

Using a Serial Cable with the Z800

The Z800 does not have a Recovery GUI so the only way to recover from a brick is to use a Serial cable.

Prerequisites

Some hardware and some software is needed in order to do a Serial cable flash of the router.

You will need a PL2303 TTL serial adapter like this. Search Amazon for *PL2303 ttl* to find one.



Only the black, white and green wires are used. **Never use the red wire as this can destroy your adapter or your router.**

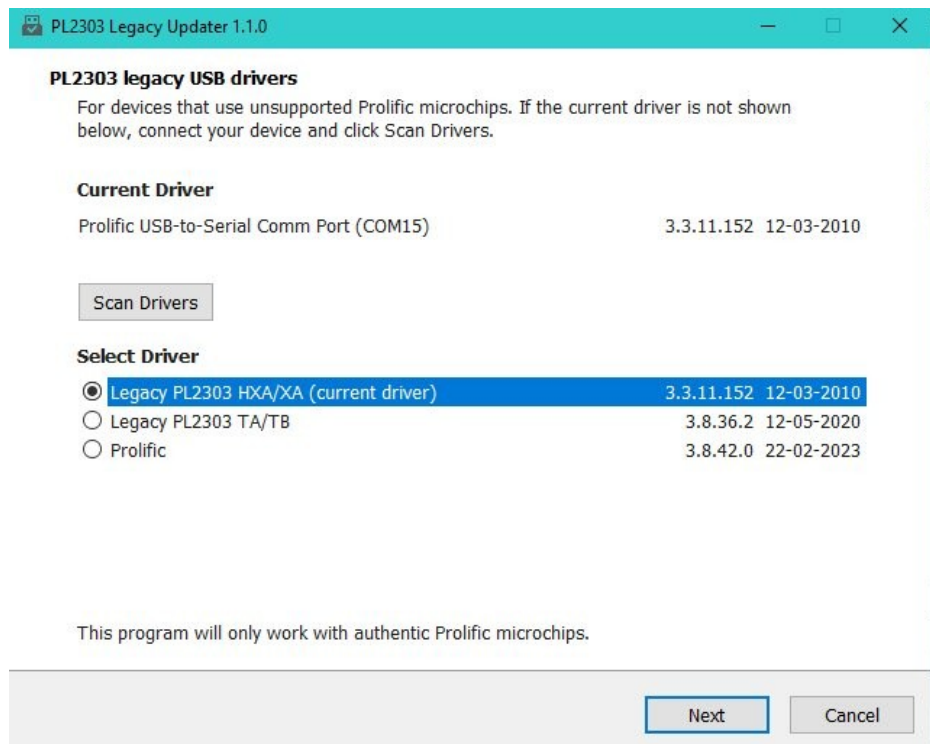
The pins should be marked GND, RX and TX. The other pins can be ignored. GND may not be marked but it is always on the end of the row of pins. The serial adapter connects the **black wire to the GND**, the **white wire to TX**

