

HPSDRProgrammer_v2 v2.0

Quartus-II Programmer

ByteBlaster

instructions

for

Apache 10/100/100D



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By Bill Diaz KC9XG 04/16/2013

Loading FPGA code with HPSDRProgrammer_v2 v2.0

OpenHpSDR/ ANAN-* SDR: Updating firmware and assigning a static IP address.

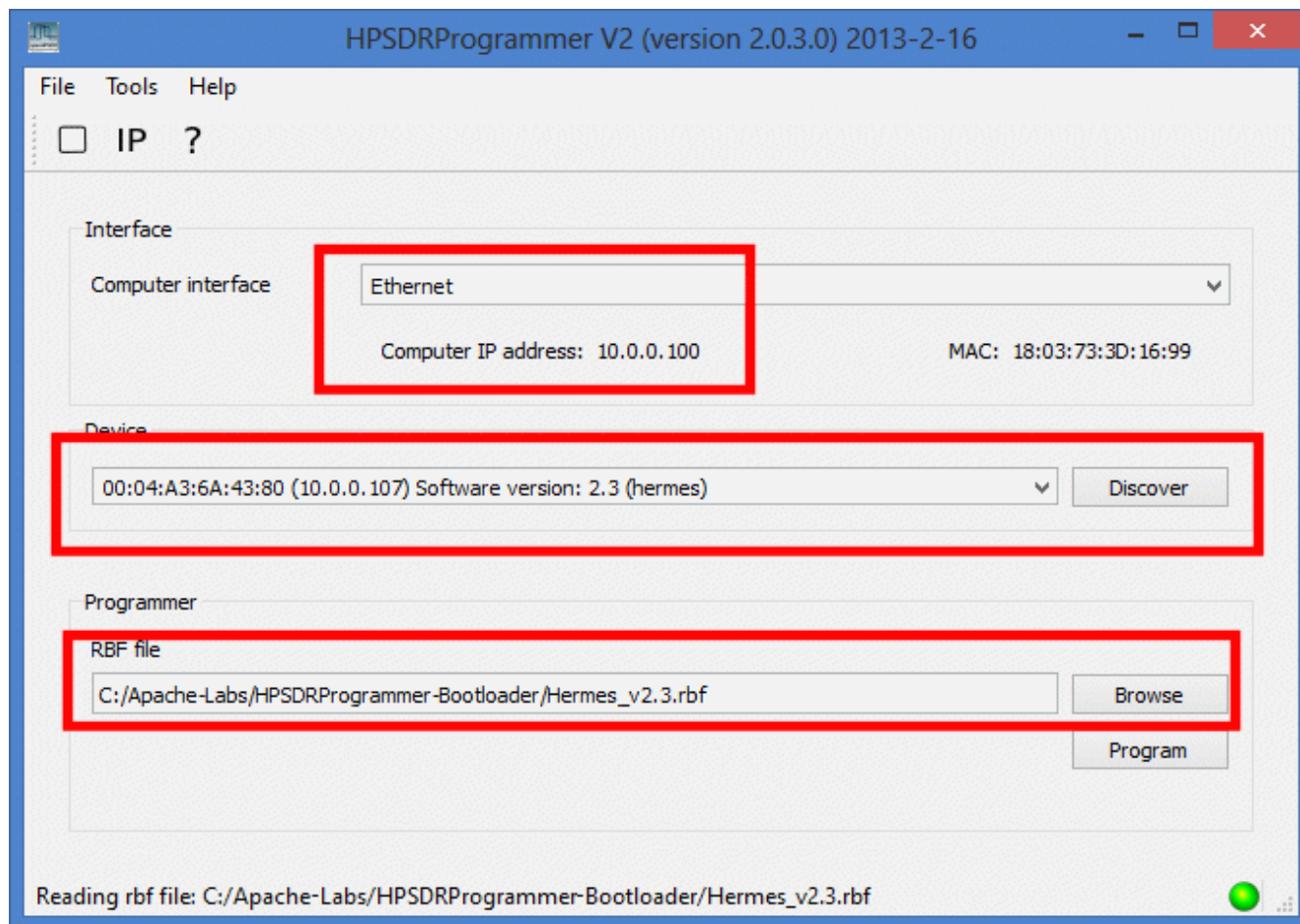
The OpenHPSDR HPSDRProgrammer_v2_V2 application provided by KV0S can be used to load new firmware and assign or change IP addresses with properly configured OpenHPSDR ANAN-* radios. No jumper changes needed. This assumes initial bootloader code has been installed properly.

