



TechnoFan PWM thermostatic fan controller

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TechnoFan

TechnoFan is a compact self contained fan speed controller designed for laser projectors but it would be equally at home in other applications where a fan does not need to run all the time. It features an on board thermistor (with an optional external one available, please contact us for details) and will mount using a single screw. Its compact size 20mm x 24mm means that it can be easily accommodated and is available in versions for 12V or 24V fans. TechnoFan can run multiple fans as long as they are wired in parallel and not series, and they must all be of the same voltage up to a max of 750mA total load.

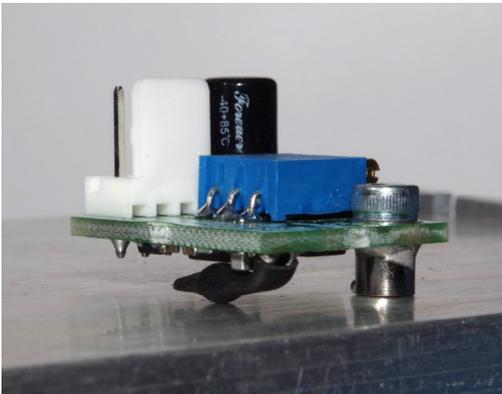
Benefits include

- Lower power consumption
- Quicker warm-up
- Less fan noise
- Longer fan Life
- Better temperature management

Operation

TechnoFan is designed to directly measure the temperature of the panel it is mounted upon. It has a built in thermistor that contacts the surface of the mounting panel below the board. An on board PWM generator uses the signal from the thermistor, the set point and the range selected to determine the fan speed. The PWM allows the fan speed to be controlled from 0% (fan not running) to 100% (fan on full) meaning the fan will only turn as fast as is needed. The set point is controlled by the multi turn pot and sets the temperature where the fan will reach 100%. The range between 0% and 100% is set by one of 3 ranges selected by a pair of solder jumpers on the PCB. At power up the fan will run briefly before it is returned to lower speed. The point at which it returns to will depend on the temperature measured therefore it could return to a low speed or stop altogether.

Mounting



It is important to consider the placement of TechnoFan, but fortunately as its very compact finding a spot for it should be fairly easy. It should be placed near the warmer parts of the projector (or other device). Placing it in a cooler area or directly adjacent to the fan it is controlling may cause it to operate less effectively.

TechnoFan uses a single screw for mounting. The mounting bush has an internal diameter of 3.2mm which needs to be considered when selecting a suitable screw, a self tapping screw may be used but we recommend an M3x8 screw as shown left. It is also important to make sure the screw used has a small head due to the limited room (max diameter of the screw head is 6mm) As can be seen from the image the thermistor that is mounted on the board is pressed against the panel where the board is mounted, its important to be sure that the thermistor is in contact with the mounting surface or the temperature measurement will not be accurate.

Before fitting examine the thermistor and ensure that it protrudes below the level of the mounting bush, to aid in good contact. The leads of the thermistor will have a small degree of spring to them, which will be enough to effect a good contact.

Connections

Before starting ensure that the fans you wish to control match the voltage of the unit you have purchased. The voltage of the TechnoFan board will be marked on a circular label affixed to the multi turn pot.

The wiring will be different between 12v and 24v versions and its important that the diagrams on the next page are followed or damage to TechnoFan may occur.

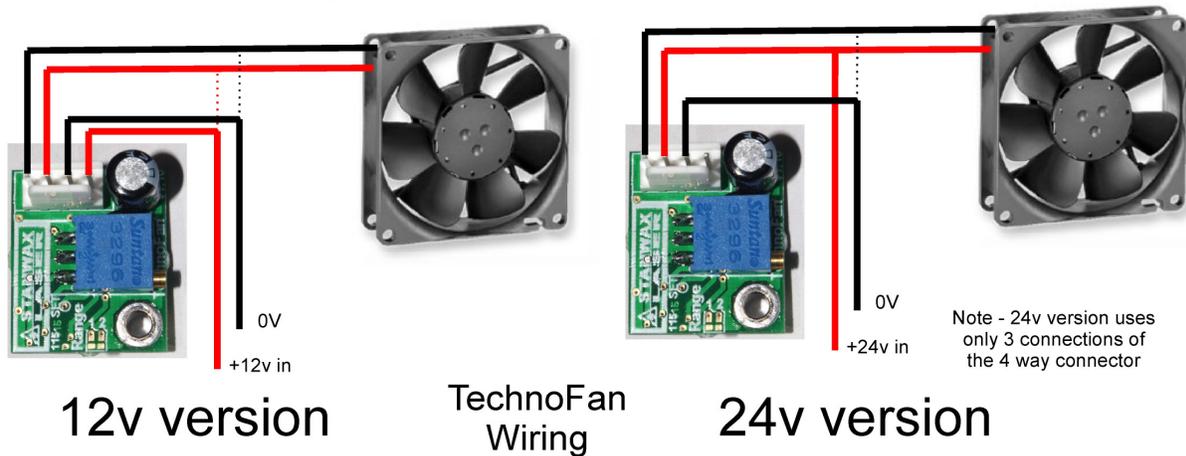
Included with the board are some crimp terminals and the 4 way plastic shell to match the 4 way connector on the PCB. Once crimped ensure the connections are pushed into the correct positions in the 4 way shell until you hear a gentle 'click' indicating that the crimp has locked into position.

