UNC Charlotte, ECGR 5/5/6090, Fall 2003: Lab 7

Introduction to distributed computing on the MSV30262-SKP

Learning Objectives

This lab will introduce you to interfacing two MSV30262-SKP boards.

General Information

The general steps for this lab are:

1. Create a new folder for lab 7. Copy your files from lab6 into the new folder.
2. Generate a new project using the files you just copied. Name your new project Lab7.
3. Open and edit your main.c file to perform the lab functions.
4. Program the lab. Don't forget the necessary include files to get the correct functionality.
5. Compile the code into an .x30 file, and load onto the board.
6. Test the program and repeat steps 4, 5, and 6 until the program works as required.
7. Write your lab report.
8. Demonstrate for a TA and turn in your report.

Prelab Activity

You may use the PCs in DAN 343 or your own PC to do this lab experiment. The machines in DAN 343 already have the software tools loaded.

Compile and make sure the new project is working.

1. What system in a house could a remote temperature sensor network be used in to improve performance?
2. Write the pseudo code for this lab.

Laboratory Assignments

In this lab you will be utilizing onboard timers, serial I/O, and the a/d converters of the starter kit to generate a master slave system for temperature monitoring. Both boards should run the same software and pressing S4 on either board will relinquish control to the board that had the SW4 pressed. The master board should request temperature data from the slave board every second. The slave board should respond with the most current temperature reading. The slave board should always be updating the on board display with the most current temperature data. You will need to determine how often is necessary, but this should be quicker than every second. All this functionality should change any time S4 is pressed. It will be up to your group to decide on an appropriate communications protocol, but the uart should be set to communicate at 9600 baud, 8,N,1 with no flow control.

1. BONUS: Top 10 groups with the lowest memory usage reported.

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 of KD30 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 a Lab TA.
7. Submit your main.c and .map file files via a method to be determined later.

Requirements

Req. 1 – The code generated is written in C for the MSV30262-SKP
Req. 2 – The code is well commented and easy to follow
Req. 3 – The serial communications should operate at 9600 baud 8,N,1
Req. 4 – The current temperature reading should be displayed on the slave board in degrees Celsius
Req. 5 – The red led on the slave board should toggle every time the temperature is measured
Req. 6 – Any time S4 is pressed on a board, that board should become the master
Req. 7 – The master board should poll the slave board for a new measurement every second
Req. 8 – The yellow LED on the master should toggle every time a new measurement is requested
Req. 9 – Both boards should run the same code
Req. 10 – Your lab report should include the final build output from the builder
Req. 11 – The master board should display the temperature in degrees Fahrenheit.

Lab Report

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 . . . .