Introduction to Arduino
Servo Motor Control

Introduction

In this lab you will be working with a special type of motor called a 'Servo' motor. These types of motors can be precisely controlled with the ability to control angular, or linear, position; velocity and acceleration. Where a regular motor has only two wires to supply power, you will see that your 'SG90' servo motor has three. The third wire allows for data communication and provides feedback to the Nano which makes the motor controllable.

Wiring

Below is both a schematic and pictorial diagram showing how your servo motor is wired. Complete the breadboad wiring for your servo.

Yellow wire is signal D9
Red is positive   5V
Black is negative   GND
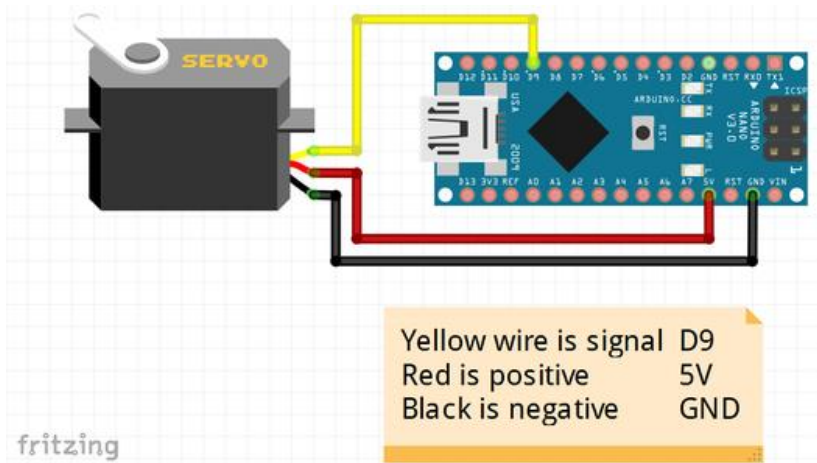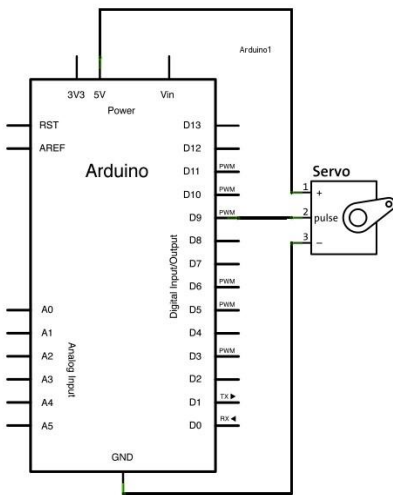
Use 3 'header pins' to connect your servo to the breadboard

Coding…

Navigate in your browser to the official Arduino website and under the 'DOCUMENTATION' tab click on 'LIBRARIES EXAMPLES'. From the column on the left of the screen select 'Servo Library' then click on the 'Sweep' exercise. Read through the material, understand the code.

In the Arduino programming environment locate and open the 'Sweep' sketch under Files > Examples > Servo.

Upload the code to your Nano and observe the results. You should attach an indicator to the shaft of the servo motor so to better see its movement. This can be one of the various plastic 'horns' that come with the servo, or simply a piece of tape that acts as a flag.

Make changes to the code and observe the results. Be prepared to demonstrate your ability to:

- Change the starting and end points of the movement (degrees)
- Change the speed of the movement

'Sweep' example code (for reference)…

```
#include <Servo.h>

Servo myservo;  // create servo object to control a servo
// twelve servo objects can be created on most boards

int pos = 0;    // variable to store the servo position

void setup() {
  myservo.attach(9);  // attaches the servo on pin 9 to the servo object
}

void loop() {
  for (pos = 0; pos <= 180; pos += 1) { // goes from 0 degrees to 180 degrees
    // in steps of 1 degree
    myservo.write(pos);              // tell servo to go to position in variable 'pos'
    delay(15);                       // waits 15ms for the servo to reach the position
  }
  for (pos = 180; pos >= 0; pos -= 1) { // goes from 180 degrees to 0 degrees
    myservo.write(pos);              // tell servo to go to position in variable 'pos'
    delay(15);                       // waits 15ms for the servo to reach the position
  }
}
```

Show Your Teacher Your Working Circuit and Operating Servo Motor

Be prepared to demonstrate understanding of servo operation