

How to Use a Configuration Device with BT-U Board 23-Sep-05

Background:

The Cyclone FPGA on the BTU board, uses SRAM storage to configure its logic. When there is no power, the SRAM is cleared and the FPGA is blank. When the Cyclone is powered, it can accept a new configuration through JTAG or through a configuration device. The BTU board supports both of these methods. When you use JTAG, you are configuring the FPGA directly. When you program a configuration device, the device stores your logic on its non-volatile memory. The device then programs your FPGA on power up. If you want your FPGA automatically configured on power up, you need a configuration device. You will also need either a ByteBlaster II or a USB-Blaster. The BT-Blaster and ByteBlasterMV will not program configuration devices. The following are instructions to install and program a configuration device on the BTU board:

Parts needed:

Configuration Device – EPCS1SI8 DigiKey PN#: 544-1241-5-ND (\$3.50)

Fine tip soldering Iron

Fine Pitch Solder (0.031" is good)

USB-Blaster or ByteBlaster II

Instructions:

1. On the solder side (bottom) of the board to the right of the PS/2 connector, you will find a small outline labeled epcs1. Notice the pin 1 indicator on the outline. On the EPCS1 configuration device, pin 1 is on the side with the bevel. Matching the orientation is critical! Solder the EPCS1SI8 in place.
2. Using the Quartus II programmer tool, select Active Serial Programming in the mode drop box. The programmer will ask if you want to clear the device list, click "Yes". Click the "Add File..." button to add the **.pof** file which will be used to program your configuration device instead of the the .sof file used to program your FPGA directly.
3. Remove the two jumpers on the J7 header. These jumpers are necessary to program your FPGA directly with JTAG, but are not used when programming a configuration device.
4. Power the BTU board.
5. Connect your USB-Blaster (or ByteBlaster II) to the J7 header – not the BB header. J7 is used to program the configuration device, while BB is used to program the FPGA directly with JTAG.
6. Check the Program/Configure box in the programmer and click "Start".

When complete (which should take about 1 sec with a USB-Blaster), the board will retain your logic even without power.