# How to Upgrade or Recover the Firmware of DA-660 Series Embedded Computers

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Moxa provides a boot loader utility for firmware upgrade or recovery. You will need the following items to use this utility.

1. The embedded computer whose firmware you would like to upgrade or recover.
2. A PC or a laptop computer.
3. A console port cable for connecting through HyperTerminal.
4. A cross-over Ethernet cable for upgrading the firmware upgrade through a TFTP server and LAN port.
5. The firmware for the embedded computer.
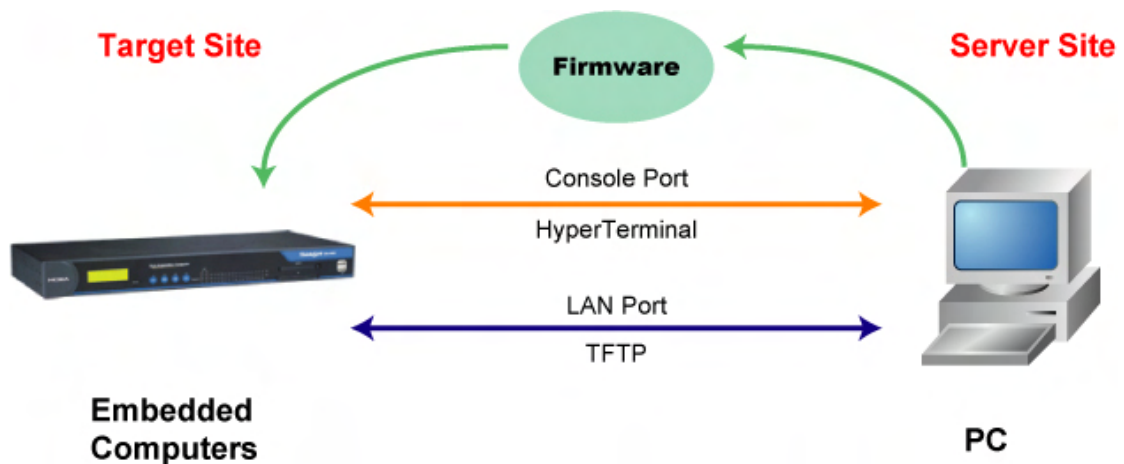
About Moxa

Moxa manufactures one of the world's leading brands of device networking solutions. Products include serial boards, USB-to-serial hubs, media converters, device servers, embedded computers, Ethernet I/O solutions, terminal servers, Modbus gateways, industrial switches, and Ethernet-to-fiber converters. Our products are key components of many networking applications, including industrial automation, manufacturing, POS, and medical treatment facilities.

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The recovery includes four steps.

A. Configure HyperTerminal for the console port.

B. Check if your embedded computer supports the boot loader utility.

C. Download and install the TFTP program.

D. Download the firmware and upgrade through HyperTerminal.

If you are familiar with Moxa's embedded computers and the firmware upgrade procedure, you may skip to Step D. However, we suggest that you follow all procedures to ensure that each step is correct.

A. Configure HyperTerminal for the Console Port.

1. Connect your embedded computer to a power source.

2. Connect the console port of the DA-660 Series embedded computer to your PC using a console port cable. Both the power input and console port are located on the rear panel of the DA-660 embedded computer. See the following figure for details.

DA-660 Series Rear View
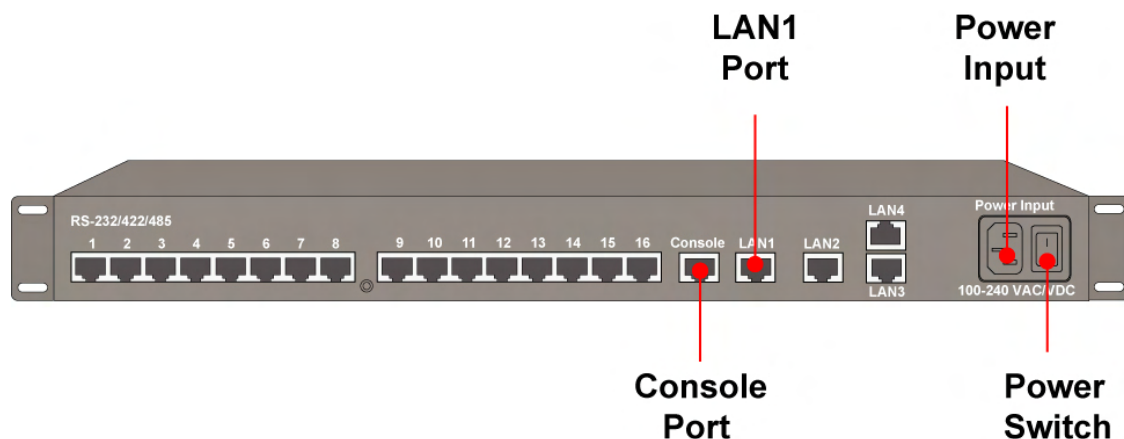
3. Launch a serial communication tool to access your embedded computer. We suggest that you use HyperTerminal, which is built into Windows XP. Click **Start** → **Programs** → **Accessories** → **Communications** and then select **HyperTerminal**.
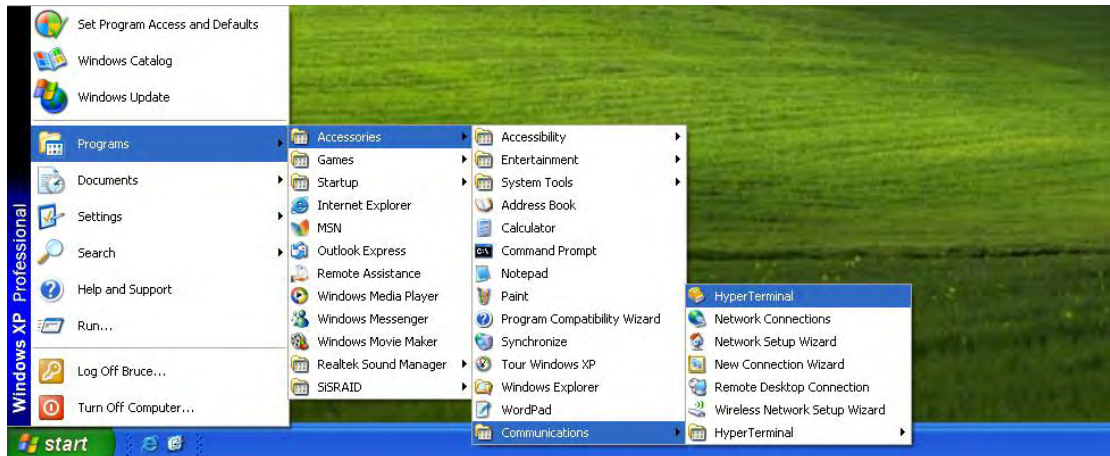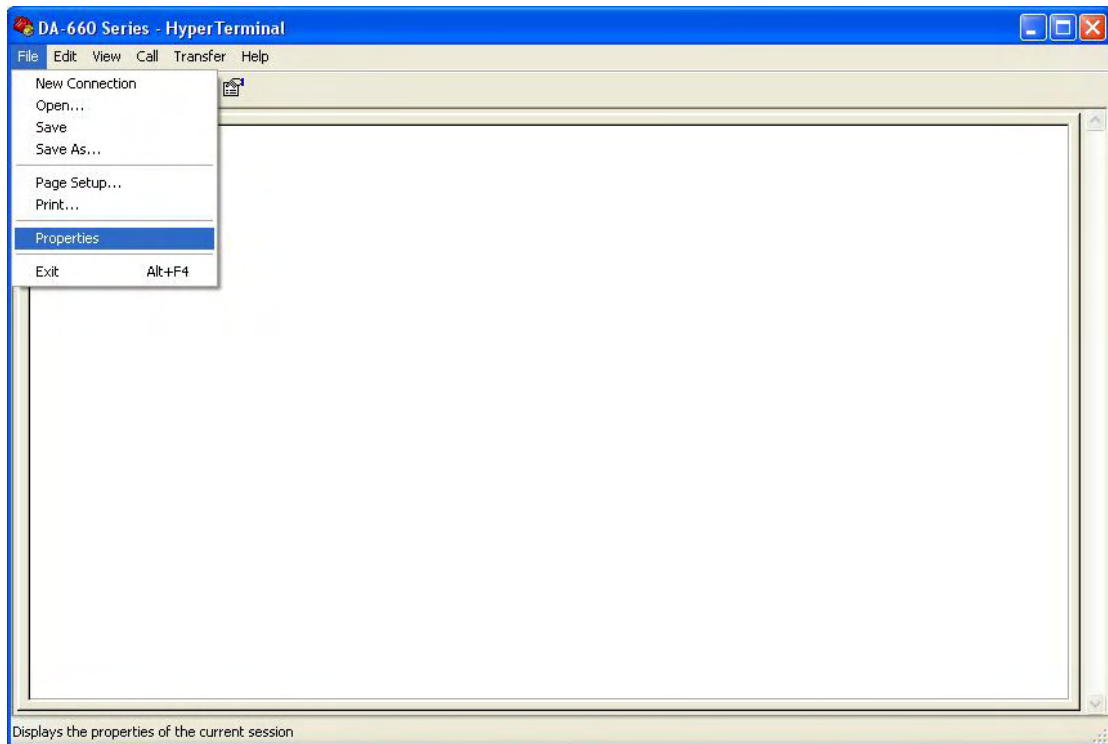

