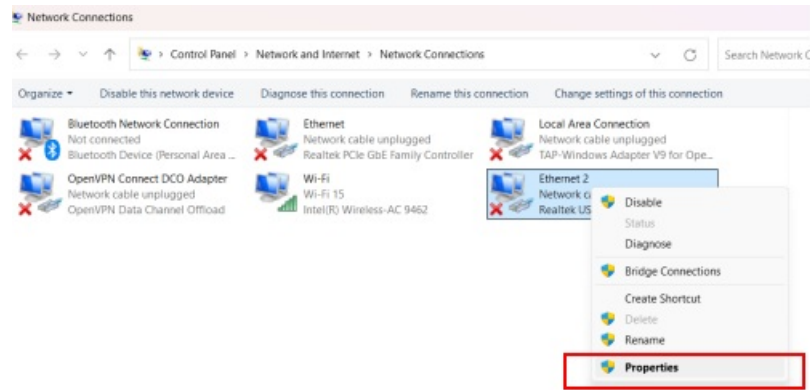
Step 1: Type “**Network Connections**” in the search bar, then select “**View network connections.**”



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**



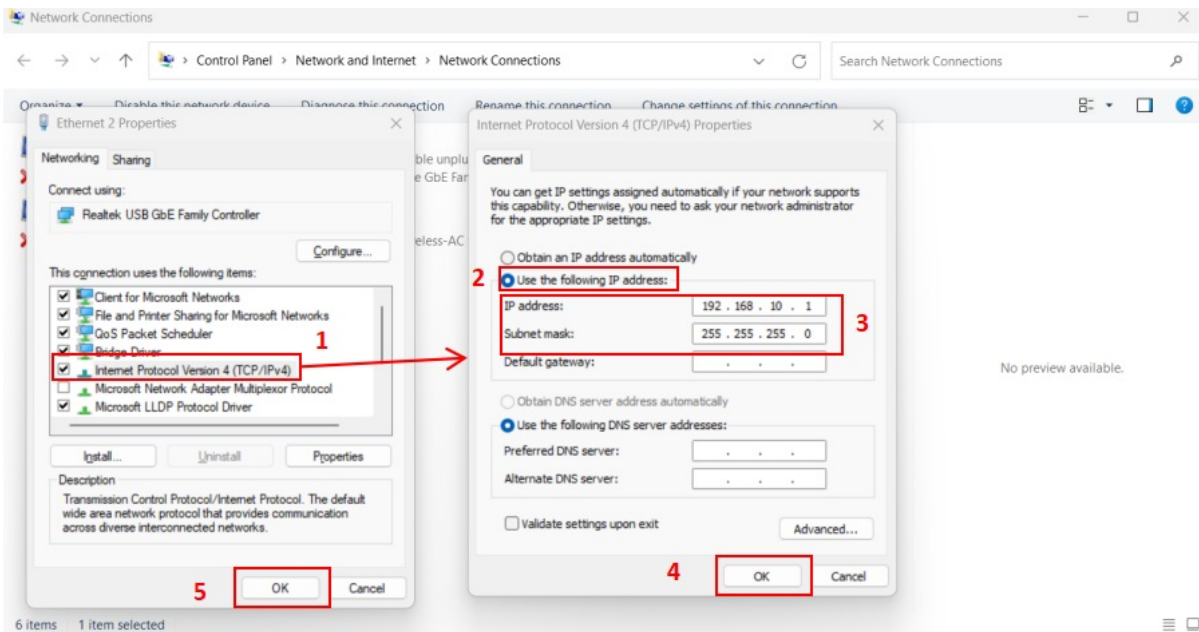
Step 4: In the **Networking** tab, select **Internet Protocol Version 4(TCP/IPv4)**.

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

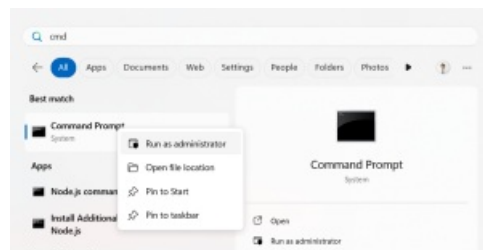
IP address : 192.168.10.1

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 Prompt to temporarily turn off the Firewall

