REV ROBOTICS

# SMART ROBOT SERVO

## USER'S MANUAL

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# 1 SRS OVERVIEW

The REV Robotics Smart Robot Servo (SRS) is configurable metal-geared servo that takes the guesswork out of aligning and adjusting servo based mechanisms. One SRS can be used as a standard angular servo, a custom angular servo, and a continuous rotation servo by simply changing its settings.


**Figure 1-1 Smart Robot Servo**

## 1.1 FEATURES

The REV Robotics Smart Robot Servo includes the following features:

- Default operation
  - 180° motion over full input pulse range
- Metal gears
- Smart features
  - Programmable with REV SRS Programmer (REV-31-1108)
  - Servo Limit Mode
    - Set right and left angular limits
    - SRS will not move past limits
  - Continuous Mode
    - SRS spins continuously
    - Speed and direction set by input pulse

## 1.2 TECHNICAL SPECIFICATIONS

Table 1-1 outlines the technical specifications of the SRS:

**Table 1-1 Technical Specifications**

| **Mechanical Specifications** | | | |
|---|---|---|---|
| **Stall torque (at 6V)** | 13.5 kg-cm / 187.8 oz-in | | |
| **Speed (at 6V)** | 0.13 s/60° | | |
| **Maximum angular range** | 180° | | |
| **Gear material** | Metal | | |
| **Spline type** | 25T | | |
| **Dimensions** | 40.2mm x 20.0mm x 38.0mm | | |
| **Weight** | 2.05 oz. | | |
| | | | |
| **Electrical Specifications** | | | |
| | **Min** | **Nominal** | **Max** |
| **Voltage rating** | 4.8V | 6.0V | 7.4V |
| **Stall current (at 6V)** | | | 2.0A |
| | **Min** | **Center** | **Max** |
| **Input pulse** | 500µs | 1500µs | 2500µs |

## 1.3 KIT CONTENTS

The REV Robotics SRS comes with the following:

- REV Smart Robot Servo
- Mounting hardware
- Servo horn (arm) assortment

# 2 OPERATING MODES

Out of the box, the SRS operates as a standard 180° servo. However, the REV SRS Programmer (REV-31-1108) can reconfigure the SRS to set angular limits or switch it into a continuous rotation mode.

## 2.1 DEFAULT OPERATION

The default range for the SRS is 180°. This range is mapped to an input pulse range of 500µs to 2500µs with 1500µs as the center point. Figure 2-1 describes the pulse-to-angle relationship.

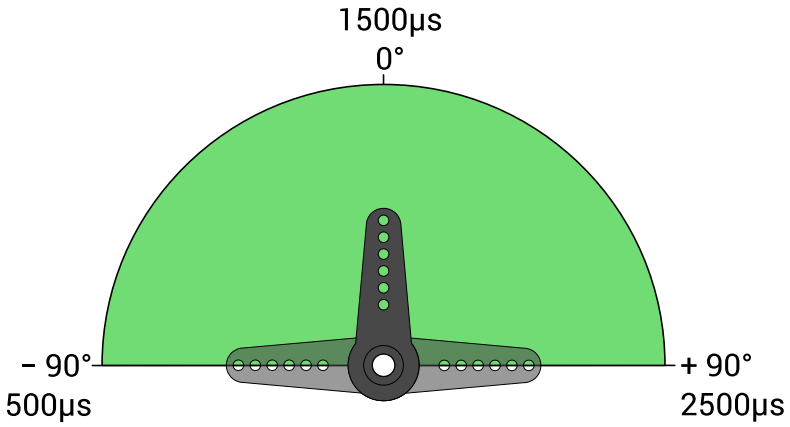


**Figure 2-1 Default Pulse-to-angle Mapping**

## 2.2 CONTINOUS ROTATION

The SRS can be configured with the SRS Programmer to operate in a continuous rotation mode. In this mode, the same input pulse range is mapped to direction and speed. Table 2-1 Continuous Rotation Pulse Mapping lists the pulse mapping for direction and speed.

**Table 2-1 Continuous Rotation Pulse Mapping**

| **Pulse Width (PW in µs)** | **500** | **500 < PW < 1500** | **1500** | **1500 < PW < 2500** | **2500** |
|---|---|---|---|---|---|
| **Direction** | Counter Clockwise | | Stopped | Clockwise | |
| **Speed** | Full | Proportional | | Proportional | Full |

## 2.3 ANGULAR LIMITS

The SRS can be easily configured with the SRS Programmer to limit right and left motion at two user-defined angles. Input pulses that occur past the limits will be ignored and the SRS will hold the limit angle. Any two angles can be set as limits as long as they are both at least 20° from center in either direction. Figure 2-2 shows the valid regions for left and right limits.

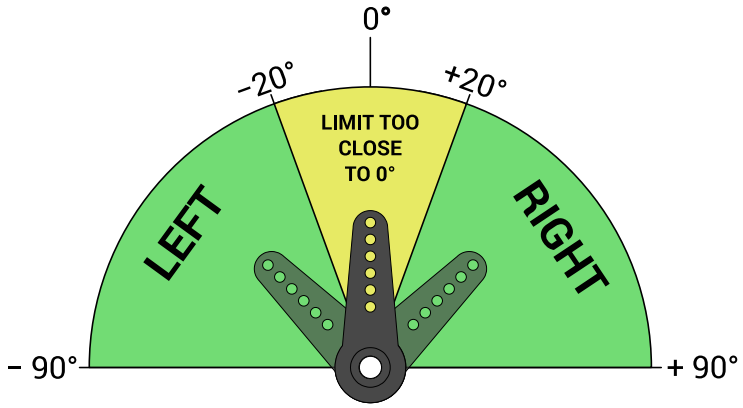


Figure 2-2 Valid Angular Limit Regions

Once valid limits are programmed, the SRS will ignore any pulses that exceed the limits and hold the limit angle. For example, in Figure 2-3 a left limit of -30° and a right limit of +60° was set.

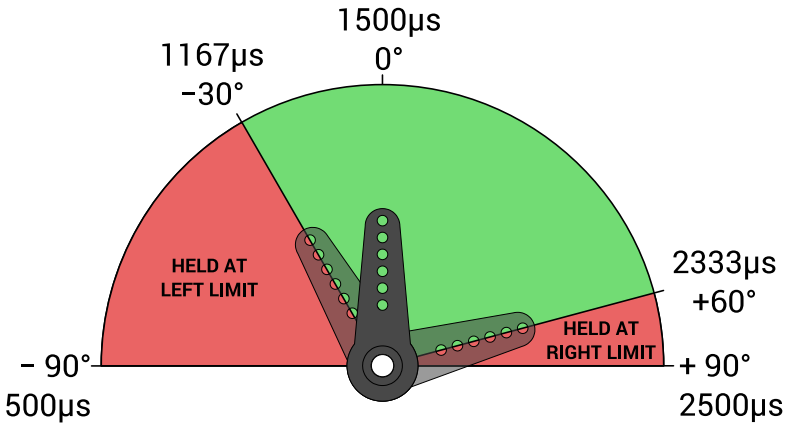


Figure 2-3 Servo Operation with Example Limits

**MORE INFO**

**Angular limits can only be set by the REV SRS Programmer. For specific instructions on using the SRS Programmer please refer to the documentation at www.revrobotics.com/srs-programmer.**