Installing OpenHPSDR's K0VS HPSDRProgrammer_V2:

1. Ensure that no applications are currently connected to your ANAN-* SDR
2. Install WinPCap per instructions at <http://openhpsdr.org/download.php> .
 - A. Windows WinPCap available at <http://www.winpcap.org>
 - B. Linux, simply install libpcap from the repository.
3. Download and install HPSDRProgrammer_v2_V2 from <http://openhpsdr.org/download.php> .
 - a) Windows version at http://openhpsdr.org/downloads/programs/HPSDRProgrammer_v2_V2.msib
 - b) Debian 64 bit at http://openhpsdr.org/downloads/programs/HPSDRProgrammer_v2_V2-debian-64.tgz
 - c) Debian 32 bit at http://openhpsdr.org/downloads/programs/HPSDRProgrammer_v2_V2-debian-32.tgz

Using HPSDRProgrammer_v2:

1. Run the HPSDRProgrammer_v2 application.
2. The HPSDRProgrammer_v2 Interface section should now contain the following information:
 - a) Computer IP address: x.x.x.x MAC hh:hh:hh:hh:hh:hh
Where x indicates numeric values and hh indicates hex values.
3. Connect your OpenHPSDR ANAN-* to your LAN or directly to your computer and power up the device.
 - a) If you connect your ANAN-* directly to your PC and an IP address has not been assigned, the unit will be waiting for assignment of a Dynamic IP address, and this process can take up to 20 minutes for APIPA to assign a workable IP address.
 - b) If you connect your ANAN-* to a LAN router or switch where a DHCP server has been enabled, IP Address assignment should only take a few seconds.
 - c) If a static IP address has been previously assigned to your ANAN-*, the SDR should be available in a second or so.
4. The ANAN-* front Panel LAN connector LED's should indicate if an Ethernet link is available on the left and Ethernet data activity on the right.
 - a) If the LED's do not light, check your LAN or PC connection to ensure your ANAN-* is connected to your PC or LAN. Ensure your PC TCP/IP capability has been enabled as well.



5. In the OpenHPSPDRProgrammer_v2 Device section, Press the "Discover" button located at the right center of the HPSPDRProgrammer_v2 Window.

