# Safeguard Solutions

## WG-24 Series Retrofit Guide for 3 PoE Port Support

This guide will walk you through step by step how to retro fit a WG-24 series box capable of powering up to 3 PoE devices.

**You will need the following tools:**

- Screwdriver set with changeable bits
- Small Adjustable Wrench
- Power drill or impact driver
- Docking station or USB hub (USB-C)
- USBC Adapter
- Keyboard and mouse
- Computer Monitor
- HDMI Cable

**Optional but very helpful:**

- Telescoping magnetic pickup tool
- Right angle HDMI adapter

Any questions please email support@safeguardsolutions.org

# Visual Tool List

**Required:**

Adj. Wrench


Screwdriver and Socket Set


Power Drill

Keyboard and Mouse

USB-C Hub

USB-C Adapter

# Visual Tool List – Continued

**Optional:**

Right Angle
HDMI

Magnetic
Pickup Tool

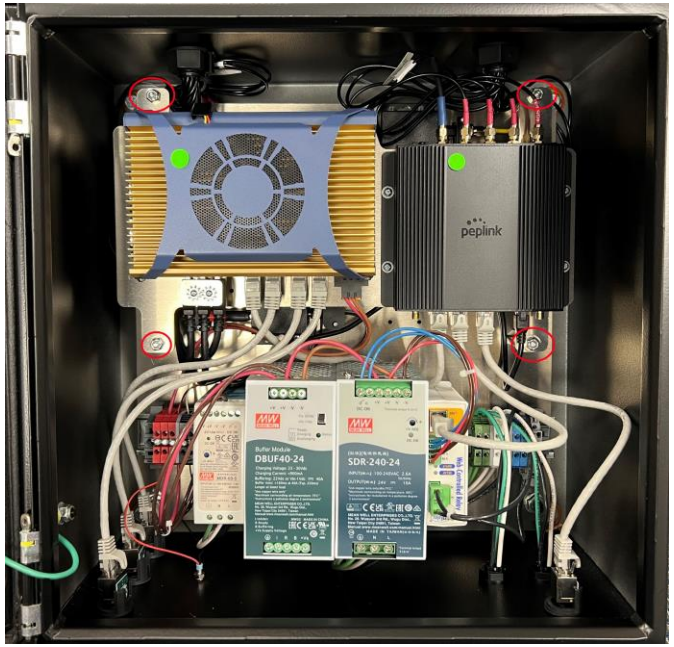
# Required Tools Cost and Links Where to Buy

| Type | Qty Needed | Cost | Purchasable From | Part Link |
|---|---|---|---|---|
| Adjustable Wrench | 1 | $6.99 | Hardware store, amazon | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=LJXNSISHEH |
| Screwdriver Socket Set | 1 | $23.99 | Hardware store, amazon | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=OIAHJSEHAS |
| USBC Hub | 1 | $15.99 | Amazon, Newegg, Bestbuy, target | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=MNDVAUJEJD |
| USBC Adapter | 1 | $9.99 | Amazon, Newegg | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=OAJSEGHSLHS |
| **Total** | | **$56.96** | | |

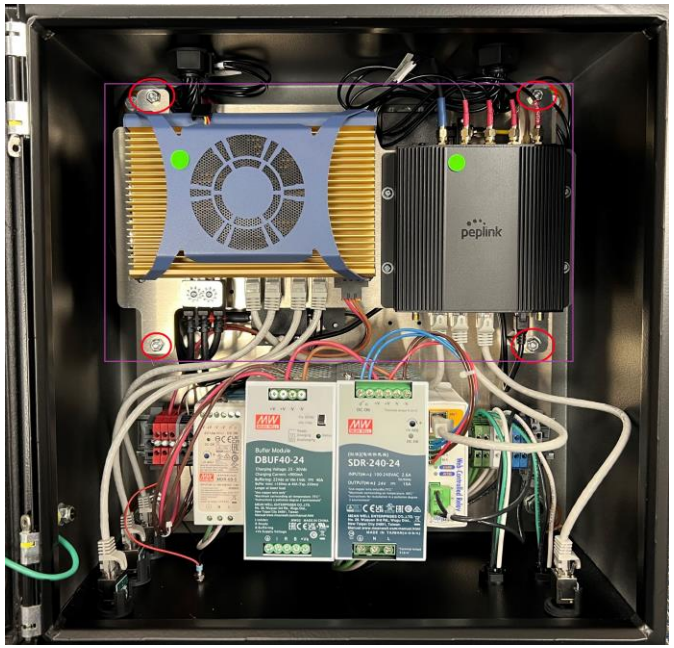
# Optional Tools Cost and Links Where to Buy

| Item | Qty Needed | Cost | Purchasable From | Part Link |
|---|---|---|---|---|
| Right Angle HDMI | 1 | $5.99 | amazon | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=MSVAJDUEH |
| Magnetic Tool | 1 | $9.99 | amazon | https://sales.safeguardsolutions.org/cgi-bin/redirect.cgi?link=IEUAHSDHSSF |
| **Total** | | **$15.98** | | |

