Circuit 3A: Servo Motors

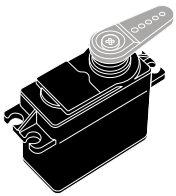
In this circuit, you will learn how to wire a servo and control it with code. Servo motors can be told to move to a specific position and stay there. Low-cost servo motors were originally used to steer RC airplanes and cars, but they have become popular for any project where precise movement is needed.

YOU NEED

SCISSORS (NOT INCLUDED)

NEW COMPONENTS

SERVO MOTORS: Regular DC motors have two wires. When you hook the wires up to power, the motor spins around and around. Servo motors, on the other hand, have three wires: one for power, one for ground and one for signal. When you send the right signal through the signal wire, the servo will move to a specific angle and stay there. Common servos rotate over a range of about 0° to 180°. The signal that is sent is a **PWM signal**, the same used to control the RGB LED in Project 1.



Included with your servo motor you will find a variety of motor mounts that connect to the shaft of your servo. You may choose to attach any mount you wish for this circuit. It will serve as a visual aid, making it easier to see the servo spin. The mounts will also be used at the end of this project.

ATTACHING YOUR SERVO: A strip of adhesive Dual Lock™ fastening tape is included in your kit. Cut two pieces of it to temporarily affix your servo to your baseplate.

NEW CONCEPTS

DUTY CYCLE: Pulse-Width Modulation (PWM) is a great way to generate servo control signals. The length of time a PWM signal is on is referred to as the duty cycle. Duty cycle is measured in percentage. Thus a duty cycle of 50 percent means the signal is on 50 percent of the time. The variation in the duty cycle is what tells the servo which position to go to in its rotation.