UNC Charlotte, ECGR 6185/8185, Spring 2013: Lab 2

Analog sensor

Learning Objectives

This lab will have students read an analog accelerometer and compare its data with the on-board digital accelerometer. This will be done using the Renesas board.

Prelab Activity

1. What is the range of G forces of the on-board sensor?
2. What is the range of G forces of the new sensor?

Laboratory Assignments

You may use the PCs in EPIC 2148 or your own PC to do this lab experiment. The machines in EPIC 2148 already have the software tools loaded. In this lab you will be utilizing API calls and analog ports of the Renesas board to read the two accelerometers. Follow the guidelines for using the device found on the sparkfun.com website (SEN-09652).

Steps

1. Modify the main.c file and include the appropriate files. Include commenting along the way.
2. Build your program slowly, testing along the way. Perform compiles and solve each requirement one at a time. Make sure comments are written as you progress.
3. Continue to build and test the program until all of the requirements have been met. Did we mention you should write your comments as you progress, not at the end?
4. If you run into problems, use the break point functionality HEW to step through the code until you find the problem.
5. Once all the requirements have been met, ensure that everything works.
6. Finish lab write-up and demonstrate for the TA.
7. Submit your report and any changed/new C code (*.c) on Moodle.

Requirements

Req. 1 – The code generated is written in C for the RX62N Eval Board.
Req. 2 – The code is well commented and easy to follow.
Req. 3 – Your lab report should include the final build output from the builder.
Req. 4 – The main objective is to use the two accelerometers (i2c vs. analog based) and compare their measurements. The measurements should be about the same when the Renesas board is moved.
Req. 5 – Display the G-forces of the X, Y, and Z axis' on the LCD in the form x.xxx, one line for each axis for each sensor. For example, the lines should be:

```
Analog:
X = x.xxx
Y = x.xxx
Z = x.xxx
Digital:
X = x.xxx
Y = x.xxx
Z = x.xxx
```

Lab Report

Include in your lab report observations and procedure like the following:
The general learning objectives of this lab were . . .
Pre-lab question answers
The general steps needed to complete this lab were . . .
Some detailed steps to complete this lab were . . . .

1. *Step one*
2. *Step two*
3. *. . . .*

Code generated for this lab…
Some important observations while completing/testing this lab were . . .
In this lab we learned . . . .