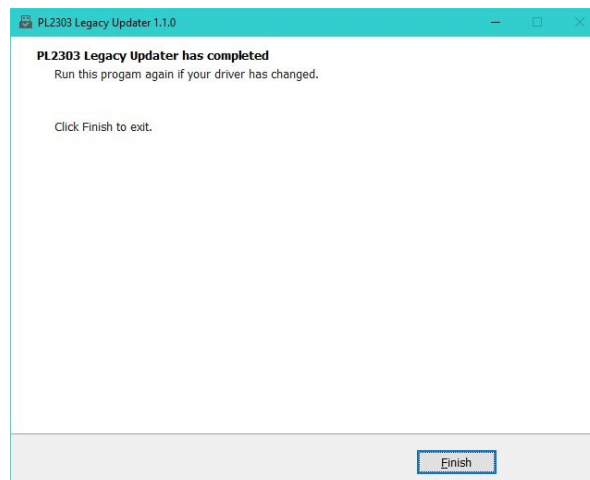
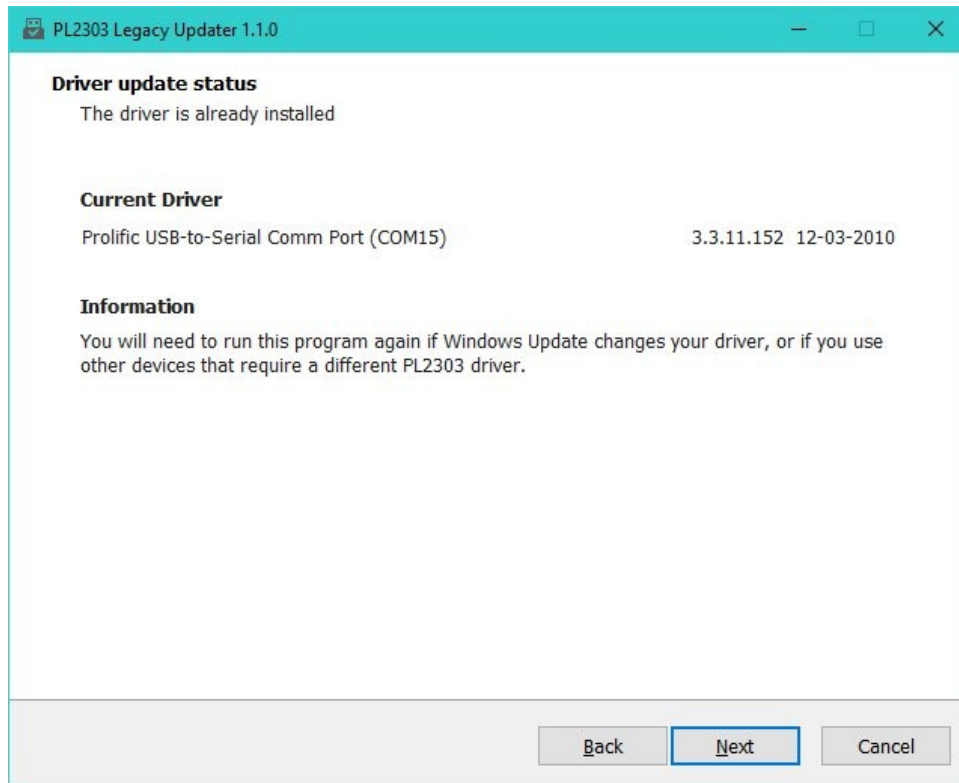
and the **green wire to RX**. This accomplished by slipping the wires over the proper pin.

Once you have the Serial adapter connected to the router you need to install the necessary software. First up is the software that installs the drivers for the adapter.

The program included in this package, *PL2303LegacyUpdaterSetup-1.1.0.exe*, will install a setup program that you then run to install the adapter driver. This may have to be done each time you use the adapter. Windows seems to replace the driver for no good reason at times. You will know you need to run the install program when you can't open the USB port of the adapter from the Terminal program.

