



"Arduino Uno Servo Motor Experiment"

EXP.NO: 2

Objective: Study and understand how a servo motor works and the basic principles of its control.

Materials:

- Arduino Uno board
- USB cable
- Micro Servo
- 220-330-ohm resistor
- Breadboard
- Jumper wires

To set up a servo motor with an Arduino, you'll need the following components:

1. Arduino board (e.g., Arduino Uno, Arduino Nano)
2. Servo motor
3. Jumper wires
4. Breadboard (optional)
5. Power source (usually USB for Arduino)

Here's a step-by-step guide on how to set up a servo motor with an Arduino:

1. Connect the Power Source: Connect your Arduino board to a power source, typically via USB.
2. Connect Servo Motor:
 - Connect the servo's red wire to 5V on the Arduino.
 - Connect the servo's brown or black wire to GND on the Arduino.
 - Connect the servo's orange or yellow wire to a PWM-capable pin on the Arduino (e.g., pin 9).

3. Write the Arduino Code:

You'll need to write a simple Arduino sketch to control the servo motor. Here's a basic example:

arduino

```
#include <Servo.h>

Servo myservo; // create servo object to control a servo

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

```
void loop() {  
  myservo.write(0); // sets the servo to 0 degrees  
  delay(1000);      // waits for a second  
  myservo.write(90); // sets the servo to 90 degrees  
  delay(1000);      // waits for a second  
  myservo.write(180); // sets the servo to 180 degrees  
  delay(1000);      // waits for a second  
}
```

4. Upload the Code:

Upload the code to your Arduino board using the Arduino IDE.

5. Run the Setup:

After uploading the code, the servo motor should start moving to the specified angles (0, 90, and 180 degrees) with one-second intervals in this example.

This is a basic setup to control a servo motor with an Arduino. You can modify the code to suit your specific requirements, controlling the servo motor's position as needed. Be sure to check the servo's datasheet for its specific voltage and current requirements to ensure safe operation.

Discussion:

1. What is a servo motor? Describe how it works and where it is commonly used.
2. What are the main components of a servo motor? Explain the roles of the control wire, power wire, and ground wire.
3. How does PWM (Pulse Width Modulation) control a servo motor? Explain the concept briefly and its importance in controlling the servo.
4. Why is a servo library used in Arduino? Describe the advantages of using the Servo library in your code.