

Lab 4 Instructions

Context Saving, Pulse Width Modulation, CCP Compare Function

This lab familiarizes the student with context saving, pulse width modulation (PWM), and the compare feature of the CCP module of the PIC. The hardware layout is the same as in Lab 2 and Lab 3.

1. Create a project using the **lab04a.asm** file from the course website. Connect a potentiometer to ADC channel 0 so that you can adjust the input voltage between 0 and 5 volts. Connect LEDs to the PORTC pins. Run the program and turn the pot. Notice how the LEDs get dimmer and brighter as you adjust the pot. This effect is a result of modulating the pulse width of the PORTC PWM output voltage.
2. Create a project using the **lab04b.asm** file. Connect an active low switch to RB0. Lab04b is a modification of lab04a so that when you press the RB0 switch, the LEDs toggle on and off. Run the program. The pot still controls the intensity of the LEDs when they are on. The RB0 interrupt is set up as a rising edge interrupt, and RB0 is active low, so the LEDs toggle when you *release* the RB0 button. **Lab04b.asm** also illustrates how multiple interrupts are handled.
3. Create a project using the **lab04c.asm** file. This program uses the CCP1 interrupt to toggle the RC2 output, which you should connect to an LED. Run the program and notice that the LED is blinking because of CCP1 interrupts.