



Fan Speed Controller

- Fan speed infinitely variable from minimum stall speed to full speed.
- Reducing fan speed results in quieter operation and lower power consumption.
- High-efficiency switching technology does not generate waste heat so controller may be mounted near optical path without affecting telescope performance.
- Maximum energy savings at slow speeds where controller will operate for most of the night.
- Controller can run multiple 12V low-power “computer” fans typically used for Dob mirror cooling (1 Amp total for all fans).
- Protective circuitry limits current to prevent damage if a wiring fault should ever occur.
- High-quality product backed by my no-hassle 5-year warranty.

Operation

- When control knob is turned fully counter-clockwise the controller is OFF.
- In the OFF position, no current will be drained from your battery.
- Turning the knob clockwise turns the fans on at minimum speed.
- At minimum speed the controller uses the least battery energy.
- As the knob is rotated further clockwise the fan speed increases.

Warranty and Technical Support

Your Fan Speed Controller is warranted to the original purchaser for 5 years from the date of purchase.

Ron Keating
269 St. Andrews Blvd., Laplace, LA 70068 USA

E-mail address changes periodically due to SPAM so go to:

www.dewbuster.com

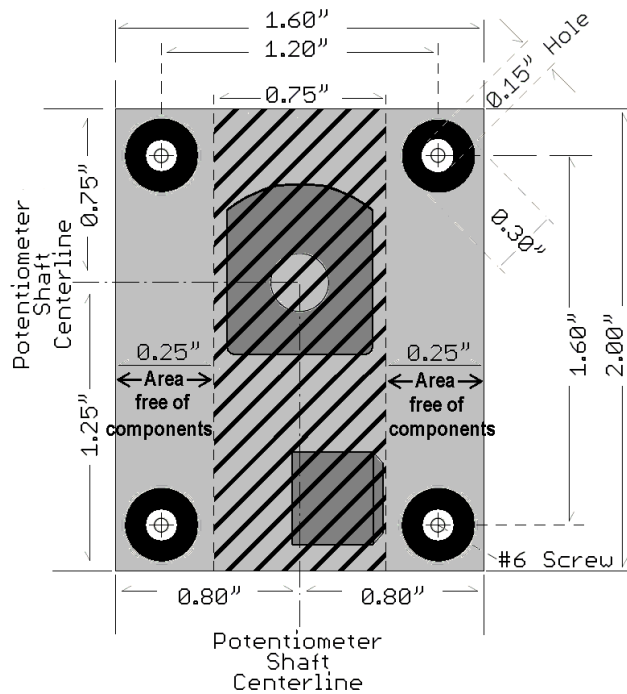
and click on CONTACT ME for current e-mail address.

Mounting

The Fan Speed Controller may be mounted using the potentiometer shaft locknut or the corner holes of the circuit board. After mounting, attach control knob to potentiometer shaft by aligning setscrew to flat and tightening.

When choosing a mounting location, consider your wires will be routed (review wiring instructions on page 3). Wires may be soldered the Fan Speed Controller solder pads on either of the circuit board. If the holes are too small for wires, solder a smaller gauge wire to the solder which can then connect to your wiring. If solder hole must be enlarged, see the important note bottom of page 3.

The corner mounting holes may be attached to metal objects using metal screws, however do allow any metal objects to touch the solder joints component leads of the circuit board (shaded in drawing at right).

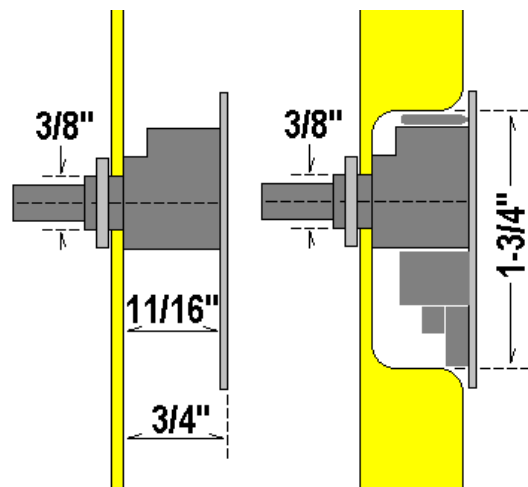


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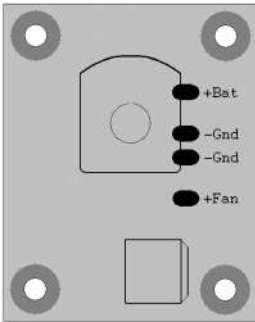
Here are a few possible mounting methods:

