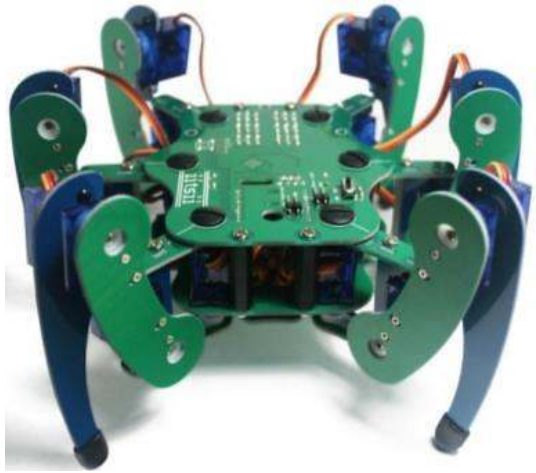
Arduino Coding – Servo Motors

Contents:

- Servo Features
- Servo Connections
- Coding Library
- Sample Sketch
- Questions

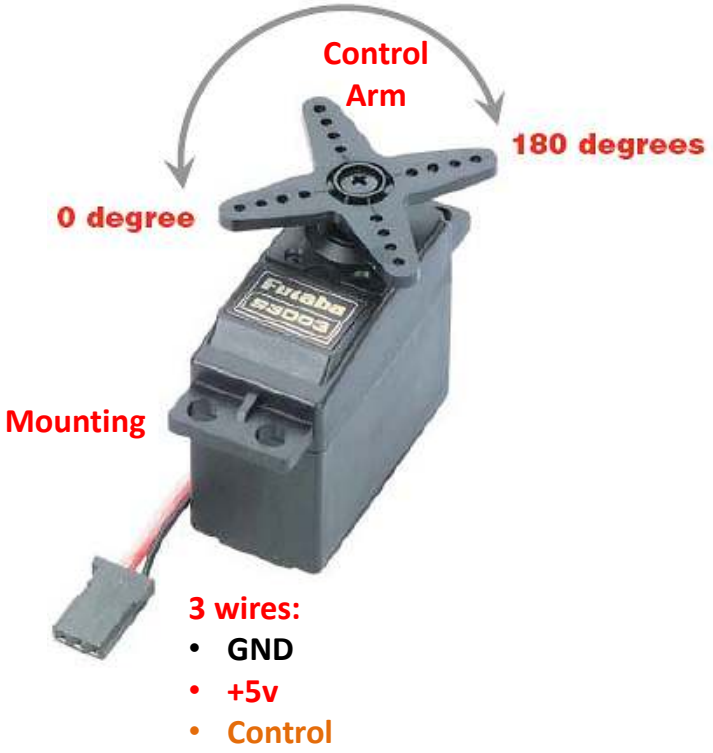
Applications:

