

## Recovering A Wired Ethernet Device's Firmware Via TFTP

This document details the method for recovering a wired Ethernet device's application firmware image via TFTP. This document applies to those ICC wired Ethernet devices that use the Finder utility for network discovery. This document is not applicable for wireless Ethernet devices. Recovering an application firmware image via TFTP is typically only necessary when a device's on-board application firmware has become corrupted. The most common reason for a device's application firmware to become corrupted is due to an error during FTP transfer of a new firmware image: if the firmware upload FTP session experiences a problem and is prematurely terminated, the application image in the device's on-board flash memory will be only partially updated, resulting in an invalid firmware image that will fail its checksum calculation upon the next subsequent reboot of the device. If a device's application firmware is not corrupt, then FTP is the preferred method of updating the application firmware (refer to the applicable user's manual for more information on FTP transfers).

### Items Required

1. A DHCP server with the ability to set options 66 and 67
2. A TFTP server
3. The device's desired application firmware image file

### General Procedure

This general procedure is intended for advanced users already familiar with the configuration and operation of DHCP and TFTP servers. For a specific example, refer to the "Example" section below.

1. Configure the DHCP server options.
  - a. Set option 66 to the IP address of the TFTP server.
  - b. Set option 67 to the filename (including extension) of the desired firmware image.
2. Configure the TFTP server. The TFTP server may also reside on the same machine hosting the DHCP server.
  - a. Confirm that the IP address of the TFTP server matches DHCP option 66.
  - b. Confirm that the name of the desired firmware image file matches DHCP option 67 and that the file is located in the base directory designated by the TFTP server.
3. Reboot the device. If the application firmware image is corrupt, the device will automatically attempt to contact the DHCP server in order to obtain the settings of options 66 and 67. If DHCP server contact is successful, the device will then begin downloading the application firmware image file from the TFTP server. Refer to the TFTP server's activity log to confirm that the application firmware image file has indeed been downloaded by the device. Once the firmware image has been fully downloaded, it will then be used to reprogram the device's flash memory. Allow ample time (at least 1 minute) for the device to then automatically reboot.

### Example

This step-by-step example is intended for personnel unfamiliar with either DHCP or TFTP servers, or those that desire a specific example. Various commercial and freeware DHCP and TFTP servers are available, and some (such as the one that will be used in this example) combine both DHCP and TFTP functionality in the same package. For simplicity, this example uses the Tftpd32 software tool to implement the TFTP and DHCP servers. This example equally applies to Tftpd64, which should be used on a 64-bit system.

1. Download and install (or extract) the latest Tftpd32 software from <http://tftpd32.jounin.net/>.
2. Ensure that no other DHCP servers are running on the network.

3. Download and store the desired application firmware file into a working folder on your computer (for example, C:\Temp). In a TFTP scenario, it is OK to change the application firmware image filename from its default value for convenience if desired (for example, an application firmware file with filename "10610a\_eth\_v2100\_image.bin" can be renamed to simply "image.bin").
4. Open Tftpd32 (refer to Figure 1).
  - a. The *Server interfaces* drop-down shows the IP address of the computer in use. If the computer being used has multiple Ethernet interfaces installed, ensure that the correct interface is selected.
  - b. Remember the selected IP address as this will be used in later steps.

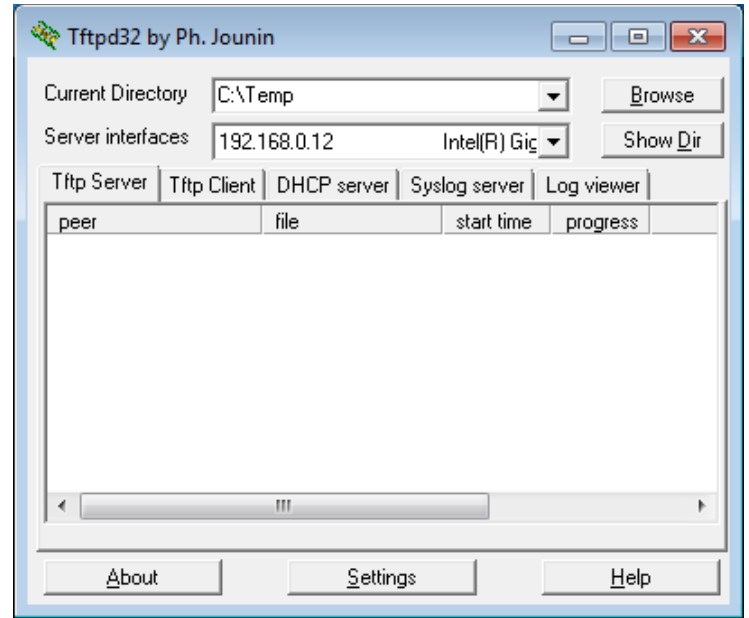


Figure 2: Tftpd32 Opening Screen

5. Click the *Settings* button to view the settings window (refer to Figure 2).
  - a. Set the *Base Directory* field to the folder containing the application firmware image to be downloaded (refer to step 3).
  - b. Check the *Bind TFTP to this address* option and select your computer's IP address (refer to step 4).

