ECE-218 EMBEDDED MICROCONTROLLER PROJECTS:
PROJECT 3: GEAR MOTOR CONTROL AND MONITORING

This project will be completed in teams of 2 people . Since there is an odd number of students in the class, one person will work individually.

PROJECT OBJECTIVE

The system you design should measure and display the rotational speed and direction of a DC gear motor on an LCD display, while the speed is controlled with a potentiometer. The display should clearly indicate what is being displayed, and should give the units. It should be stable enough to easily read, but should keep up with the changing speed when the potentiometer is rotated. The motor should move in both directions.

PROJECT HINTS

Be very careful when planning your connections to the PIC24. The LCD display requires 5V tolerant pins. Remember that you will need to use a 5V tolerant pin for IC1 as well. Check the datasheet to recall which are 5V tolerant. And be sure your software matches the pin connections you make.

The 5V regulator has a 0.5V "dropout voltage", which means that the Vin voltage must be at least 5.5V (when drawing up to 1A current) for the regulator to work. If your batteries run down, this can become a problem, so take a couple extra batteries as spares.

PROJECT DOCUMENTATION

As in previous projects, you will document your project in a video demonstration, submission of your final, commented code, and a project report. Review feedback from previous projects. For this project, there should be verification in your demo that the speed you report is accurate. The motors are quite slow, so the easiest way to do this is manually measure the number of rotations for a full minute, and compare that "rotations per minute" value to what is displayed. You will need to find something visible to securely attach to the motor shaft.