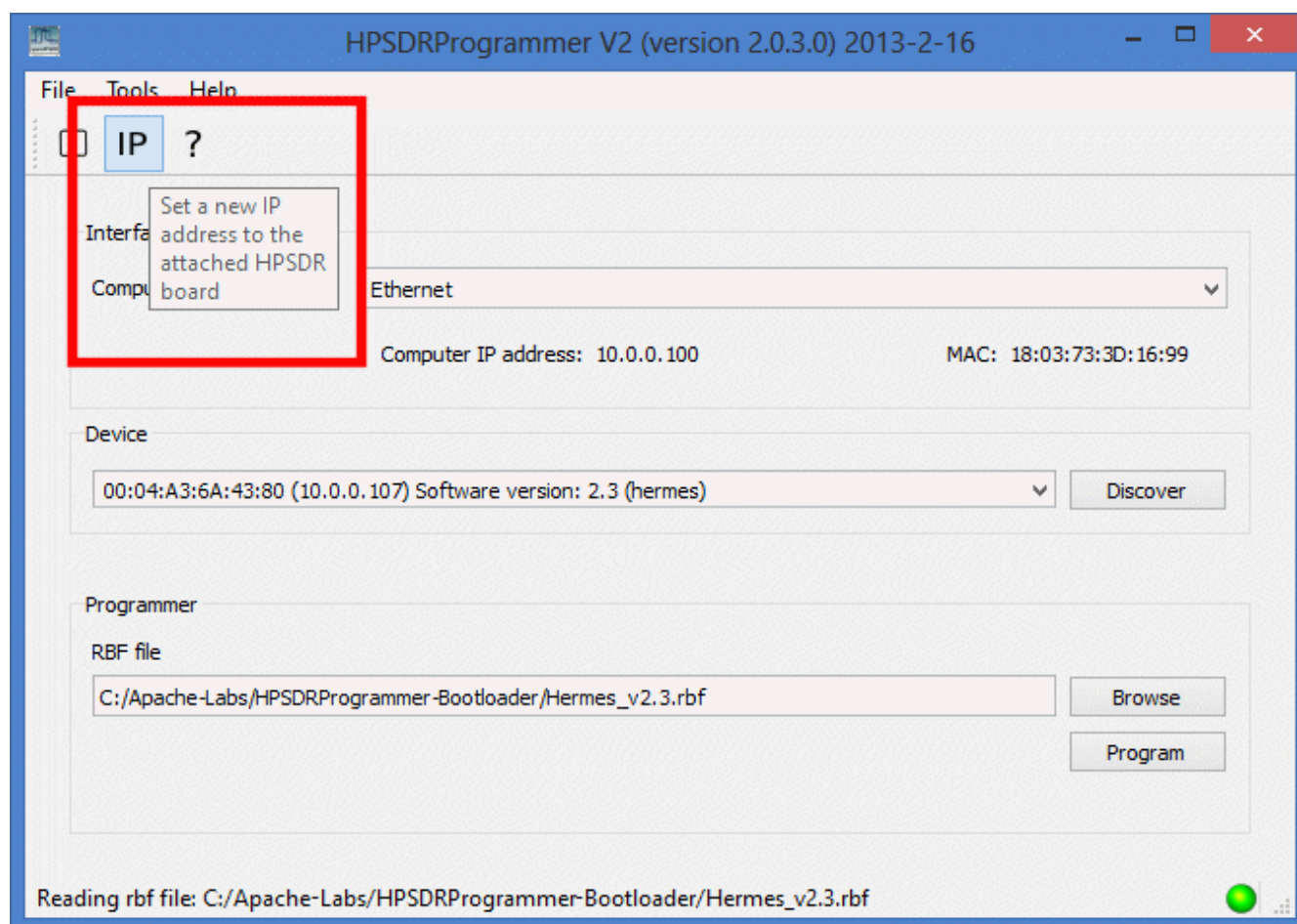
- a) The "Device" text box should now show something similar to:
00:04:A3:6A:54:B5 (192.168.1.88) Software version: 2.3
- b) If your ANAN-* MAC and IP address are not shown as indicated above, your OpenHpSDR ANAN-* cannot be found on your network. Please check your ethernet connections and try again.

Upgrading OpenHPSDR firmware using HPSDRProgrammer_v2:

1. Download new firmware by visiting <http://openhpsdr.org/download.php> . Find the appropriate .rbf firmware file for your SDR. For example, the current firmware file for ANAN-* radios should be listed as Hermes V_2.x.rbf. Download and save the appropriate .rbf for your SDR to a convenient location on your computer, for later recall.
2. Press the "Browse" button in the "Programmer" section of HPSDRProgrammer_v2 and locate the *.rbf firmware file you downloaded previously and select it in the browse "Open" dialog and then press the "OK" button.
3. The Hermes_v2.x.rbf or whatever firmware filename you selected previously must now be displayed in the "Programmer", "RBF file" text box.
4. Press the "Program" button to load the .rbf file into your OpenHpSDR ANAN-* SDR.
5. HPSDRProgrammer_v2 should display the progress of the firmware loading process.
6. Upon successful completion of loading the new firmware, the Device text box should contain the new version number.

Assigning an IP address using HPSDRProgrammer_v2:

1. Click on Menu Selection "Tools", "IP", or simply click on the IP text just below the menu selections.



2. The "Address Dialog window will appear.
3. An IP address can be assigned by placing 8 bit values in each of the 4 text boxes.
 - a) 8 bit values are numbers which can range from 0 to 255.
 - b) Each of the 4 text boxes must have a valid value entered.

- c) If you do not know what IP address to use, just enter 0's in each box to revert to automatic IP assignment (DHCP).
 - d) Press the Write IP button to write the entered IP address to your ANAN-*
4. Entering 0's in all 4 text boxes will revert your ANAN-* to DHCP or dynamic IP address assignment.
 5. After entering a new IP address, close the "Address Dialog" window.
 6. Hit the "Discover" button again to verify the IP address you just wrote.