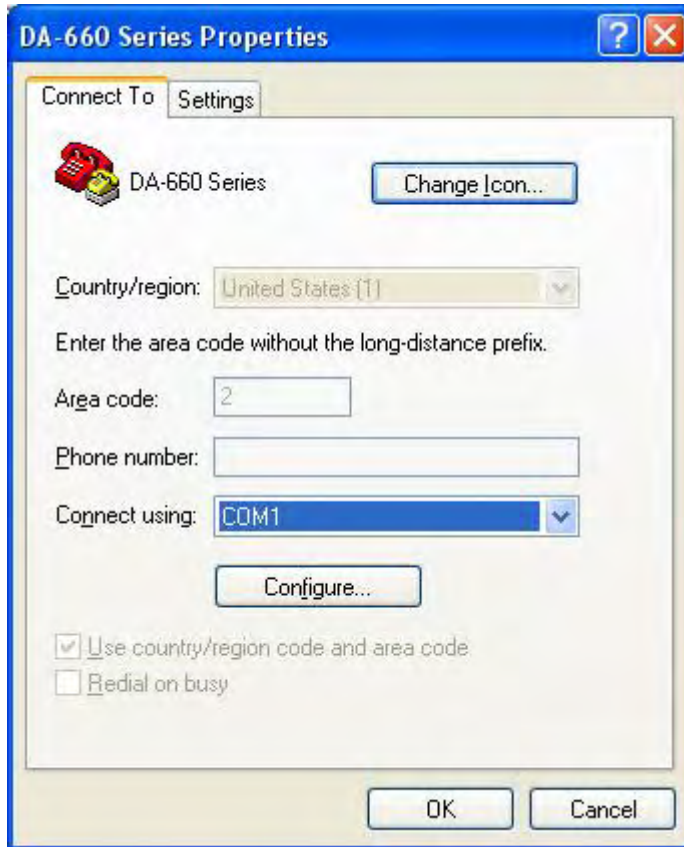4. After HyperTerminal launches, enter a name for the connection.

5. Click **Cancel** when the "Connect To" window opens.

6. Select **File → Properties** from the main HyperTerminal screen.

7. You can change the COM port number on the Properties window. Click **Configure** to see additional configuration options.

8. Configure the **Port Settings** with
following parameters:
Bits per second: 115200
Data bits: 8
Parity: None
Stop bit: 1
Flow control: None.
Click **OK** to continue.
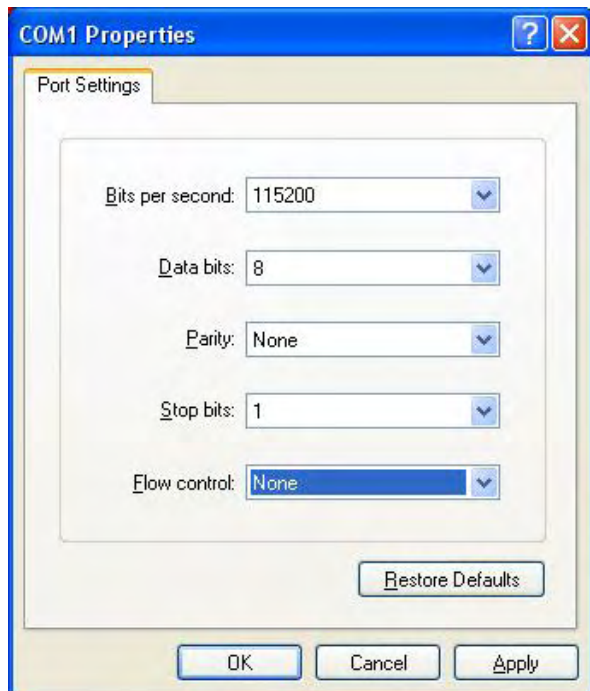
9. Click the **Settings** tab and then select **VT100** for Emulation. Click **OK** to finish the configuration.
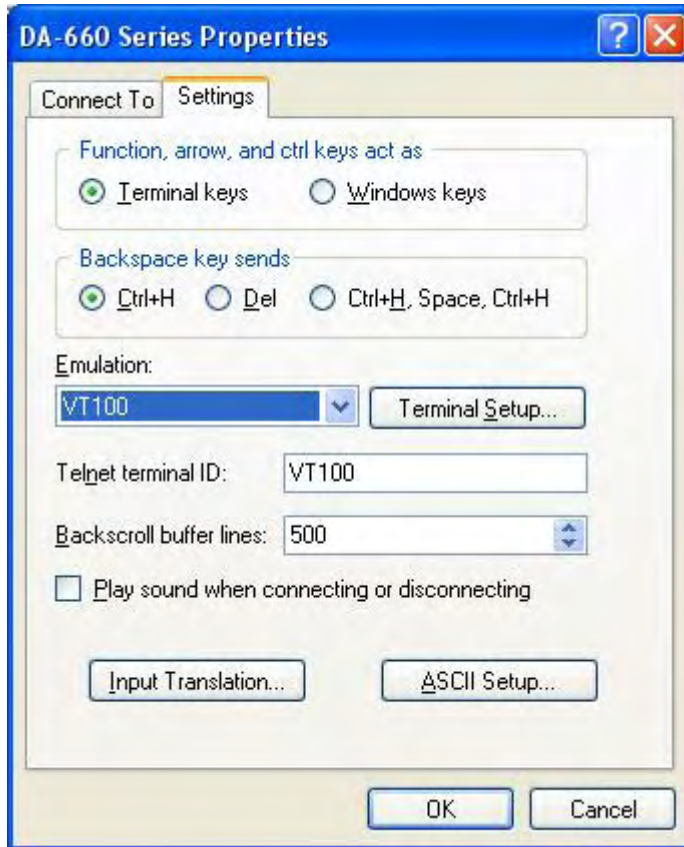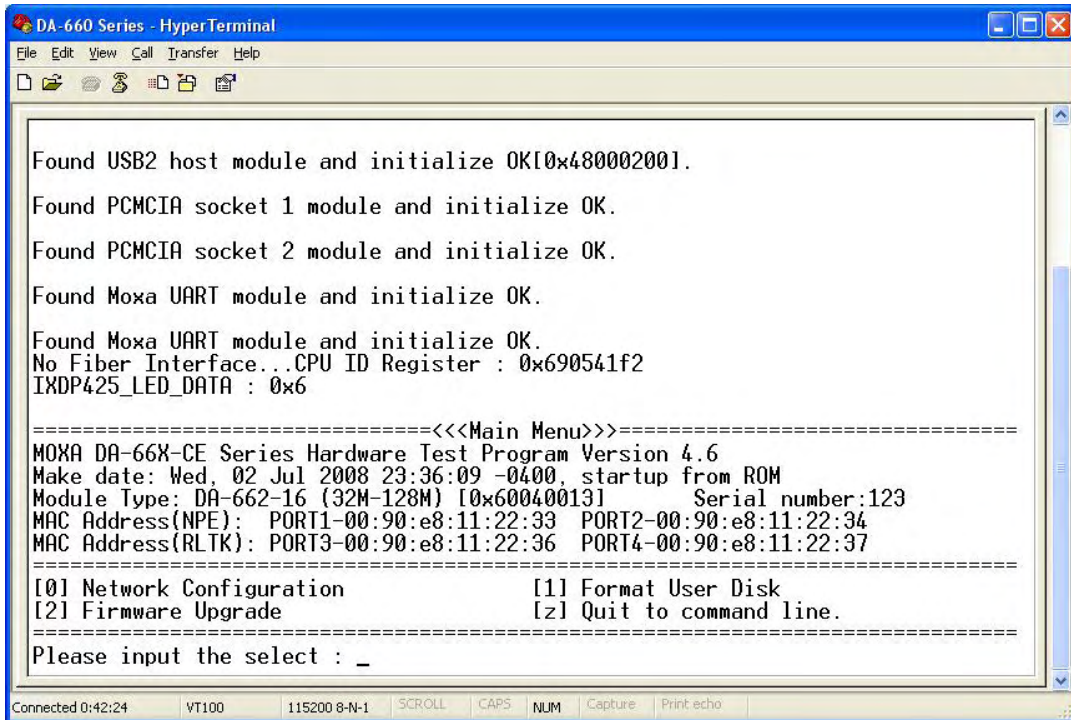
B. Check if Your Embedded Computer Supports the Boot Loader Utility