# IMSI Removal

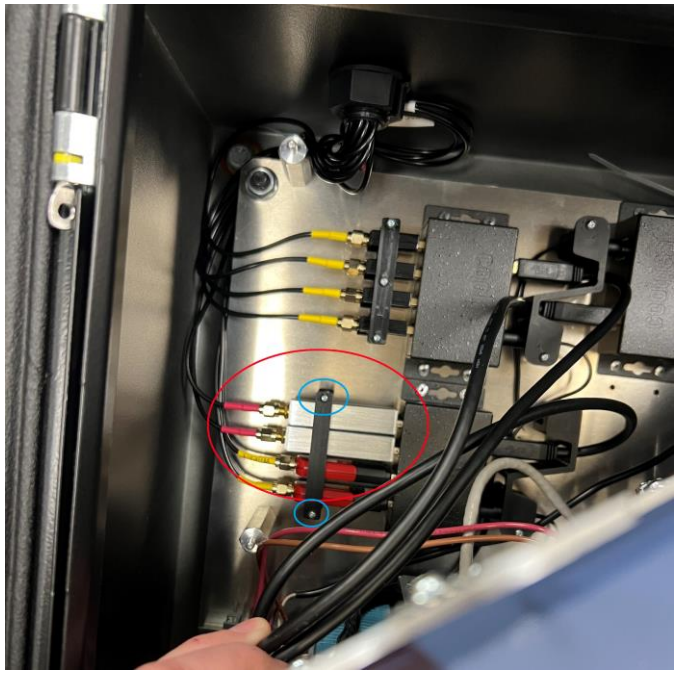



1. Remove the four nuts circled in red. Set Aside.

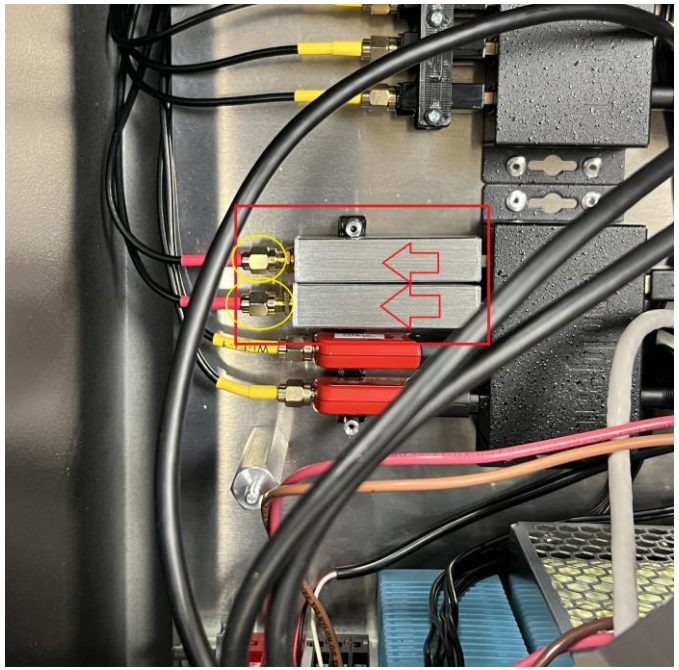



2. After the four nuts are removed, carefully lift up and flip the metal plate outlined by the purple box so that its standing on one edge. It will still be connected to the various wires, but there will be clearance.

## IMSI Removal Continued…

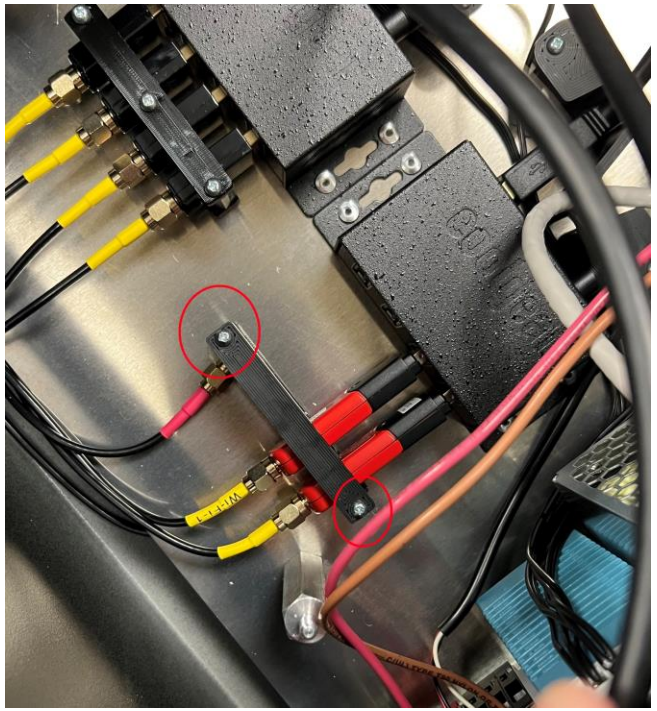


1. Remove the two Phillips screws circled in blue.  Set aside.
2. The arm bar clamping down on the USB dongles should come right off.  Set aside.



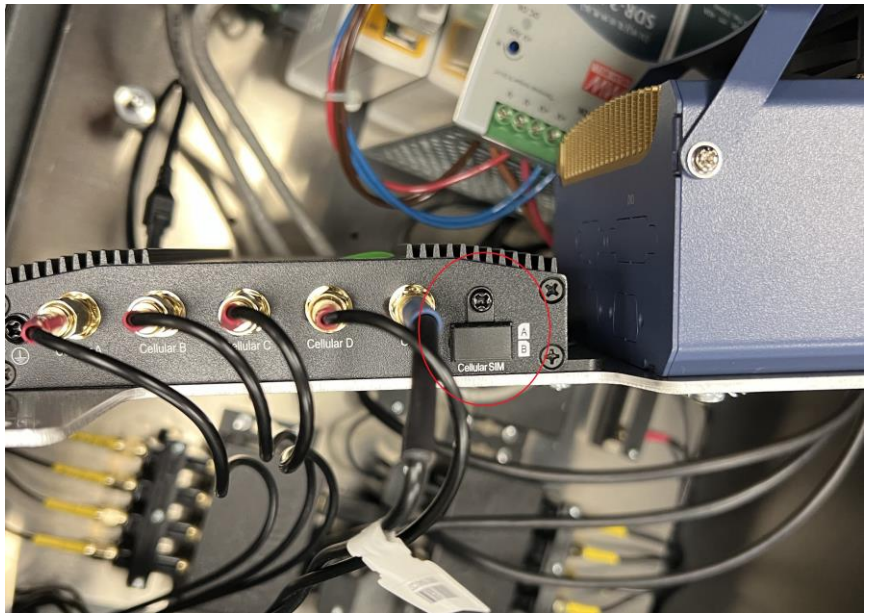
1. Remove the two silver IMSI USB dongles.
2. Using an adjustable wrench, disconnect the SMA connectors circled in yellow.
3. The IMSI USB dongles can then be set aside and are not needed.

# IMSI Removal Continued...

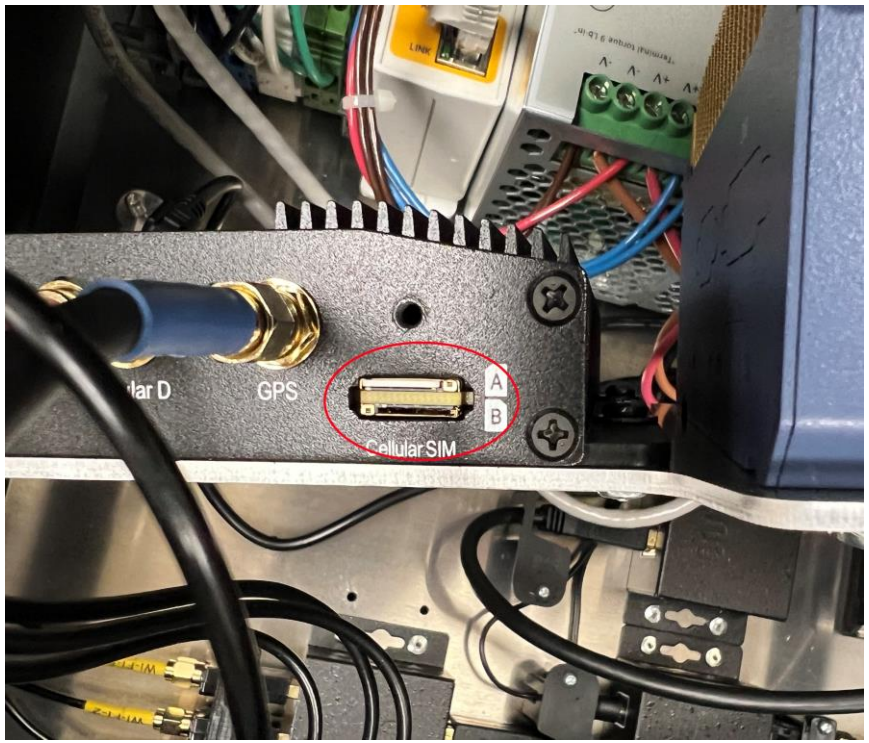


1. Reconnect the arm bar from the previous step using the two Phillips screws.

## Router Reset




1. On the metal plate that is floating, unscrew the cover over the sim card.




1. Remove the current sim card and discard.
2. Insert your new sim card in the top slot (A). If you have a backup sim card, this is inserted into the slot on the bottom (B).

