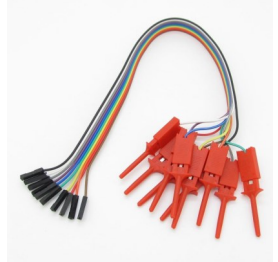


Restoring the TP-Link Firmware using TFTPd32 and a Serial Cable

Items needed:

1. A USB to 3.3v TTL Header cable. GearMo sells one on Amazon.com for \$21.95 - http://www.amazon.com/GearMo%C2%AE-Header-TTL-232R-3V3-Windows-Support/dp/B004LBXO2A/ref=sr_1_1?ie=UTF8&qid=1461243288&sr=8-1&keywords=usb+to+3.3v%2Fttl+header
2. A test hook clip, like the following one on Amazon.com which costs \$9.55 - http://www.amazon.com/High-Quality-Ideal-Electronic-Experiment/dp/B00NHG8Q5U/ref=sr_1_8?ie=UTF8&qid=1461247171&sr=8-8&keywords=hook+test+lead
3. (Possibly) a soldering iron
4. 6" to 8" of wire
5. A small 2.4 mm phillips screwdriver (like for eyeglasses) to unscrew the board from the casing.
6. Two small regular head screwdrivers (1.4, 2.0, or 2.4 mm in size for prying the front cover off).
7. A pair of needle nose pliers
8. A pair of wire cutters



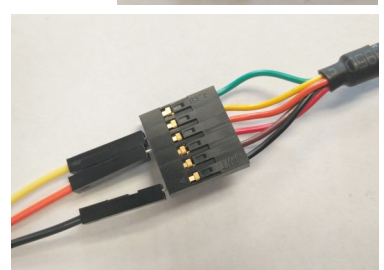
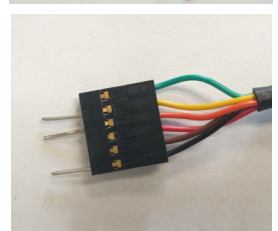
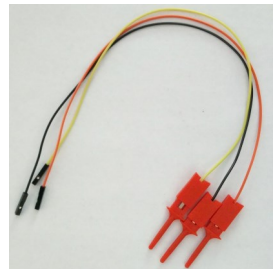
Software and files needed:

1. Terminal if using a Mac, otherwise Putty, which can be downloaded from www.putty.org (the file name for download is putty.exe).
2. The latest standard edition of TFTPd32, which can be downloaded from http://tftpd32.jounin.net/tftpd32_download.html
Mac users will need to download and try TftpServer for Mac, which can be downloaded from <http://www.macupdate.com/app/mac/11116/tftpserver>
3. Download from www.friedzombie.com/tplink-stripped-firmware/ the appropriate stripped bootloader firmware file for your TP-Link unit.

Step 1: Assemble your serial cable

The assembled cable will have a USB connection on one end and 3 test hooks on the other end.

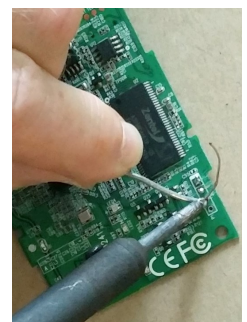
1. Strip apart from each other the individual coloured cables of the test hook clip. If you purchased the one above, this will leave you with 10 separate coloured test hook cables.
2. We will only be using the yellow, orange, and black test hook cables; store away the others. (Note: if your 3 test hook cables are coloured differently, they will work the same).
3. Connect these 3 test hook cables, with a short bit of snug fitting wire, to the 6 pin header yellow, orange and black wires of the USB serial cable. (If you are using differently coloured test hook cables, make a note of which ones you connect to the yellow, orange and black serial cable leads).
4. Plug the USB end of your assembled serial cable into your computer in order for your computer to assign it a device driver.



Step 2: Prepare your bricked TP-Link unit to connect to the test hook ends of your assembled serial cable

You can try the full unbricking procedure by simply inserting the test hooks into the appropriate pins on the unit's board. The best guarantee however, for a good connection is to solder wire into each of these pin holes and then to clip the test hooks onto these soldered-on bits of wire. These pins are located on the bottom right side of the board, pin 4 being the closest to the bottom right corner (see photo). Pin 1 will take the yellow clip, pin 2 the orange and pin 3 the black. Pin 4 will not be used.

1. Take off the cover of the bricked TP-Link unit and remove the battery.
2. With your 2.4 mm phillips screwdriver, unscrew the 2 screws holding on the front cover to the back casing, located on the back of the unit at the top center and bottom left.
3. Gently remove the unit's front cover from the back casing to expose the board. There are 4 main molded plastic clips on the front cover holding it snugly onto the back casing, which you can see from the back of the unit at each of the corners just outside of the battery compartment. To get these to unsnap will require you to use a small screwdriver as a wedge, starting at the back top left corner working counterclockwise, and then pressing down and inward on each of the 4 clip points around the battery compartment with another small screwdriver. Once you get the first clip to unsnap, the others, with continued counterclockwise effort, will unsnap one by one until the cover is off and the board is exposed.
4. To keep from losing the two very small screws, screw them part way into the detached front cover.
5. Try all the remaining steps first without soldering. If there is no communication between your serial cable and the bricked unit, solder 3 bits of wire into pins 1, 2 and 3 on the board.



Step 3: Set the IP address on your computer

Your computer (once connected to the bricked unit) will **not** automatically receive an IP address from it, because it's DHCP is not functioning. You will need to set your computer to a fixed IP address.