netsh advfirewall set allprofiles state off

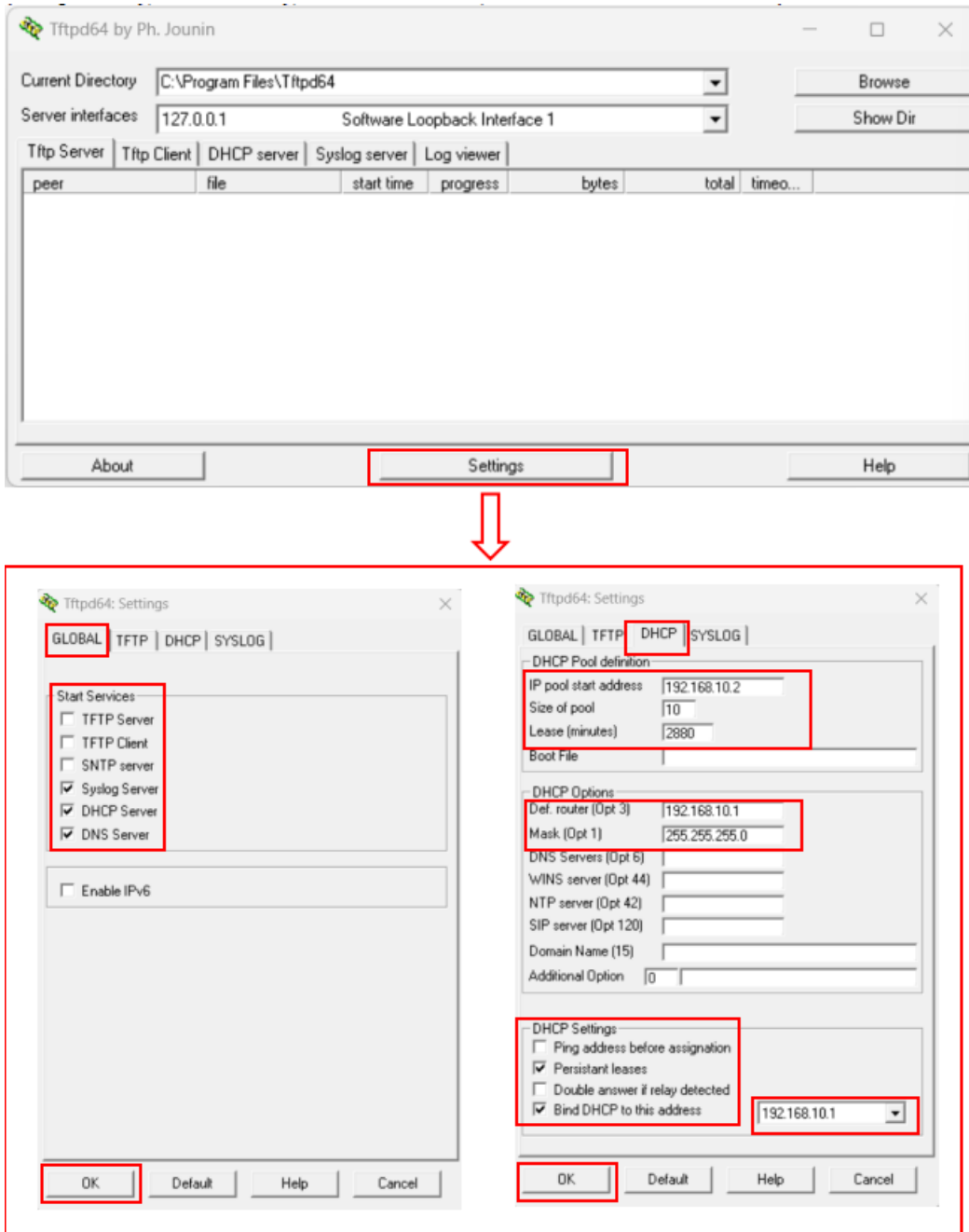
```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.22631.5335]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32> netsh advfirewall set allprofiles state off
Ok.

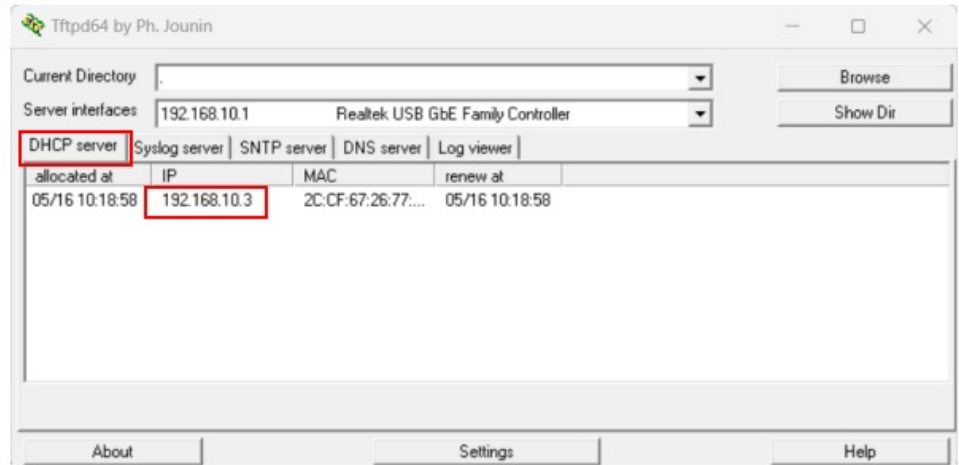
C:\Windows\System32>
```

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.

