

Quartus-II Programmer

ByteBlaster

OPENHPSDR programmer

instructions

for

ANAN-10/Hermes



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By Bill Diaz KC9XG 11/29/2012

Updating EEPROM bootloader using USB Blaster Download cable.

Updating Hermes 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

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 Option 2: Individual Files

Quartus II Programmer Software	Platform	File Name	Size
Quartus II Programmer Software	Windows	12.1_programmer_windows.exe MD5: 65ebf1c62c51744b98f8b5b814fde7d4	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.buyaltera.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.

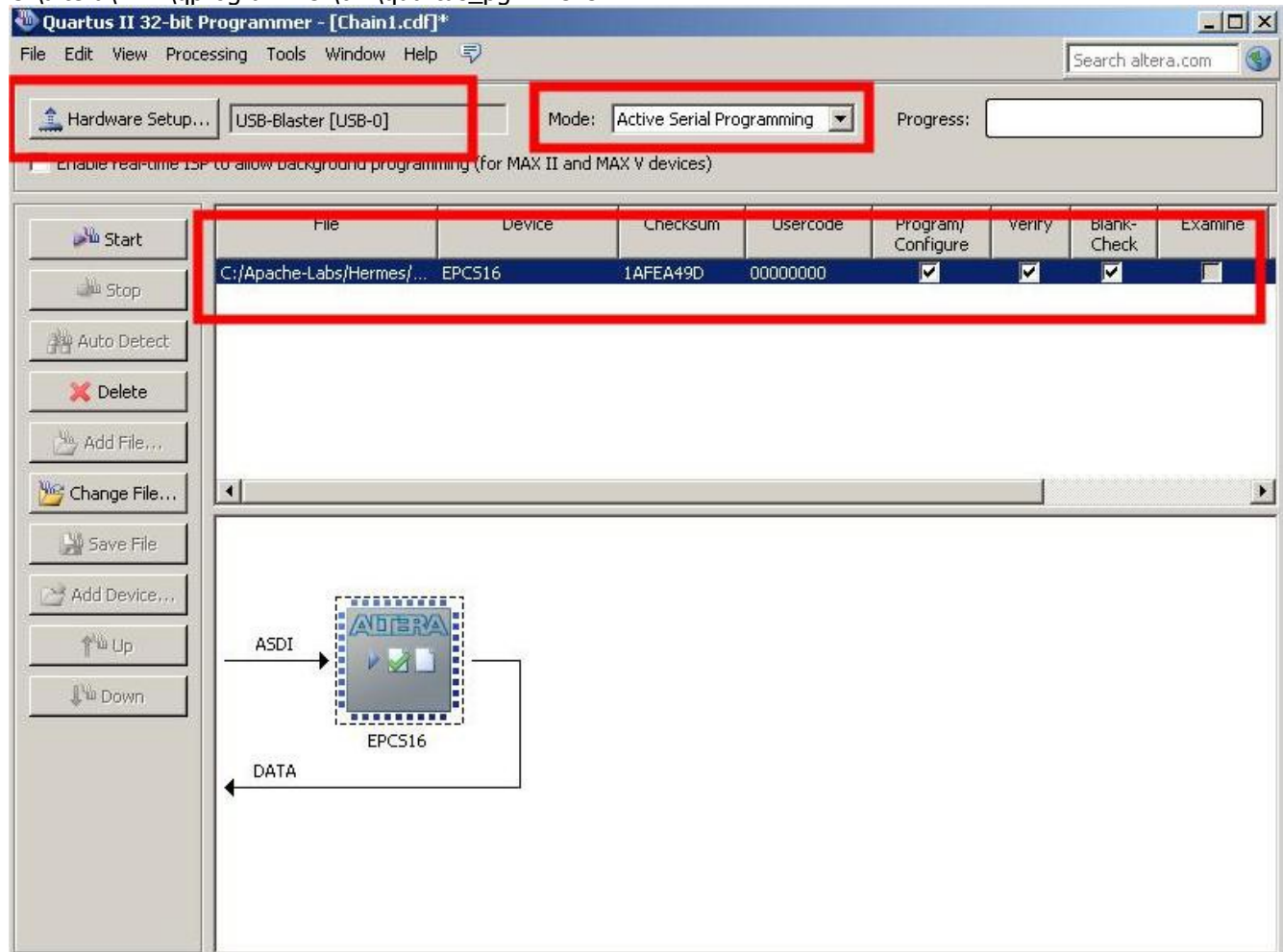
Driver installation:

