



Setting Up And Running A Project In The Nios II Development Tools For Eclipse

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YouTube

<https://www.youtube.com/watch?v=c--JenWcXdA>

Website

<http://fpga.seanwrall.com/lessons/lesson5/>

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Housekeeping before starting dev tools

We need to create a software folder in our project directory so that our software can be stored

1. Navigate to our project folder for example C:\altera\mySystems\system1
 - A. Add a new folder by right clicking --> new --> folder
 - B. Name this folder "software"
2. Now navigate into the software folder we just made at C:\altera\mySystems\system1\software
 - A. Add a new folder by right clicking --> new --> folder
 - B. Name this folder "workspace"



Setting up a project in Nios II IDE

1. Start the Nios II Software build tools for eclipse
2. A popup asking for workspace should pop up, in this popup click browse
 - A. Select the workspace folder we just made C:\altera\mySystems\system1\software\workspace
3. Once eclipse has loaded go to file --> new --> Nios II Application and BSP form template
 - B. A popup should show up, specify the path to your socp information file name by clicking on the ... icon (this should be located at C:\altera\mySystems\system1\niosIISystem.socpinfo
 - C. Name the project (Hello_world in this case)
 - D. For project location select default, this should be the location to the software folder we just created. If the default location is different de-select the use default location check box and enter in the correct project location
 - E. You can now select a template file, for this demo we will be using the Hello World Small template. If you are building a new custom project from scratch you can select Blank Project
 - F. Click next
 - G. You want to make sure the bsp is stored in the same location as the project location on the previous screen.
 - H. Make sure the filename for the bsp is Hello_World_bsp
 - I. Click finish
4. Once its finished in the project explorer pane (on the left hand side) there should be two projects, Hello_World and Hello_World_bsp
5. Right click on the Hello_World_bsp and go to properties --> Nios II BSP Properties and click on BSP editor; this will open the bsp editor
 - J. Make sure that stdin, stdout, stderr are all set to jstg_urt
 - K. Under hal.linker make sure that for exception_stack_memory_region_name and interrupt_stack_memory_region_name are both set to onchip_memory
 - L. Go to the linker script tab at the top and make sure it is setup like figure 1
6. Click Generate
7. Once generated click exit
8. In the properties window click ok

Note: You cannot have any spaces in your file names



Setting up a project in Nios II IDE

Main Software Packages Drivers Linker Script Enable File Generation Target BSP Directory				
Linker Section Mappings				
Linker Section Name	Linker Region Name		Memory Device Name	
.bss	onchip_memory		onchip_memory	
.entry	reset		onchip_memory	
.exceptions	onchip_memory		onchip_memory	
.heap	onchip_memory		onchip_memory	
.rodata	onchip_memory		onchip_memory	
.rwdata	onchip_memory		onchip_memory	
.stack	onchip_memory		onchip_memory	
.text	onchip_memory		onchip_memory	
Linker Memory Regions				
Linker Region Name	Address Range	Memory Device Name	Size (bytes)	Offset (bytes)
onchip_memory	0x00000020 - 0x00004FAF	onchip_memory	20368	32
reset	0x00000000 - 0x0000001F	onchip_memory	32	

Figure 1 BSP Linker Script Settings

9. Right click on the Hello_World project and go to Build Project

10. Plug in the FPGA power and usb cables as seen in figure 2 for the DE2-115

USB Blaster (left most usb)

