



## Arria II GX FPGA Development Kit

# Quick Start Guide

## A Complete Development Environment

### Introduction

The Arria® II GX FPGA Development Kit, which comes with a one-year license for Quartus® II software, provides all that's needed to prototype and test high-speed serial interface designs for Altera's Arria II GX FPGA.

You can use this development kit to:

- Develop and test PCI Express® (PCIe) designs using the PCI-SIG®-compliant development board.
- Develop and test memory subsystems consisting of DDR3 and DDR2 memory.
- Take advantage of the modular and scalable design by using high-speed mezzanine card (HSMC) connectors to interface to one of over 30 different HSMCs provided by Altera partners.
  - Available HSMC support protocols: PCIe, XAUI, Serial RapidIO® (SRIO), Common Public Radio Interface (CPRI), Gbps Ethernet (GbE), OBSAI, and many others

### What's in the Box

- Arria II GX FPGA Development Board
  - Arria II GX EP2AGX125EF35C4N FPGA
  - DDR2 small outline DIMM (SODIMM)
  - DDR3 device
  - 1 HSMC connector
  - PCIe x8 edge connector
  - GbE port
  - LCD
- Download and install Arria II GX 6G edition kit installer
  - Design examples
    - Board Update Portal design
    - Board Test System design
  - Documentation
    - Arria II GX FPGA Development Kit User Guide
    - Arria II GX FPGA Development Board Reference Manual
    - Board design files
- Download and install Altera design software:
  - Quartus II software (required)
  - Nios® II embedded processor (optional)
  - MegaCore® IP library (optional)
  - ModelSim® (optional)
- AC adapter power supply
- Ethernet and USB cables
- Printed literature

## Keep Your Board Current With the Board Update Portal

The Board Update Portal design example included in this development kit facilitates easy development kit software and board flash memory updates, allowing you to do the following tasks:

- Link to useful information on [www.altera.com](http://www.altera.com), including the page that contains updated software and design examples
- Load designs into the flash memory on your board

Performing the steps below will ensure that you have the latest software available on both your computer and your board. The Board Update Portal design example, which includes a Nios II embedded processor, an Ethernet media access control (MAC), and a web page, is stored in the “factory” portion of your board’s flash memory. The source for this design is installed with the development kit software. When your board is connected to a DHCP-enabled network, the Nios II processor obtains an Internet protocol address and allows you to interface with your board over the network through a web page.

You will need the following items:

- A computer with a connection to a working Ethernet port on a DHCP-enabled network.
- A separate working Ethernet port connected to the same network for your board.
- The Ethernet and power cables and development board included in your kit.

*Step 1. Connect your board.*

1. With the board powered off, make sure dual in-line package (DIP) switch SW4.4 is in the off position.

2. Attach the Ethernet cable from the board to your network hub.
3. Power up the board. The board connects to your network server and obtains an Internet protocol address, which will be displayed on the board’s LCD when it has been assigned. Meanwhile, the LCD displays “Connecting.”
4. Launch a web browser on a computer that is connected to the same network, and type the Internet protocol address displayed on the LCD in the address bar. The Board Update Portal web page is displayed on your PC.
5. Select the link that says “Arria II GX FPGA Development Kit” and download the latest version of the development kit software.
6. Browse through the additional designs that are available and download any that interest you. Check this website often for new designs and for updates to existing designs and documentation.
7. If necessary, click on the link to the Software Download Center and download and install the latest Altera software tools, including Quartus II software, Nios II processor, and intellectual property (IP) functions.
8. This development kit comes with a one-year license for the Quartus II Development Kit Edition (DKE) design software. To get your one-year license, click on the Licensing link on the right side of the page or visit [www.altera.com/support/licensing/lic-index.html](http://www.altera.com/support/licensing/lic-index.html).

If you cannot connect to the Board Update Portal, go to <http://www.altera.com/products/devkits/altera/kit-aiigx-pcie.html> to ensure that you have the latest development kit software.

*Step 2. Install the development kit software.*

Install the latest development kit software tools from [www.altera.com](http://www.altera.com).

*Step 3. If necessary, use the Board Update Portal to update your board and load the latest board test system.*

The Board Update Portal allows you to download new FPGA configurations to the “user” portion of the board’s flash memory. If the Board Update Portal webpage displays the latest software version number, then your board is up-to-date and you can skip this step and go directly to “Using the Board Test System.”

If you cannot connect to the Board Update Portal, refer to the kit’s User Guide for other options to update the flash memory.