# Router Reset Continued…


1. Replace the plate on the four pegs circled in red.  Do not reattach the nuts yet.


1. Using a small flat head screw driver, remove the plug in circled in red by unscrewing the screws marked by the yellow circle. Note that the screws will not come all the way out.  You may need to lift the plate up to get a better angle on the screws.
2. Unplug the plug circled in purple on the web relay and leave it hanging to the side.
3. Remove the middle ethernet cable circled in orange and replace it with an ethernet cable going to a laptop or desktop computer.

## Router Reset Continued…

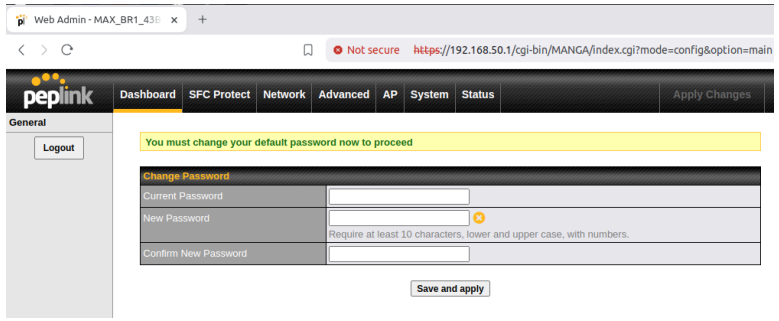
PoE Network Switch Prep (TL-SG1005p)


1. Connect an ethernet cable from your local internet (either a router or network switch) into the top right WAN port. This will provide the router with internet for the next steps.
2. Connect the power cable for the box to the bottom right port to power on the box.


1. Once the router has been powered on for about 20 seconds, use a small paperclip or SIM reset tool and hold the reset button on the router (circled in orange) for about 15 seconds then release.

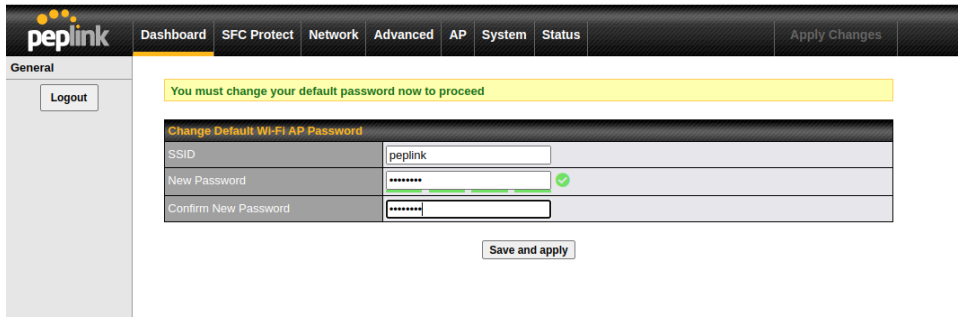
# Router Configuration


1. Open an internet browser and navigate to 192.168.50.1. If the page does not load, repeat the reset step from the previous page.
2. It may warn you about a security risk – ignore this and proceed to the router configuration website.
3. Type in ‘admin’ for both the username and password and then login.



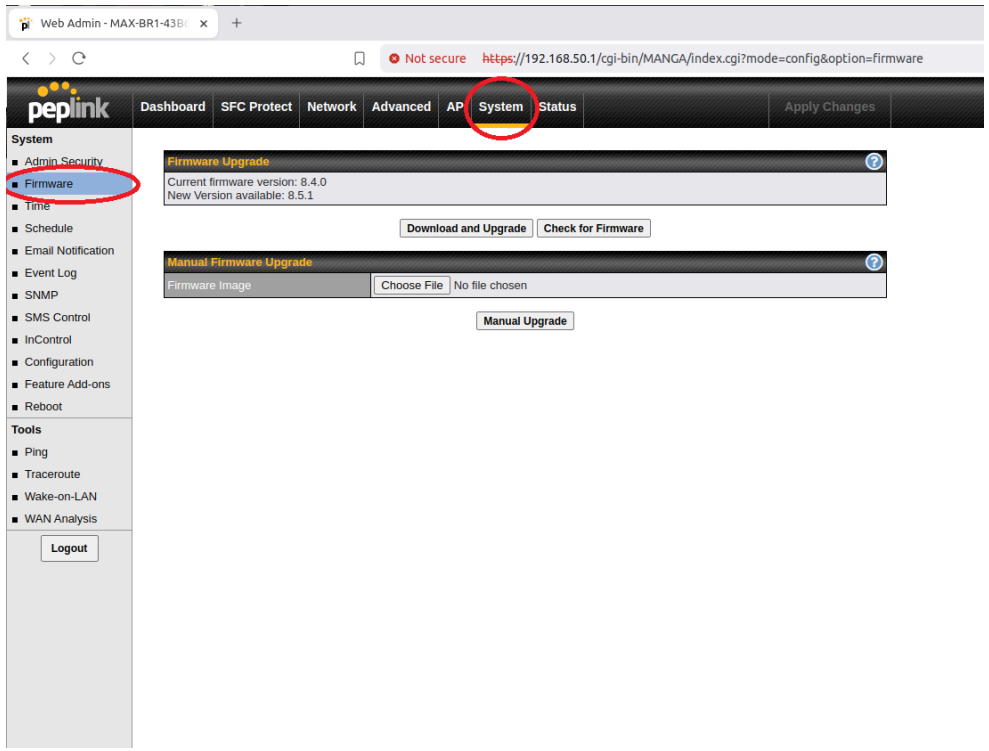

1. It will ask you to reset the password – type in ‘admin’ for the current password.
2. Set the new password to: ‘PepwaveAdmin123’

# Router Configuration Continued…




1. It will then ask you to setup the wifi.
2. Enter in peplink for the SSID
3. For the passwords, enter: ‘abcdabcd’

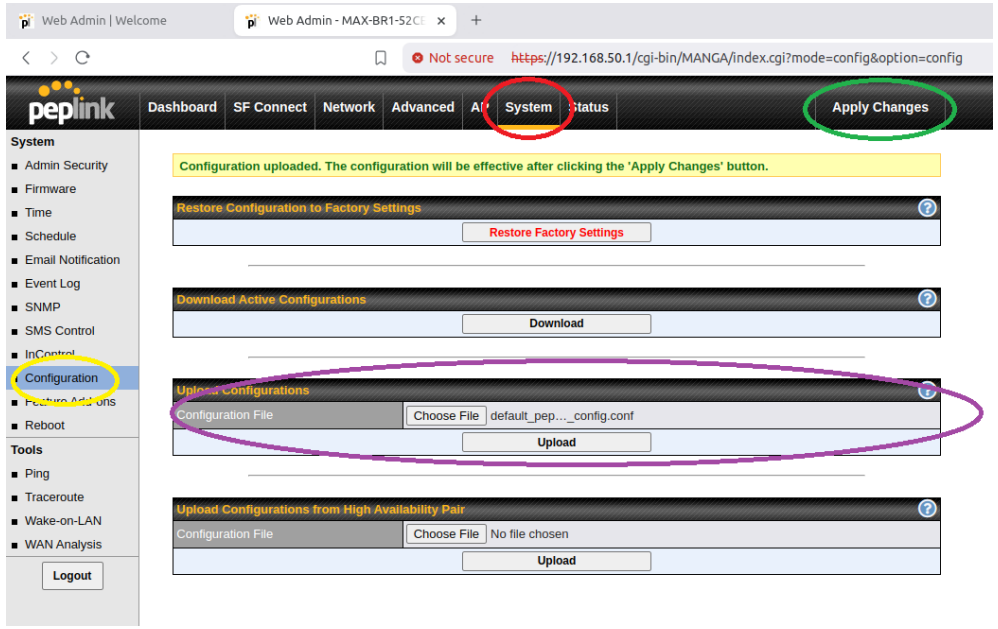
This will be disabled when we load the config at a later step, but the router forces you to enter in a password to get to the next step.




