

ENGR 2323 Digital Design Lab

Programming DE10-standard Board

Once a project has been successfully compiled; a FPLD can be programmed with the design. Following are the steps to program the DE10-standard board using Intel Quartus project.

Programming DE10-standard Board

The first step is to assign the inputs and outputs of your design pins on the DE-10 board. These include the switches, buttons, LEDs and seven-segmented displays. To do that go to “Assignments” on the tool bar and select “Pin Planner”. (See Figure 1).

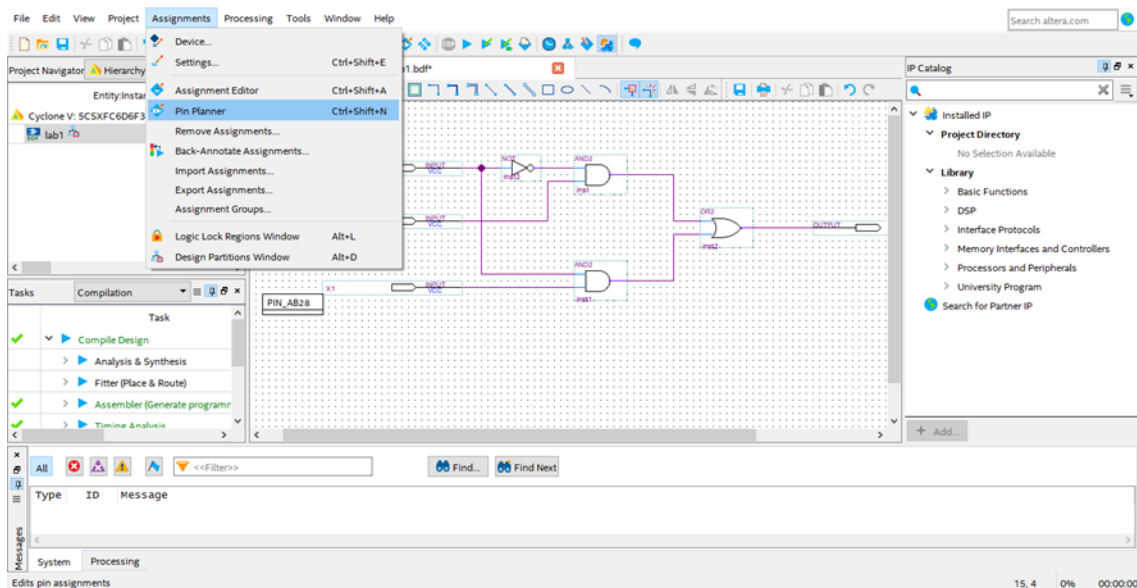


Figure 1. Pin Planner

A screen like Figure 2 should appear. In the screen of Figure 2, the pins for the design are already assigned, before assignment the location column is blank.

To assign pins, type, paste, or select the pin name in the “Location” column of the node. (Here, the pins are already assigned to the nodes.) Reference the Pin Assignment document for pin names and locations. For this lab, have an LED as the output, that way the output can easily be seen. And the inputs should be switches to allow for easy I/O inputs.

Once the pins are assigned, exit the planner and recompile the program. If there are no errors, go to “Tools” and click on “Programmer” (See Figure 3).

