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Application Note #5494
Upgrading Plus Ethernet Radio Firmware
September 9, 2013

The Plus Ethernet transceivers share a common firmware upgrade platform and process using the FreeWave TFTP Server and a FreeWave-supplied firmware upgrade file. This application note details the step-by-step process to upgrade firmware either locally (directly connected to the transceiver using an Ethernet cable) or over the air (OTA).

> **Important:** Upgrading firmware locally is much faster than if done OTA. Only attempt an OTA firmware upgrade if the link is stable and of good quality. If the link is unstable or poor, the firmware upgrade is likely to fail.

Upgrading firmware does not change any transceiver settings. The same is not true for downgrading firmware. If you are considering downgrading the firmware version, contact FreeWave Technical Support for additional information.

> **Note:** The instructions provided in this application note are also available in the user manuals for the Ethernet transceivers.

Before You Begin

Before you can upgrade an Ethernet transceiver's firmware, complete the following:

- Create a folder on your computer desktop called **Root**.
- Download the firmware upgrade file from www.FreeWave.com and save it in the **Root** folder on your desktop. If you are unsure which file you need or require assistance, contact FreeWave Technical Support.
- Download and install the TFTP Server software, also available on www.FreeWave.com.
- Ensure that you know the IP address of the transceiver you are updating, and ensure your computer's IP address is in the same network as the transceiver you are updating. To program a transceiver, the computer used must have an IP address that shares the first three numbers in its IP address as that of the transceivers in the network. For example:

  Computer - 192.168.111.99
  Gateway Transceiver - 192.168.111.100
  Endpoint or Repeater Transceiver - 192.168.111.101

  For instructions about how to change the IP address on your computer, see "Changing Your computer's IP Address" at the end of this document.

Step 1 – Configuring the FTP Server

The FreeWave TFTP Server enables the transfer of the firmware file from your computer to the transceiver. After you download the FreeWave TFTP Server program, run the installer to gain access to the executable program, fwTFTP.exe. After the installation, you are ready to configure the TFTP Server.

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1. From the Windows Start menu, select **All Programs > FreeWave Technologies >fwTFTP > fwTFTP.exe**.

    If you installed the TFTP server in another location, follow that directory path and open the fwTFTP.exe file.

2. After the application displays, click **Configure** to display the Server Configuration dialog box.

3. In the **Root Folder** field, click the icon next to the field and locate the folder in which you saved the firmware upgrade file.

4. Click **OK** and verify that the folder is listed in the **Root Folder** field.

5. Click **OK** to return to the main TFTP Server window.

6. Click **Start Server** in the upper left of the TFTP Server window.

    If the button and text are gray, the server is started.

7. Minimize (*do not close*) the FreeWave TFTP Server window and continue with the next step.

Step 2 – Launch the Web Interface and Start the Upgrade

After you have configured the TFTP Server, you are ready to complete the firmware upgrade using the transceiver's configuration web pages.

1. Open your preferred web browser, such as Internet Explorer or Firefox, and enter the IP address of the transceiver you are upgrading in the **Address** field.

    If are upgrading a local transceiver using an Ethernet cable connection, connect an Ethernet cable from your computer to the Ethernet port on the transceiver and ensure the transceiver is powered on.

2. Enter the user name and password to access the transceiver and click **OK**.

The default user name and password is **admin**. If the user name and password have changed, enter the appropriate credentials to log in.

Note: If you have forgotten the user name and password to access the transceivers, contact FreeWave Technical Support.

3. In the Pages menu on the left side, click **Tools** to display the Tools page.

4. In the **Address of TFTP Server** field in the TFTP Firmware Upgrade section of the page, enter the IP address of the computer on which the TFTP Server is installed (*not* the transceiver's IP address).

5. In the **File Name** field, enter the exact name of the firmware upgrade file you saved in the Root folder on your desktop.

    If the file name includes an extension, such as .bin, include that in the name. For example, **http2_22.bin**.

    To view file extensions in Windows 7, from within Windows Explorer, click **Organize** in the tool bar at the top of the window and select **Folder and search options** from the drop-down list. Click the **View** tab and ensure that the **Hide extensions for known file types** option is not selected. Click **OK**.