1. Power on the embedded computer. If the following information appears on the HyperTerminal screen, it means that you can use the boot loader utility to upgrade or recover the firmware.

PRESS <DEL> FOR SYSTEM RECOVERY
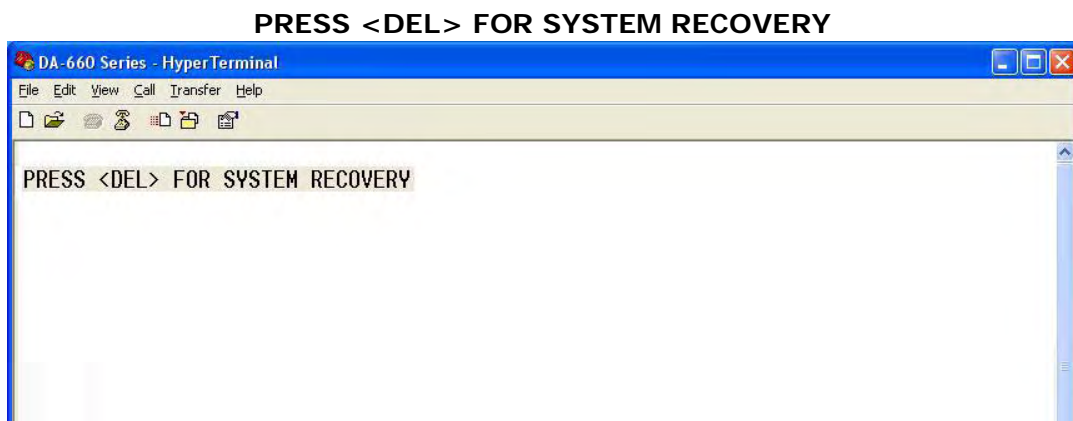
2. Some models support the boot loader utility, but the screen will not appear. In this case, hold down the **DEL** key on your PC and then power on the embedded computer again. If the boot loader utility menu appears, continue to the next chapter for firmware upgrade or recovery instructions.

```
Found USB2 host module and initialize OK[0x48000200].

Found PCMCIA socket 1 module and initialize OK.

Found PCMCIA socket 2 module and initialize OK.

Found Moxa UART module and initialize OK.

Found Moxa UART module and initialize OK.
No Fiber Interface...CPU ID Register : 0x690541f2
IXDP425_LED_DATA : 0x6

===============================<<<Main Menu>>>===============================
MOXA DA-66X-CE Series Hardware Test Program Version 4.6
Make date: Wed, 02 Jul 2008 23:36:09 -0400, startup from ROM
Module Type: DA-662-16 (32M-128M) [0x60040013]      Serial number:123
MAC Address(NPE):  PORT1-00:90:e8:11:22:33  PORT2-00:90:e8:11:22:34
MAC Address(RLTK): PORT3-00:90:e8:11:22:36  PORT4-00:90:e8:11:22:37
=============================================================================
[0] Network Configuration              [1] Format User Disk
[2] Firmware Upgrade                    [z] Quit to command line.
=============================================================================
Please input the select : _
```

3. If you do not see the boot loader utility menu, your embedded computer does not support the boot loader utility. contact Moxa's technical support staff for assistance.

C. Download and install the TFTP program.

1. You will need to download a free TFTP server package to upgrade the firmware for the boot loader utility. Link to the following URL to download:
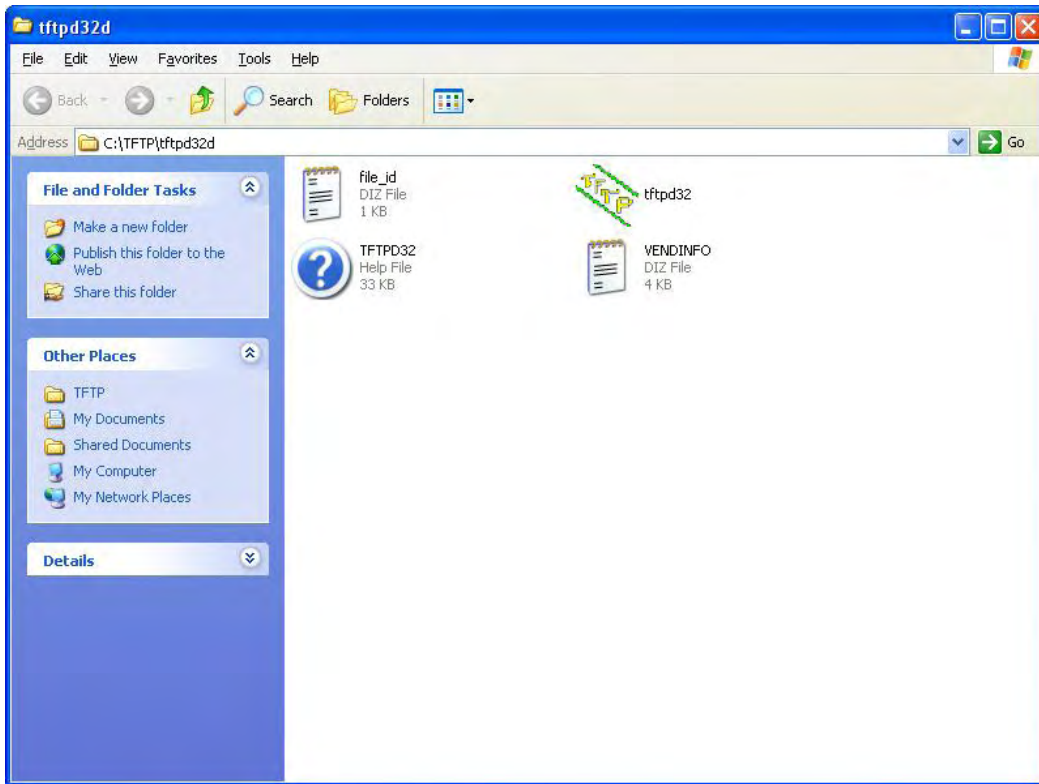
ftp://papa.indstate.edu/