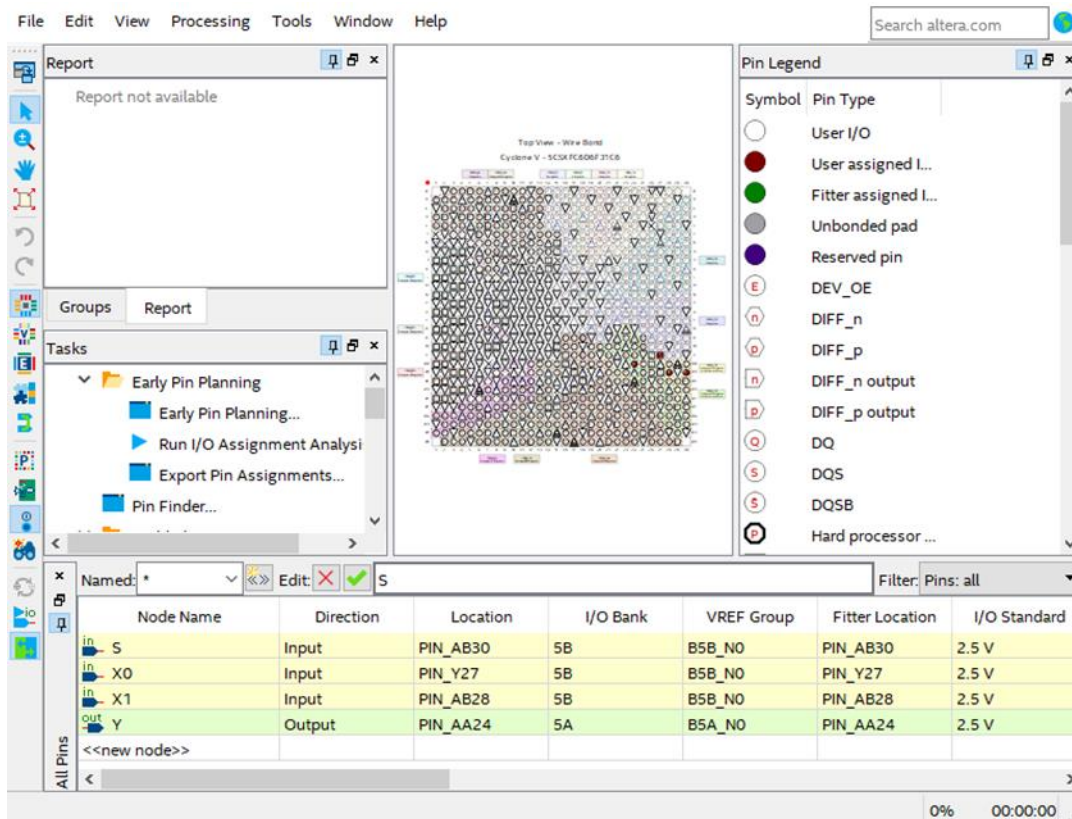


Figure 2. Pin Planner Screen with Assigned Pins

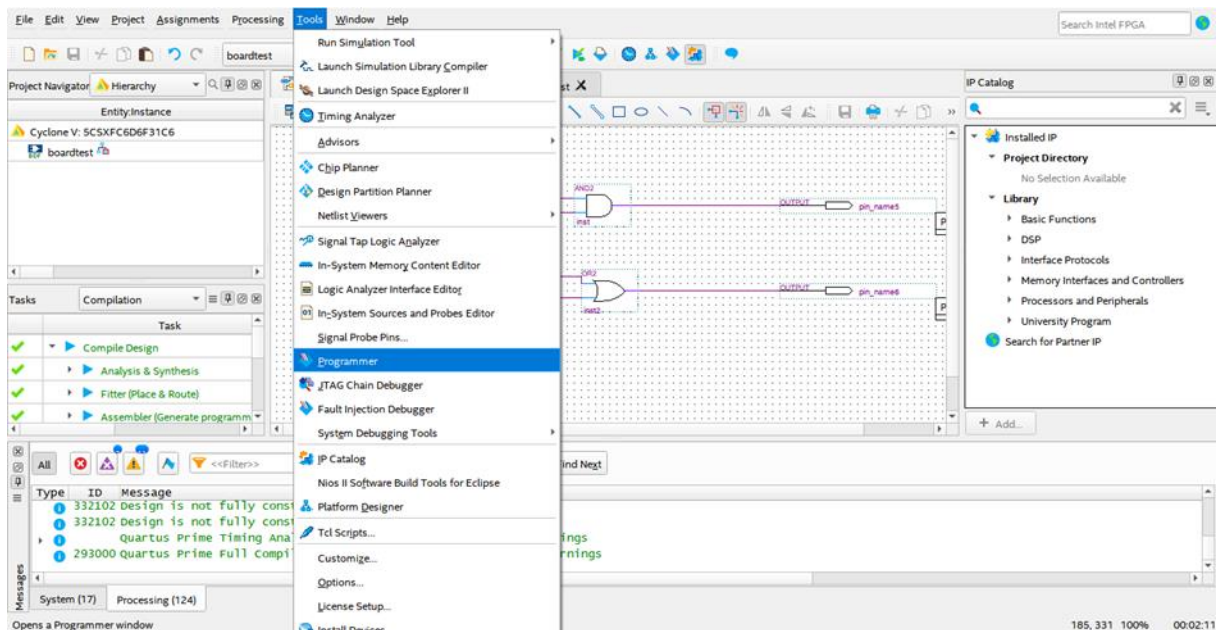


Figure 3. Programmer Selection

Figure 4 shows the programmer screen. First, make sure the DE10-standard board is plugged into power and to the computer and turn it on. (press the red button on the