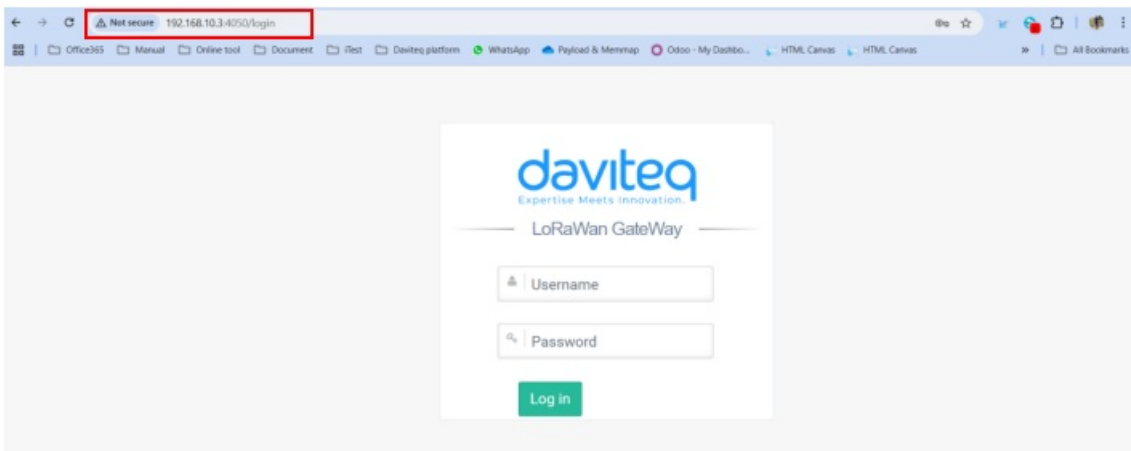
(Only change the settings in the red box, leave the rest as default)



Step 7: Power on the gateway, then connect the Ethernet cable 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



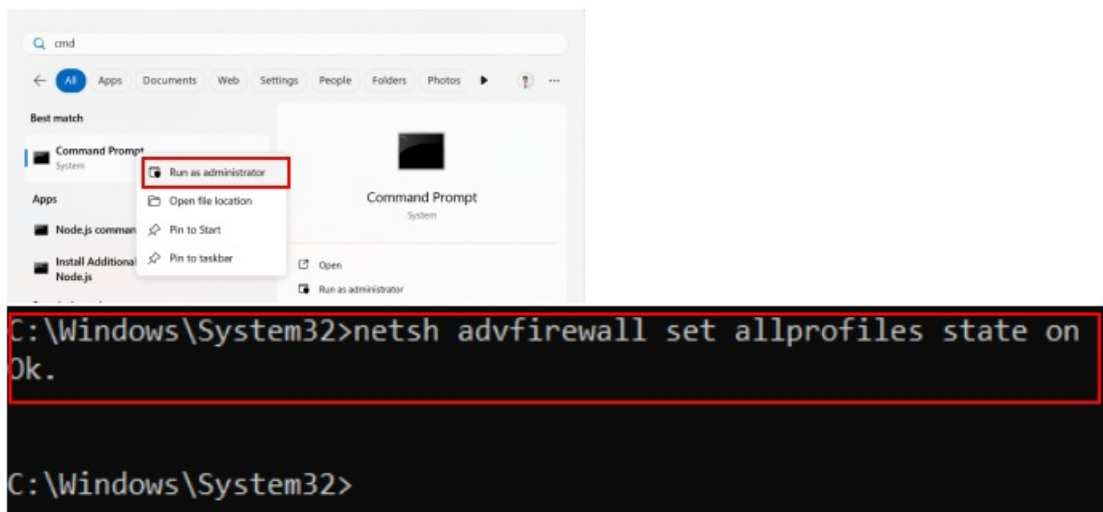
Step 8: Access the gateway's GUI via the IP address and port 4050 (e.g., 192.168.10.3:4050). If the web browser displays as shown in the image below, it means you have successfully accessed the gateway. Next, refer to the user guide to configure the Wi-Fi and the LoRaWAN Package Forwarder for the gateway.



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 Prompt

netsh advfirewall set allprofiles state on



🔄 Revision #5

★ Created Tue, Jul 22, 2025 2:39 AM by [Phi Hoang Tran](#)

✎ Updated Mon, Jul 28, 2025 3:07 AM by [Phi Hoang Tran](#)