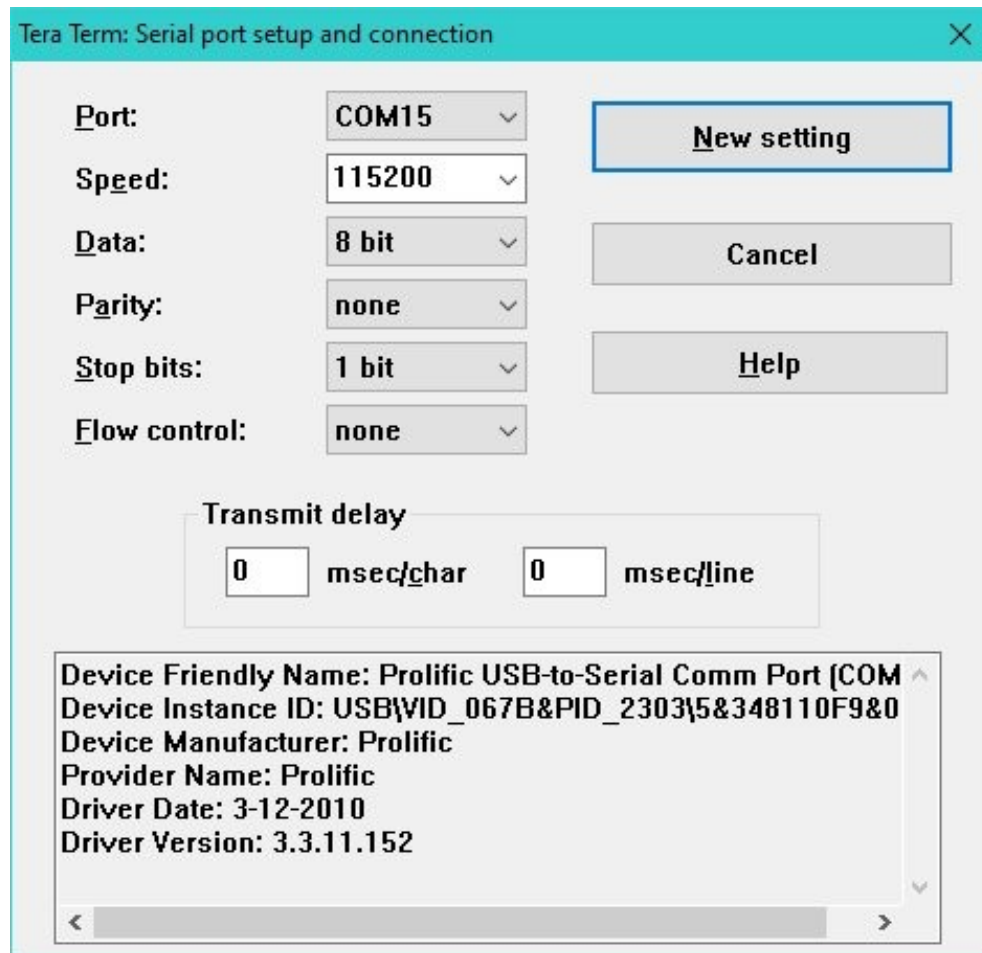
Plug in the adapter to a USB port on your computer and run the install program. The router should be powered off at this time. The installer can be found at <C:/Program Files/PL2303 Legacy Updater/PL2303LegacyUpdater.exe>.





Next, install the Terminal program, *teraterm-5.0-alpha1.exe*. Once it is installed you are ready to use the Serial adapter on the router. The router must be powered off at this time and the adapter plugged into a USB port.

Run the *TeraTerm* program and setup the serial port to be used. Go to the *Setup* menu and the *Serial Port* submenu.