Bootloader explained by Phil VK6APH

This is how it works.

The bootloader fits in EEPROM from 0 to 1MB. The code fits in from 1MB to 2MB.

When the board starts it reads from address 0 i.e. the bootloader code. If J12 is in then it runs the bootloader and if removed the bootloader forces the FPGA to read from 1MB and hence runs the code.

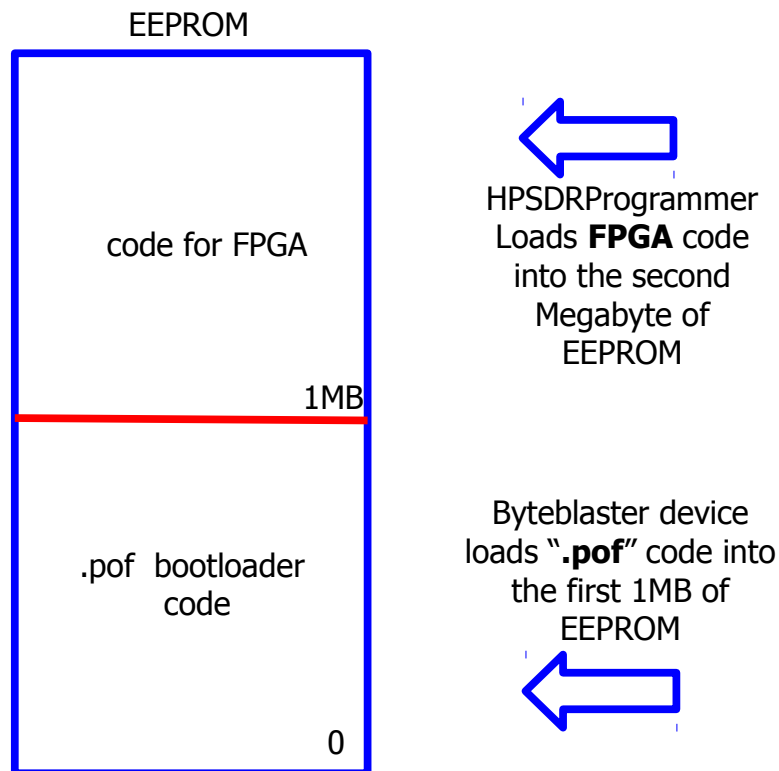
When running the code and using HPSPDRProgrammer_v2, if you update the code then it gets loaded at the 1MB address in the EEPROM. The update code is designed so you can **never** overwrite the bootloader - in which case if something goes wrong you can always recover using the bootloader.

If you use the USB Blaster to load the bootloader you will overwrite the existing code at address 0. You then use HPSPDRProgrammer (in bootloader mode) to load the version of you want.

You can't do any damage and since you have a USB Blaster you can always recover the board.

Load the bootloader using the USB Blaster then put in bootloader mode and use HPSPDRProgrammer_v2 to load FPGA code.

73 Phil...



Updating EEPROM bootloader using USB Blaster Download cable .

Updating Firmware can be accomplished using an Altera USB Blaster cable or equivalent. You will need to obtain the following hardware and software/drivers.

1. Download the USB Blaster user guide: http://www.altera.com/literature/ug/ug_usb_blstr.pdf
2. Download and install Altera Quartus II Stand-Alone Programmer and drivers:
 - a. Browse to <https://www.altera.com/download/software/prog-software>

Quartus II Stand-Alone Programmer

Home > Support > Downloads > Quartus II Stand-Alone Programmer

Release date: November, 2012

Quartus II Programmer Software v12.1

Download Option 1: Altera Installer

Use Altera® Installer to select your choice of design software with non-NTLM proxies. You must first download this small Altera Installer, which then allows you to choose the software and device you want to install. The Altera Installer reduces file download size by up to 50 percent.