board, it should start blinking and counting, this means that it is ready to receive the design).

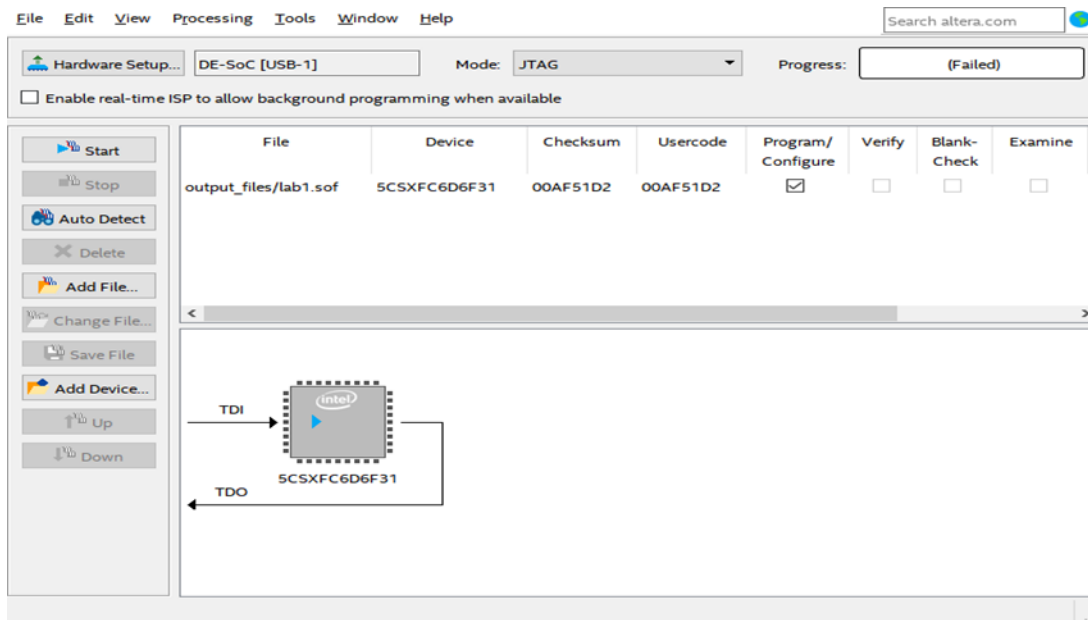


Figure 4. Programmer Screen

Go to “Hardware Setup” at the top left of the screen and double click on “DE-SoC” then close Hardware Setup. It should show up next to the “Hardware Setup” button now.

