



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 that could interfere with your telescope's performance.
- Maximum energy savings occur at slow speeds where controller will operate for most of the night.
- Controller can run up to 8 fans (1 Amp total).
- 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.

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

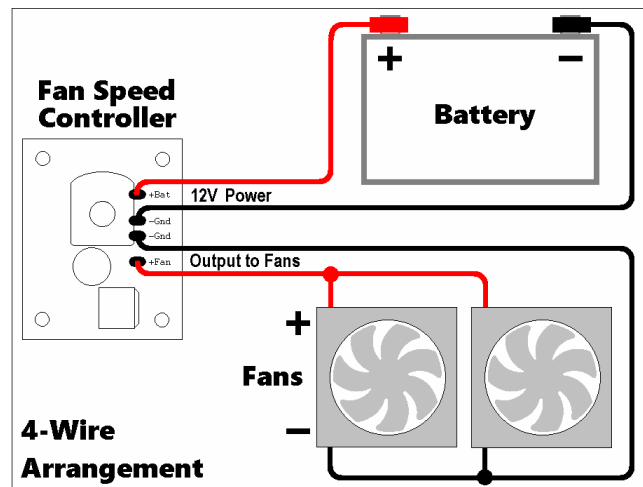
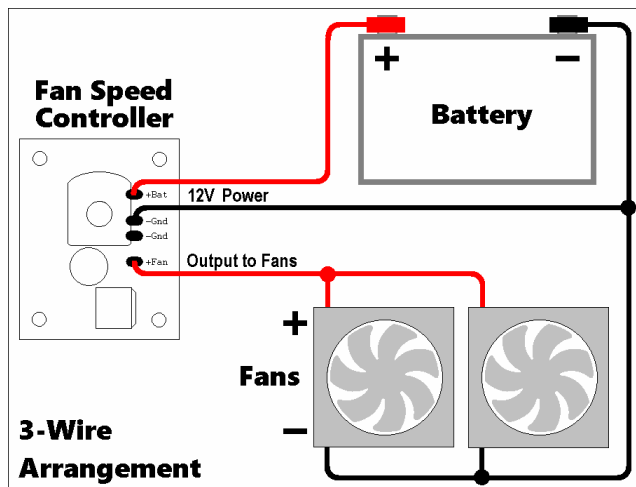
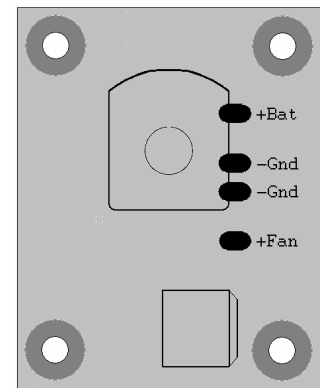
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Wiring

The Fan Speed Controller has 4 solder pads:

<u>PAD</u>	<u>TYPE</u>	<u>CONNECTS TO</u>
+BAT	Power Connection	Positive wire from 12V battery
-GND	Power Connection	Negative wire from 12V battery
-GND	Output Connection	Fan negative wire (if needed)
+FAN	Output Connection	Fan positive wire



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.

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

The Fan Speed Controller has large solder pads to make it easy to solder. 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 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/).

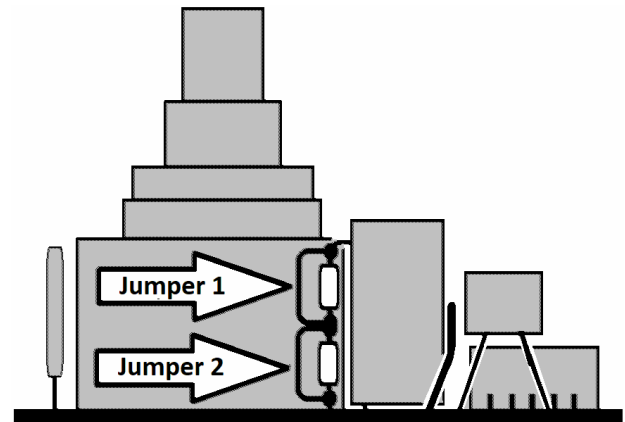
IMPORTANT: The holes in the solder pads are sized for 22 gauge wire which is adequate for up to 8 fans. If your fans are already wired with 18 gauge stranded wire, you may enlarge the holes in the solder pad by drilling them larger, however this will break the plated-thru-hole connection. Therefore, if the hole is drilled larger, you must solder each wire on both the top and the bottom of the circuit board to restore the connection between the top and bottom solder pads.

Initial Test of Fan Speed Controller Operation

1. Start with Fan Speed Controller's control knob turned full clockwise until a click is heard, indicating the switch is turned OFF.
2. Connect telescope to 12V Battery or 13.8VDC Power Supply.
3. Verify that fan(s) are not running.
4. Turn Fan Speed Controller's control knob clockwise until fan(s) begin to turn.
5. Gradually increase control knob and verify fan speed increases.
6. When control knob reaches full clockwise position the fan(s) should be running at full speed. **IMPORTANT: If fan(s) do not turn with control knob fully clockwise then immediately turn control knob OFF and verify:**
 - Fan(s) spin freely when rotated by hand.
 - Fan wiring matches diagrams on page 3.
 - Use a voltmeter to check that fans are receiving +12 Volts across red (+) and black (-) wires.
7. Now that you have verified the fan(s) are changing speed when control knob is increased, we must verify that fan(s) do not stall (stop turning) at minimum control knob position. Perform the stall test as follows:
 - Turn control knob OFF and wait until fan(s) stop turning.
 - Turn control knob clockwise until click is heard and verify that fan(s) begin turning.
 - Repeat several times and if fan(s) do not stall then installation is complete.
 - If fans stall then it will be necessary to cut a jumper to increase minimum voltage to insure the fan(s) do not stall.

This is done as follows:

- While viewing left side of circuit board as shown at right, locate Jumper 1 and Jumper 2.
- Cut either one of the jumpers to increase the minimum fan voltage by approximately one Volt.



Left Side View of Circuit Board

- Repeat the stall test above and if the fan(s) stall then cut the second jumper to increase the minimum fan voltage by another Volt.