

IVALab Arduino Experiments: Interrupt Handlers

In this setup of experiments, we will rely on the interrupt handler capabilities of the Arduino. Interrupt handlers are integral functional elements of microprocessors. They provide real-time execution capabilities of time-sensitive tasks.

Experiment 5. Connect the system to an RC servo-motor. The wires for servomotors typically goes as follows positive (red), negative (black/brown), and signal (white/yellow). The positive and negative are naturally the supply voltage and the ground connections. The signal is for the PWM signal.

The signal will have to be converted because the A/D converter output is 10-bit and the PWM output is 8-bit. That means that the input value will have to be shifted by 2 bits prior to being used as output to the servo.

Experiment 9. Combine Experiment 8 (R/C Servo) and Experiment 5 (Button switch) together.

Experiment 10. Learn how to use the external trigger capabilities of the Arduino to count up whenever a rising edge is detected. Using the setup of Experiment 8 (Switch), connect the switch to the trigger to count how many times a switch has been toggled.

Experiment 10. Instead of the switch, connect the appropriate output of a motor encoder to the trigger to count when the encoder shaft is spun. If you divide by the number of ticks per revolution, you can get to total number of revolutions of the encoder shaft. The tick and revolution counts should be output through the serial port.