1. Once logged in, click on ‘System’ at the top
2. Then click on firmware.
3. Click ‘Check for Firmware’
4. It should then give you an option for ‘Download and Upgrade’, click that to begin the update.
5. This will take about 5 minutes depending on your internet connection.

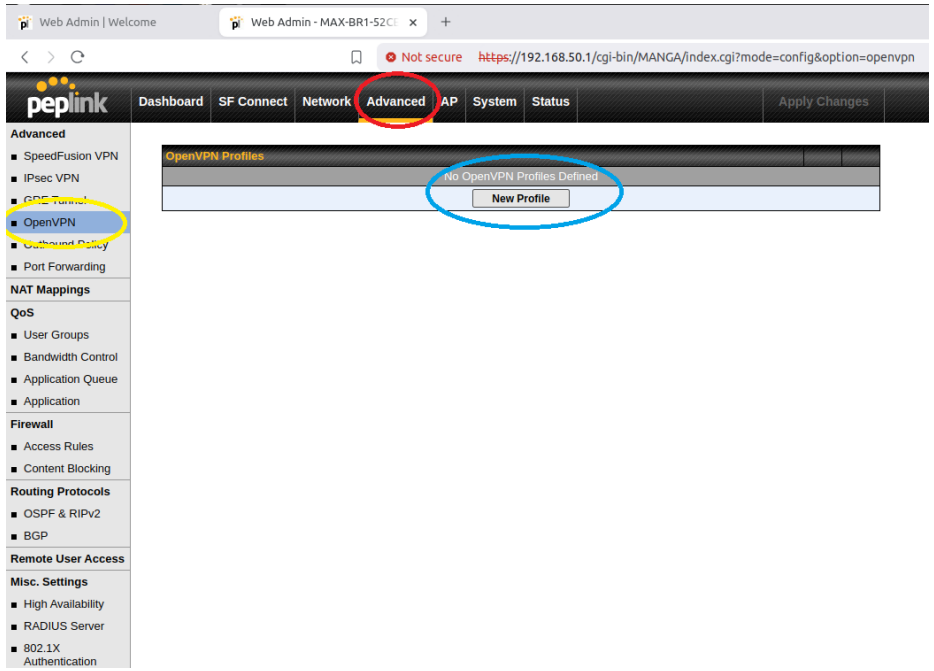
# Router Configuration Continued…


1. Once the update is complete, log back onto 192.168.50.1 with your username and password (admin and PepwaveAdmin123).




1. Navigate to ‘System’ at the top (circled in red)
2. Click on ‘Configuration’ on the left side (circled in yellow)
3. Download this file to your local computer: https://support.safeguardsolutions.org/default_pepwave_config.conf
4. Upload the configuration you just downloaded under the ‘Upload Configuration’ section (circled in purple).
5. Click Upload.
6. Click ‘Apply Changes’ at the top right.

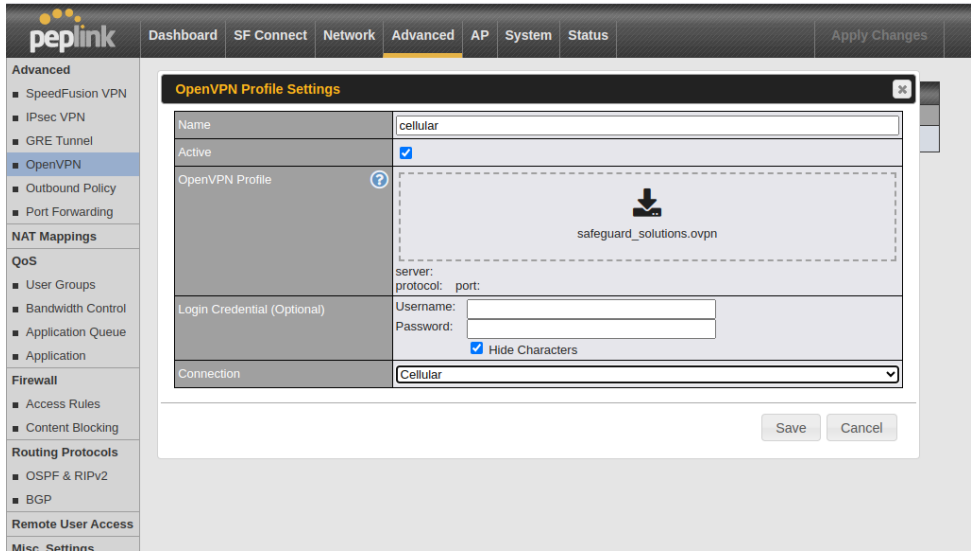
# VPN Installation



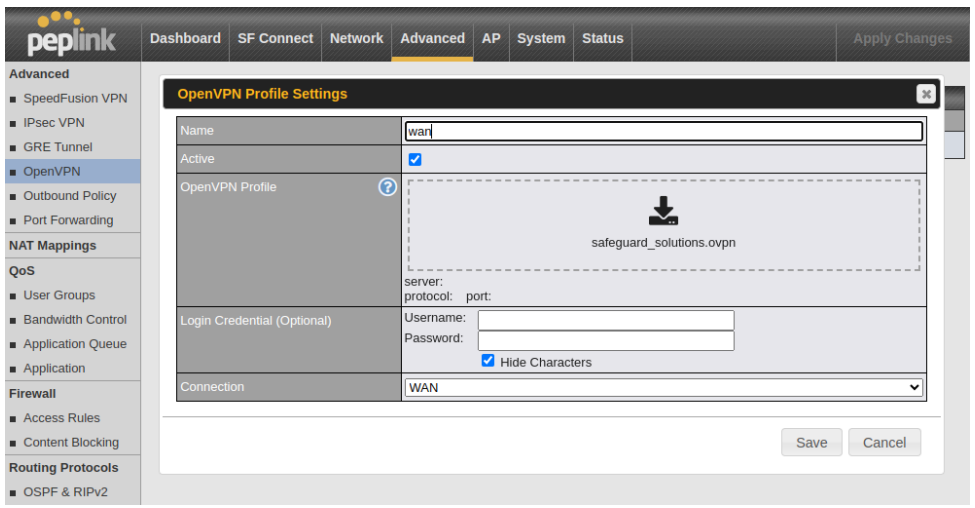

1. Every box will require a unique VPN configuration file. You cannot use the same VPN config for multiple boxes. If you need VPN configs, please request them from support@safeguardsolutions.org. Be sure to include the location of where the box will be deployed.
   Please note this step can be skipped and done later if you are waiting for VPNs from Safeguard Solutions.