    To view file extensions in Windows XP, from within Windows Explorer, click **Tools** and select **Folder Options**. Scroll down and then click **Folder and search options**. Click the **View** tab and ensure that the **Hide extensions for known file types** option is not selected. Click **OK**.

6. Click **Upgrade Firmware**.

    The transceiver attempts to retrieve the firmware file from your computer. To verify that this is working properly, or to see the status of the firmware retrieval, open the FreeWave TFTP Server application that you minimized. If the firmware file is being uploaded to the transceiver, there is a new entry in the FreeWave TFTP Server window, with a progress bar.
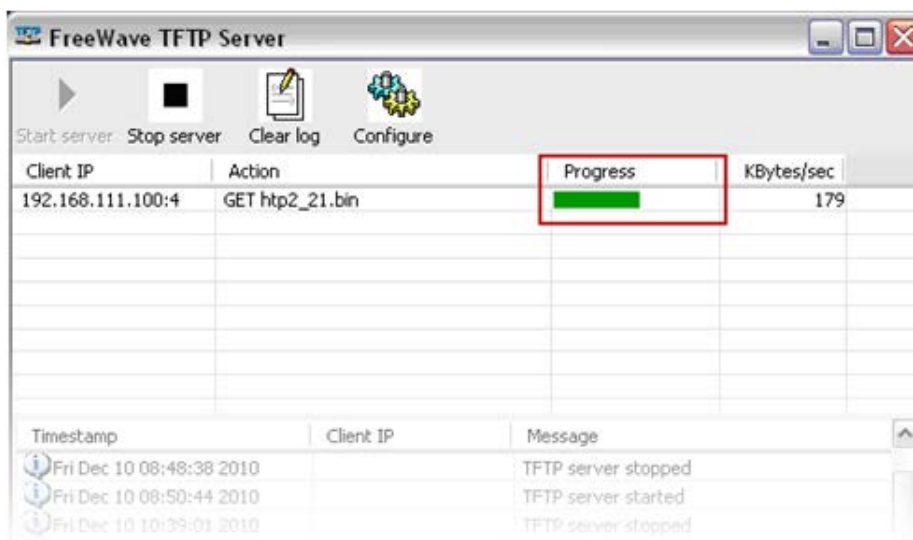
Connected locally with an Ethernet cable, the upgrade can take less than 30 seconds. If you are upgrading a transceiver over the air, the process can take significantly longer, depending on the link quality.

On the Tools page in the configuration web interface, the status of the firmware upgrade process updates as the status changes. After the firmware upgrade is complete, the transceiver reboots and returns to its programmed state.
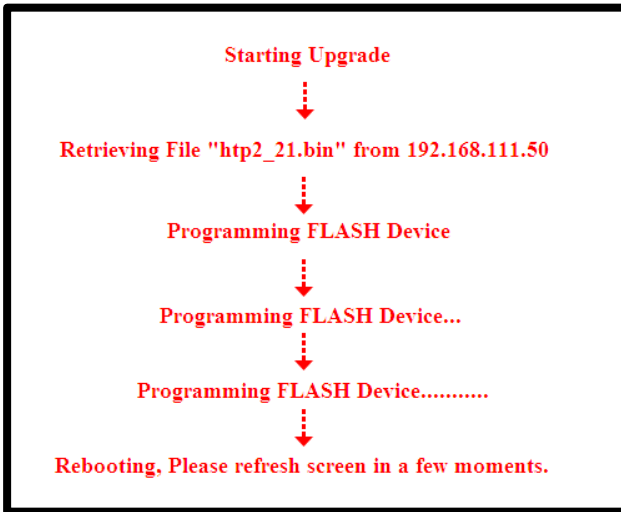
Step 3 – Verifying the Upgrade

After the upgrade has been installed, the radio reboots to its previously programmed state. After the reboot is complete, verify that the firmware upgrade was successful.

1. Refresh the transceiver's web pages by refreshing your browser window or opening a new session.

   It may be necessary to clear your browser's cache and cookies. This process varies depending on the browser you are using. If you need assistance, contact FreeWave Technical Support.

2. From the Pages menu on the left side, click **Status** to display the Status page.

   This page loads by default when you log in.

