



Tutorial 1: Introduction to Laboratory Equipment

1 Introduction

This tutorial is aimed at giving you an introduction to *Altium Designer* and the *Altium NanoBoard* as described in the first lecture. This equipment will be used for all tutorial and laboratory sessions, so it is important to become familiar with it. This tutorial also introduces the concept of design hierarchy and the use of VHDL code to describe digital designs.

At the start of the tutorial session, you will need to get a *NanoBoard Kit* from the laboratory manager and connect the NanoBoard to the computer as described in the instructions enclosed in the kit. At the end of the tutorial, you will have to disconnect the NanoBoard from the computer and return it to the laboratory manager. The laboratory manager will hold your student card while you have the NanoBoard.

A few things to note about the Altium tools and the NanoBoard:

- The process of building a design to download to the NanoBoard does take time, so be patient.
- The resultant files from a build process contained in the **Out** directory can be large. You may want to delete this directory when you have finished to save disc space.
- The NanoBoard is a delicate piece of hardware with exposed components. Please treat it carefully.

For an introduction to FPGA design using the Altium tools, refer to Lecture Notes Part II Appendix B.1 *FPGA Designer's Quickstart Guide*. The document is also available as part of the help facility or on-line:

- GU0101 FPGA Designer's Quickstart Guide
(http://www.altium.com/files/AltiumDesigner6/LearningGuides/GU0101_FPGA_Designers_Quickstart_Guide.pdf)

There is only one task to complete for this tutorial. You may also complete the additional tasks if you have time.

2 Main Task

Complete the attached *Getting Started with FPGA Design* tutorial provided by Altium. This tutorial is also available as part of the help facility or on-line:

- TU0116 Getting Started with FPGA Design
(http://www.altium.com/files/AltiumDesigner6/LearningGuides/TU0116_Getting_Started_with_FPGA_Design.pdf)

This task is expected to take from one to one and a half hours to complete.

3 Additional Tasks

In any remaining time, look at some of the example designs as mentioned on the first page of the attached document. You may want to specifically look at designs that use processor cores and designs which demonstrate simulation, as these are the other two aspects of the Altium tools that will be used in other tutorials sessions.

To build and download any of the example designs you will first need to copy it to a writable directory. You can use either the local work directory or your own account. You need to copy the whole directory, which includes the project file and all the supporting files such as schematics and VHDL files.

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NOTE: This is the shell version of Tutorial 1 and as such does not contain the attached material. However, the reference to the attached material is provided above.