- Mount inside a small plastic or metal enclosure and install in rocker box.
- Use a metal or plastic plate with 3/8" diameter hole and fasten board using the potentiometer shaft and locknut.
- Route or chisel-out a 3/4" wide by 1-3/4" long recess on inside surface of rocker box to allow clearance for the circuit board components. Then drill a 3/8" hole for the potentiometer shaft to protrude on the outside when board is fastened to inside using screws in corner holes.

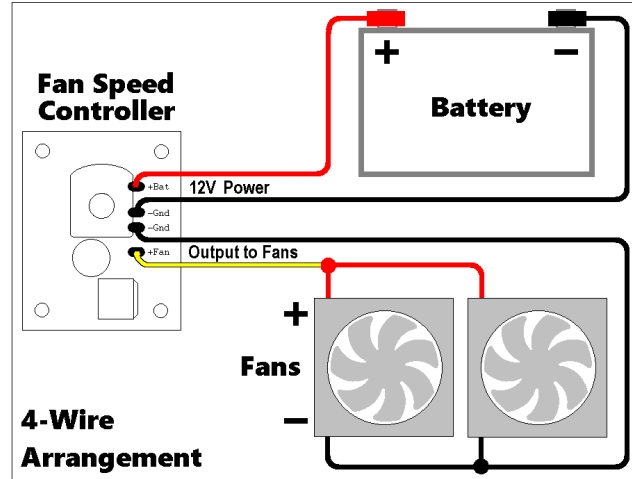
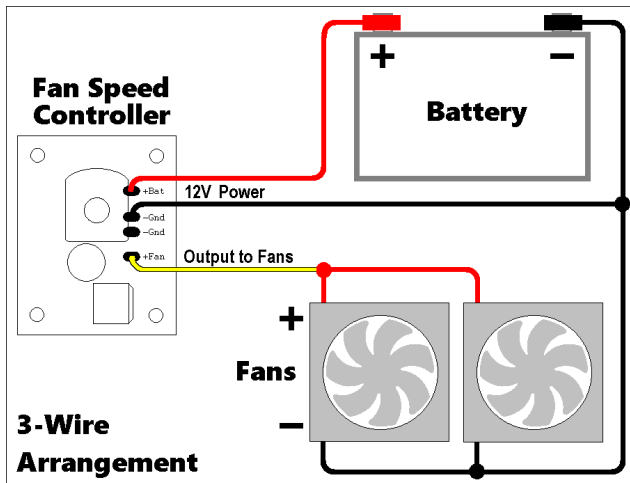


Wiring

The Fan Speed Controller has 4 solder pads:



<i>PAD</i>	<i>TYPE</i>	<i>TYPICAL WIRE COLOR</i>	<i>CONNECTS TO</i>
+BAT	Power In	Red	Positive of 12V battery
-GND	Power In	Black	Negative of 12V battery
-GND	Output	Black	Negative Wire of Fan (if needed)
+FAN	Output	Yellow	Positive Wire of Fan



The Fan Speed

Controller may be wired in either a 3-wire or 4-wire arrangement as shown above. The only difference is that the 4-Wire Arrangement uses the Fan Speed Controller to provide a Ground connection to the negative lead of the fans. If the fan negative is already connected to the battery the 3-Wire Arrangement is easier to wire. Pre-wired Fan Speed Controllers have 4 wires soldered to the circuit board. The 2nd black wire has heat shrink insulation covering the end which is left in place for 3-wire arrangement and removed for 4-wire arrangement.