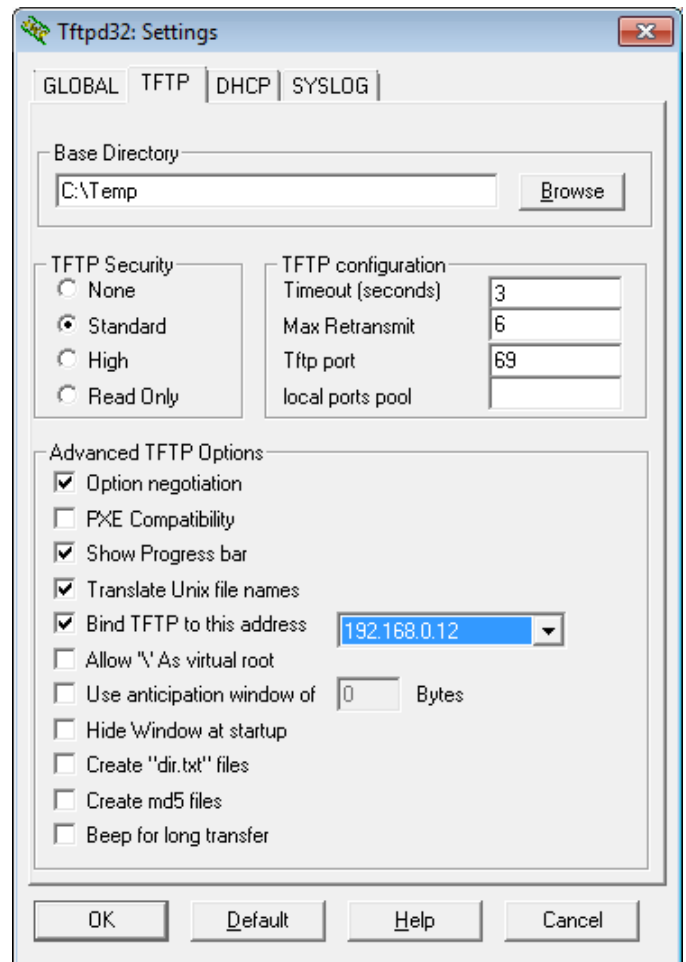


Figure 1: Tftpd32 TFTP Settings Window

6. Click on the GLOBAL tab to enter the global settings (refer to Figure 3).
  - a. Ensure that the *TFTP Server* and *DHCP Server* checkboxes are enabled. The remaining settings can remain at their default values.

