

CE2800 Lab week 1

Procedure

This lab is intended to familiarize you with the Nios II processor running on the DE0 board. In this lab you will be downloading the Nios II configuration to the Cyclone III FPGA on the DE0 board. Three files are needed to complete this exercise, CE2800_project.POF, nios_system.sopcinfo and lcd_example.elf. All of the files are available on my web page (<https://faculty-web.msoe.edu/~barnekow/>). Copy all three files into a convenient directory. Instructions for downloading the POF file to your DE0 board are also available on my web page.

When you have successfully installed the Nios II system on your DE0 board, the next step is to try running a program on the Nios II system. Before proceeding, connect the USB cable between your DE0 board and an available USB port on your laptop. Turn on the power to your DE0 board. This will automatically load the Nios II system to the DE0 board.

The program development environment we will use throughout the quarter is Eclipse. The Eclipse software was bundled with the Quartus Web Edition and can be run from the Windows Start button. Go to Altera 13.0.1.232 Web Edition. When you click on it you will see Nios II EDS 13.0.1.232. Click this and choose Nios II 13.0sp1Software Build Tools for Eclipse. Click this to start Eclipse. When Eclipse starts up you will be asked to select a workspace. The workspace will contain all of the projects that you will create this quarter. Instead of accepting the default name, change the name to something like CE2800_projects and click OK.

Once Eclipse is running, you must create a project. The procedure that you will follow is described below.

From the File menu, select New->Nios II Application and BSP from Template. You will then be asked to provide a SOPC information file name. Browse to the directory in which you saved nios_sistem.sopcinfo and open it. After it completes loading the file, you must provide a project name. Call it something like lab1 (no spaces) and under Templates, select Blank Project. Then click Next followed by Finish. You will see two new files in the project explorer panel, lab1 and lab1_bsp.

Right click the file named lab1_bsp and select Nios II->Generate BSP.

From the Run Menu, select Run Configurations.

Double click Nios II Hardware.

Under the Project tab, check the box that reads Enable browse for file system ELF file and browse to the folder in which you saved lcd_example.elf and select it.

Now click the Target system tab. There are two check boxes that need to be checked, Ignore mismatched system ID and Ignore mismatched system time stamp. Then scroll to the right and click the button labeled Refresh Connections. This will connect the Eclipse downloader to the DE0 board via the USB cable. You should see that the Run button is no longer grayed out. If it is not, double check that you have checked the boxes described above and try again to refresh connections. Click the Run button to download the programming file (.elf) to the Nios II program memory. Answer yes if asked to proceed despite an error. If all works properly, you should see a message displayed on the LCD (provided it has been soldered to the DE0 board).