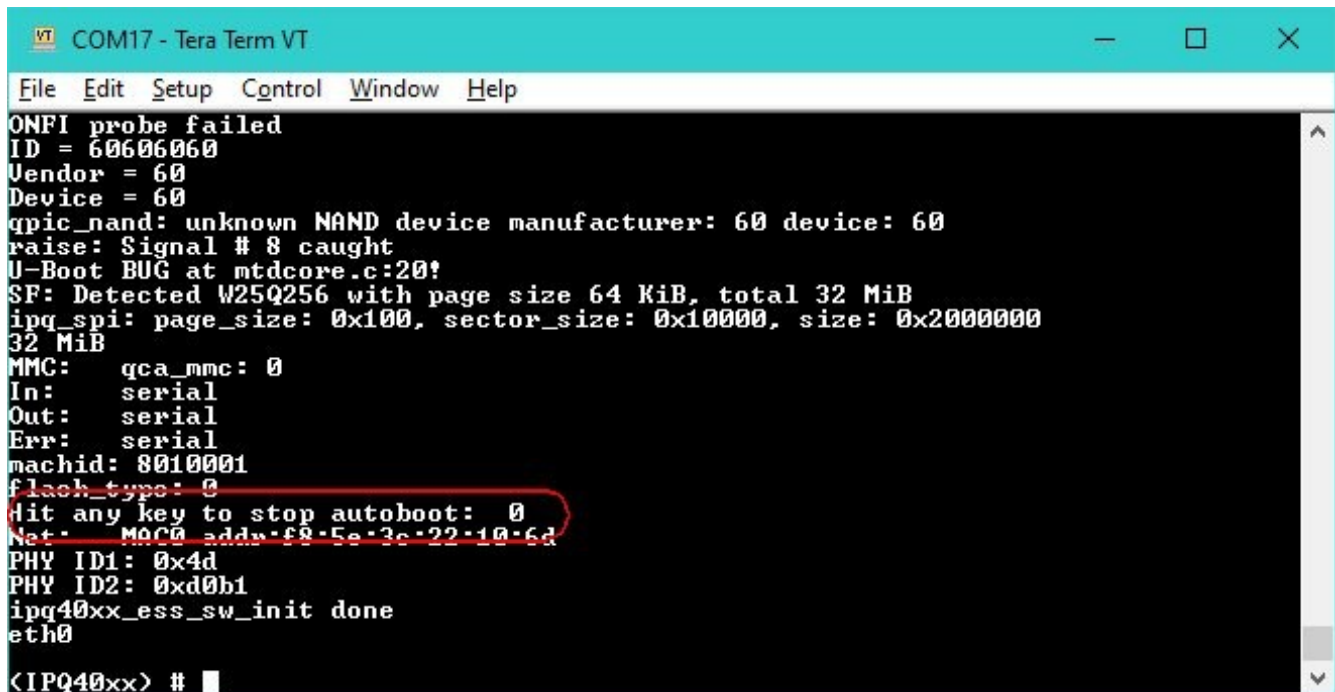


The Port is usually the highest COM port in the drop down list and it should have a similar Device Name as above. The speed is normally 115200. Click *New Setting* to set these values for the current session. To make these your default settings go to the *Setup* menu and the *Save Settings* submenu.

You may find that you need to close the Terminal and unplug the Serial adapter to completely power down the router. Then plug it in again and run the Terminal.

You are now ready to check if everything works. Plug in the router and you should see something in the Terminal. If you see nothing then the green and white wires may need to be swapped. If you see gibberish then the Speed

may have to be changed in the *Serial Port* menu. There may be a bunch of unreadable text at the start but eventually you will see something like below. Make sure the Terminal has the focus by clicking on it before plugging in the router. It will need keyboard input at this point.



```
COM17 - Tera Term VT
File Edit Setup Control Window Help
ONFI probe failed
ID = 60606060
Vendor = 60
Device = 60
qpic_nand: unknown NAND device manufacturer: 60 device: 60
raise: Signal # 8 caught
U-Boot BUG at mtdcore.c:20!
SF: Detected W25Q256 with page size 64 KiB, total 32 MiB
ipq_spi: page_size: 0x100, sector_size: 0x10000, size: 0x2000000
32 MiB
MMC: qca_mmc: 0
In: serial
Out: serial
Err: serial
machid: 8010001
flash_type: 0
Hit any key to stop autoboot: 0
Net: MAC0 addr=f8-5e-3c-22-10-6d
PHY ID1: 0x4d
PHY ID2: 0xd0b1
ipq40xx_ess_sw_init done
eth0
<IPQ40xx> #
```

