School of Engineering

Grand Valley State University

EGR 326 – Lab #12

**Light Sense with the A/D Converter**

**Objective**

* To develop a C program to detect ambient light intensity and set screen light intensity

For the final lab, you will be writing program functions in C that use the MSP432 to collect input from a photocell found in your kit. You will also need to control the intensity of an LED for your display, similar to the proximity sensor exercise. This lab will demonstrate both of these concepts in a single project.

**Procedure:**

The first part of lab time will be used to test your photocell to get a better idea of how it works. The second part will include code on your MSP432 Launchpad board to get the Photocell up and running and incorporate visual feedback to the sensor.

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**Part I – Measuring the photocell sensor**

1. Examine the photocell datasheet. Notice that this is a “photoconductor” or sometimes referred to as a “photoresistor” since it can be used as a variable resistor. The resistance is a function of the light it receives
2. Measure the resistance of the photocell. Place the photocell in both a dark and bright environment. Record the resistance. How does this compare with the datasheet?

**PART II – Interfacing the photocell to the MSP432**

1. Create a voltage divider using a 10K and the photocell. The mid-voltage point of the divider should connect to an MSP432 ADC pin.
2. Create a program that will read the voltage representing the ambient light. The program should control an EXTERNAL LED based on this voltage

Photocell at max resistance = turn on LED at MAX intensity

Photocell at min resistance = turn on LED at MIN intensity

1. Print out on the LCD display the magnitude of the ambient light (scaled from 0 – 10, 10=brightest)

This may be a little piece of your final project. If you pick your pins wisely, your code and project are a little closer to being done

**At The End Of The Laboratory**

* Clean up your workstation. Don’t leave a messy room.

**Laboratory Deliverables**

Submit the following to Blackboard before the due date/time. You must demonstrate your working circuit to your instructor by the next lab period.

* Deliverables in your report
  + Schematic
  + Code (with comments)
  + Answers to questions and recorded data