2. Click ‘Advanced’ at the top (circled in red).
3. Click ‘OpenVPN’ on the left (circled in yellow).
4. Click ‘New Profile’ in the middle (circled in blue)

# VPN Installation Continued…



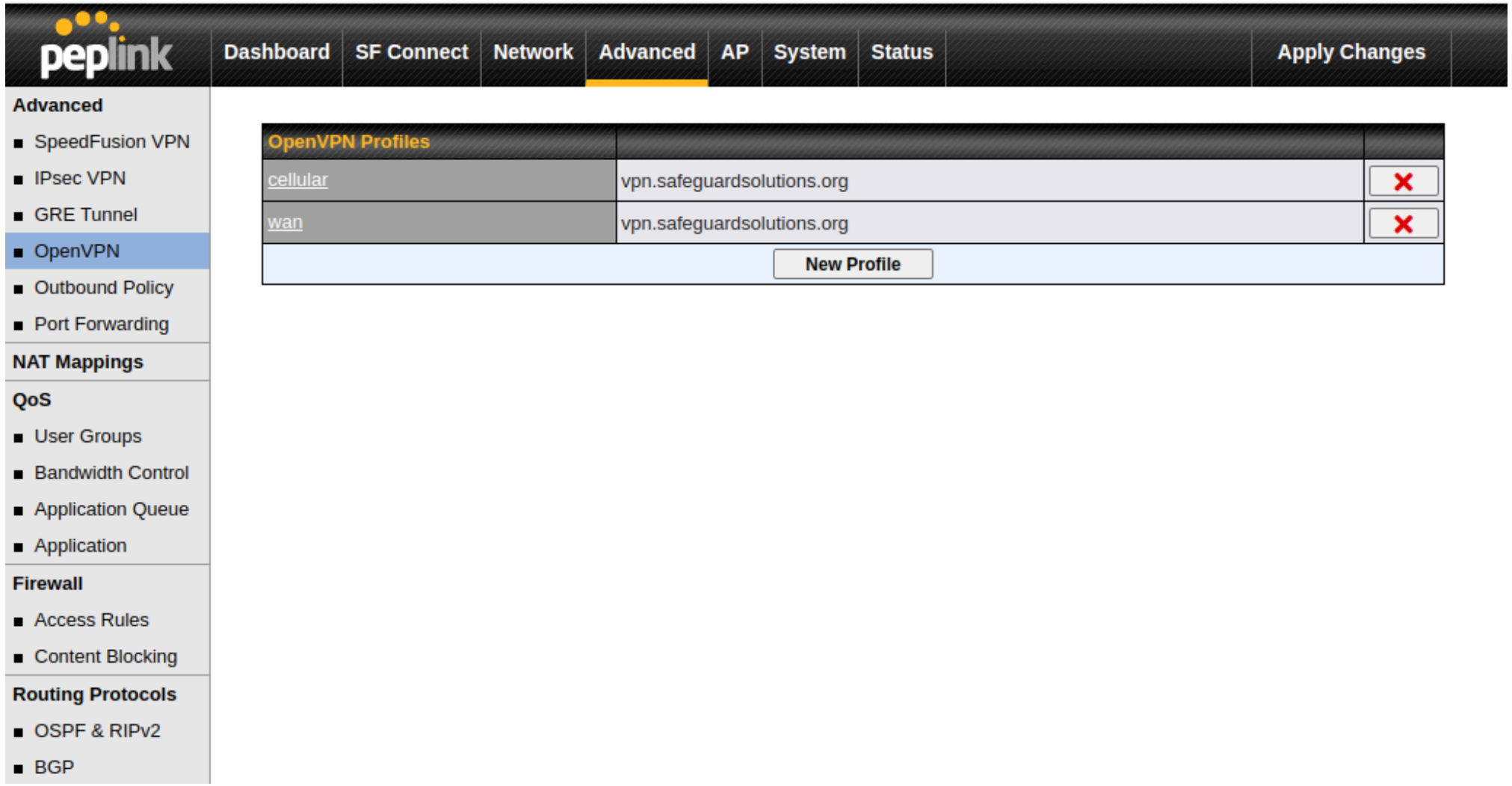

1. Fill out the form:
    1. Name: Cellular
    2. Connection: Cellular
    3. Drag the VPN for this box into the ‘OpenVPN Profile’.
    4. Login Credentials are left blank
    5. Click ‘Save’




1. Fill out the form:
    1. Name: WAN
    2. Connection: WAN
    3. Drag the VPN for this box into the ‘OpenVPN Profile’.
    4. Login Credentials are left blank
    5. Click ‘Save’

# VPN Installation Continued...

1. This should be the end result of the VPN Installation.



# Web Relay Reset


1. Unplug the router (circled in yellow)
2. Unplug your computer's ethernet cable from the router (circled in red) and reattach the ethernet cable that was plugged in there (Should be from the web relay).
3. Replace the ethernet cable from the web relay circled in blue with the ethernet cable going to your computer.
4. Your laptop or desktop computer should now be connected to the Web Relay.

# Web Relay Reset Continued...

1. You now need to set your laptop or desktop computer's ip address to a static ip of: 192.168.1.5
2. For Windows, follow the instructions to the right.
   Please note depending on your version of Windows the instructions could vary slightly.
3. For other operating systems or other versions of Windows you may need to search the internet for proper instructions.

**For Windows:**
**Step 1: Open Network and Sharing Center**

1. **Right-click** on the **Network** icon in the bottom-right corner of the taskbar (next to the clock).
2. Click on **Open Network & Internet settings**.
3. In the new window, click on **Network and Sharing Center**.

**Step 2: Access the Properties of Your Network Adapter**

1. In the **Network and Sharing Center**, under the section labeled **Active Networks**, click on the link next to **Connections** (it will show the name of the network you're connected to, like "Ethernet" or "Wi-Fi").
2. This will open the **Status** window of the selected network. Click on the **Properties** button.

**Step 3: Change the IP Configuration**

1. In the **Network Connections** window, look for **Internet Protocol Version 4 (TCP/IPv4)** in the list.
2. Select **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties**.