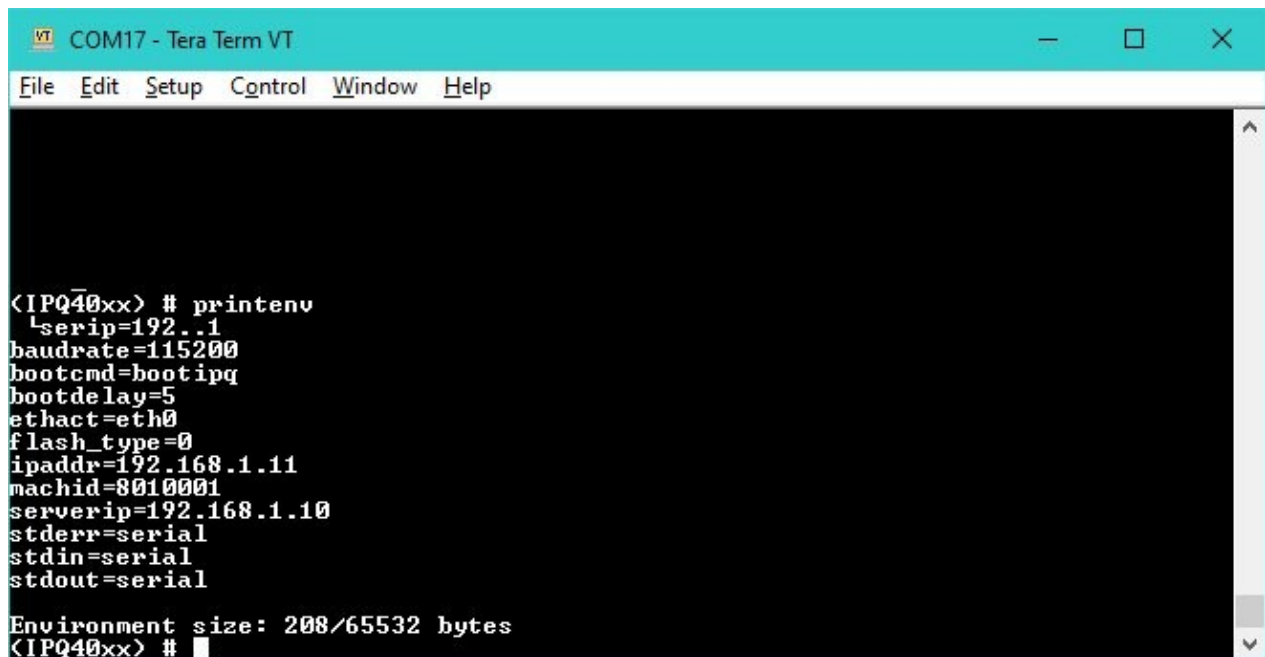
There will be a countdown when the *Hit any key to stop autoboot* line appears. If you miss this then unplug the router and start again.

At this point make sure your computer is connected to the router. You will have to set your computer to have a Static IP Address which we will determine now.

Enter

printenv

into the Terminal and you will see this.

A screenshot of a Tera Term VT window titled "COM17 - Tera Term VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The main area is a black terminal with white text. The text shows a command prompt "<IPQ40xx> # printenv" followed by a list of environment variables: 'serip=192.1.1', baudrate=115200, bootcmd=bootipq, bootdelay=5, ethact=eth0, flash_type=0, ipaddr=192.168.1.11, machid=8010001, serverip=192.168.1.10, stderr=serial, stdin=serial, and stdout=serial. Below this, it says "Environment size: 208/65532 bytes" and then another prompt "<IPQ40xx> #".

```
<IPQ40xx> # printenv
'serip=192.1.1
baudrate=115200
bootcmd=bootipq
bootdelay=5
ethact=eth0
flash_type=0
ipaddr=192.168.1.11
machid=8010001
serverip=192.168.1.10
stderr=serial
stdin=serial
stdout=serial
Environment size: 208/65532 bytes
<IPQ40xx> #
```

The information we have about this is

- Router IP address (ipaddr) – 192.168.1.11
- Computer IP address (serverip) – 192.168.1.10

The router IP is only for flashing using the serial cable. Once flashed the IP will be 192.168.1.1.

The Z800 may have a different router and server IP than the above so remember what they are for later.

The computer must now be given a Static IP address that matches what the router expects. Set your computer to have a static IP address by going to *Network and Internet Settings* and *Change Adapter Options*. Select the *Local Area Connection* and then the *Properties* button. Next select the *Properties* for the Internet Protocol 4 entry. Change the data there to the following.

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 192 . 168 . 1 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: 192 . 168 . 1 . 4

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: 8 . 8 . 8 . 8

Alternate DNS server:

☐ Validate settings upon exit

Advanced...