Download the TFTP program located in the following path.

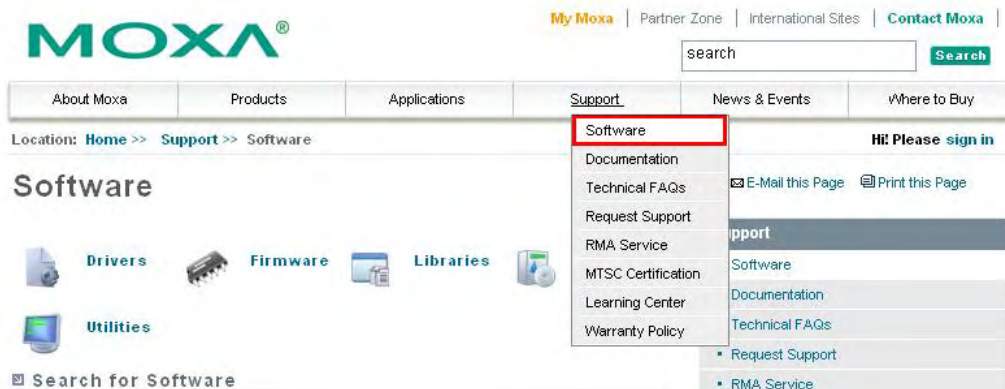**/winsock-1/Windows95/Daemons/TFTPD/**

Download the file named **tftpd32d.zip**.

2. When you finish downloading, extract the files to your PC.

D. Download and upgrade the firmware through HyperTerminal.

1. Connect to Moxa's website at http://www.moxa.com and select Software from the Support drop-down menu.

2. Under **Search for Software**, select the product line and then choose the specific product model. Click on **Search** to continue.

3. Extract the file and put the latest firmware image in the same directory that the TFTP files reside.
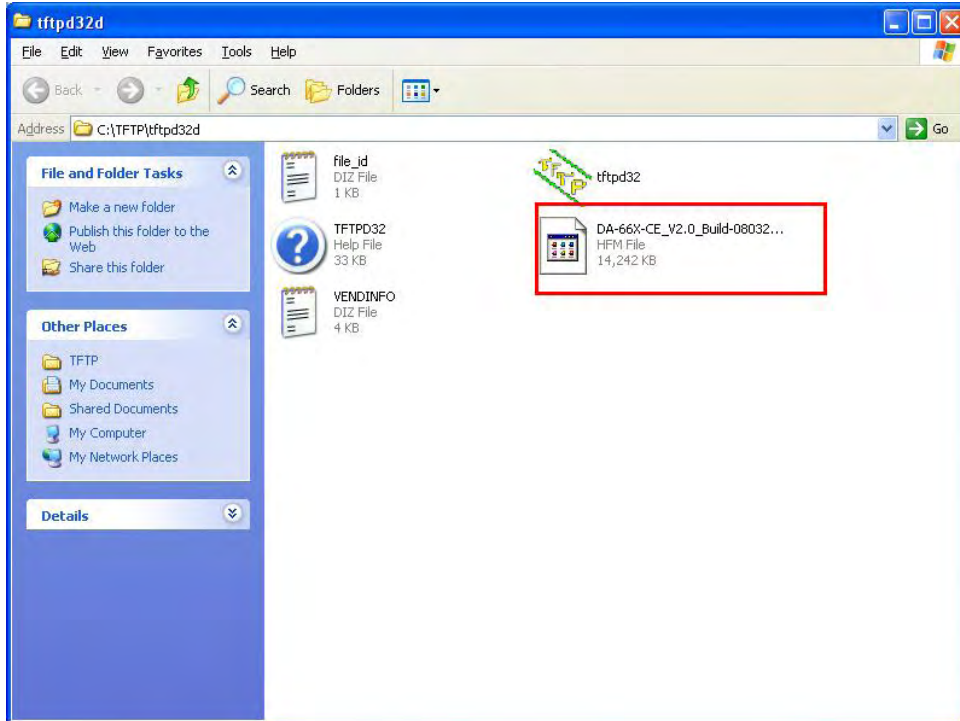
4. Connect **LAN1** of the embedded computer to your PC using a cross-over Ethernet cable. The LAN1 port is located on the rear panel of the embedded computer.
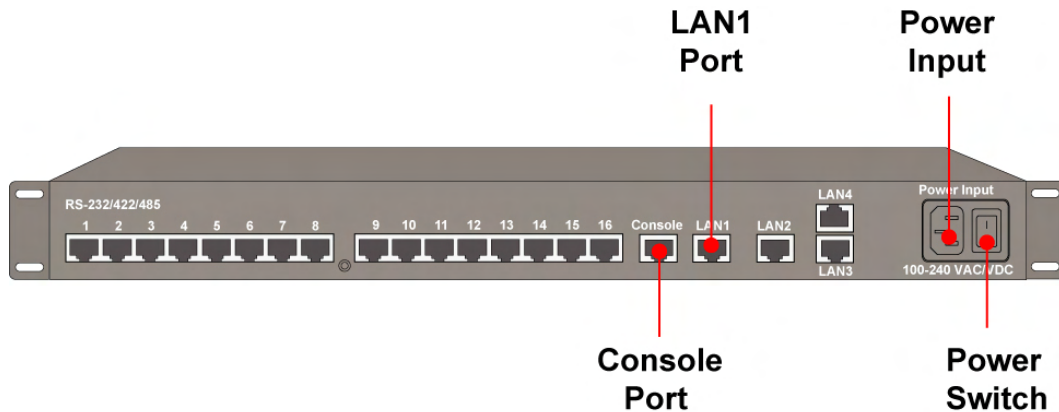
5. Note that for the DA-663 embedded computer, you will need to use a **fiber-to-Ethernet converter** to connect your PC with the embedded computer. We suggest using **Moxa's IMC-21-M-SC** to connect the DA-663 with the PC. The fiber port is located on the rear panel of the DA-663.

6. While holding down the **DEL** key on your PC, power on the embedded computer. You will be guided to the boot loader utility menu.