Follow these steps to update your board:

1. Follow the steps in Step 1 to display the Board Update Portal web page.
2. Specify the new .flash file(s) you downloaded in the “Hardware Image” box by clicking “Browse” and specifying ...\\kits\\arriaIIGX\_2agx125\_fpga\\examples\\board\_test\_system\\sof\\bts\_config.flash. Because the design does not have a software component, leave “Software Image” blank.
3. Select “Upload” to upload the file.
4. Reconfigure the FPGA with the new files through the following steps:
  - a. Move DIP switch SW4.4 to the “on” position.
  - b. Power cycle the board.

The Board Test System design should now be running in the FPGA.

The Board Update Portal can also be used to upload your custom designs. The kit’s User Guide describes in detail how to prepare your designs for use with the Board Update Portal.

## Using the Board Test System

The Board Test System interface allows you to verify most of the components on your board. All design files for the Board Test System are included in the ...\\kits\\arriaIIGX\_2agx125\_fpga\\examples\\board\_test\_system directory.

### Board Test System Interface

When you launch the BoardTestSystem.exe file in that directory, or through the Start Menu, the screen shown below appears. To view each tab, select the design from the Configure menu. Each tab has options for interfacing to one or more of the board components. The Help menu provides further information about each test design.

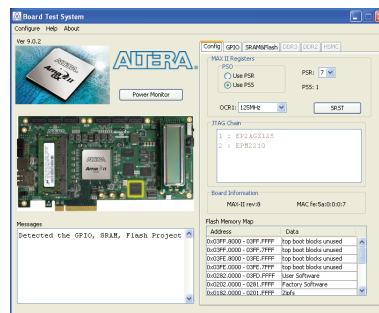


Figure 1. Board Test System Interface

## Power Monitor

The Power Monitor, available via the Start Menu or the button in the upper left of the Board Test System interface, can be used to see how any design—including your custom design— affects the FPGA's power consumption.

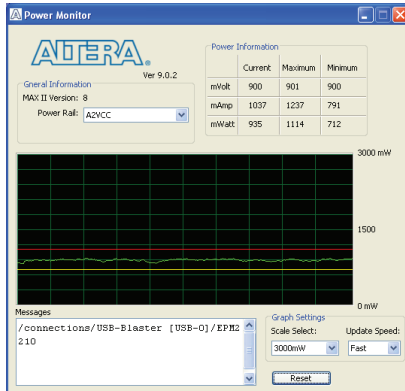


Figure 2. Power Monitor GUI

## Related Links

### Kit-Specific Resources

- Arria II GX FPGA Development Kit:  
<http://www.altera.com/products/devkits/altera/kit-aiigx-pcie.html>
- Transceiver protocols:  
[www.altera.com/technology/high\\_speed/hs-index.html](http://www.altera.com/technology/high_speed/hs-index.html)
- Video and Image Processing Suite of MegaCore functions:  
[http://www.altera.com/products/ip/dsp/image\\_video\\_processing/m-alt-vipsuite.html](http://www.altera.com/products/ip/dsp/image_video_processing/m-alt-vipsuite.html)

- Arria II GX devices:  
[www.altera.com/products/devices/arria-fpgas/arria-ii-gx/aiigx-index.jsp](http://www.altera.com/products/devices/arria-fpgas/arria-ii-gx/aiigx-index.jsp)
- Arria II GX Device errata:  
[www.altera.com/literature/es/es\\_arriaii\\_gx.pdf](http://www.altera.com/literature/es/es_arriaii_gx.pdf)

## General Design Resources

- Board Design Resource Center:  
[www.altera.com/technology/signal/board-design-guidelines/sgl-bdg-index.html](http://www.altera.com/technology/signal/board-design-guidelines/sgl-bdg-index.html)
- Licensing:  
[www.altera.com/support/licensing/lic-index.html](http://www.altera.com/support/licensing/lic-index.html)
- Software Download Center:  
[www.altera.com/support/software/download/sof-download\\_center.html](http://www.altera.com/support/software/download/sof-download_center.html)
- Technical Support Center:  
[www.altera.com/support/spt-index.html](http://www.altera.com/support/spt-index.html)
- Development kits:  
[www.altera.com/products/devkits/kit-index.html](http://www.altera.com/products/devkits/kit-index.html)
- Embedded processing:  
[www.altera.com/embedded](http://www.altera.com/embedded)
- Altera Forum:  
[www.alteraforum.com](http://www.alteraforum.com)