Download Windows Version (22 MB) **Download** Linux Version (21 MB)

Download Option 2: Individual Files

Quartus II Programmer Software	Platform	File Name	Size
Quartus II Programmer Software	Windows	12.1_programmer_windows.exe MD5: 65ebf1c62c51744b98f8b5b814fdc7d4	143 MB
Quartus II Programmer Software	Linux	12.1_programmer_linux.tar.gz MD5: f0d221445dd0ac543dd9f3f44e9babbb	327 MB

[What the MD5 sum value is and what it is for](#)

Other Individual Download Files:

- [Quartus II Subscription Edition](#)
- [Quartus II Web Edition](#)
- [ModelSim-Altera](#)
- [ModelSim-Altera Starter](#)
- [Nios II EDS](#)
- [DSP Builder](#)

Download Option 3: DVD .iso File

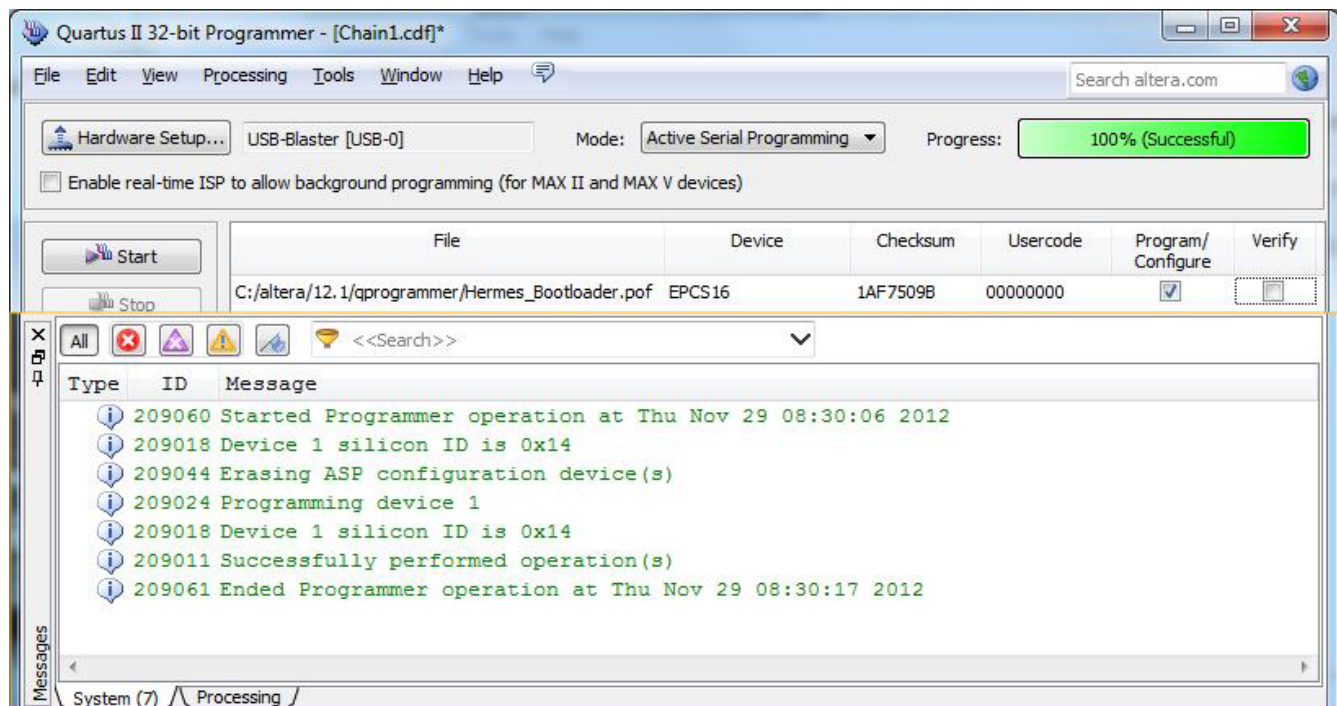
Use a DVD image to create your own installation DVD to install Altera software and device support if you do not have consistent Internet access or you require a DVD. You download one large file and use it to create an installation DVD.