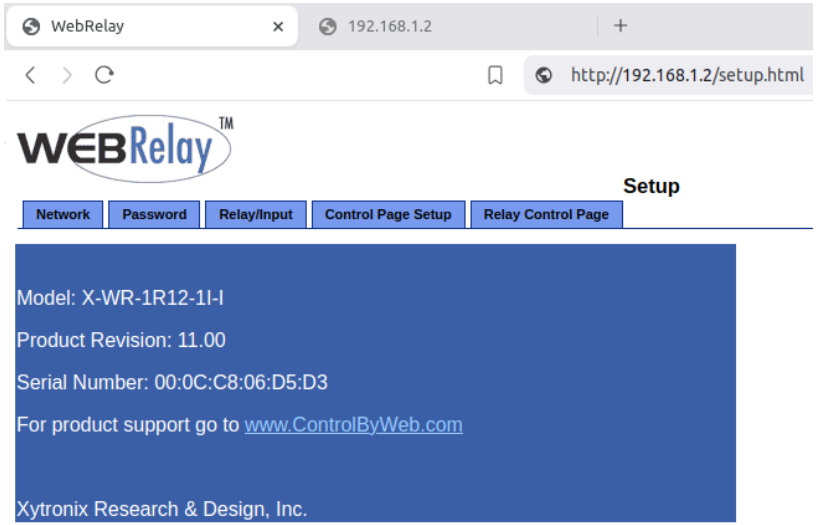
**Step 4: Set the Static IP**

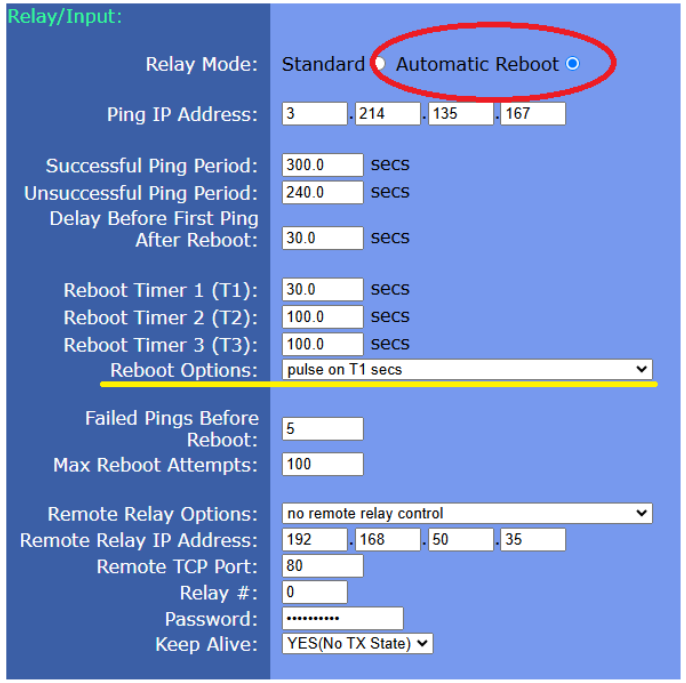
1. In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, select the option **Use the following IP address**.
2. Enter the following information:
   - **IP Address**: 192.168.1.5 (This is the static IP address you want to assign.)
   - **Subnet Mask**: 255.255.255.0 (This is the default subnet mask for most local networks.)

**Step 5: Save and Close**

## Web Relay Reset Continued…


1. To reset the web relay, you must hold in the reset button while applying power.
2. Using a small paperclip or a SIM ejector tool, press it into the small reset hole (circled in red).
3. While holding in the reset button, plug in the power adapter circled in purple.
4. Continue to hold until you hear an audible click, then remove the paperclip from the reset hole.
5. You will know that the reset worked because the power supply will begin making the audible click about every 10 seconds. During this time, the power is cycling with every click.



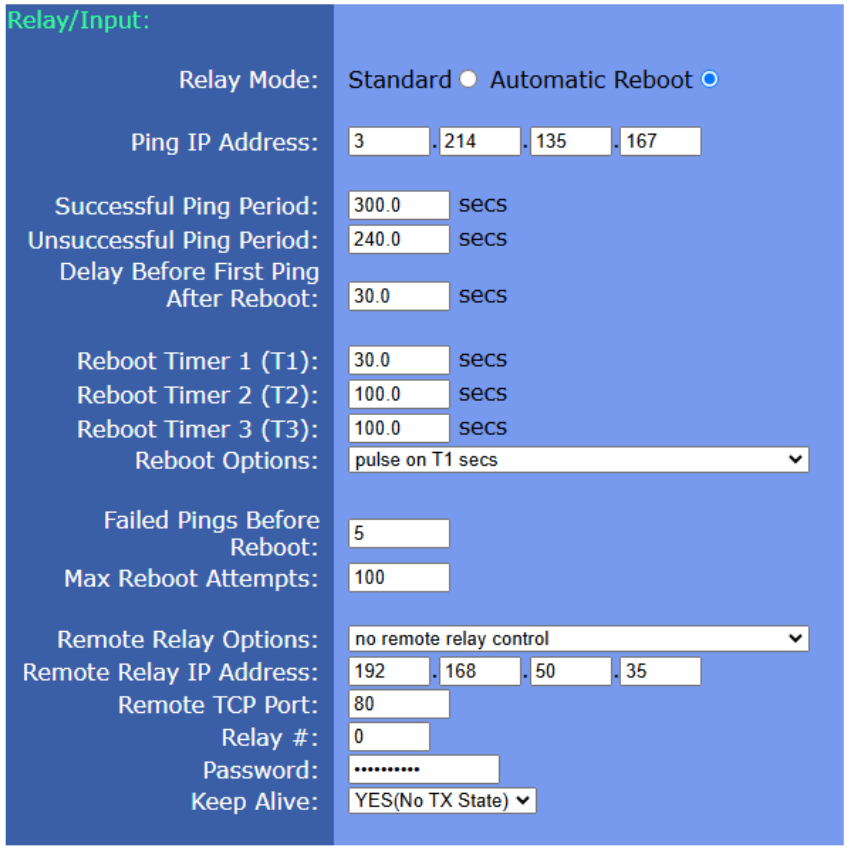




# Web Relay Reset Continued…

1. Open an internet browser and navigate to http://192.168.1.2/setup.html
2. Click on ‘Relay/Input’
3. Enter in:
    1. Username: admin
    2. Password: webrelay
4. Click ‘Automatic Reboot’ (circled in red)
5. Click Submit
6. Change “Reboot Options: ” to “pulse **on** T1 secs” (circled in yellow)
7. Click Submit.
8. The box should now stop the rapid rebooting and clicking sound.

    Depending on how fast you complete these steps, you may need to reload the page a few times.