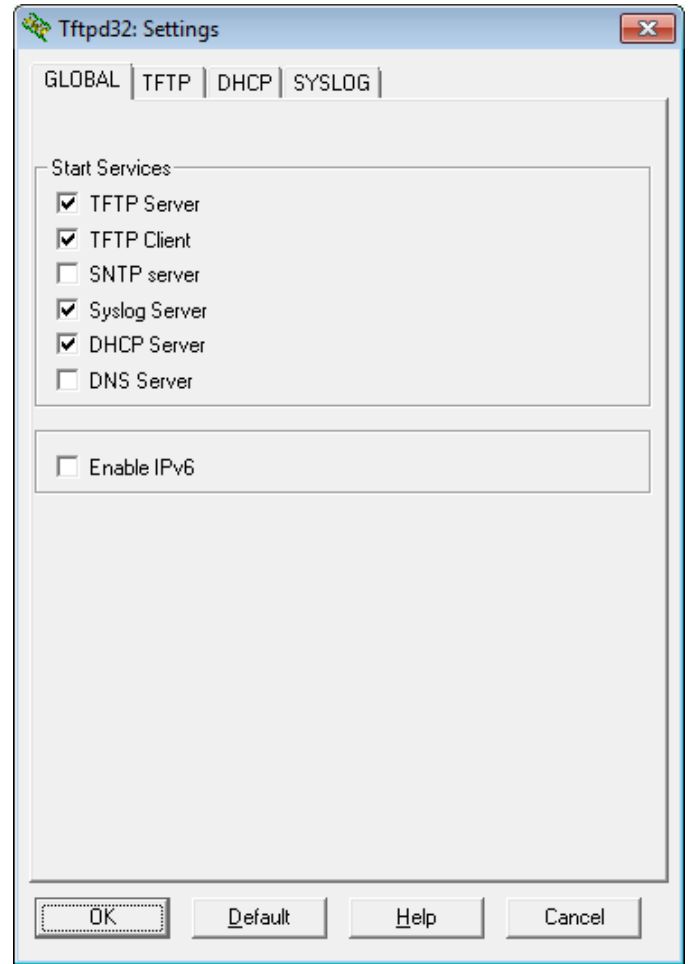


Figure 3: Tftpd32 Global Settings Window

7. Click on the DHCP tab to enter the DHCP settings (refer to Figure 4).
  - a. Enter an *IP pool start address*. This address should start with the same 3 octets as your computer's IP address, as selected in step 4. Ensure that these settings that do not conflict with any existing devices on the Ethernet subnet.
  - b. Enter a *Size of pool* of 10.
  - c. Enter the name of the application firmware image in the *Boot File* field (refer to step 3).
  - d. Enter your computer's IP address in the *Def. router* field. This is the same as the address selected in step 4.
  - e. Enter a *Mask* of 255.255.255.0.
  - f. Uncheck the *Ping address before assignation* option.
  - g. Check the *Bind DHCP to this address* option and select your computer's IP address (refer to step 4).
  - h. Click the OK button to accept the settings. You may be prompted to restart Tftpd32, if so close the program and reopen it.