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



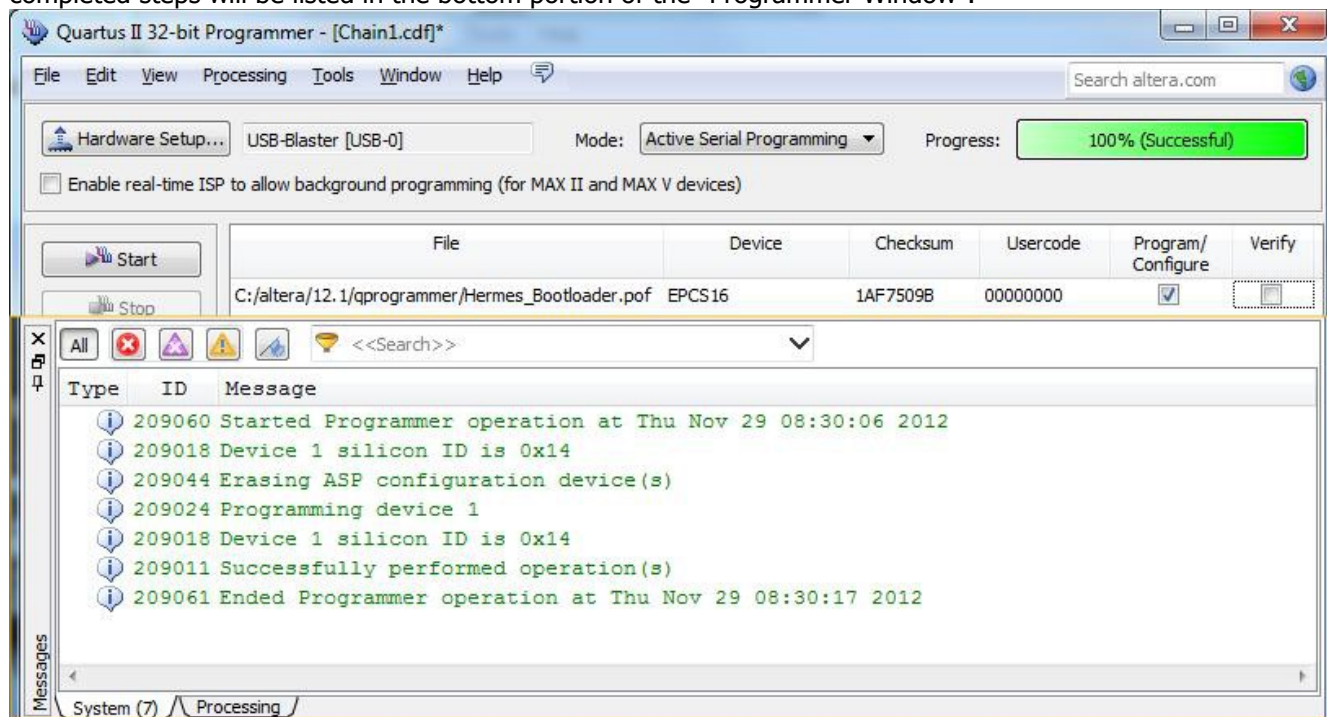
2. Choose Programmer (Tools menu).
3. Click Hardware Setup. The Hardware Settings tab of the Hardware Setup dialog box is displayed.
4. From the drop-down menu, select USB-Blaster [USB-0].
5. Click Close to close the Hardware Setup dialog box.
6. In the Mode list, select the desired mode (Programmer 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 hermes board about 1" out of the front of the housing.**
- Do NOT attempt to remove the board completely from the ANAN-10 housing! Loading**

hermes_bootloader.pof into the ANAN-10/Hermes

1. Locate the Hermes P2 10 pin jack behind the Mic, Headphones, Key jacks on the front panel.
 2. 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.
 3. Apply power to the ANAN-10.
 4. 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".