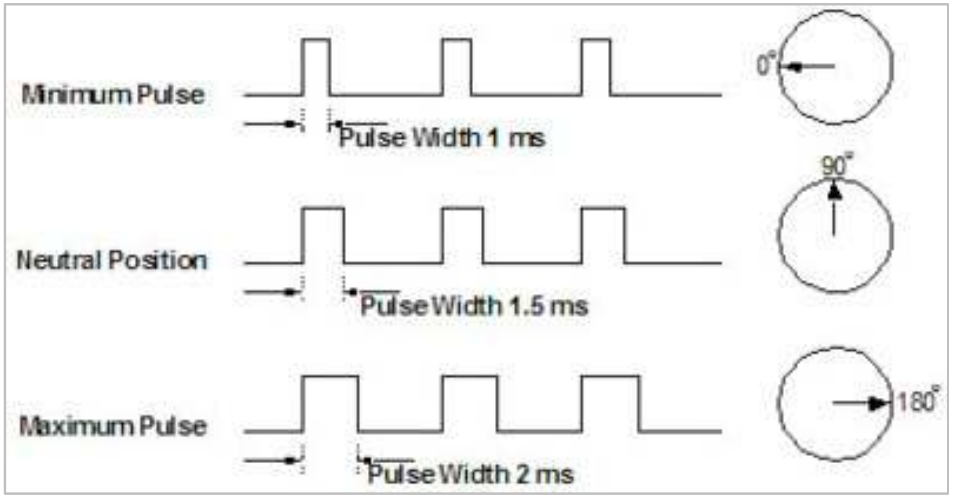


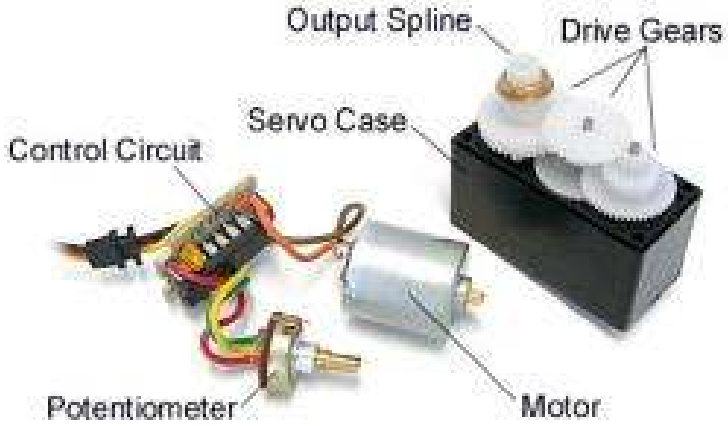
Servo Features

- Half-turn or Continuous
- 3-wire connection (4.8 – 6.2v)
- Control arm on drive shaft
- PWM proportional control signal
- Easy to use?

- PWM must to be continuous
- 90° centre point & gain not guaranteed
- Trimming normally required
- Load dependant drive current
- USB power may not be sufficient







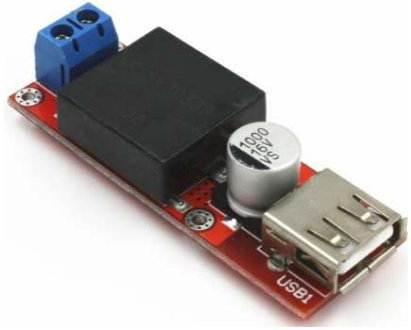
Servo Connections

- Remove power before wiring
- Pot wiper connected to analogue A0
- Servo control on digital pin 2

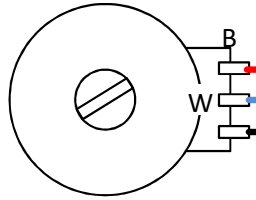
If servo draws too much current:

- Connect a separate 5v supply
- Make common GND connections

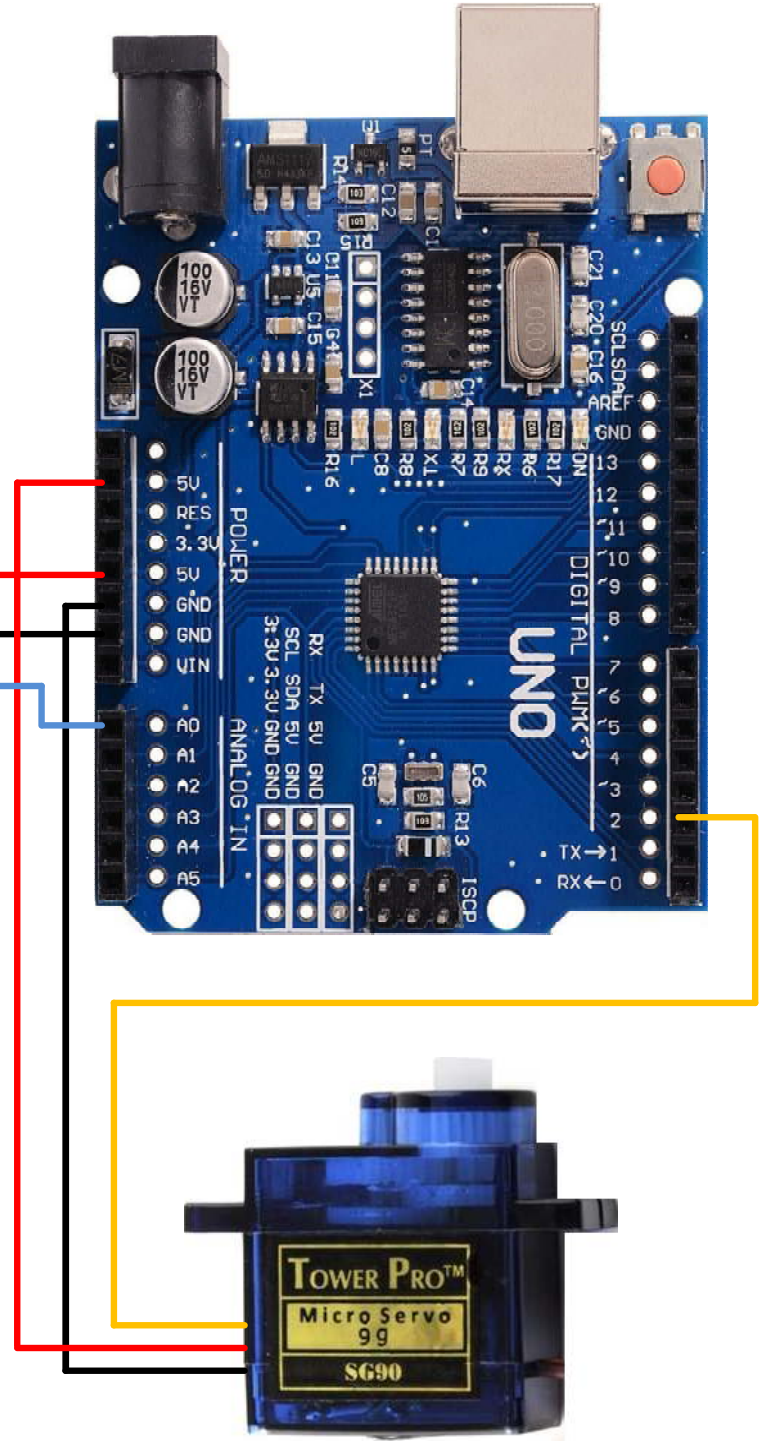
DC 5V 2A



WYHP 5V USB
DC 7V-24V to 5V 3A



Potentiometer
10KΩ



Servo Library

Reference Language | Libraries | Comparison | Changes

Servo library

This library allows an Arduino board to control RC (hobby) servo motors. Servos have integrated gears and a shaft that can be precisely controlled. Standard servos allow the shaft to be positioned at various angles, usually between 0 and 180 degrees. Continuous rotation servos allow the rotation of the shaft to be set to various speeds.

The Servo library supports up to 12 motors on most Arduino boards and 48 on the Arduino Mega. On boards other than the Mega, use of the library disables analogWrite() (PWM) functionality on pins 9 and 10, whether or not there is a Servo on those pins. On the Mega, up to 12 servos can be used without interfering with PWM functionality; use of 12 to 23 motors will disable PWM on pins 11 and 12.

Circuit

Servo motors have three wires: power, ground, and signal. The power

Functions

- attach()
- write()
- writeMicroseconds()
- read()
- attached()
- detach()

Examples

- Knob: control the shaft of a servo motor by turning a potentiometer.
- Sweep : sweeps the shaft of a servo motor back and forth.

Functions

- attach()
- write()
- writeMicroseconds()

Sample Sketch

Servo_Motor_N_Pot_00

```
// ##########################################################################
//
//  Servo Motor Sketch v0.1 Beta
//
//  Released:  21/05/2015
//
// ##########################################################################
/*
    This program simply drives the servo motor to a position
    determined by a potentiometer.

    Initialise
    Read pot value
    Convert to servo angle
    SEnd to servo
    print to screen
    wait 100ms
*/
// Declare and initialise global variables
#include <Servo.h>
int newAngle  = 90;  // start with servo in the centre pos
int potPin = 0;  // define pot wiper input pin
Servo servoMain; // Define our Servo
```

```
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  servoMain.attach(8); // servo on digital pin 8
  servoMain.write(90);    // centralise the servo to start with
  delay(1000);           // wait 1 second
}

void loop() {
  // put your main code here, to run repeatedly:
  newAngle = analogRead(potPin);
  newAngle = 180 - (newAngle / 5.68);
  Serial.print("Angle = ");
  Serial.println(newAngle);
  servoMain.write(newAngle);  // move servo
  delay(10);           // Wait 10 ms
}
```

Note:

- servo.writeMicroseconds(value)
- Gives finer control.
- 1500 µs for centre position
- Range 1000 – 2000 nominal