7. In the boot loader utility, select **[0] Network Configuration**, and then **[0] Change IP Setting** to configure IP addresses.
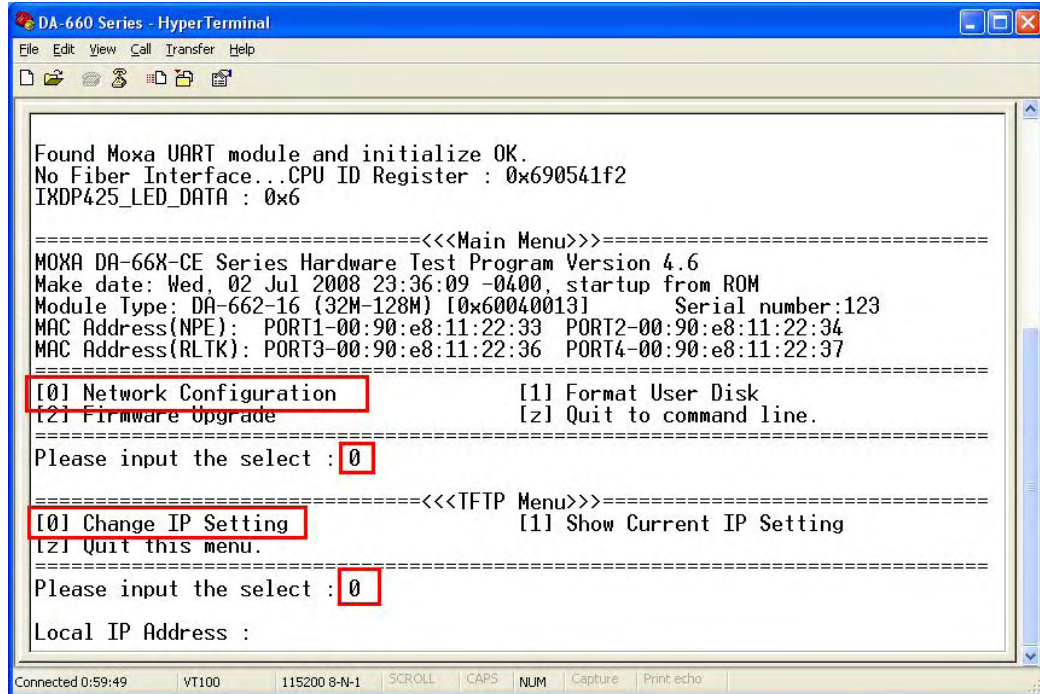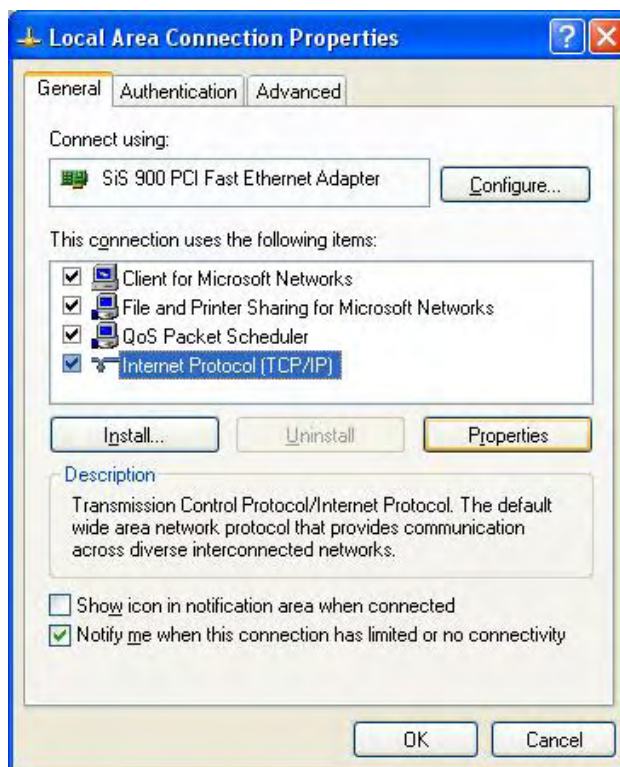

8. You will need to enter the IP addresses of the embedded computer and your PC. Follow the steps below to configure the IP addresses.

    a. From **Start → Settings**, select **Network Connections**.
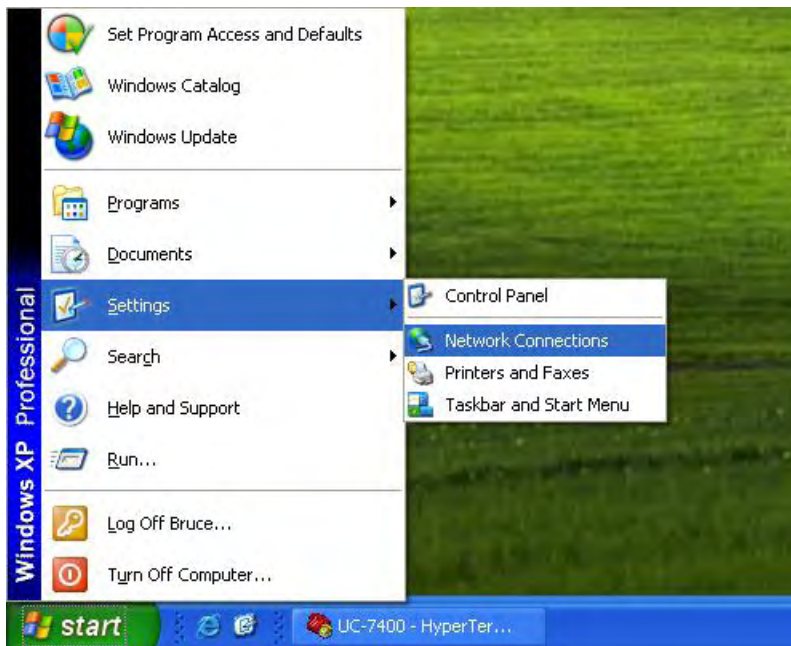
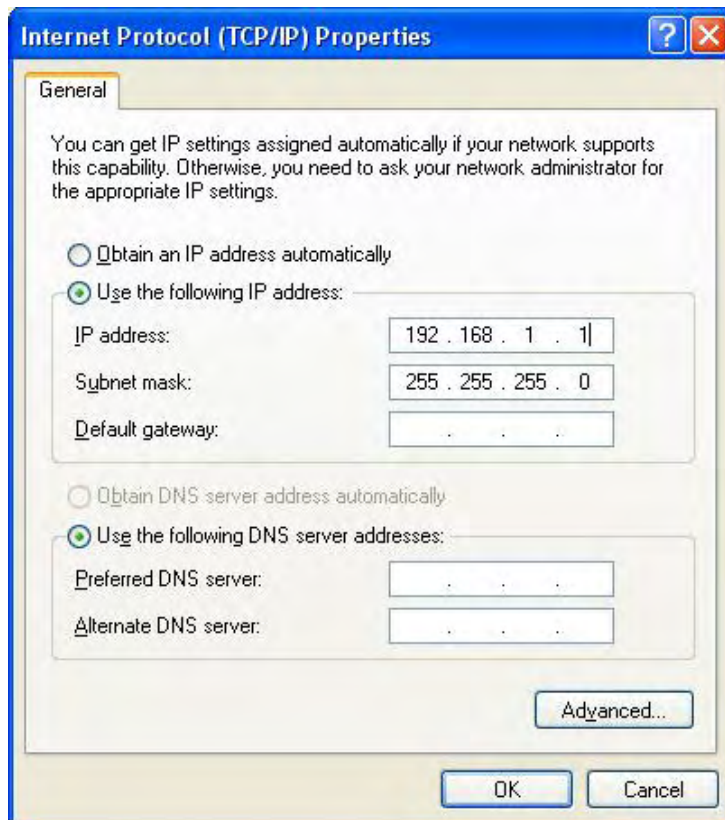b. Right-click on **Local Area Connection**, and then select **Properties**.
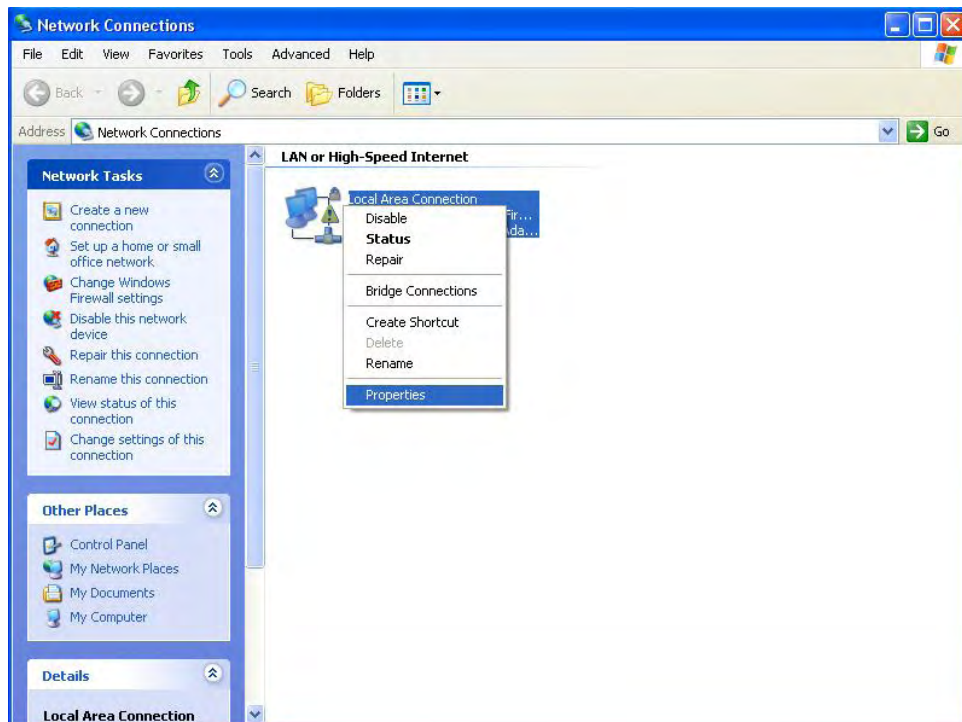
c. Click the **General** tab and select **Internet Protocol (TCP/IP)**, and then click on **Properties**.

