



CompexWRT Firmware/Loader Upgrade

Using Loader or TFTP to Upgrade Loader/Firmware

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Revision History

Revision	Date	Description
1.0	June, 2014	Initial documentation
1.1	July, 2014	Added the TFTP way to upgrade the firmware.
1.2	July, 2014	Updated the TFTP method to upgrade the firmware.
1.3	July, 2014	Finding out if board is 8 MB flash or 16 MB flash version.
1.4	July, 2014	Added the method to upgrade the loader.
1.5	March, 2015	Added Section: Using the Serial Cable in Windows 8.1

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CompexWRT Firmware Upgrade

This section describes three methods to upgrade the firmware in the board, using a CompexWRT firmware image.

Using the CompexWRT LuCI web page

The easiest way is to go to the configuration webpage of the AP, then go to

System > Backup / Flash Firmware > Flash new firmware.

There is an option to keep the current configuration.

If the LuCI webpage cannot be seen, press the hardware “reset” button on the board for less than 3 seconds to reboot.

If the LuCI webpage still cannot be accessed, press and hold the “reset” button for between 4 and 30 seconds to reset to factory default, which retains the current firmware version. Please access the default IP address 192.168.1.1 of the AP.

If the LuCI webpage still doesn't show up, other methods described in the following sections have to be used.

Using the loader mode of the serial console

This section describes how to upgrade the firmware into the board using loader mode, when webpage has already hanged. A serial cable is required. Please connect the Ethernet port further away from the power adapter, to the PC with the TFTP Server.

1. Setup a TFTP server on your PC. The opensource Tftpd32 program can be used. Put the firmware "**compexwrt-wpj344-xxx.img**" into the same directory.
2. Go into loader mode of the board from the serial console. Press any button when the board is loading.

```

U-Boot 1.1.4 (May 14 2014 - 12:57:52)
U-Boot DB120
Wasp 1.2

DRAM: 128 MB
Top of RAM usable for U-Boot at: 88000000
Reserving 146k for U-Boot at: 87fd8000
Reserving 192k for malloc() at: 87fa8000
Reserving 44 Bytes for Board Info at: 87fa7fd4
Reserving 36 Bytes for Global Data at: 87fa7fb0
Reserving 128k for boot params() at: 87f87fb0
Stack Pointer at: 87f87f98
Now running in RAM - U-Boot at: 87fd8000
Flash Manuf Id 0xc2, DeviceId0 0x20, DeviceId1 0x18
Flash found: mx25l16mb
Flash: 16 MB
Using default environment

eth_set_enetaddr(num=0, addr=04:f0:21:0c:d5:49)
eth_set_enetaddr(num=0, addr=04:f0:21:0c:d5:49)
In: serial
Out: serial
Err: serial
Net: ag934x_enet_initialize...
   wasp reset mask:c02200
WASP ----> S17 PHY *
athrs17_reg_init: complete
: cfg1 0x80000000 cfg2 0x7114
eth0: 04:f0:21:0c:d5:49
eth0 up
eth0
Setting 0xb8116290 to 0x3c782d0f
Hit any key to stop autoboot: 0
ar7240>
ar7240>
ar7240>
ar7240>
ar7240>

```

3. Set the server IP in the loader mode to be the PC's IP address.

\$ setenv serverip <IP address of the PC>

4. TFTP in the firmware into the board by using the following commands

\$ cpxing compexwrt-wpj344-xxx.img

```

ar7240> setenv serverip 192.168.1.158
ar7240> cpimg wpj344-art_11AC_8m_b140425.img
Trying eth0
dup 1 speed 1000
Using eth0 device
TFTP from server 192.168.1.158; our IP address is 192.168.1.1
Filename 'wpj344-art_11AC_8m_b140425.img'.
Load address: 0x81000000
Loading: #####

done
Bytes transferred = 7022068 (6b25f4 hex)
Updating firmware at addr 0x81000000 ...
Updating firmware, please wait .....
Erasing flash... .....
Erased 22 sectors
Copy to Flash... .....done
Erasing flash... .....
.....
Erased 99 sectors
Copy to Flash... .....done
Update firmware successfully! Please reboot.
ar7240>

```

5. Reboot the device after loading in the firmware.

\$ reset

Using the TFTP method

This section describes how to upgrade the firmware into the board using the TFTP method, when webpage has already hanged. A serial cable is not required.

