Exercise 2: Introduction to Digilent FPGA-based Boards

Revision: August 26, 2007

Problem 1: Obtain and read the board’s reference manual, paying close attention to the Power Supply and Configuration Sections. Complete the following.

How many LED’s are on the board? _____ Are they illuminated with a logic ‘1’ or ‘0’? _____

How many pushbuttons on the board? _____ Do they output logic ‘1’ or ‘0’ when pressed? _____

How many slideswitches on board? _____ Do they output constant logic levels (yes or no)? _____

Which signals turn on the seven-segment displays? _____ _____ _____ _____

Problem 2: Obtain and print the board schematic, and identify the following components by circling and labeling them, both in the schematic and on the photo below. Write the reference designator in the spaces following the components.

1. Pushbutton number 2 Reference Designator: __________
2. 3.3V voltage regulator Reference Designator: __________
3. JTAG programming header Reference Designator: __________
4. The FPGA Reference Designator: __________
5. The Platform Flash ROM Reference Designator: __________
6. “CLK1” oscillator Reference Designator: __________
7. The Mode Select jumper Reference Designator: __________
8. Any LED Reference Designator: __________
9. The FPGA reset pushbutton Reference Designator: __________
10. Capacitor C71 What is C71’s value? __________
11. Resistor R62 What is R62’s value? __________
Problem 3: Perform a basic inspection and test of the board.

- Inspect the board and note any components that appear to be missing, damaged, or otherwise compromised. When inspecting the board, you can compare it to the picture on the Digilent website (or the picture in this document).
- Set the programming mode jumper to ROM.
- Apply power to the board, and ensure the power-on LED illuminates and glows brightly.
- The automated test, stored in the on-board Flash ROM at manufacturing time, will automatically configure the FPGA with a circuit that can be used to test all circuits. If the automated test does not automatically load, the ROM image may have been overwritten. Obtain the appropriate “Board Verification Project” from the Digilent website, and re-load the Flash ROM (see Appendix A the Lab Project 2 document for a brief tutorial on using Adept).

Complete the check-off sheet below. If any item has been checked “N” in the table, consult the lab assistant for help in resolving the issue.

All required components present (board, programming cable, etc.) Y N
Visual inspection reveals no obvious problems Y N
“Power On” LED glows brightly when power supply attached Y N
All segments on all seven-segment digits are functional Y N
All slide switches function correctly by illuminating/extinguishing LEDs Y N
All LED’s illuminate properly Y N
All pushbuttons function correctly Y N