

## ECGR4101/5101, Fall 2008: Lab 3

### Building a Simple Program using A/D - **Version 1.1**

### Learning Objectives

You are to write a program that runs on your QSK62P board **that senses the temperature and displays it in ASCII characters.**

### Laboratory Assignments

In this lab you will be generating a main.c file from scratch. At power-up the LCD should display the temperature of the thermistor, in Fahrenheit. Print the temperature by converting the raw number to a temperature in Fahrenheit and displaying it with the format xxx.x. You must use a table lookup. Therefore, you must build the table based on the thermistor **formula or an approximation based on the datasheet.**

### Steps

1. Follow the steps given in lab 2 for generating a new project.
2. Create the main.c file and include the appropriate files.
3. Build your program slowly, testing along the way. Perform compiles and solve each requirement one at a time.
4. Continue to build and test the program until all of the requirements have been met.
5. If you run into problems, use the break point functionality of KD30 to step through the code until you find the problem.
6. Once all the requirements have been met, ensure that everything works.
7. Finish lab write-up and demonstrate for a TA.

### Requirements

- Req. 1 – The code generated is written in C for the QSK board.
- Req. 2 – The code is well commented and easy to follow
- Req. 3 – The current temperature reading should be displayed on the first line of the LCD in degrees Fahrenheit, in the format xxx.x.
- Req. 4 – The program must use a table lookup.
- Req. 5 – The temperature must be accurate to within 2 degrees F.
- Req. 6 – You may not use floating point operations in the regular running code.

### Lab Report

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

1. Temperature displayed in degrees F \_\_\_\_\_
2. Board works without HEW running \_\_\_\_\_
3. Temperature rises when heat applied \_\_\_\_\_

Turn in a hard copy of the code you wrote **and a printout of the map file (NOTE - use a small font, like 8, so that the file takes a few pages).** Also 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. . . . .

*Code generated for this lab...*

*Some important observations while completing/testing this lab were . . .*

*In this lab we learned . . . .*