If desired, the Fan Speed Controller can replace of the fan's on/off switch since it will serve the same purpose.

Unless your Fan Speed Controller was pre-wired, you will need to solder your wiring to the circuit board's soldering pads. Wires may be connected to either side of the board. Use a soldering iron, not a soldering gun because you do not want to overheat the solder connections and damage the circuit board. Use rosin core electrical solder, NEVER use acid core solder. If you are not experienced at soldering then take a look at the free beginner's guide "[Soldering is Easy](http://mightyohm.com/blog/2011/04/soldering-is-easy-comic-book/)" (<http://mightyohm.com/blog/2011/04/soldering-is-easy-comic-book/>).

IMPORTANT: The holes in the solder pads are sized for 22-gauge wire. If your wiring is larger, you have 2 options:

- Solder a smaller wire to the circuit board then connect it to your wire (**recommended**).
- Or drill the hole larger. However, this breaks the connection between the top and bottom solder pads so you must reconnect them by soldering your wire to both the top solder pad and the bottom solder pad of the circuit board.

Initial Test of Fan Speed Controller Operation

1. Start with Fan Speed Controller's knob turned fully counterclockwise (Off).
2. Connect telescope to 12V Battery or 13.8VDC Power Supply.
3. Verify that fans are not running.
4. Turn Fan Speed Controller's control knob clockwise until fans begin to turn slowly.
5. Continue turning control knob and verify that fan speed increases proportionally reaching full speed at full clockwise position. You should be able to vary the speed over a wide range with fine control.

IMPORTANT: If fans do not run with control knob fully clockwise then immediately turn control knob OFF and verify that:

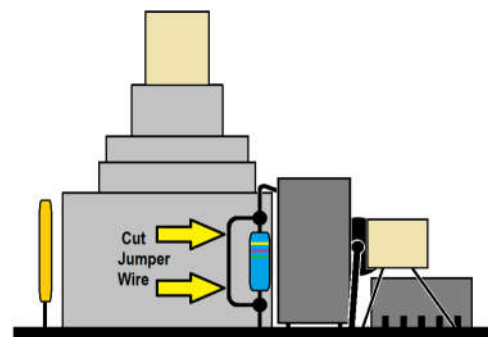
- Fans spin freely when rotated by hand (no mechanical issues).
- Fan wiring matches diagrams on page 3 and do not connect to any other equipment.
- The fans are 12VDC and do not draw more than 1 Amp total for all fans.
- Using a Voltmeter, verify that with knob fully clockwise you have +12 Volts across the fan wires and the polarity is correct. Computer fans with 3 or 4 wires should only have two wires connected, the extra wires are not used and should be insulated to prevent inadvertent contact.

NOTE: If fans do not start turning until knob is over halfway and will not run very slow, then your fans may not be suitable for variable speed. Computer cooling fans work great and will gradually vary their speed as the voltage changes between 5V and 12V.

6. Now that speed control works, we must **verify that when the control knob is at minimum speed the fans do not stall** (stop turning) because a stalled fan may overheat from lack of cooling. Most fans need at least 4 Volts to begin turning, but some require more. The Fan Speed Controller is preset for most fans but is equipped with a jumper to increase the minimum output voltage if needed to prevent stalling. Perform the stall test as follows:
 - Turn control knob OFF and wait for fans to stop turning.
 - Turn control knob clockwise until click is heard and verify that fans begin turning.
 - **Repeat several times. If fans never stall, then installation is complete.**

- **Continue with the steps below ONLY if the fans stall:**

- On left side of circuit board near the Serial Number, locate jumper wire across the little blue resistor
- Use diagonal cutting pliers to cut the jumper wire at arrows. This adds the little blue resistor to the circuit and raises the minimum output voltage to prevent the fans from stalling.



Left Side View of Circuit Board

- Repeat the stall test above to verify the fan(s) do not stall.

IF YOU NEED ASSISTANCE CONTACT DEWBUSTER TECH SUPPORT.