
Controlling a Servo Motor with Arduino

Objective:
Control the **angle of rotation** of a servo motor using Arduino for robotics or automation applications.

Components Required:

- Arduino Uno (or ATtiny85)
- Servo motor (like SG90 or MG996R)
- Power supply (Arduino 5V for small servos)
- Jumper wires

Circuit Overview:

- A **servo motor** has 3 wires:
    - **VCC** (power, usually 5V)
    - **GND**
    - **Signal** (connected to a PWM-capable Arduino pin)
- The Arduino sends **PWM signals** to control the angle (usually from 0° to 180°).

Working Principle:

- The servo motor rotates to a specific angle based on the width of the PWM signal.
- Arduino uses **precise pulse timing** to set the position.
- You can control the angle using **potentiometers**, **sensors**, or **button inputs**.

Use Cases:

- Robotic arms
- RC car steering
- Automated locks or doors
- Camera gimbals and pan/tilt mechanisms

Note:
Use an **external power source** for larger or multiple servos to avoid resetting the Arduino.