   The **Firmware Version** field in the Hardware Information section of the page displays the current firmware version installed. Ensure this version matches the firmware version to which you were upgrading.

   You have completed the firmware upgrade process for your Ethernet transceiver!

   Important: If you are connected to a local transceiver via Ethernet cable, do not disconnect the Ethernet cable until the reboot has completed and the COM port LEDs are no longer blinking.

Common Problems and Solutions

"File Not Found" in either the web interface or the FreeWave TFTP Server
Check the filename of the firmware upgrade file. This must be typed *exactly* as the file is named. If you have checked the name and are still unsuccessful, check the extension of the file. f your computer does not display file name extensions, see the tip on page 3 to display file extensions.

Firmware upgrade times out
Ensure you are connecting to the proper IP address and that the radio is powered on. If you are able to access the web interface, but the firmware upgrade times out, check to make sure the FreeWave TFTP Server is configured properly and is started.

Firmware upgrading taking a long period of time
If the firmware upgrade is being done over the air, it can take a significant amount of time to complete the file transfer. The time can increase if the quality of the link is poor. FreeWave recommends only attempting an firmware upgrade over the air with links that are stable and of high quality.

## Changing Your Computer's IP Address

To configure an Ethernet transceiver, a static IP address on the same subnet may need to be assigned to the router/switch and/or the computer used to access the transceiver's configuration parameters. The following sections detail how to change the IP address of your computer in Windows XP, Windows 7, and Windows 8 (using the "classic" menu interface).

Note the following if you need to change the IP address of your computer:
- The computer and the transceiver you are connecting to cannot have the same IP address.
- If you are in an environment with a wireless network to which your computer links, you may need to disable wireless access to successfully connect to the transceiver.

To change the IP address in Windows 7 and Windows 8 (using the "classic" menu interface):

1. From the Windows Start menu, select **Control Panel**.

2. If you are viewing the Control Panel by Categories, select **Network and Internet**.

    If you are viewing the Control Panel by icons, select Network and Sharing Center and continue with step 5.

3. In the Network Sharing Center group, click **View network status and tasks**.

    The middle of the displayed screen shows your active networks.

4. Within your active networks, click **Local Area Connection** to display the Local Area Connection Status window.
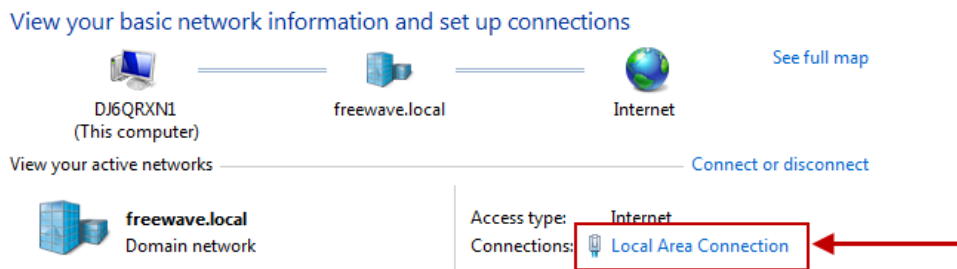
5. Click **Properties** to display the Local Area Connection Properties window.

6. Select **Internet Protocol Version 4 (TCP/IPv4)** in the list and click **Properties**.
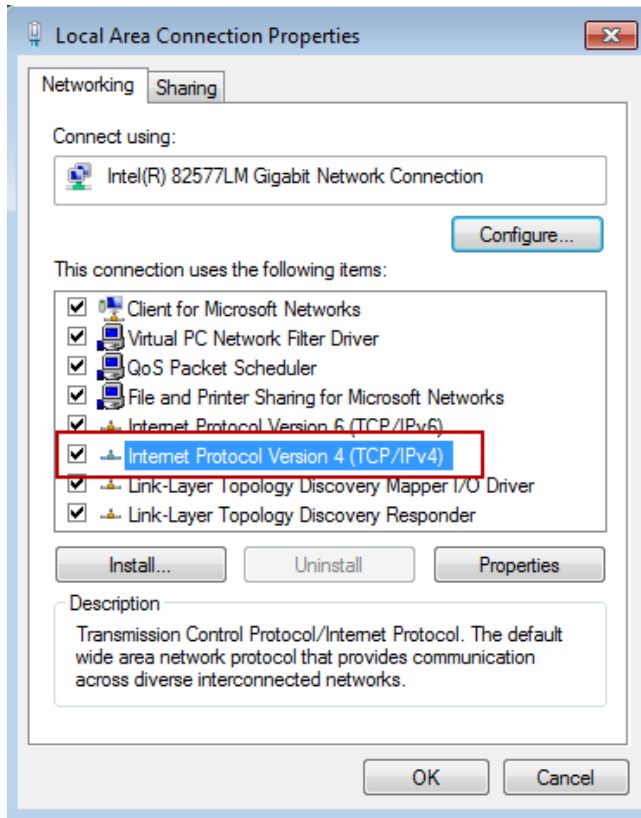
At the time of this publication, FreeWave Ethernet transceivers support only IPv4 addresses.