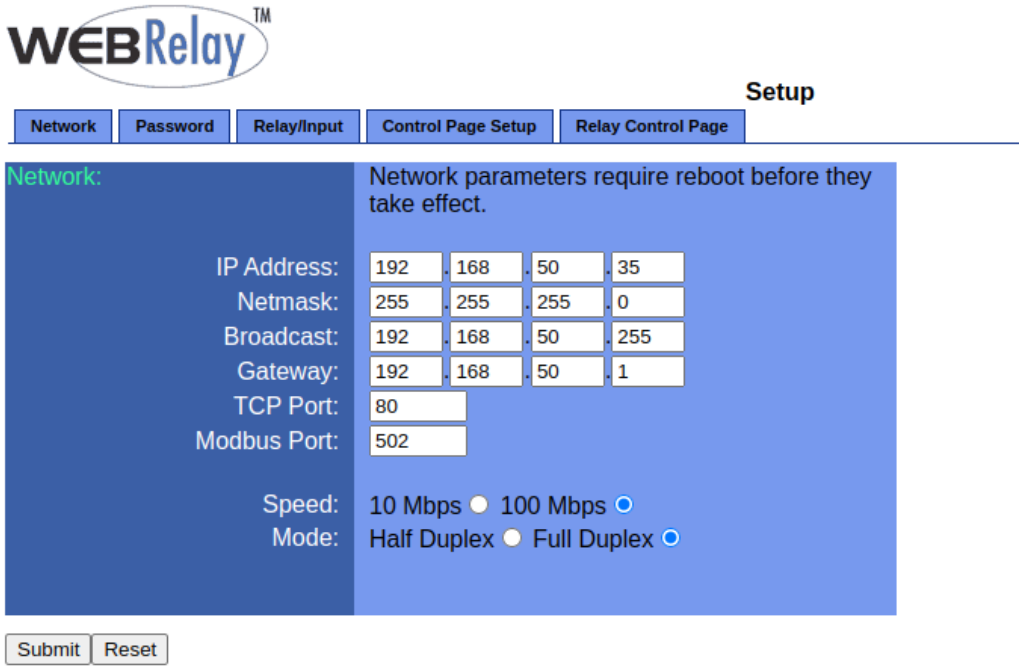
# Web Relay Reset Continued…




1. Change the following settings:
2. Ping IP Address: 3.214.135.137
3. Successful Ping Period: 300
4. Unsuccessful Ping Period: 240
5. Delay Before First Ping After Reboot: 30
6. Reboot Timer 1 (T1): 30
7. Reboot Timer 2 (T2): 100
8. Reboot Timer 3 (T3): 100
9. Remote Relay IP Address: 192.168.50.35
10. Click Submit

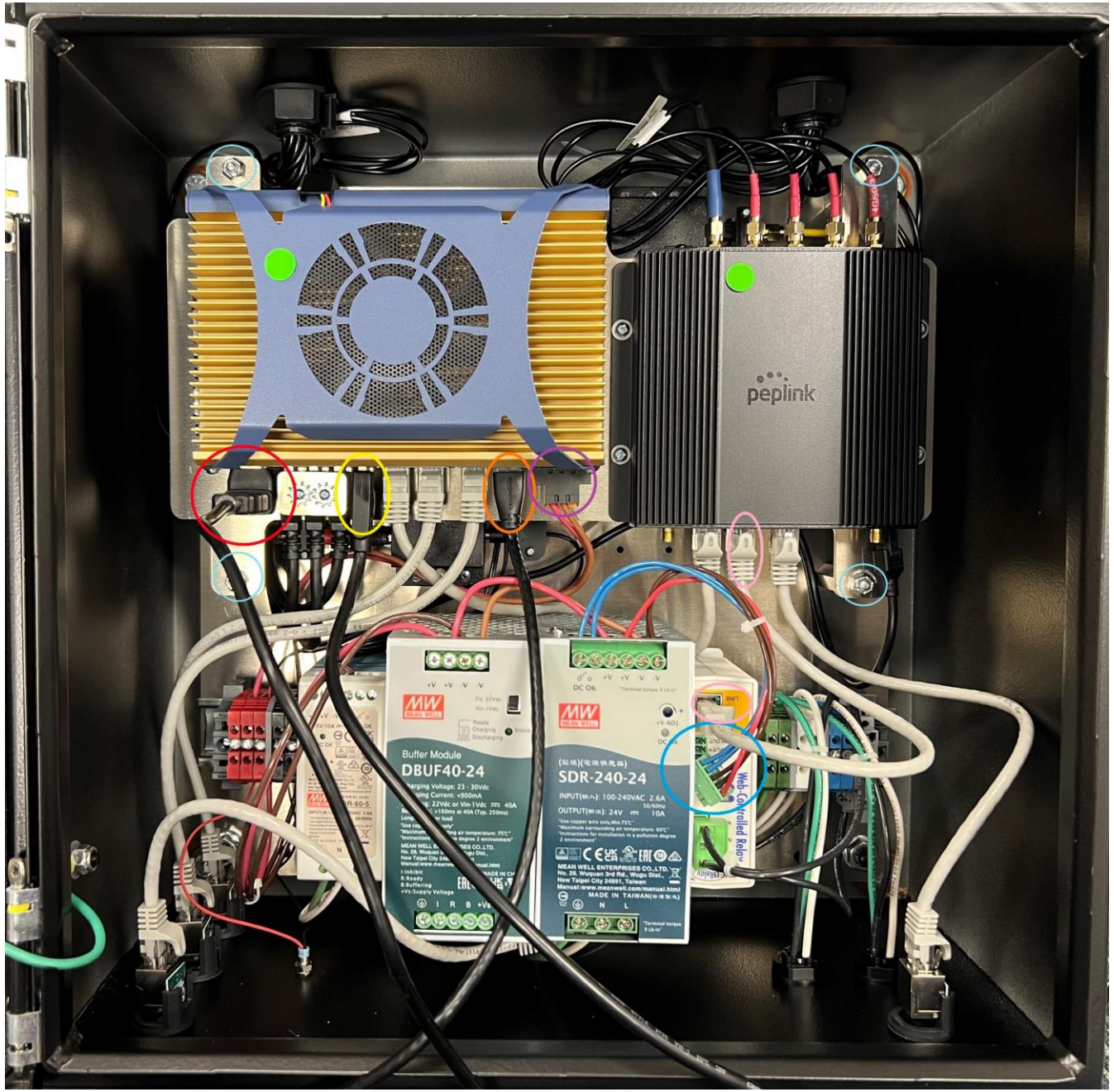
Your config should match the config on the left.

# Web Relay Reset Continued…




1. Click on ‘Network’ at the top left.
2. Change the following settings:
3. IP Address: 192.168.50.35
4. Broadcast: 192.168.50.255
5. Gateway: 192.168.50.1
6. Speed: 100 mbps
7. Mode: full duplex
8. Click Submit.
9. The web relay is now configured.

# Reassembly




1. Unplug the power supply to the box.
2. Reattach the power cable to the computer (circled in purple)
3. Reattach the nuts to secure the metal plate (circled in light blue)
4. Unplug the web relay power cord (circled in blue).
5. Reattach the ethernet cable from the router to the web relay (circled in pink).
6. Remove the last most ethernet cable (circled in orange) and connect an ethernet cable connected to internet from your router or network switch.
7. Connect your USB Hub to the computer (circled in yellow).
    1. Make sure to connect:
        1. Keyboard and mouse
        2. Bootable USB drive with Ubuntu 24.04 (see next page)
8. Connect your HDMI cable to your monitor (circled in red)

# Create Ubuntu Bootable USB Drive

**1. Download Ubuntu 24.04 ISO**

- Go to the official Ubuntu download page and download the Ubuntu 24.04 ISO file.

**2. Prepare a USB Drive**

- You'll need a USB drive with at least 4 GB of storage (8 GB or more is recommended for a smoother experience).

**3. Create a Bootable USB**

- You can create a bootable USB drive on either a Linux, Windows, or macOS system. Here are methods for each:
  - **On Windows:**
    - **Use Rufus:**
      - Download and install Rufus.
      - Open Rufus and select the Ubuntu 24.04 ISO you downloaded.
      - Choose your USB drive.
      - Leave other settings as default, but make sure the partition scheme is set to MBR (for BIOS/legacy boot) or GPT (for UEFI).
      - Click Start to create the bootable USB.
  - **On macOS:**
    - **Use Etcher:**
      - Download and install Etcher.
      - Open Etcher and select the Ubuntu 24.04 ISO.
      - Choose your USB drive and click Flash to create the bootable drive.
  - **On Linux:**
    - **Use Make Bootable USB Stick:**
      - Right click on the Ubuntu 24.04 ISO.
      - Select “Make Bootable USB Stick”.
      - Select the USB stick from the drop down.
      - Click “Write”.

