ECGR4101/5101, Spring 2010: Lab 2
Building a Simple Program and Using a Logic Analyzer

Learning Objectives

This lab will help you demonstrate how to change an executable on the QSK62P plus board and take measurements with the mixed signal scope (logic analyzer).

General Information

The general steps for this lab are:

1. Change the program from Lab 1 to add your name in the boot-up section.

2. Compile the QSK62P plus test program to your board, download and run.

3. Take measurements with a mixed signal scope (logic analyzer).

4. Demonstrate for a TA and upload your lab report to moodle.

Prelab Activity

You may use the PCs in Woodward 203 or your own PC to do this lab experiment. Also read the online information or users guide for the mixed signal scope (logic analyzer).

Pre-lab Questions

(These are not rhetorical questions - answer them on your lab report!)

1. How many analog inputs does the Mixed Signal Scope have? How many digital inputs?

2. I call the device a logic analyzer and a mixed signal scope. Why might I do this?

Laboratory Assignments

1. Follow the instructions on the QuickStart Guide. Note carefully the steps required to build a program, download, and debug a program. Note the change of behavior of the board.
2. You will next build a new project based on the "tutorial" (on QuickStart Guide step 4d). Download and run this new code. Note the change of behavior of the board.
3. In the project editor, the program in several areas for these new requirements:
   a. Change the flashing the lights to the sequence
      D2 -> D3 -> D4 -> off -> D2 -> D3 -> D4 -> off -> D2 -> . . . . .
      This will require you to change some code.
   b. In the file header comments (bottom of comments), add a few lines stating your name, date changed, and values changed.
   c. In the procedure that changed, add a line or two of comments stating the changes.
   d. Add your name to the boot-up sequence of the board (instead of the Renesas name and Tutor 1).
   e. Change the names of the "Buttons" to show "SW1", "SW2", and "SW3" on the LCD
4. Save the file.
5. Now use the rebuild button on the toolbar to rebuild the project. This will pull up the builder and show the status as the project is cleaned and rebuilt using the updated files. The memory should be adjusted for the added lines of code.

6. Reload the software onto the boards and test. Verify that the new functionality works as specified.
7. Take a reading with the mixed signal scope (logic analyzer) with three of the digital inputs for three cycles. Save the reading as a figure and include in your lab report.
8. Complete your lab report.
9. Bring the new board to the lab TA and demonstrate the new code (without the HEW application running.

Lab Report

Include in the checkout part of your lab report the lines:

1. Names of individual in the boot-up of board   _____

2. LEDs flashing as specified   _____

3. Show "SW1", "SW2", and "SW3" on the LCD when Switches pushed   _____

4. Other functionality works as in original code.   _____

Include in your lab report observations and procedure like the following:
The general learning objectives of this lab were . . .
The general steps needed to complete this lab were . . .
Some detailed steps to complete this lab were . . . .
1. Step one
2. Step two
3.   . . . .
Some important observations while completing/testing this lab were . . .
In this lab we learned . . . .

Create a single pdf containing:

1. Your lab report

2. Your code (no need to include the sect30.inc, ncrt0.a30, LCD, or any .h files). Include all c files that have code that you wrote (but if you are smart, this should be one small file so that the code size is small). Ensure you use an 8 or 9 courier font so that most lines of code take one line of text.

3. The full map file.). Ensure you use an 8 or 9 courier font so that most lines take one line of text.

Upload this pdf to moodle. Name the file xxxxxxx_lab2.pdf, where xxxxxxx is your last name.

FAILURE TO FOLLOW THESE SIMPLE INSTRUCTIONS COULD RESULT IN THE LOSS OF POINTS.