d. Next, select **Use the following IP address** and enter the following
    information.

   **IP address: 192.168.1.1** (for example)

    Subnet mask: 255.255.255.0

9. Go back to the boot load utility menu and enter the local IP address. This local IP
    address is the IP address of the embedded computer. **Note that local IP address
    must be on the same network area with the server IP address**. For example,
    if the server IP address is 192.168.1.1, you can choose a local IP address from the
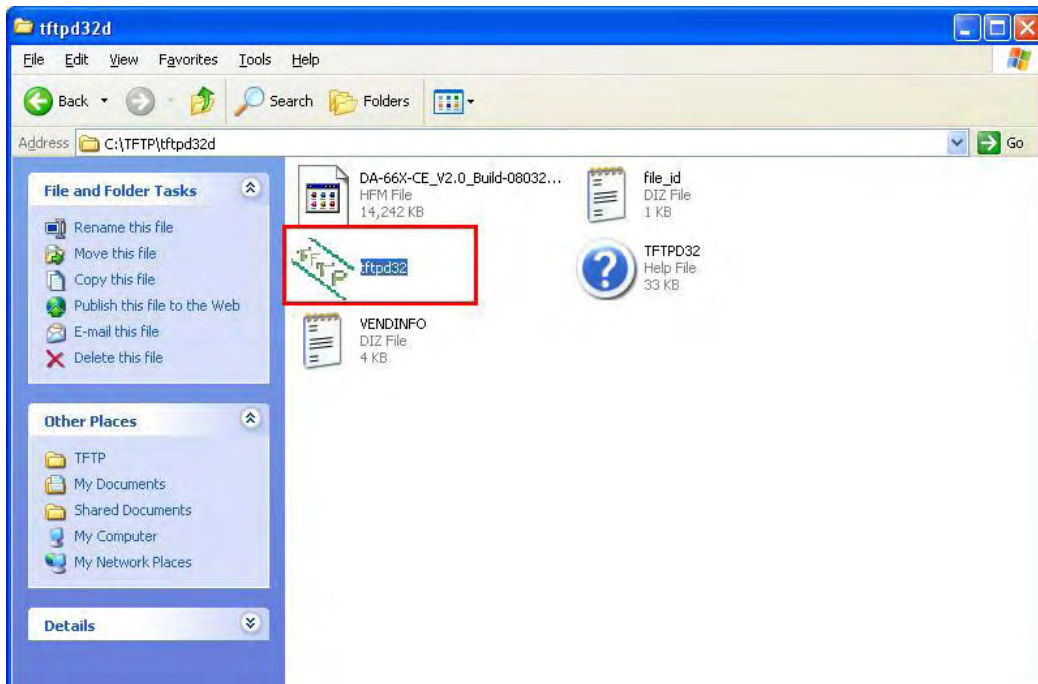   range 192.168.1.2 to 192.168.1.255.
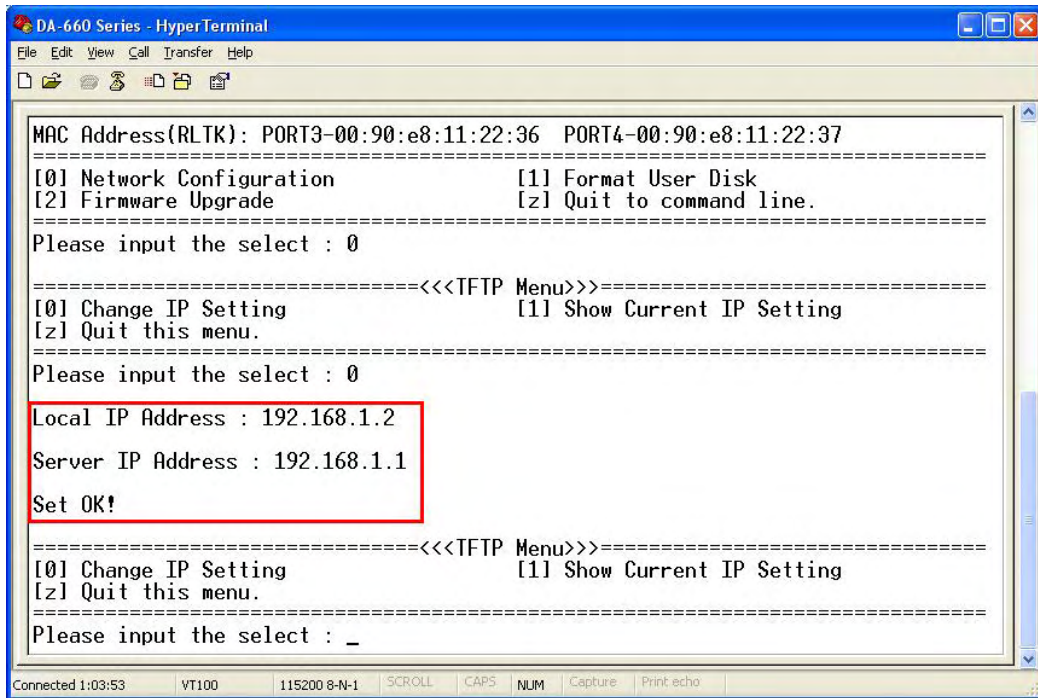
10. After you finish the IP Setting, select **[1] Show Current IP Setting** to make sure the IP addresses are correct.
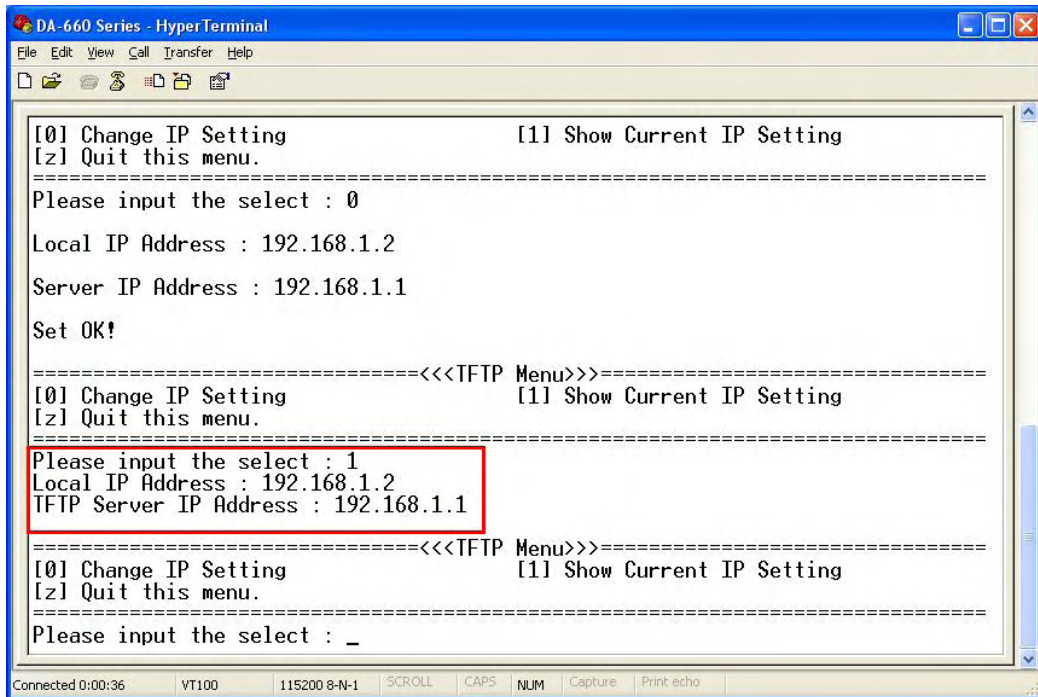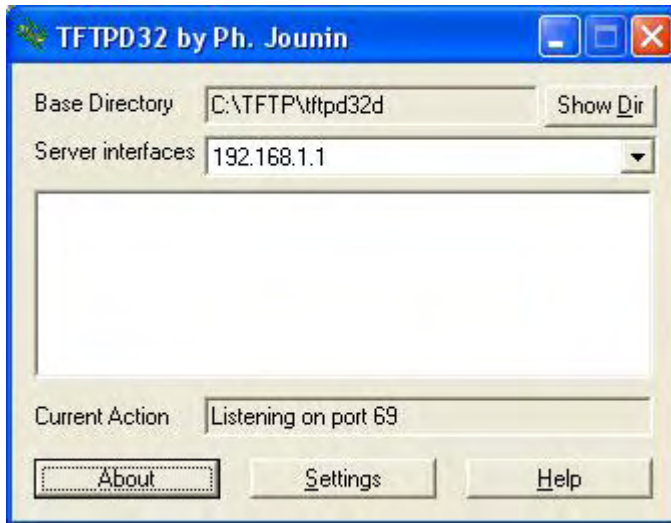
11. Select **[z] Quit to command line** to exit the IP setting option. Next, select **[2] Firmware Upgrade**, and then **[0] Load from LAN to continue**.
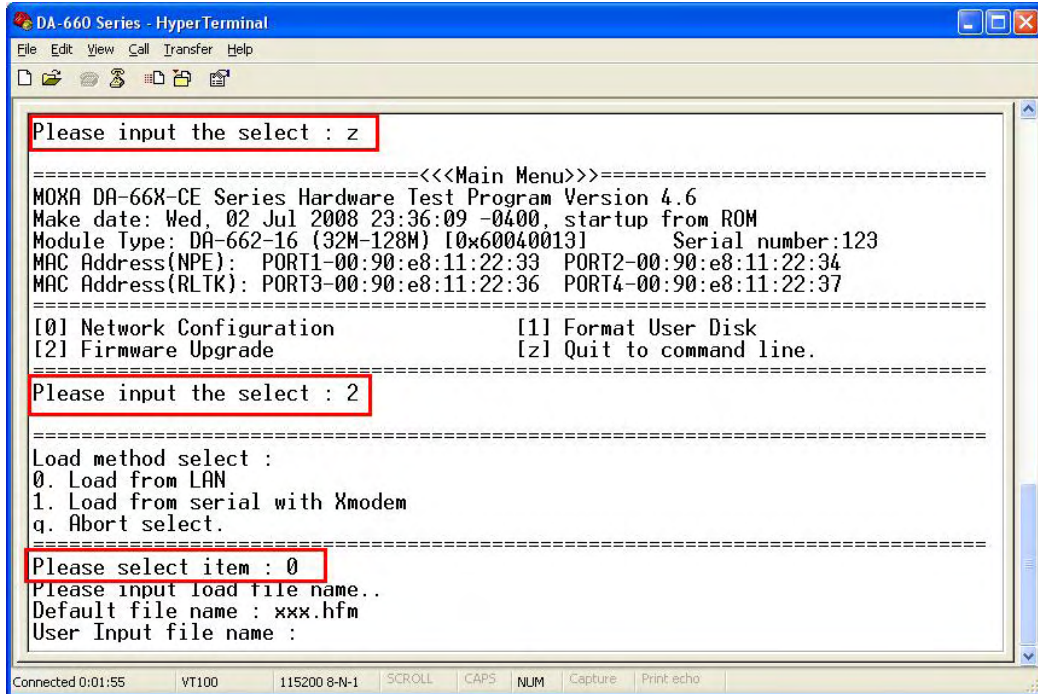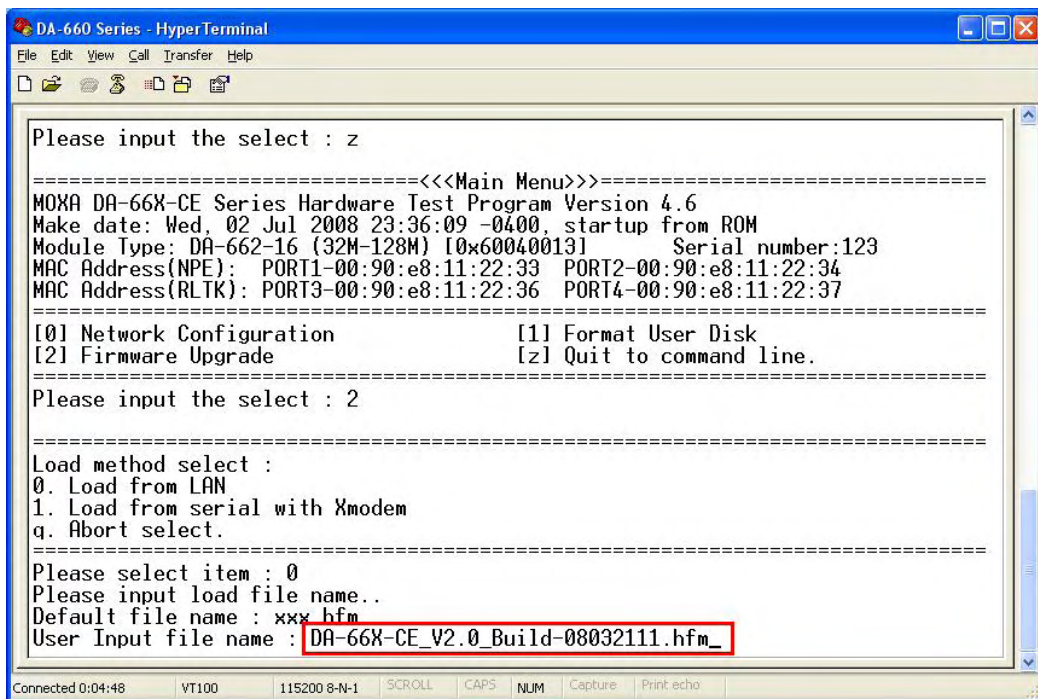