# Installing Ubuntu 24.04

**Steps to Boot from the USB Drive and Install Ubuntu**

**1. Plug in the Bootable USB Drive**

Insert the bootable USB drive into the computer or USB hub.

**2. Access the BIOS/UEFI**

Plug in the power supply to the computer.  Enter the BIOS/UEFI settings by pressing a specific key during boot (typically Del or F2). The key varies by manufacturer, so check the screen during boot or consult the manual.

**3. Change Boot Order (If Necessary)**

In the BIOS/UEFI, find the Boot Order settings.
Set the USB drive as the first boot device. This will ensure the computer boots from the USB drive instead of the hard drive.

**4. Save Changes and Restart**

Save the changes and exit the BIOS/UEFI.
The system will reboot, and it should boot from the USB drive, showing the Ubuntu installation menu.

# Installing Ubuntu 24.04 - Continued

**Begin Installing Ubuntu 24.04**

**1. Choose the Installation Type**

After booting from the USB drive, you'll see the Ubuntu installation menu. Select Install Ubuntu.

**2. Choose Language**

Select the English language and click Continue.

**3. Keyboard Layout**

Choose your keyboard layout and click Continue.

**4. Prepare Installation Disk**

You will be asked how to install Ubuntu: Erase disk and install Ubuntu.

**5. Select the Disk/Partition for Installation**

Make sure you select the correct drive and not the current USB.

**6. Timezone & User Setup**

Choose your timezone.

Create a user account with the following username and password:

- Username: guard
- Password: safeguard

**7. Installation Progress**

The installer will copy files and install Ubuntu. This process can take some time, depending on the speed of the USB drive.

# Installing Ubuntu 24.04 Continued

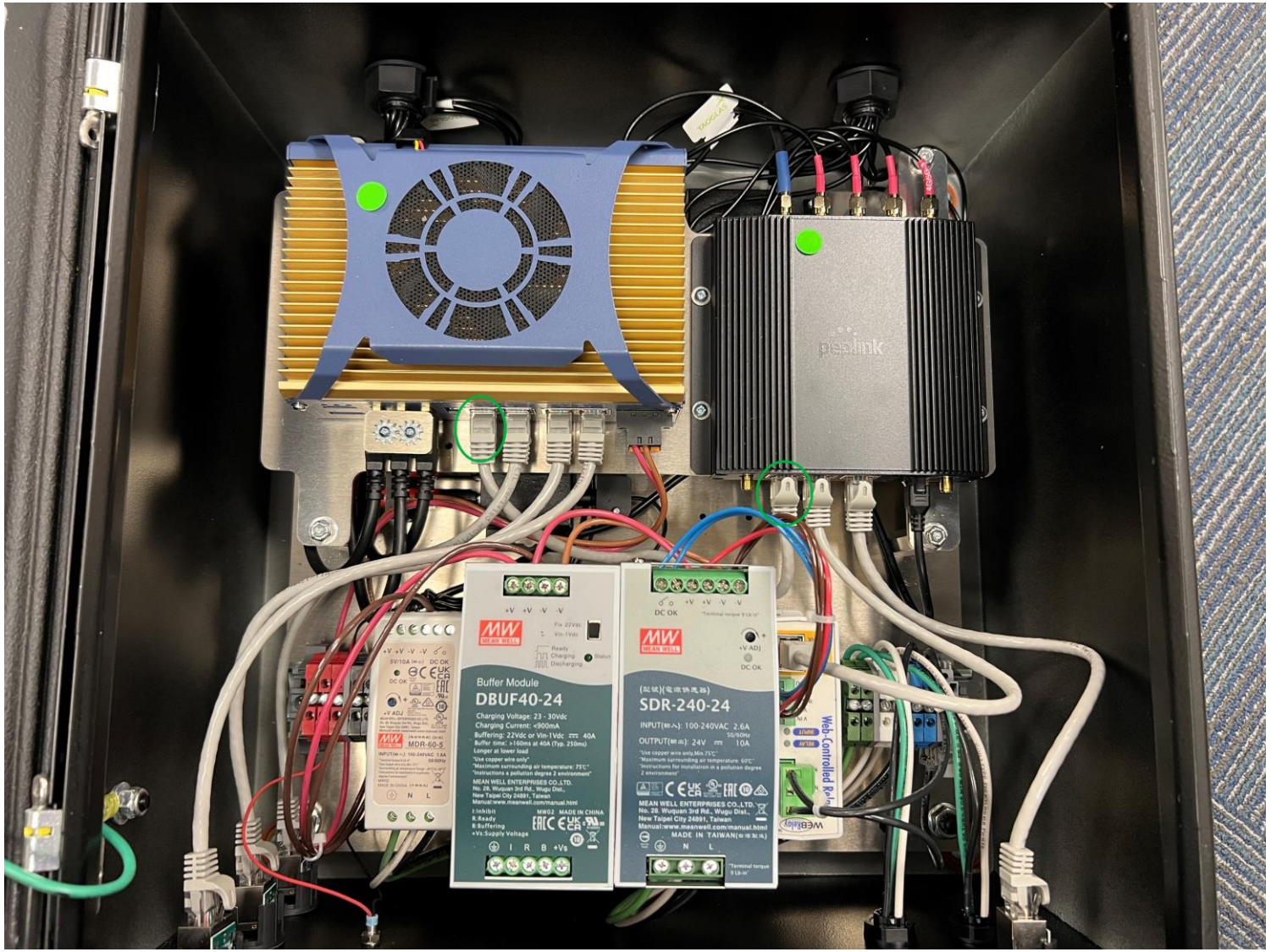
**1. Reboot After Installation**
Once the installation is complete, the system will ask you to restart.
It will prompt you to remove the USB drive and then press enter.

**2. Boot into Ubuntu 24.04**
After rebooting, you should be able to boot into Ubuntu 24.04 on the system.

**3. Log into Ubuntu 24.04**
- After login, open a terminal and run the following commands:
- sudo apt update
- sudo apt upgrade
- sudo apt-get install openssh-server

**5. Reboot the machine**

# Final Steps




1. Your box should now be fully configured and assembled.
2. Reference the picture on the left to your finished product to ensure everything has been reassembled correctly.
3. Please ensure that the ethernet cable going from the computer to the router is in the first slot of the computer. (circled in green)

   The 1st port on the computer is configured slightly different in the computer bios and the router will malfunction if it is connected to a different port on the computer.

# Final Steps: Testing and Software Installation


**To test that the box is working correctly and to complete the setup, the box must be connected to the internet:**

1. **With your local internet (Preferred Method):**
    1. Connect an ethernet cable with internet from your local router or network switch into the wan port.
    2. Power the box up.
2. **With an Activated Sim Card and good cell reception:**
    1. If an ethernet connection is not possible, power the box up in a location with an activated sim card and good cell connectivity.
    2. Power the box up.
3. **Confirm With Safeguard:**
    1. Email support@safeguardsolutions.org and ask for a status confirmation.
    2. We will confirm that the box is up and accessible and begin installing additional drivers and software to complete the conversion.
    3. You will need to leave the box powered on and connected while we complete this step.
    4. You will receive a confirmation email when the box is fully configured and ready to be deployed!