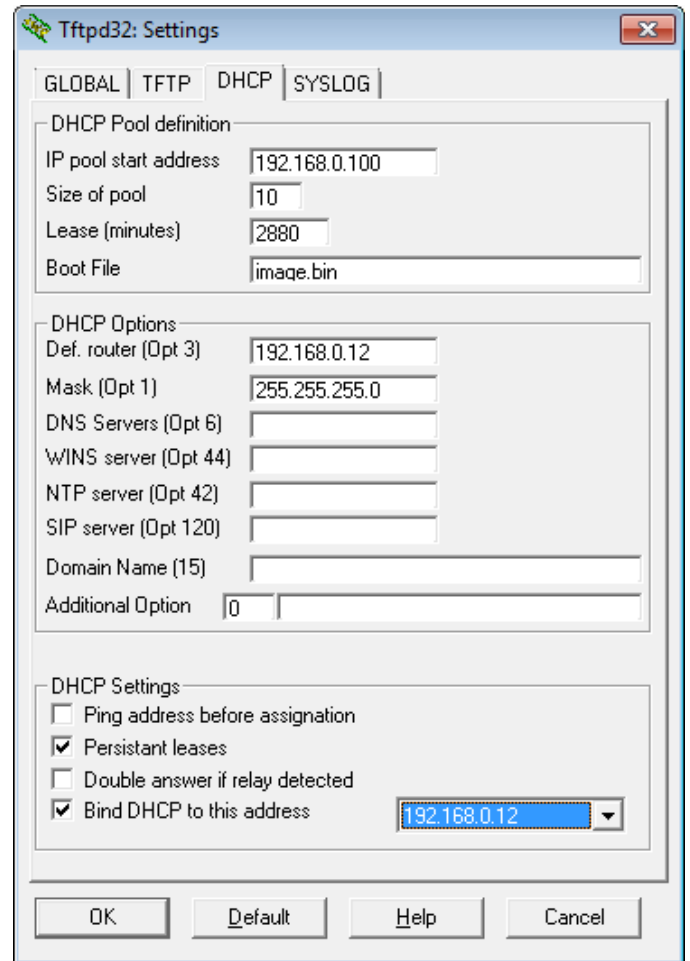


Figure 4: Tftpd32 DHCP Settings Window

8. Verify that the *Current Directory* field is now set to the path containing the firmware file (refer to step 3).

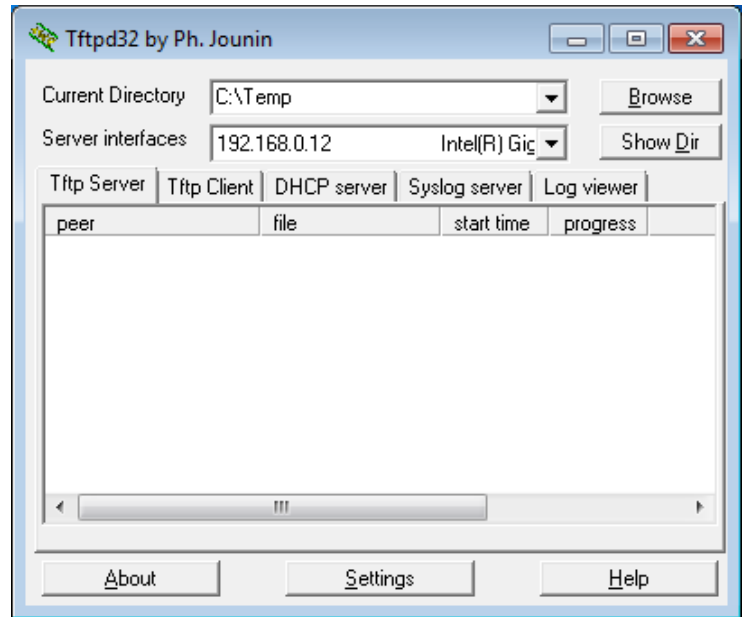
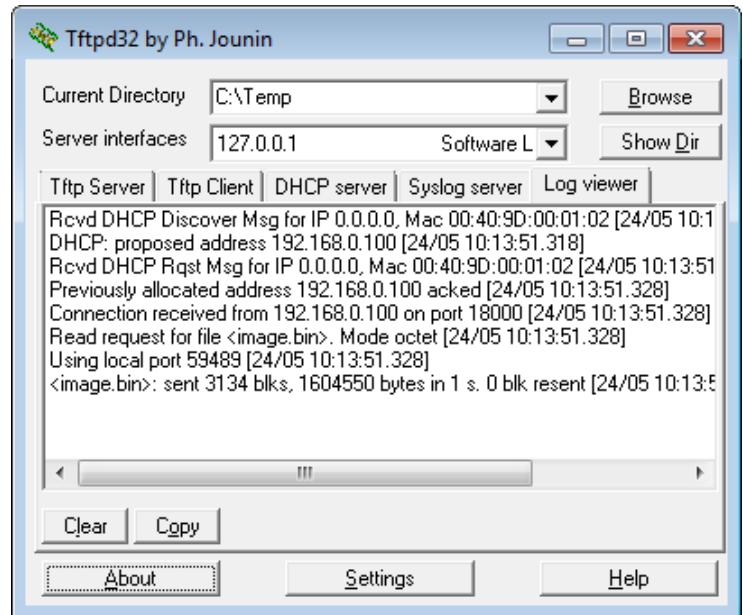
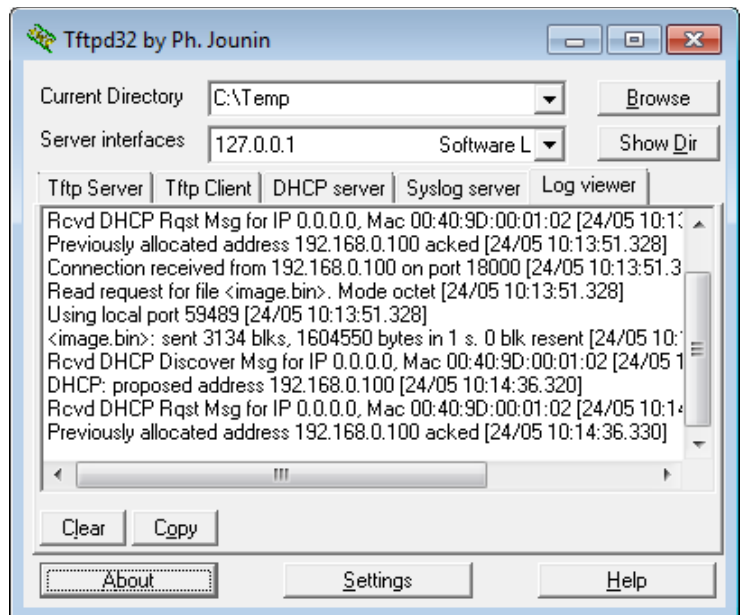


Figure 5: Tftpd32 Home Screen

9. Plug an Ethernet cable into the device and apply power to it. If the application firmware image is corrupt, the device will automatically begin downloading the designated application firmware image file. Navigate to the *Log viewer* tab to observe the status of the file transfer (refer to Figure 6). If the Tftpd32 software is not detecting the device, you may need to disable all other network interfaces on your computer and restart Tftpd32.
10. While the file transfer itself should occur very quickly (the example screen in Figure 6 shows that only 1s was required to transfer the 1.6MB file), the device will need considerably longer (perhaps up to 1 minute) to write the transferred file into its flash memory. Do not remove power from the device or otherwise reset the equipment that the device is installed on during this time, or the application firmware image will once again become corrupted. When the device has completed updating its flash memory, it will automatically reboot on its own (refer to Figure 7).
11. The device should now be fully operational. Tftpd32 can now be closed. Contact ICC Support if problems are encountered.



**Figure 6: Log Viewer Tab after Successful File Retrieval**



**Figure 7: Log Viewer Tab after Device Reboot**