

# ServoTester2 Operation (rev B1)

author: Dave Harris 06/2023

This module operates a 'hobby' 3 wire, 5 Volt, servo that uses a Pulse Width Modulated signal to determine the servo position. The signal repetition is 50 Hz and its pulse high duration is centered on 1.5 ms for servo mid-position. A traditional/early servo has a movement range of 90°, driven by pulses in the range of 1.0 ms to 2.0 ms. A modern servo, *generally*, has a movement range of 180°, driven by pulse in the range of 0.5 ms to 2.5 ms. The ServoTester2 generates pulses over the 0.5 ms to 2.5 ms range.

*Beware that 90° servos can be damaged if driven past their limit.*

**Servo connector.** This 3 pin header for the servo has the legend of '**S 5 0**'. The 'S' identifies the signal pin and is normally the orange, yellow or white wire. '5' is 5V pin and '0' is 0V pin.

**LEDs.** The 3 LEDs indicate the current being pulled by the servo from the 5V supply.

*(The currents in the following items are averaged values and NOT peak values)*

- Yellow on its own shows less than 25mA is flowing.
- Green plus yellow shows that between 25mA and 250mA flowing.
- Red on its own shows more than 250mA. A larger servo may trigger this.

If the yellow is blinking, and red and green are off, then there is an **UnderVolt** (<4.75V) fault detected. In a fault state, the module is paused for 2 seconds.

**Rotary knob.** This controls how far the signal moves from the 1.5 ms mid-position. Fully counterclockwise the signal is mid-position. Fully clockwise is maximum movement.

**Toggle switch.** This enables or pauses an internal 1.0 Hz oscillator. Up is Run and down is Pause. Each phase of the oscillator either adds or subtracts the rotary knob value to/from the mid-position signal of 1.5 ms. With the knob fully counterclockwise, the servo will be stationary in its mid-position. With the knob fully clockwise, the servo will oscillate between its extremes of movement, driven by pulses of 0.5 ms to 2.5 ms. With the knob at half-way rotation, the signal will oscillate between 1.0 ms to 2.0 ms.

While in Pause mode, the servo is operating in the add or the subtract phase it was in. To get to the other phase, then do a momentary switch toggle to Run and back to Pause.

**Servo Isolate.** For normal use, this 2 pin header has a jumper strap fitted. Removing it, isolates the servo signal, for when investigating how it responds to a loss of signal.

**Scope header.** This 2 pin header is for a meter or oscilloscope, when investigating unfiltered current in detail. A small Voltage is developed across an internal current sense of 0.2 Ohm.

**USB B micro.** The 5V power. This needs to be a charge rated cable, connected to a 2A rated USB port. *The use of an insubstantial cable or port will cause fault detections.*

Play and enjoy!