

# SENSORS AND ACTUATORS

## SERVO MOTOR

*Laboratory Guide*

### IDENTIFICATION

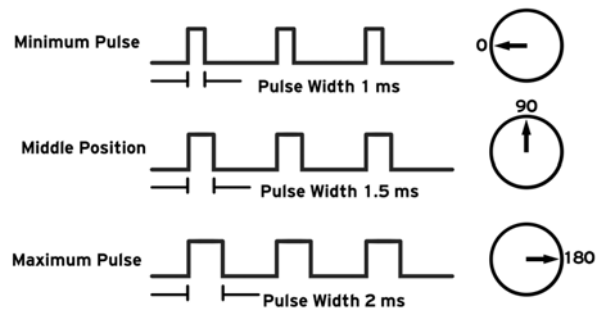
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### INTRODUCTION

A servomotor is a rotary actuator that allows for precise control of angular position. It consists of a suitable DC motor coupled to a sensor for position feedback. It contains a driver circuit.



The servo motor is controlled with a pulse width modulation signal like the one shown in the figure below.



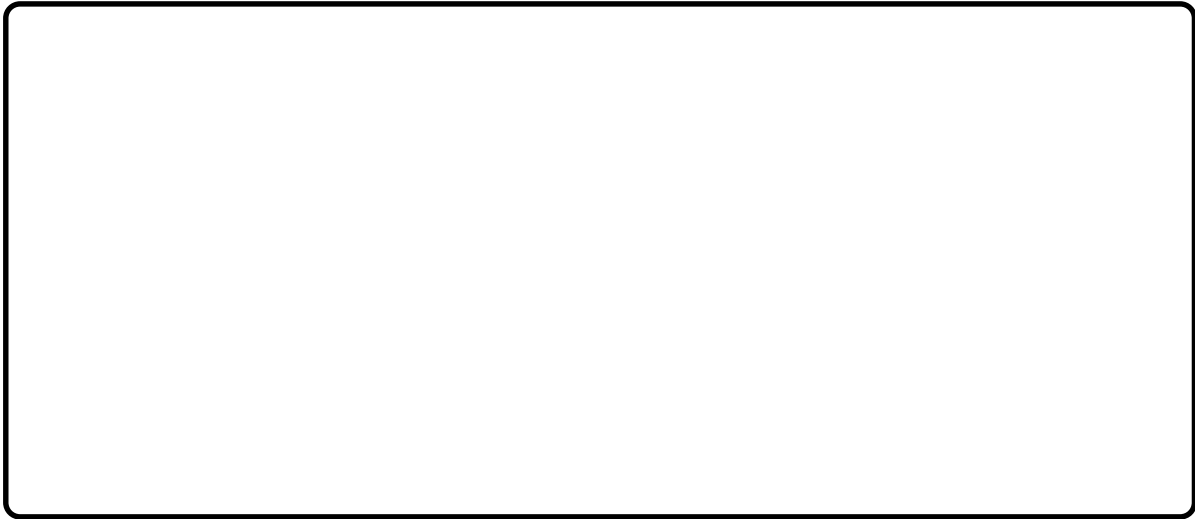
It has three wires: 5V DC power supply (red), ground (black) and control signal (typically yellow).

*Recommended reading:* <https://en.wikipedia.org/wiki/Servomotor> and <https://www.instructables.com/Arduino-Servo-Motors/>.

## EXECUTION

### *1) Connecting the Servo Motor to the Arduino*

Use an Arduino microcontroller to make the servo motor rotate in both directions. Present the electrical circuit assembled.



### *2) Maximize the rotation speed*

Make the motor shaft rotate by  $6^\circ$  once a second (similar to the seconds needle in an analog wristwatch). Adjust the settings used to make the servo motor rotate by  $90^\circ$  in as little time as possible. Measure that time.



## MATERIAL

- 1 servo motor.
- 1 board with an Arduino UNO microcontroller.