5. When the "Progress Box" shows "Completed", you may power down Hermes and disconnect the Blaster cable from the Hermes card. .
 6. 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".
 7. When the "Progress Box" shows "Completed", you may power down the Hermes and disconnect the Blaster cable from the HPSDR card.
- Your "Bootloader EEPROM" is now all ready to operate properly.

Loading FPGA code with HPSDRProgrammer v1.6

1. Obtain HPSDRProgrammer Windows-32bit V1.6 (HpSDRProgrmmmer-v1.6-win32.zip) from <http://openhpsdr.org/download.php>
 2. Extract all files from HpSDRProgrmmmer-v1.6-win32.zip to a convenient folder.
 3. Locate the current Hermes_V1.x.rbf file to your HPSDRProgrmmmer folder from <http://openhpsdr.org/download.php>
 4. Power up your Hermes radio and connect it your local LAN using the RJ45 connector on the front panel.
 5. Run HPSDRProgrammer.exe
 6. Select Device Hermes.
 7. Select the Discover button. Hermes Discovery information will be displayed at the bottom of the HPSDRProgrmmmer window. If Discovery cannot find any cards, check your LAN connection to your Hermes. Hermes must either use a dynamic IP address (DHCP) or have a static address programmed into the card.
 8. Press the Browse button to load the .rbf file you downloaded in step 3, above.
 9. Press the Program button to load the .rbf file onto your hermes card.
- NOTE:** do not run PowerSDR/OpenHPSDR or any other program while running the Programmer

Bootloader explained by Phil VK6APH

This is how it works.

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

When the Hermes 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 Hermes code.

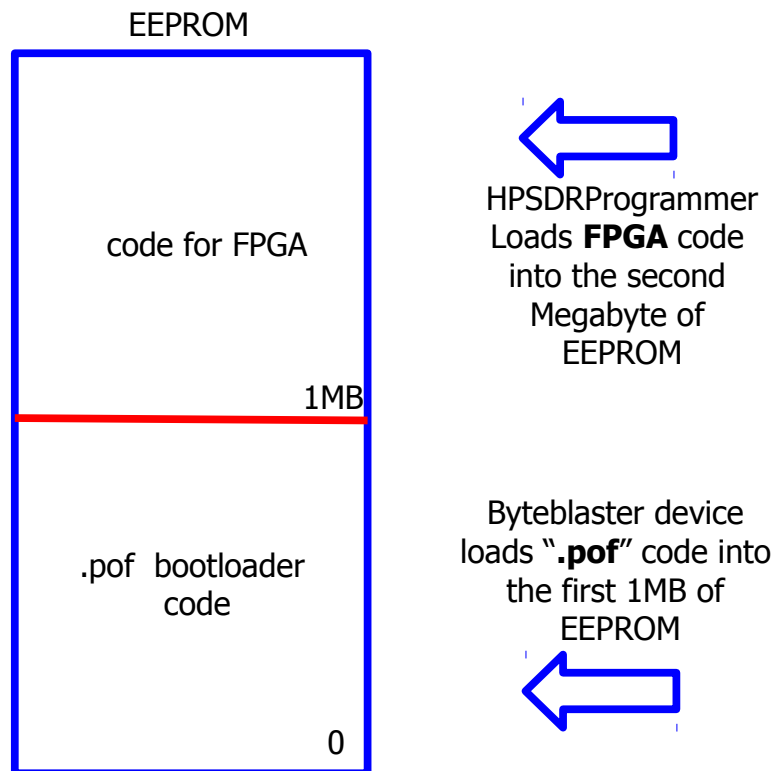
When running the Hermes code and using HPSDRProgrammer, if you update the code then it gets loaded at the 1MB address in the EEPROM. The update code is designed so you can **never** overwrite the bootloader - in which case if something goes wrong you can always recover using the bootloader.