If the wiring is made in the wrong order damage to the board may occur, this will not be covered by warranty, so double check the connections before powering up!

If you are using TechnoFan with multiple fans (up to a maximum of 750mA) it is recommended that you wire the fan connections back to a terminal block and then run a single pair of wires between this and the TechnoFan 4 way connector.



Existing fan wiring to be cut is shown with dotted lines



Setting TechnoFan

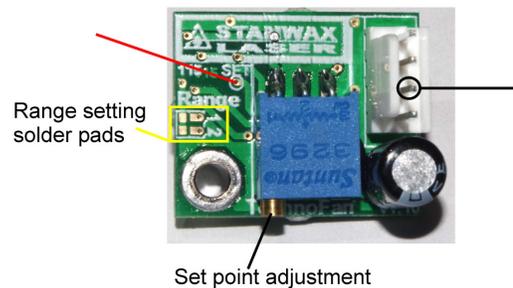
To set TechnoFan its important to understand how the setting is performed. The multi turn pot is used to set the point at which the fan achieves 100% duty cycle. The range setting solder pads are used to set the span of temperature between then 0% fan duty cycle low temperature level and the 100% fan duty cycle level.

The range setting solder pads relate to the following ranges.

Pads marked 1 joined = aprox. 10°

Pads marked 2 joined = aprox 15°

No pads joined = aprox 20°



Select which of the ranges you wish to use and blob solder between the appropriate pads. To adjust the set point, you will need to use a multi-meter set to a 20v DC voltage range connected between 0V (as indicated by the black line in the image above) and the 'SET' pad (indicated by the red line in the image) The pad should allow a pointed meter probe to positively locate for ease of measurement while adjusting. With the power applied turn the pot (clockwise to increase and anticlockwise to decrease the voltage) and monitor the reading on the meter. Adjust the set point using the chart on the next page as a reference – remember this set point is the voltage value on the chart that matches the temperature where you wish the fan to be at 100% - i.e. fully on.

Note. when adjusting the pot you may notice that turning the pot anticlockwise may increase the fan speed, this is not because the pot is the wrong way round but because it is lowering the point at which the fan reaches 100%

Altenative setup method

As an alternative to the method above you can employ a quick and dirty approach to setting up TechnoFan. For this you will still need to chose a range between 0% and 100% fan speed by using the solder jumpers. Then with TechnoFan fitted and wired up run your laser projector up to temp. When the temperature of the case or base plate reaches the maximum temperature you would like, adjust the multi turn pot so that the fan is just running at 100%. To detect 100% the tone of the fan should change and a faint buzzing present when the fan is running at a reduced duty cycle will disappear. Once this set point has been established turn the multi turn pot anti clockwise half or one full turn. This will allow the fan to achieve 100% running before the temperature reaches the maximum you desire. If during testing you find the fan is not reaching 100% soon enough back the pot off in the anticlockwise direction to shift the set point down.

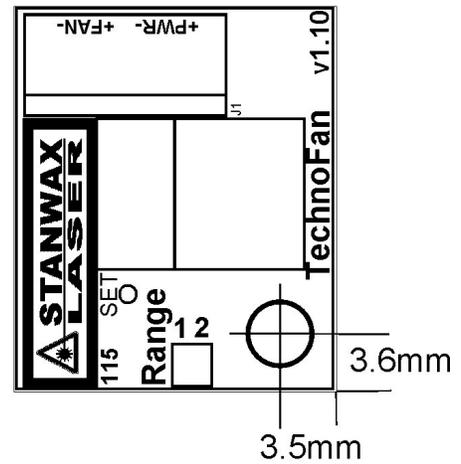
Note.

All the temperature values listed are approximate, TechnoFan is not designed or sold to be a device of high accuracy as there is no need in this application. A slight variation in the settings will correspond to fluctuations in supply voltage.

If you require TechnoFan to operate in a different temperature band please contact us as we can make special versions with alternative temperature ranges.

Temperature set up table.

Temperature (°C) 100% duty cycle		Voltage at SET point (V)
20		4.30
25		4.68
30		5.06
35		5.45
40		5.67
45		6.08
50		3.35
55		6.70
60		6.99
65		7.20
70		7.44



TechnoFan mounting hole drill details

Specifications

Power supply 12V or 24V DC (dependant on the version purchased)
 Supply current (excluding fan current) >10mA
 Size 20mm x 24mm
 Height including connector 25mm
 Max output Current 750mA
 PWM frequency 260hz ±10%
 Duty cycle 0-100% proportional
 Temperature range 10-70 °C