Z2M Part Number:
MMD-00002-A
MMD-00002-B

Servo Motor
(Technical Note)

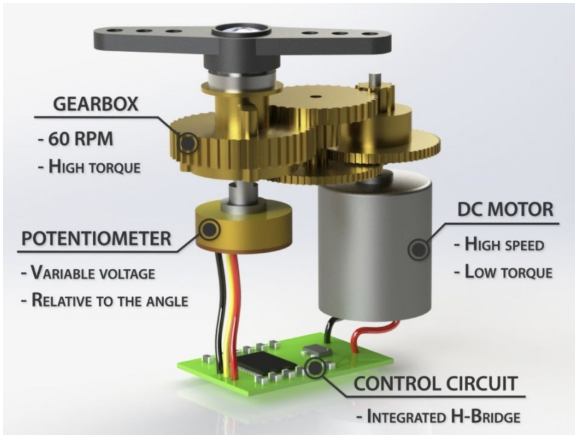
Introduction

A servo motor is an electromechanical device which can rotate its shaft to a specific angle. A servo motor can usually only turn 90° in either direction for a total of 180° movement.
Inside a servo motor is a position sensor (potentiometer) that is used to control the motor position to the required angle, set from the Signal pin, by the internal controller board. A 50Hz Pulse Width Modulated (PWM) signal, generally between 5-10% (1 to 2 mS) ON time, locates the motor axis to -90 to +90 degree angles.

MMD-00002-A

MMD-00002-B

Servo motors are used in applications where only a limited angular movement is needed, such as controlling opening & closing dampers and pickup claws. Multiple servo motors used together can offer multi-axis movement as in a robotic arm.



Applications

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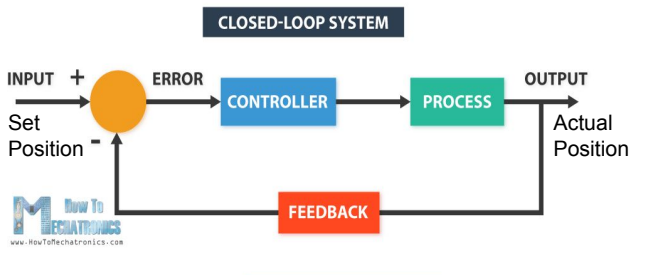
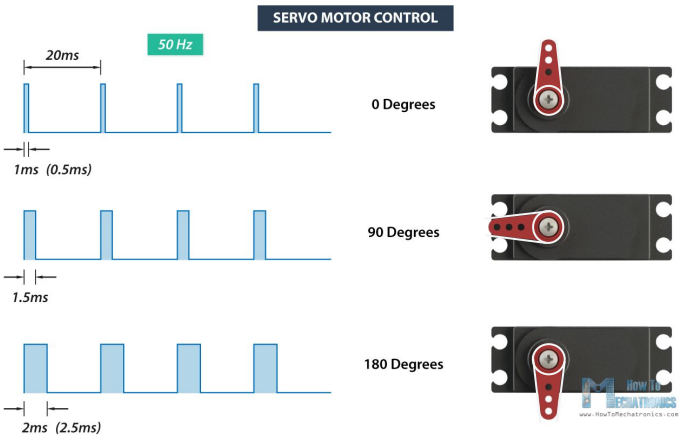
Applications

- *Robotics*
  To activate movements, giving the arm to its precise angle.





References:

1. https://www.watelectrical.com/servo-motor-types-and-working-principle/
2. https://learn.sparkfun.com/tutorials/pulse-width-modulation/all
3. https://howtomechatronics.com/how-it-works/how-servo-motors-work-how-to-control-servos-using-arduino/

Z2M Part Number:
MMD-00002-A
MMD-00002-B

Servo Motor
(Application Note)

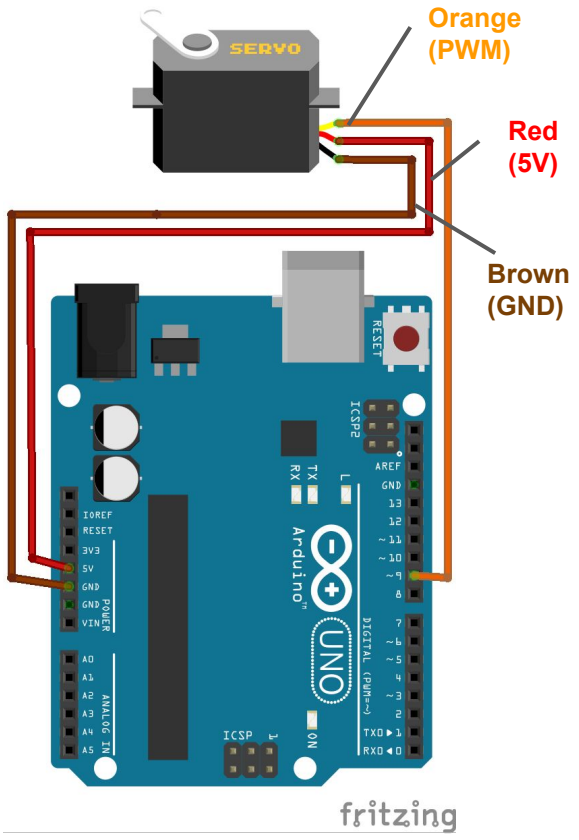
Project

To make a servo turns from -90 to +90 degree and then back and forth slowly.

Procedure

1. Connect orange PWM wire (Servo) to Pin 9 (Arduino).
2. Connect red 5V (Servo) to 5V (Arduino).
3. Connect brown GND wire (Servo) to GND (Arduino).
4. Put on the servo arm to the servo.
5. Find and install the required libraries (h files) from https://tinyurl.com/Z2MLibraries.
6. Run the code.
7. You should see the servo arm move slowly from 0 degree to 180 degree back and forth.

Schematic



Components Required

Component	Zero2Maker Part No.	Qty
Arduino UNO	EMX-00001-A	1
SG90 Servo	MMD-00002-A OR MMD-00002-B	1
Jumper M-M	EDA-00001-B	3

Code

```
/*include this library*/
#include <Servo.h>

/*initiate and assign servo name*/
Servo myservo;

/*create a variable for angle*/
int ang;

void setup()
{
  /*Set pin 9 to control the servo*/
  myservo.attach(9);
}

void loop()
{
  /*for (initialization; condition;
increment)tell servo to go from 0 to 180
degree with increment     of 1 every cycle.
*/
  for (ang = 0; ang <= 180; ang += 1)
  {
    myservo.write(ang);
    delay(15);
  }

  for (ang = 180; ang >= 0; ang -= 1)
  {
/*tell servo to go from 0 to 180 degree
with decrement of 1 every cycle.*/
    myservo.write(ang);
    delay(15);
  }
}
```

Challenge Yourself

1. Make the servo move back and forth faster.
2. Make the servo move only when ultrasonic sensor detect a near object.