7. Select the **Use the following IP address** radio button, and enter an appropriate IP address in the **IP Address** field.

8. Press **Tab** and Windows enters a Subnet Mask of 255.255.255.0 automatically.

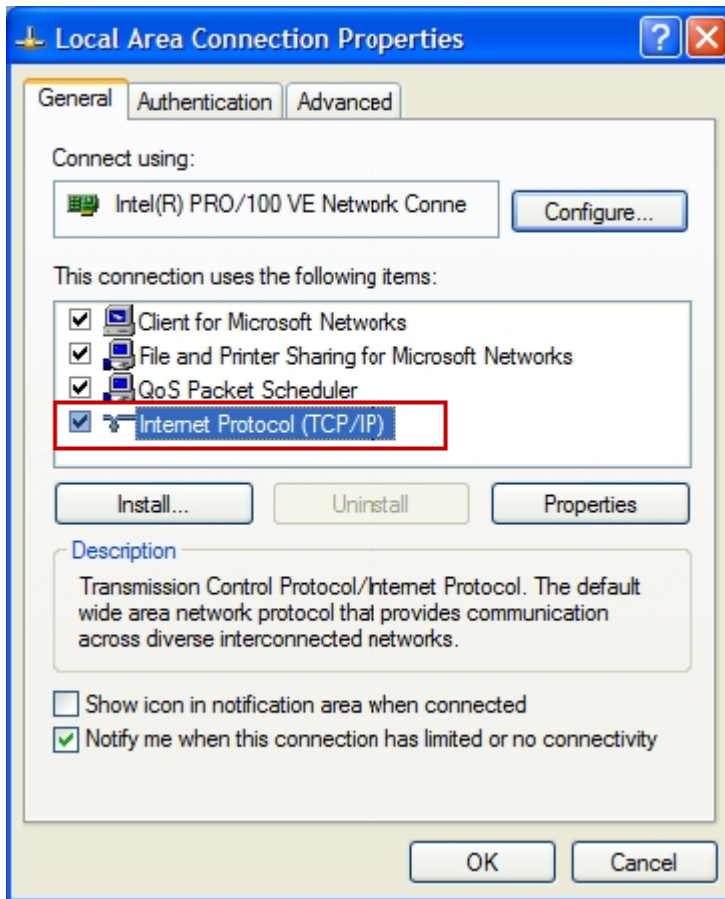9. Click **OK** to accept your changes and **OK** again to close the Local Area Connection Properties window.

To change the computer IP address on Windows XP:

1. From the Windows Start menu, select **Control Panel** or **Settings > Control Panel**.

2. Double-click the Network Connections icon.

3. Right-click **Local Area Connection** and select Properties to display the Local Area Connection Properties window.
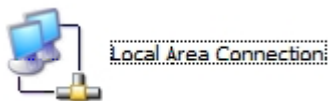
> **Note:** Depending on the Network setup, different icons may display here. Contact your IT Department if you cannot find the proper icon.

4. Click **Internet Protocol (TCP/IP)** to highlight it, then click **Properties** to display the Internet Protocol (TCP/IP) Properties window.

5. Select the **Use the following IP address** radio button, and enter an appropriate IP address in the **IP Address** field.

6. Press **Tab** and Windows enters a **Subnet Mask** of 255.255.255.0 automatically.

7. Click **OK** to accept your changes and **OK** again to close the Local Area Connection Properties window.