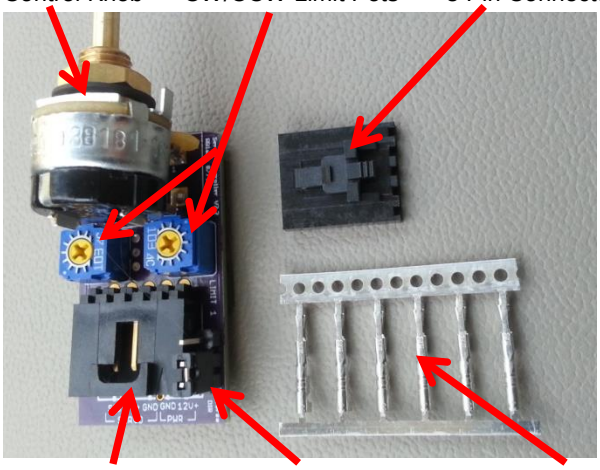
12V Servo Controller Instructions:

Control Knob CW/CCW Limit Pots 5 Pin Connector

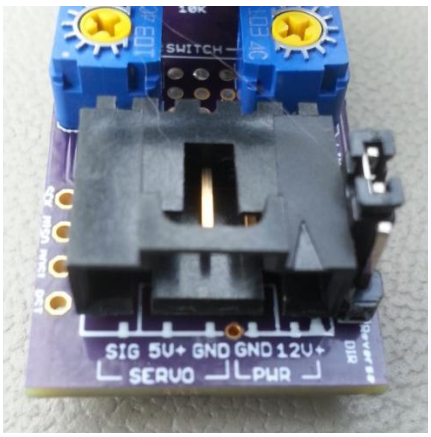


PWR/Servo Connector Dir Swap Jumper 6 crimp pins

Kit includes: Controller, instrument panel Control Knob, 5 Pin male Connector, 5 Pin female PWR/Servo Connector, 5 crimp pins (+1 extra), and a Direction Swap Jumper .

Wiring:
This controller is a drop in replacement for units shipped prior to 1 Aug 2015. Just hook the existing 5 pin connector to the controller then skip over to the Servo Reversing section.

For new installations: Wiring should be accomplished with the servo controller in the off position (Control knob turned fully CCW beyond the "click") to start.

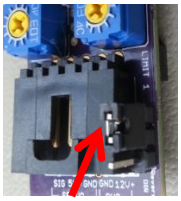


Wiring inputs from Left to Right:
Sig : Servo signal output (Yel,Org, Wht)
5V+ : Servo Power output (Red)
GND : Servo Ground output (Blk, Brn)
GND : Aircraft Ground input (Blk)
12V+ : 12V Power input 7-16V (Red)

Have servo installed in NACA duct and wired to controller to complete the next sections.

Servo Reversing:
Unit ships with a jumper installed on the "Dir Reverse" 3 pin Jumper. Use pliers or a pair of tweezers to swap the jumper if reverse operation is desired.

The following three scenarios are allowed:


Center – Forward


Center – Rear


Jumper Missing

1. Jumper between (Center – Forward)
   Servo rotates **same** as knob.
2. Jumper between (Center – Rear)
   Servo rotates **opposite** knob.
3. Jumper Missing
   Servo rotates **same** as knob.

Setting CW and CCW limits:
This procedure is used to set the end limits for maximum servo travel once installed in the NACA duct assembly.

WARNING – At no time during this procedure should the servo be allowed to drive beyond its normal rotational limits to where it buzzes or shudders for more than a few seconds. Doing so can damage the servo and or the controller unit as it draws a significant amount of current in the stalled condition.

1. Use a mini Philips screwdriver to set Limit 1 and Limit 2 potentiometers (blue cubes with yellow phillips slots) to **center of rotation**. This step helps keep the servo inside of its full limit of travel.
2. Turn unit on by rotating control knob CW until a click is felt. The servo should jump to life and rotate one direction or the other. Rotate knob back and forth to determine servo rotation compared to knob rotation. Swap the jumper to change direction per scenarios given above if needed.
3. Set control knob full CCW but not into off position. Pay heed to warning above should servo travel to a limit and begin to buzz or shudder.

Note: As you adjust the Limit 1/Limit 2 pots you will find that only one will work for the direction you are trying to trim.

4. Adjust the working Limit pot until the CCW servo limit is adjusted as needed.
5. Turn control knob full CW.
6. Adjust other Limit pot (the working one) until CW servo limit is adjusted as needed.
7. Turn control knob stop to stop to do final check of travel. Re-adjust if necessary.
8. The unit is now trimmed and ready for installation into your aircraft.

Useful Suggestions:

1. Can I throw away the jumper if I find it is not needed for direction swap? Yes, You may want to keep it in case some day you wish to swap directions.
2. When using the controller with the direction swapped (scenario 2), can I de-solder the 3-pin jumper pins and just install a wire between holes labeled (10 – GND)? Yes, In fact, do that or at least glue or lock-tite the jumper so it does not slip loose over time. Should it come loose the servo will revert to the other direction.
3. Can I use my servo controller with a 5V supply of power? No, Your Control Unit was designed specifically to be used in 12V (13.8V) systems. The Control Unit requires a minimum input voltage of 7V to operate properly. Operating the unit at less than 7V or greater than 16V could damage the VR or the microcontroller chip.
4. Can I use the servo controller on a 24/28V system? No, Doing so will damage the unit.
5. What size Fuse/Circuit Breaker should I use to wire to the controller? Depends. Fuses/CBs are not there to protect the equipment only the wires connecting the equipment to the aircraft bus. Refer to standard AWG tables to determine what size Fuse/CB is needed for the size wire you are running to the controller. Assume the servo controller will normally draw 300mA, but keep in mind it can temporarily draw up to 1.5A for a few seconds should it become stalled against its stops.
6. Can I remote mount the circuit board separate from the Panel Rheostat? Yes, in fact Aerosport Products keeps a supply of controllers on hand that have not had the control rheostat soldered to the board. When ordering just ask them to ship your controller with the rheostat separate. You will need to solder at least 24 gauge wire from the rheostat to the circuit board and 20 gauge from the rheostat switch to the board. The board is labeled, but with close inspection and some common sense you should have no problem identifying which wires go where.
7. I want my air valve to go from off to full open as soon as I turn the rheostat on, is this possible? Yes, just swap the servo direction with the jumper. Now your system will go from off to on/full open decreasing to full closed as you rotate the knob. Note: you may have to reset your limits.
8. My controller is hot to the touch is that a problem? Usually not but maybe. During set up and testing you will probably get a kick out of running the servo back and forth a whole bunch of times (cuz it's fun). Doing so excessively when unloaded (servo by its self) or lightly loaded (installed in system) will result in heating of the Voltage Regulator (VR), but will not damage it. On the other hand, Jamming the servo or excessively loading it for periods longer than 10-15 secs may cause overheating and possible damage to the servo or the control unit.
9. Should my servo controller be on my list of things to inspect during each annual? Yes. You should check the condition of the control unit, servo and NACA duct unit at least once a year for any signs of binding, wear or overheating. Repair or replace parts if needed.