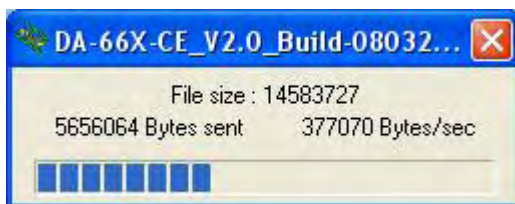12. To start the TFPF server, double-click on the **tftpd32** icon to launch the TFTP server.

13. When the TFTP server has been launched, the following screen will appear.
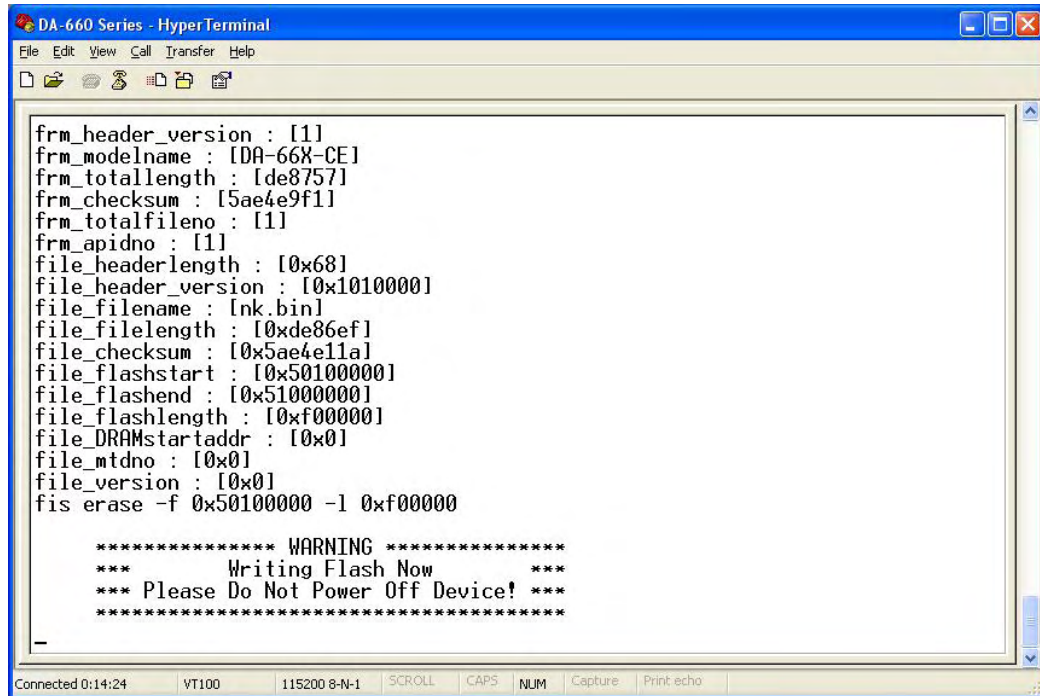

14. Go back to the boot loader utility menu and enter the firmware image file name.

15. The firmware upgrade will start running.

16. It will take several minutes for the firmware files to be written to your embedded computer. **Do not power off your computer!**
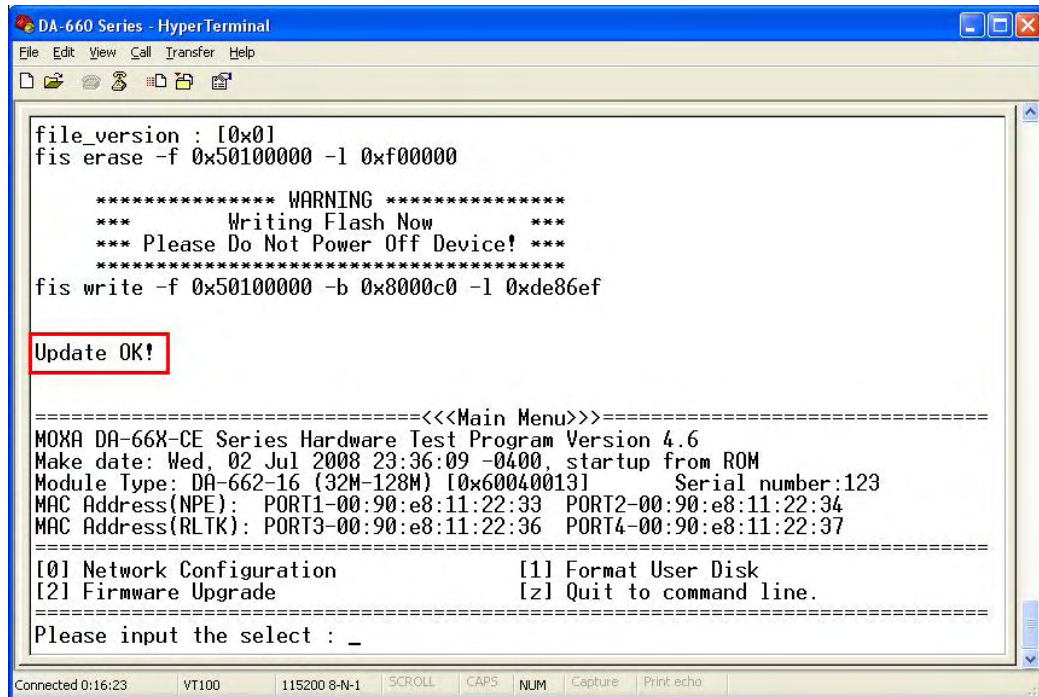
```
frm_header_version : [1]
frm_modelname : [DA-66X-CE]
frm_totallength : [de8757]
frm_checksum : [5ae4e9f1]
frm_totalfileno : [1]
frm_apidno : [1]
file_headerlength : [0x68]
file_header_version : [0x1010000]
file_filename : [nk.bin]
file_filelength : [0xde86ef]
file_checksum : [0x5ae4e11a]
file_flashstart : [0x50100000]
file_flashend : [0x51000000]
file_flashlength : [0xf00000]
file_DRAMstartaddr : [0x0]
file_mtdno : [0x0]
file_version : [0x0]
fis erase -f 0x50100000 -l 0xf00000


        *************** WARNING ***************
        ***         Writing Flash Now        ***
        *** Please Do Not Power Off Device! ***
        ***************************************
_
```

17. When you see **Update OK**, the firmware upgrade has finished. At this point, you may reboot the embedded computer to complete the firmware upgrade or recovery from the boot loader utility.

18. If you cannot reboot your embedded computer, contact Moxa's technical support staff for assistance.