Since there is no serial output, one would have to take note of the LEDs which indicate the progress of the firmware upgrade. The physical arrangement of LEDs on the router may differ for different models. For example, on the WPJ344 router, the LEDs starting from the one nearest the corner are: Power (green), Diagnostics (green), LED#1 (red), LED#2 (orange), LED#3 (green), and LED#4 (green).

The following applies to the WPJ344, WPJ342, WPJ558, and all newer AP boards.

1. Please make sure the AP (power off) is connected to your PC or your network via a LAN cable. Note that Gigabit Ethernet is currently not supported by the APs. (This problem is being looked into.) If your PC has a Gigabit Ethernet port, the AP cannot be connected directly to the PC, but should be connected to a switch which is in turn connected to the PC.

2. While holding down the "reset" button, supply power to the board, then release the "reset" button after at least 4 seconds. LED#4 would start to blink about 3 times per second.

3. Open a DOS window / command prompt and input

```
tftp -i 192.168.1.1 put "F:\firmware\wpj344_140616_v1.img"
```

("F:\firmware\wpj344_140616_v1.img" is the path of the firmware. You can directly pull it into the window.)

While the firmware is being transferred from the PC to the board, both the Diagnostic LED and the LED#4 would blink about 3 times per second.

4. Wait till you see

"Transfer successful: 4719000 bytes in 26 seconds, 181500 bytes/s" or

"Transfer successful: 6237776 bytes in 52 seconds, 119957 bytes/s".

The board would then erase the flash memory and copy the firmware to the flash memory. During this process, the LEDs stop blinking.

After the board has updated the firmware, the LED#4 would blink about once per second.

5. Power off the board, then supply power again after at least 4 seconds. Check if you can login to the webpage (192.168.1.1). If yes, that means you have upgraded the firmware successfully.

Finding out if board is 8 MB flash or 16 MB flash version

The flash memory on the board may be of the size of 8 MB or 16 MB.

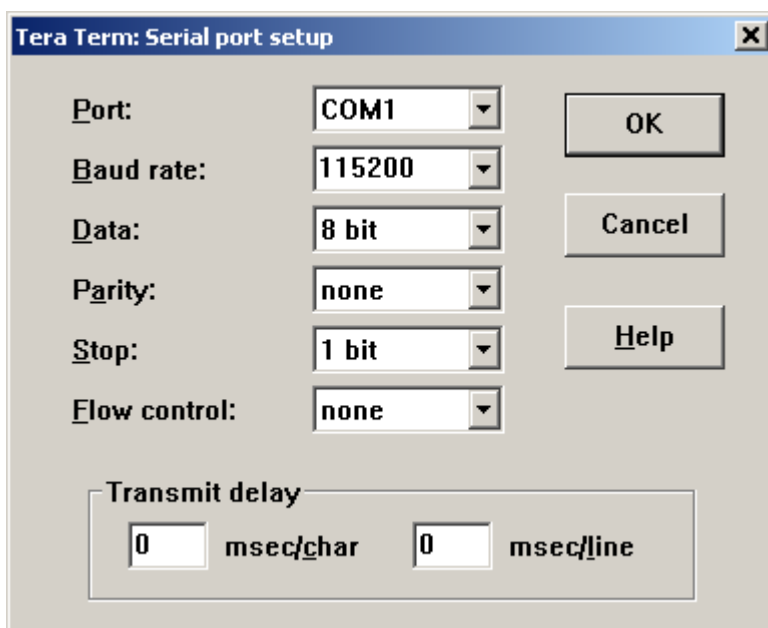
The 8 MB flash firmware can be used on a 16 MB flash board, but half of the flash is never used.

There are two methods to find out the flash memory size of the board: using the serial console, or looking at the dmesg output.

By using the serial console

If using the serial console, it is easy to see whether the flash is 8 MB or 16 MB.

See that the board is linked to the PC by a serial connector. Open the Tera Term application. The following picture shows the configuration settings for the serial port.



When you turn on or reboot the AP, the following line can be seen within the first 20 lines of the Tera Term output.

