

ECGR4101/5101, Fall 2009: Lab 7

Timers

Learning Objectives

You are to write a program that runs on your QSK62P board that uses the timers. You will need to also transmit serial data.

Laboratory Assignments

In this lab you will be programming the timers and using interrupts. The LED's will be used for signaling and the LCD will be used to display light information. This lab must be demonstrated to the TA.

Requirements

- Req. 1. The code generated is written in C for the QSK62P or QSK62P Plus.
- Req. 2. The code is well commented and easy to follow
- Req. 3. You may not use the BNS functions for transmitting data on the serial line.
- Req. 4. You will use two boards - one will be the "sensor board" and the other will be the "display board".
- Req. 5. The sensor board will have a light sensor. It will sense light at the 0% level (darkness) to 100% (bright LED shining into the sensor). Room lighting should be somewhere in between.
- Req. 6. The sensor board will send the light value in percent to the display board via RS-232.
- Req. 7. The RS-232 communications should be 4800 bps, even parity, 1 stop bit. You only need to send one byte (a value between 0 and 100), so there is no need for queues.
- Req. 8. Send the light-level byte once every 2 seconds. Use a timer and interrupt to send the byte. There is no need for using Round Robin.
- Req. 9. The exact same code should be loaded on each board. After reset, if SW1 is pressed, it is the sensor board. If SW2 is pressed, it is the display board.
- Req. 10. The string on the display board should be of the format

```
Light:  "
"100%  " (the value will be between 100% and 0%)
```
- Req. 11. You do not need to display anything on the sensor board.
- Req. 12. You will need to get a light sensor from Eddie Hill. You will need to design your own sensor circuit.

Test Procedure

See the lab checkout sheet to understand the rubrics of the demonstration.

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.

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, ncrct0.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 xxxxxxxx_yyyyyyyy_lab7.pdf, where xxxxxxxx is the last name of one lab partner, and yyyyyyyy is the last name of the other lab partner.

Next, upload the code file as text to Moodle. . Name the file xxxxxxxx_yyyyyyyy_lab7.c, where xxxxxxxx is the last name of one lab partner, and yyyyyyyy is the last name of the other lab partner.

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