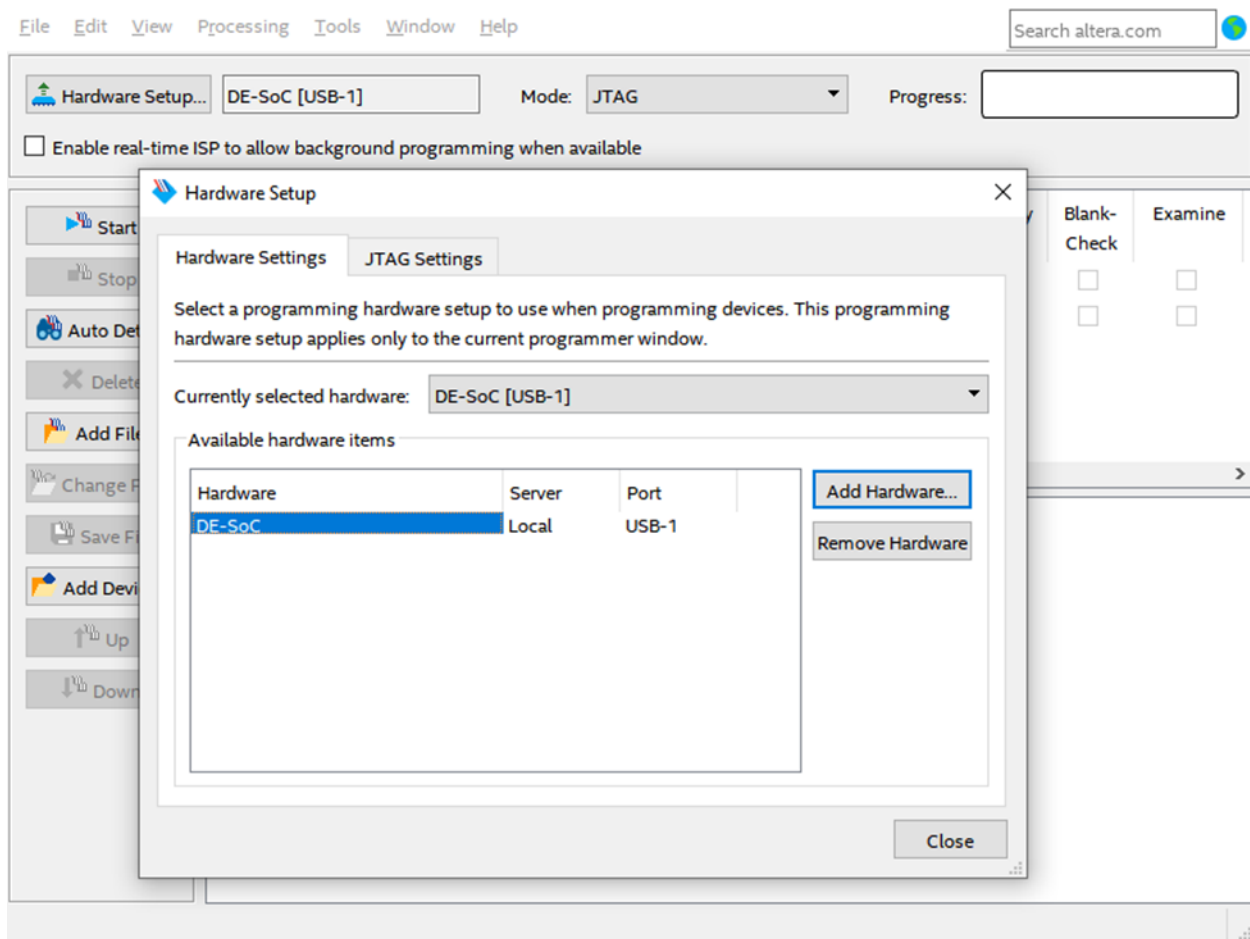


Figure 5. Selecting the DE-SoC

Next, click “Auto Detect”, and select: “5CSXFC6D6”. Click yes to the prompt that pops up (Figures 6 and 7).