OK Cancel

Included in this package is the *tftpd32* TFTP server program. This will be used to upload the firmware to the router. The above information needs to be supplied to *tftpd32* so it will work with the router. This is done by editing the *tftpd32.ini* file with a text editor.

```
1  [DHCP]
2  Lease_NumLeases=0
3  IP_Pool=192.168.1.11
4  PoolSize=1
5  BootFile=firmware.bin
6  DNS=
7  DNS2=
8  WINS=
9  Mask=255.255.255.0
10 Gateway=192.168.1.11
11 Option42=

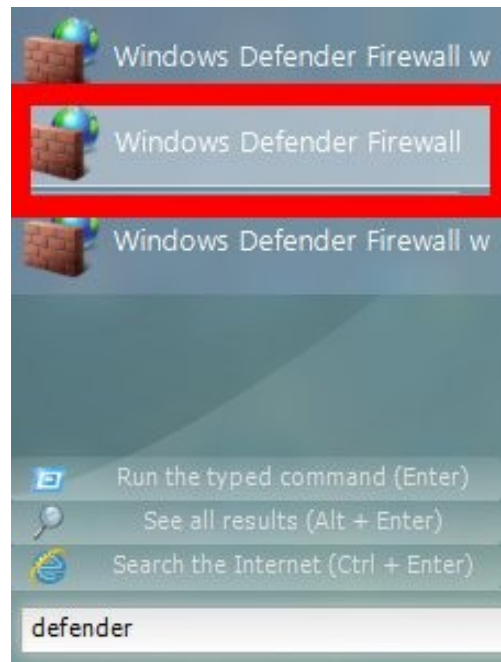
50 MD5=0
51 LocalIP=192.168.1.10
52 Services=15
53 TftpLogFile=
54 SaveSyslogFile=
55 PipeSyslogMsg=0
56 LowestUDPPort=0
57 HighestUDPPort=0
58 MulticastPort=0
59 MulticastAddress=
60 PersistantLeases=0
61 DHCP Ping=0
62 DHCP LocalIP=192.168.1.10
63 Max Simultaneous Transfers=100
64 UseEventLog=0
```

Change the *IP_Pool* and the *Gateway* to the router's IP address and make sure *LocalIP* and *DHCP LocalIP* are the computer's IP address. These are the IP Addresses you found above and may be different from what is shown here.

Save the file.

Copy the firmware you wish to flash into the folder that contains *tftpd32* and rename it to ***firmware.bin***. This file is already included in the package so normally nothing needs to be done.

And lastly, before we attempt to flash the router, we must turn off the computer's Firewall. Go to the *Start* menu and search for *Defender*.



You will the have this pop up.



Go to the menu to turn off the Firewall.

Customize settings for each type of network

You can modify the firewall settings for each type of network that you use.

Private network settings



☐ Turn on Windows Defender Firewall

☐ Block all incoming connections, including those in the list of allowed apps

☒ Notify me when Windows Defender Firewall blocks a new app



☒ Turn off Windows Defender Firewall (not recommended)

Public network settings



☐ Turn on Windows Defender Firewall

☐ Block all incoming connections, including those in the list of allowed apps

☒ Notify me when Windows Defender Firewall blocks a new app



☒ Turn off Windows Defender Firewall (not recommended)

Click on *OK*. Remember that after you have finished flashing the router to turn the Firewall back on.

You may not have to turn off the Firewall to do this as Windows may popup a dialog box asking if you want the program to be allowed. Try it without turning the Firewall off first and see if this happens. This will only happen the first time you run the program and it will remember it afterword.

We are now ready to flash the router. Run *tftpd32.exe* to start the TFTP server. **Make sure the Ethernet cable from the computer is plugged into a LAN port on the router.**

Power up the router, interrupt the autoboot process so you are at the Terminal command line.

Run the following command

tftpboot firmware.bin

Both tftp32 and the Terminal will show the file being uploaded. If this does not happen recheck the settings given above and make sure the Firewall is turned off.

Once the upload process is completed type this in the Terminal.

bootm

This will reboot the router and run the uploaded firmware. You can watch the boot process on the Terminal.

The above process does not actually flash the router but loads the firmware into RAM and runs it from there. No changes have been made to the flash memory at this point.

You should now be able to access the ROOter GUI at 192.168.1.1 and proceed to the next step.

Use the ROOter GUI at System->Backup/Flash to flash the sysupgrade firmware (not the factory firmware). This will actually flash the router's flash memory and then reboot like normal.

The Recovery process is now complete.