Flash: 8 MB

or

Flash: 16 MB

By looking at the dmesg output

If you do not have a serial console, you may run the command “**dmesg**” in PuTTY.

From the dmesg log about 0.3 seconds from startup, you may see something like:

```
[ 0.300000] m25p80 spi0.0: mx25l6405d (8192 Kbytes)
```

or

```
[ 0.300000] m25p80 spi0.0: mx25l12805d (16384 Kbytes)
```

The “8192 Kbytes” means that the flash is 8 MB.

The “16384 Kbytes” means that the flash is 16 MB.

Loader Upgrade

Normally, there isn't a need to upgrade loader. And it is the best not to upgrade loader, because once it is corrupted due to wrong upgrading process, the only way to recover is to JTAG the board.

The only way for Loader Upgrade is to use the Serial Console. Please connect the Ethernet port further away from the power adapter, to the PC with the TFTP Server.

1. Setup a TFTP server on your PC. The opensource Tftpd32 program can be used. Put the firmware "**tuboot.bin**" into the same directory.
2. Go into loader mode of the board from the serial console. Press any button when the board is loading.

```
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U-Boot DB120
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Stack Pointer at: 87f87f98
Now running in RAM - U-Boot at: 87fd8000
Flash Manuf Id 0xc2, DeviceId0 0x20, DeviceId1 0x18
Flash found: mx25l 16MB
Flash: 16 MB
Using default environment

eth_set_enetaddr(num=0, addr=04:f0:21:0c:d5:49)
eth_set_enetaddr(num=0, addr=04:f0:21:0c:d5:49)
In: serial
Out: serial
Err: serial
Net: ag934x_enet_initialize...
wasp reset mask:c02200
WASP ----> S17 PHY *
athrs17_reg_init: complete
: cfg1 0x80000000 cfg2 0x7114
eth0: 04:f0:21:0c:d5:49
eth0 up
eth0
Setting 0xb8116290 to 0x3c782d0f
Hit any key to stop autoboot: 0
ar7240>
ar7240>
ar7240>
ar7240>
ar7240>
```

3. Set the server IP in the loader mode to be the PC's IP address.

```
$ setenv serverip <IP address of the PC>
```

4. TFTP in the firmware into the board by using the following commands

```
$ run lu
```

```
ar7240> setenv serverip 192.168.1.158
ar7240> run lu
Trying eth0
dup 1 speed 1000
Using eth0 device
TFTP from server 192.168.1.158; our IP address is 192.168.1.1
Filename 'tuboot.bin'.
Load address: 0x80060000
Loading: #####
done
Bytes transferred = 58867 (e5f3 hex)
Erasing flash... .
Erased 1 sectors
Copy to Flash... done
ar7240>
```

5. Reboot the device after loading in the firmware.

\$ reset

Important Note: You would see that for all the boards, it is using “ar7240>”. This does not matter at all. We used the same architecture for all the boards’ loader, so they have the same names regardless of which board you are using.

Using the Serial Cable in Windows 8.1

Question:

On WPJ344, we have trouble to stop booting with serial cable using Windows 8.1 computer. This happened during flash new firmware. How can we input to the board using the serial debug cable?

Answer:

I also had some problems initially with using the serial terminal console on a new Windows 8.1 PC.

TeraTerm would not show up the last few characters of each line (maybe because of USB, closing and opening the program may solve it). Some time later, it would only show nonsense maze characters.

RealTerm at first cannot show, then changing the baud rate to 115200 and other font, it can show, then after some time it becomes corrupted. Also it cannot copy the text.

PuTTY could use the serial console properly in Windows 8.1. Please open the Device Manager in the Control Panel to see the COM number. For example, "Prolific USB-to-Serial Comm Port (COM5)" under "Ports (COM & LPT)" means that you should specify "COM5" as the Serial line name in PuTTY.

PuTTY is also working very well with "ATEN USB to Serial Bridge (COM3)", a generic Made-In-China USB-to-Serial cable.

MobaXterm is also running well. It detected (COM3) and you would need to modify the serial port settings to the following:

Serial Port Settings:

Baud rate / bits per second = 115200;

Data bits = 8;

Stop bits = 1;

Parity = None;

Flow control = None;

I suggest to apply the same settings in your Windows 8.1 Device Manager.