

Three Position Servo Driver from Oxford V.U.E., Inc.

Use this versatile little module for a variety of animation projects on your model railroad. Three positions are settable and the LED output can be set to normally high (5 volts) or normally low (ground). Although the firmware is optimized for the control of a semaphore signal the PIC16F628 is in a socket so you can tweak the code to do other things.

Inputs:

Power, 7.5 to 16 volts D.C. (12 volts nominal)

Control, 3 active low digital inputs for “Red”, “Amber”, and “Green”

SW1 and SW2 pushbuttons

Outputs:

5 volts for servo and LED/Lamp

PWM Servo signal.

LED or Transistor Drive.

Installation of a Semaphore Signal Controller

Nearly any standard R/C servo can be used. The choice should be driven by physical size and torque required. An HO scale signal needs very little torque, while a large scale or full size signal will need a much larger and more powerful servo.

Build the control mechanics and adjust the linkage on the workbench then install on the layout. In the example telescoping square brass tubing was used so that the control mechanism can be mounted on stand-offs with two wood screws to the underside of the layout. The semaphore is then dropped into place from the top. With some careful measuring, the semaphore can be removed or replaced with only minor adjusting required. If the magnetic coupling method (Photo 1) is used only the light wires need to be connected/disconnected.

Lighting the 1.5V lamp in the Tomar semaphore:

Two parts are required a logic level MOSFET like a 2N7000 and a current limiting resistor 100 Ohm. Connect the 1.5 volt lamp in series from the 5 volt output through the 100 Ohm resistor, through the lamp, through the MOSFET to ground.

To connect the servo output horn to the semaphore push rod a small neodymium magnet epoxied to the servo horn is recommended. P/N:B222 from K&J Magnetics (www.kjmagnetics.com) works well with the Tomar Industries (www.tomarindustries.com) HO scale semaphores like #H-854. Bend a small loop in the end of the push rod. For larger scales a more robust linkage will be required.

Adjusting the positions:

Connect one of the position inputs to ground and wait for the servo to stop moving. Momentarily press SW1 or SW2 to fine tune the position associated with this input. If the positions get so crossed-up that you just want to start over then press both SW1 and SW2 while any of the inputs are active.

Setting the LED output:

This output can be either active low or active high as needed. To change this setting press SW1 or SW2 while none of the position inputs are low.

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Photo 1: Magnet on servo horn, linkage and wires.

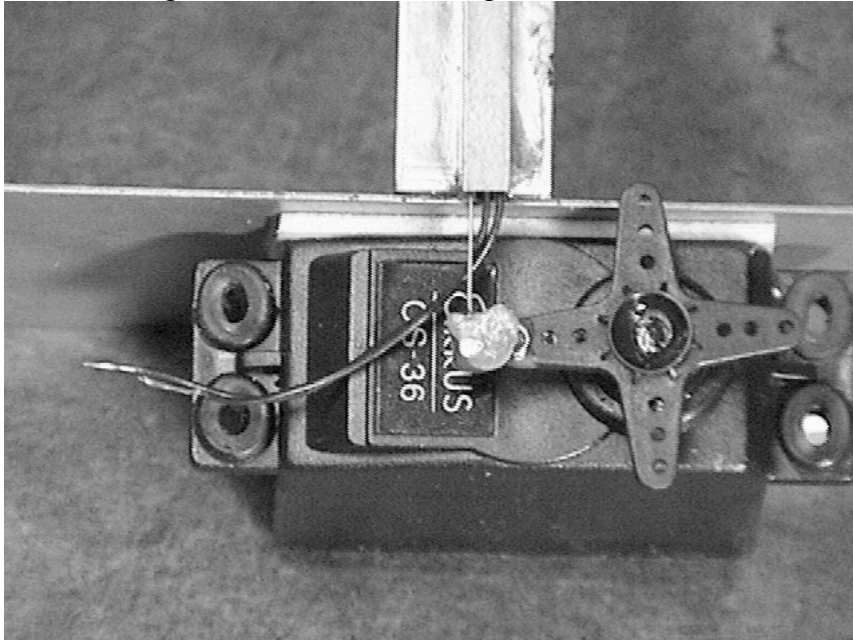


Photo 2: Mounting hardware.

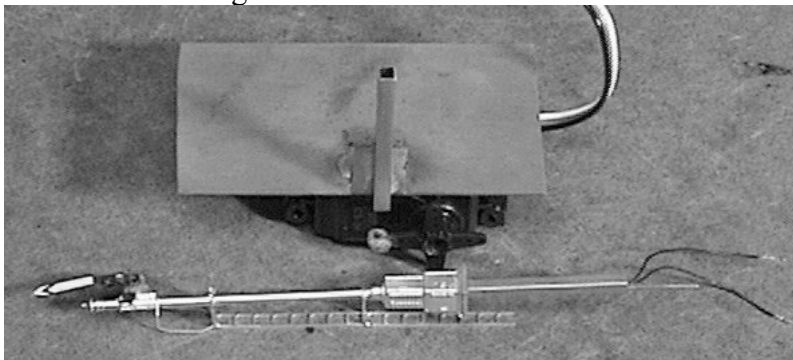


Photo 3: PCB Front.

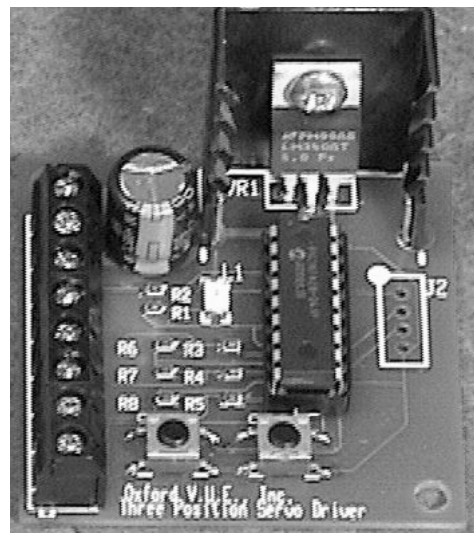


Photo 4: PCB Back.