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

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

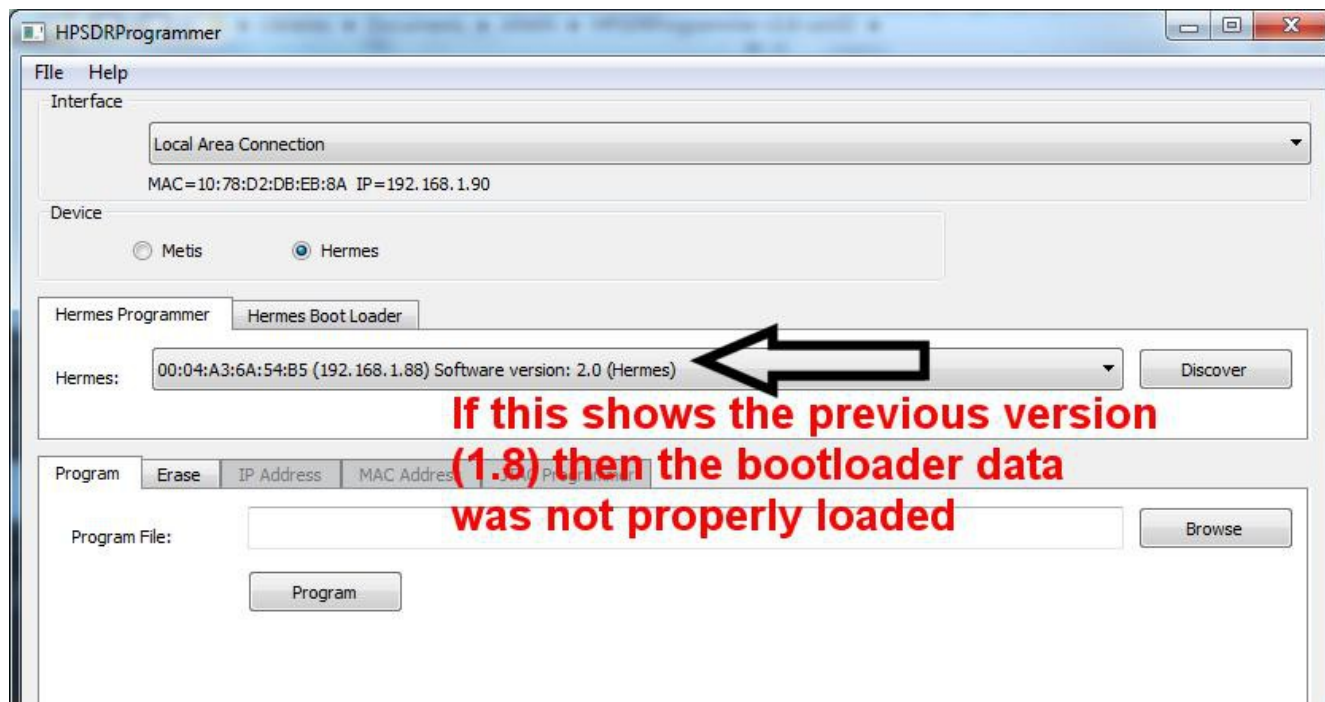
Load the bootloader using the USB Blaster then put Hermes in bootloader mode and use HPSDRProgrammer to load Hermes FPGA code.

73 Phil...



Appendix I – bootloader information

If you have loaded new FPGA code into your system and then on a reboot it shows the OLD version of the FPGA code, it indicates that you have not successfully loaded the bootloader code into the EEPROM.



Appendix II – VK6APH FPGA V2.0

----- Original Message -----

Subject: [hpsdr] New Hermes code released

Date: Sat, 1 Dec 2012 09:58:58 +0800

From: Phil Harman <phil@pharman.org>

To: HPSPDR list <hpsdr@lists.openhpsdr.org>

***** High Performance Software Defined Radio Discussion List *****

All,

There is a new version of the Hermes code (V2.0) which will be available shortly from openhpsdr.org \ Downloads.

This provides the following features:

- fix for the lock-up problem some users have been experiencing
- Increased number of receivers from two to four
- Support for switching the input attenuator in 1dB steps from 0 - 31dB
- Improved Alex support when using multiple receivers

The increase in the number of receivers does increase the current consumption. On my Hermes board, with four receivers running, the board draws approximately 700mA from a 13.8V supply.

Please see the Hermes User Guide for instructions relating to installing this new version of code.

Many thanks to Joe, K5SO, for developing the FPGA code and the members of the beta test team.

73 Phil...VK6APH