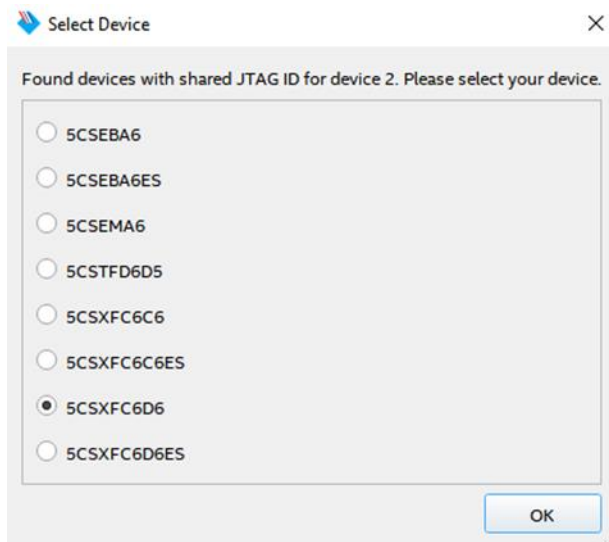


Figure 6. Device Selection Screen

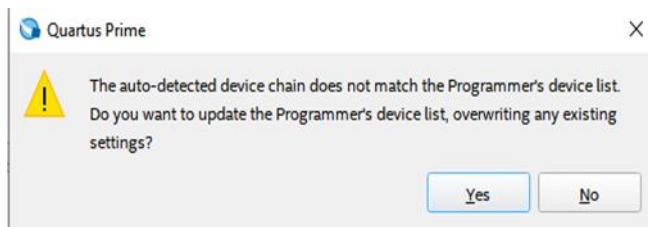


Figure 7. Updating Programmers Device List

The device should appear in the diagram on the bottom part of the screen. Next, double click on the "File" column of "5CSXFC6D6" in the device list and select the .sof file you wish to test (check the output_files folder in your project folder.)

Then tick the box that says "Program/Configure" on the same row as "5CSXFC6D6" (The device may change names).

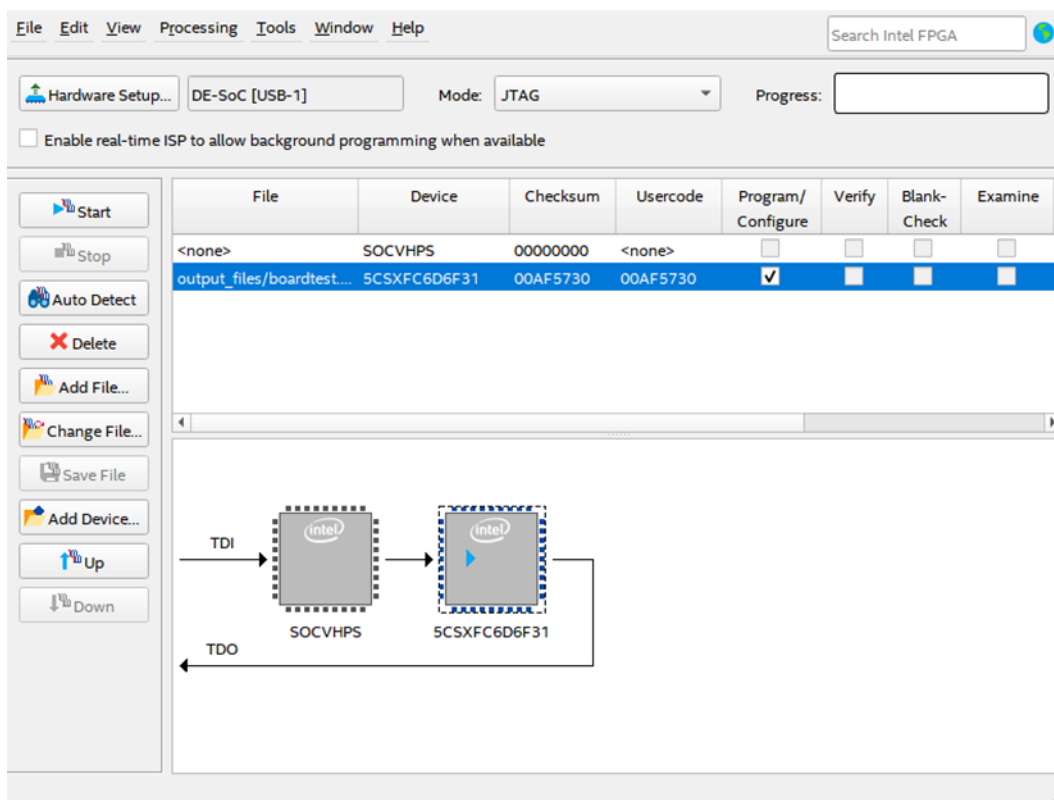


Figure 8. Final Screen with Programming File Selected

Now click "Start" on the left side of the screen, and the board should stop blinking and the FPLD should be programmed with the design. The design operation can now be verified using the board switches and LEDs.

Last modified Friday, August 12, 2022



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