
Servo Motor Interfacing with Arduino Uno

Objective:
Control the angular position of a servo motor using Arduino for precise movement in robotics and automation.

Components Required:

- Arduino Uno
- Servo motor (e.g., SG90 or MG996R)
- External power supply (recommended for larger servos)
- Jumper wires & breadboard

Circuit Overview:

- Servo motors have **three wires**:
    - **VCC (Red)** → 5V (or external power)
    - **GND (Brown/Black)** → GND of Arduino
    - **Signal (Orange/Yellow)** → PWM-capable pin on Arduino (e.g., D9)

Working Principle:

- Arduino sends **PWM (Pulse Width Modulation)** signals to the servo's control pin.
- The **width of the pulse** determines the angle (usually 0° to 180°).
- Servo responds by rotating its shaft to the specified angle.

Use Cases:

- Robotic arms and joints
- Automated door locks
- Pan-tilt camera systems
- DIY projects involving movement

Note:
Avoid powering high-torque servos directly from Arduino's 5V pin. Use an external 5V supply and connect GNDs together.