- b. Download option 2: Individual Files
 - c. Click on 12.1_Programmer_Windows.exe and follow instructions on web page. You may be asked to register. Use one time option.
 - d. Download file size about 143MB, but requires 931mb on disk.
 - e. C:\altera\12.1\qprogrammer\bin\quartus_pgmw.exe is the executable.
3. Obtain a USB Blaster from one of the following sources (ebay typical price about \$10 and up):
 - a. <http://www.buylaltera.com/scripts/partsearch.dll?Detail&name=544-1775-ND>
 - b. <http://www.terasic.com.tw/cgi-bin/page/archive.pl?Language=English&CategoryNo=&No=46>
 - c. http://www.ebay.com/sch/i.html?_sacat=0&_from=R40&_nkw=usb%20blaster&_sop=15

Once you have obtained a USB blaster you can begin the process to install the drivers. You must have system administration (Administrator) privileges to install the USB-Blaster download cable driver.

Driver installation:

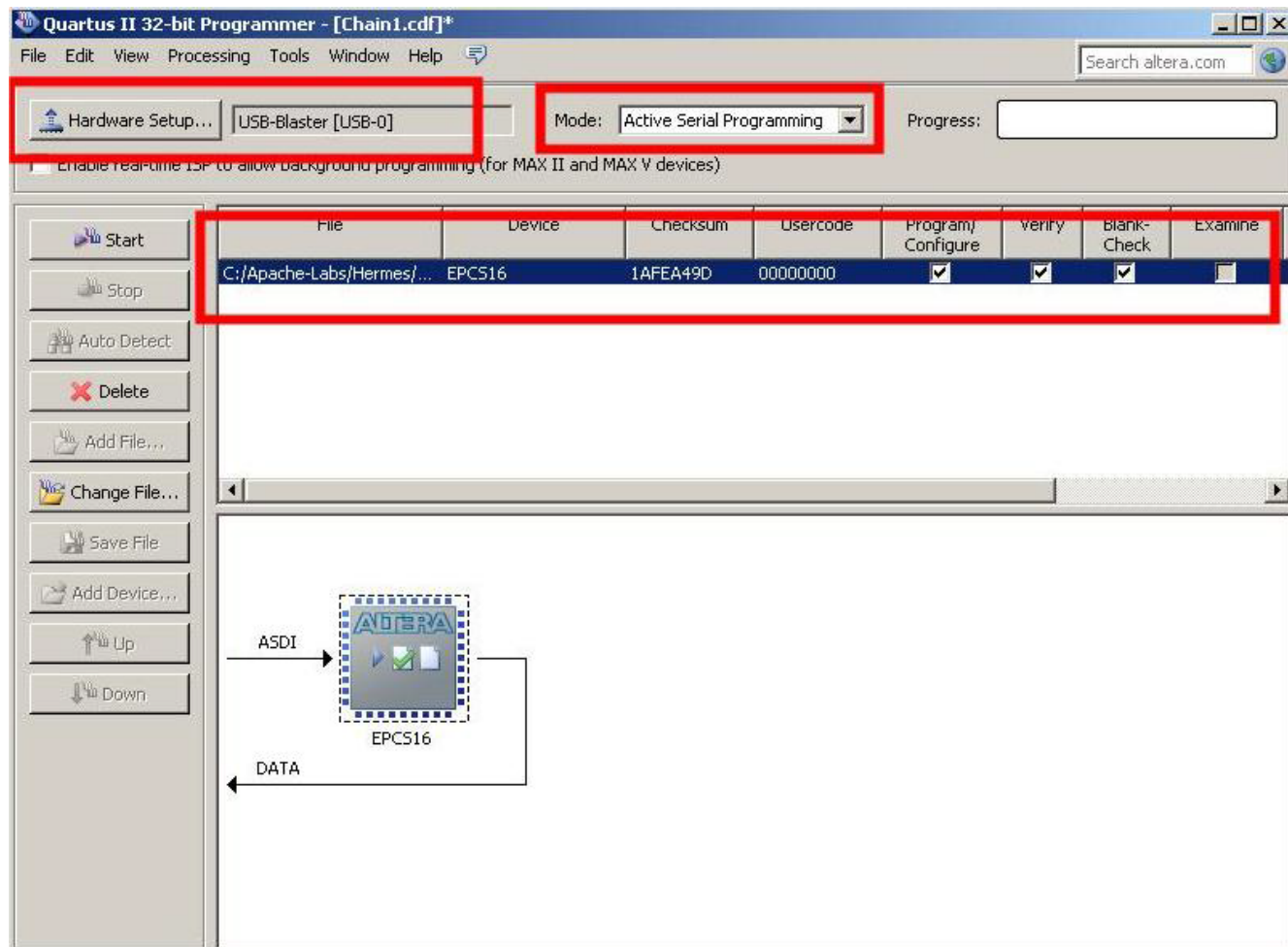
1. Plug your USB Blaster into a USB port on your PC.
2. The Windows Found New Hardware dialog box prompts you to install the driver.
NOTE: Do NOT use the Add Hardware Wizard from the Control Panel!
3. Select "Locate and install driver software" (recommended).
4. Select "Don't search online".
5. When you are prompted to "Insert the disc that came with your USB-Blaster", select "I don't have the disc. Show me other options".
6. Select "Browse my computer for driver software (advanced)" when you see the Windows couldn't find driver software for your device.
7. Click Browse and browse to the appropriate USB Folder (Example Paths to Quartus II installation
.....\drivers\Usb-blaster)
a: C:\altera\12.1\qprogrammer\drivers\usb-blaster\x32\
b: C:\altera\12.1\qprogrammer\drivers\usb-blaster\x64\
8. Click OK.
9. Select the "Include subfolders" option and click Next.
10. If Windows can't verify the publisher of this driver software, select "Install this driver software anyway" in the Window Security dialog box.
11. When "The software for this device has been successfully installed" appears, click Close.