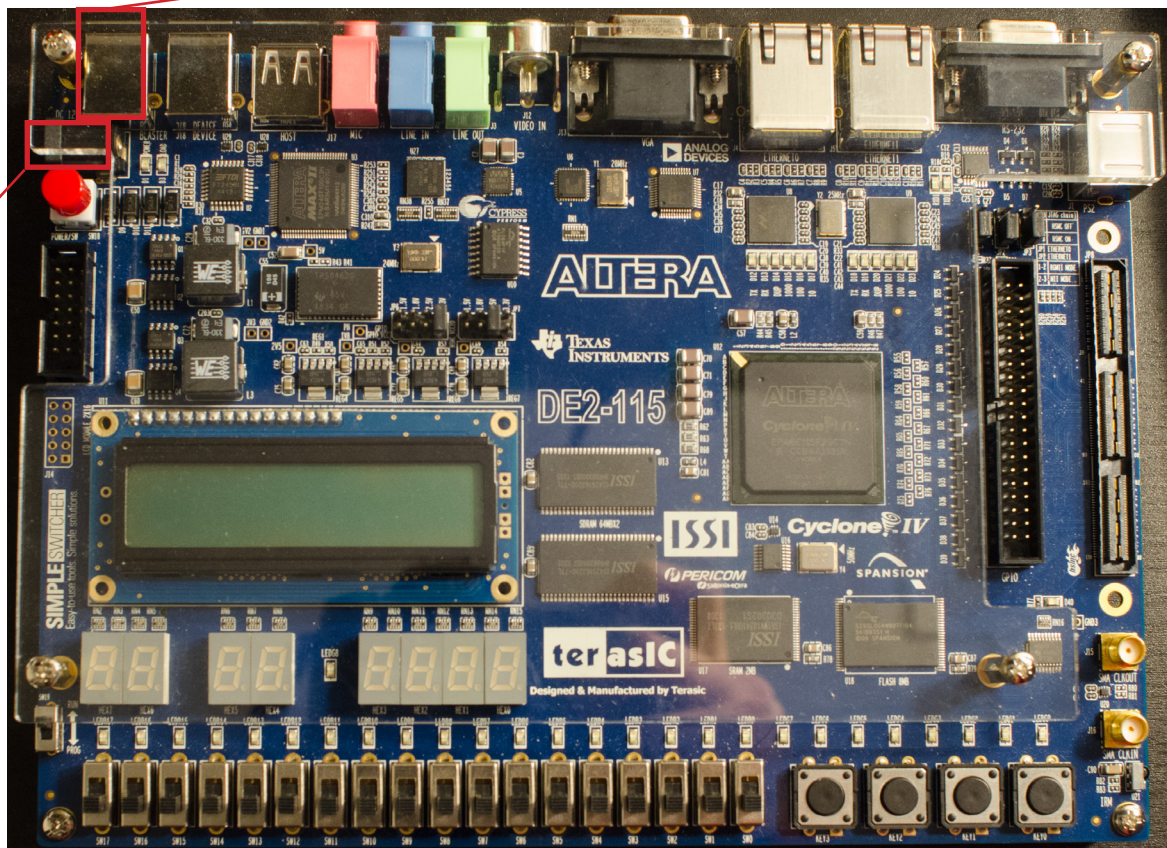


Figure 2 FPGA Power and USB Placement



Setting up a project in Nios II IDE

11. Go to Nios II in the top navigation and select Quartus II programmer, this will open the Quartus II programmer utility
 - A. Click add files and select the .sof files located at C:\altera\mySystems\system1\output_files\NiosII_time_limited.sof (if you paid for Quartus II and are not using the web edition the file will just be NiosII.sof)
 - B. Click OK to the time limited popup
 - C. Click start
 - D. Once the progress is finished the board will have the system programmed onto the fpga (note this is just the system and not the software, think of this as building hardware)
 - E. If a popup opens for time limited notice, leave this popup open as it allows the use of Altera IP in the web edition.
12. Go back to the Nios II dev tools for eclipse and right click on the Hello_World project and go to Run As --> Nios II Hardware
13. Your project should now run on the fpga
14. Some common errors are elf error, failure to download. This error is a blanked error that most likely occurs because you ran out of space for your program, like using on chip memory when you should use sram. This can also occur for other reasons, if it does go back and check your system and your bsp settings.
15. If you get a popup saying no Nios II target connection paths were located, go under the Target connection tab, click refresh connections
16. If you get timestamp or mismatch system id errors fix this by going to the run configurations window
 - F. Right click on your Hello_World project go to run/debug settings
 - G. Double click on the one for the current project Hello_World Nios II Hardware Configuration
 - H. Under target connection tab in system ID checks check the Ignore mismatched system ID and Ignore mismatched system timestamp

Note: Do not edit files in the Hello_World_bsp project