1. Open **Control Panel** and choose **Network and Sharing Center**
2. Click **Change Adapter Settings**
3. Choose **Local Area Connection**
4. Click **Internet Protocol version 4**
5. Click **Properties**
6. Click the **Use the following IP address** radio button
7. Click in the **IP address:** box and type the address **192.168.1.100**
8. Click in the **Subnet mask:** box to automatically fill in the subnet
9. Click **OK** and then **OK** again to close the *Properties* dialog

Step 4: Unbricking your unit

Your bricked TP-Link unit needs to be fully charged before continuing. Plug it in and wait for the yellow/red charging light to turn green. If the lights are flashing wildly and you are unsure just how much of a charge it has, let the unit charge for a couple hours and then leave the unit plugged in throughout this unbricking step.

1. Install Putty (Mac users will instead use Terminal).
2. Install TFTPd32 (Mac users will instead install and use TftpServer for Mac).
3. Turn off your computer's wifi.
4. Turn off Windows Firewall. (If you have a mac, your firewall protection is turned off by default).
5. Connect your bricked TP-Link unit via Ethernet cable to your computer.
6. Ensure that the USB end of your assembled serial cable is plugged into your computer.
7. Attach the 3 coloured test hooks of the other end of your assembled serial cable to the pins on your bricked MR3040. Pin 1 takes the yellow hook cable (or whatever cable you substituted for yellow), pin 2 the orange (or whatever cable you substituted for orange), and pin 3 the black (or whatever cable you substituted for black).
8. Open Putty and under *Connection type* click **Serial**.
9. You need to know what COM port your computer is using for the serial cable, in order to type that in the *Serial line* window of Putty. So, open your computer's **Control Panel**, choose **System**, then **Device Manager** and once there click on **Ports**. You should see something like *USB Serial Port (COM3)*. Type COM3 (or whatever yours is) in the *Serial line* window of Putty.
10. In Putty, in the Speed window, type **115200**.
11. Click **Serial** in the bottom left *Category* window and make sure the *Parity* and *Flow control* are set to **none**.
12. Click **Open**
13. Turn on your bricked TP-Link unit and quickly type on your computer **tpl** and hit the enter key. If you do not type and enter this quick enough, Putty's boot process will continue looping and you will need to turn the unit off and then try this step again. Keep trying this step until it settles on the *hornet>* prompt in Putty.
14. Copy the previously downloaded stripped bootloader firmware file (which will have a name like *TL-MR3040-V1-FW0.0.3-stripped.bin*), to the TFTPd32 folder. The location of this folder is given in the *Current Directory* window of the open program. The default install path for TFTPd32 is C:\Program Files (x86)\Tftpd32
15. Open TFTPd32
16. In Putty, at the *hornet>* prompt, type **tftpboot 0x81000000** followed by a space and the name of your stripped bootloader file. For example, the command string for a bricked MR3040 version 1 unit would be: **tftpboot 0x81000000 TL-MR3040-v1-FW0.0.3-stripped.bin**
Hitting the enter key will cause Putty to load the stripped bootloader file to a temporary memory place on your bricked unit. You should see the screen below. If instead you get a repeating T, check your connections (you may need to solder) and recheck all your settings and try again.

Using eth0 device

TFTP from server 192.168.0.100; our IP address is 192.168.0.1

Filename 'TL-MR3040-v1-FW0.0.3-stripped.bin'.

Load address: 0x81000000

Loading: #####

#####

#####

#####

#####

done

Bytes transferred = 3932160 (3c0000 hex)

17. In Putty, at the `hornet>` prompt, type **`erase 0x9f020000 +0x3c0000`**
It will return to the `hornet>` prompt when finished. This will clear that section of memory on your bricked unit's board. You will see the following screen:

```
First 0x2 last 0x3d sector size 0x10000
61
Erased 60 sectors
```

18. In Putty, at the `hornet>` prompt, type **`cp.b 0x81000000 0x9f020000 0x3c0000`**
It will return to the `hornet>` prompt when finished. This will copy the file to the cleared memory section of your bricked unit. You will see the following screen:

```
Copy to Flash... write addr: 9f020000

done
```

19. In Putty, at the `hornet>` prompt, type **`bootm 9f020000`**
This process will take 10 to 15 minutes to complete, whereupon the stripped bootloader firmware file will be installed. You will see the following final text on your screen:

```
DES SSID SET+TP-LINK_MR3040_5C0FD7
br0: port 2 (ath0) entering forwarding state
Device ath1 left promiscuous mode
br0: port 3 (ath1) entering disabled state
Br0: starting userspace STP failed, starting kernel STP
```

20. Reset the IP address on your computer to **Obtain an IP address automatically** (Refer to Step 3 above).
21. Open your webbrowser and type **192.168.0.1**
If the process is complete you will be prompted to enter your user name (admin) and password (admin).
21. If after typing admin/admin and hitting enter, you see the TP-Link page, congrats, you have successfully unbricked your router!

Step 5: Resetting your computer and finishing up

1. Close your browser window.
2. Close Putty (or Terminal).
3. Close TFTPd32 (or TftpServer for Mac).
4. Turn on Windows Firewall.
5. Turn on your computer's wifi.
6. Turn off your TP-Link unit.
7. Unclip the hook ends of your serial cable from your TP-Link unit.
8. Unplug the USB end of your serial cable from your computer.
9. Proceed with the BibleBox build as you would with a new unit. (See BibleBox.org for instructions).
10. Unplug the Ethernet cable from your computer and TP-Link unit.
11. If you soldered wires onto the board of your TP-Link unit, trim them off with a pair of wire cutters.
12. Unscrew the two screws from the front cover of your TP-Link unit and snap the front cover back on.
13. Screw the front cover into place with the two screws.
14. Put the battery back in and snap the back cover into place.