Configuring your USB-Blaster/Quartus II software.

Refer to page 1-6 Setting Up the USB-Blaster user guide downloaded previously from http://www.altera.com/literature/ug/ug_usb_blstr.pdf

1. Start the Quartus II software, downloaded previously. Example
C:\altera\12.1\qprogrammer\bin\quartus_pgmw.exe



2. Choose Programmer (Tools menu).
3. Click Hardware Setup. The Hardware Settings tab of the Hardware Setup dialog box is displayed.
4. From the drop-down menu, select USB-Blaster [USB-0].
5. Click Close to close the Hardware Setup dialog box.
6. In the Mode list, select the desired mode (Programmer window).
7. Select Mode "Active Serial Programming".
8. The Device column of the "Programmer Window" should now show **EPCS16 for Hermes**
9. Check the "Program/Configure" box on the "Programmer Window"

Disassembly of the ANAN-10

1. Remove the power from the ANAN-10/Hermes.
2. Disconnect ALL external cables/connectors from the ANAN-10/Hermes.
3. Remove the nuts and washers from the 4 SMA connectors on the rear panel.
4. Remove the 4 screws from the front panel.
5. Press on connector J16 on the rear panel to slide the board about 1" out of the front of the housing.

Do NOT attempt to remove the board completely from the ANAN-10 housing!

Loading H ermes_bootloader.pof into the ANAN-10/Hermes

1. Download the Bootloader.pof file from the OpenHPSDR website:
<http://openhpsdr.org/download.php> - look for the "Hermes_bootloader.pof"
(remember where you downloaded this file) using the ADD FILE left hand menu option, have the Altera Quartus software load and recognize the bootloader.pof file and note it in the "FILE" section of the Quartus display.
2. Locate the P2 10 pin jack behind the Mic, Headphones, Key jacks on the front panel.
3. Place the 10 pin USB Blaster Ribbon cable on P2, with the red stripe adjacent to the edge of the board. The 10 pin plug is not keyed. Make sure the red stripe is adjacent to the edge of the board and that all 10 pins are engaged.
4. Apply power to the ANAN-10.
5. Click "Start" in the QUARTUS II "Programmer Window". Progress of the programming process will be shown in the "Progress Box" and completed steps will be listed in the bottom portion of the "Programmer Window".
6. When the "Progress Box" shows "Completed", you may power down and disconnect the Blaster cable from the card.
7. Click "Start" in the "Programmer Window". Progress of the programming process will be shown in the "Progress Box" and completed steps will be listed in the bottom portion of the "Programmer Window".
8. When the "Progress Box" shows "Completed", you may power down the and disconnect the Blaster cable from the HPSDR card. Your "Bootloader EEPROM" is now all ready to operate properly.

