

Two Channel Voltage Regulator TCVR -2

A unique and multi-purpose voltage regulator module for builders who desire two independent channels to control their incandescent or LED interior lighting and value quality, performance and price.

The system is designed using high quality MIL style miniature controls and a unique chassis mounted two channel regulator that avoids the overheating drawbacks of similar units using inadequate heat sinks. Regulator style dimmers can generate very high temperatures when operated in the dim position at their full rated capacity. Small heat sinks temperatures may raise as high as 270 degrees F. and cause the regulator to shutdown. Mounting the regulator directly to the chassis provides a vast area to disperse this heat and avoid problems such as hot heat-sinks, un-commanded dimming or lighting flash.

The typical regulators that are used in lamp dimming systems have several attributes which make them desirable for this application. The LM317 for example, has internal current limiting, thermal overload protection and can supply 1.5 Amps of current. It also has some characteristics which you need to be aware of:

- 1) With larger current use, a large heat sink is required to dissipate the heat generated in the regulator chip when the control is in the dim position..
- 2) The mounting tab on the chip is internally connected to the output terminal. Care must be taken when mounting to avoid shorts.

Our regulator chips have the same desirable features without the disadvantages and by using the chassis as the heat sink, the module can be made much smaller and more efficient.



Two independent channels

Miniature controls MIL-R-94

Knobs have a raised white pointer, brass insert and setscrew.

Module size is only 1 1/4" by 2 1/2" long.

Simple three hole mounting.

Each channel can handle 1.5 Amps.

Light weight and easy to wire.

Convenient DB connector.

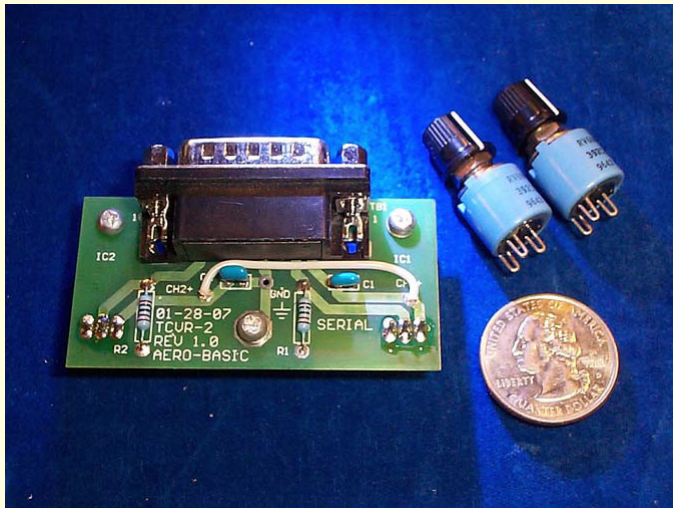
Multiple outputs.

Master / Slave modes

Power can be split and each channel powered by its own power source.

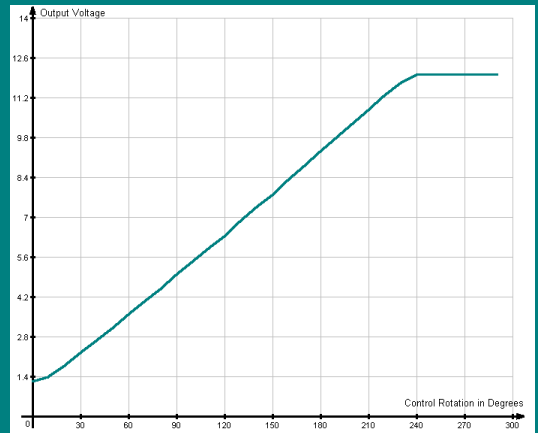
Top quality components.

Basic Components of the TCVR System



Shown with a quarter for size comparison.

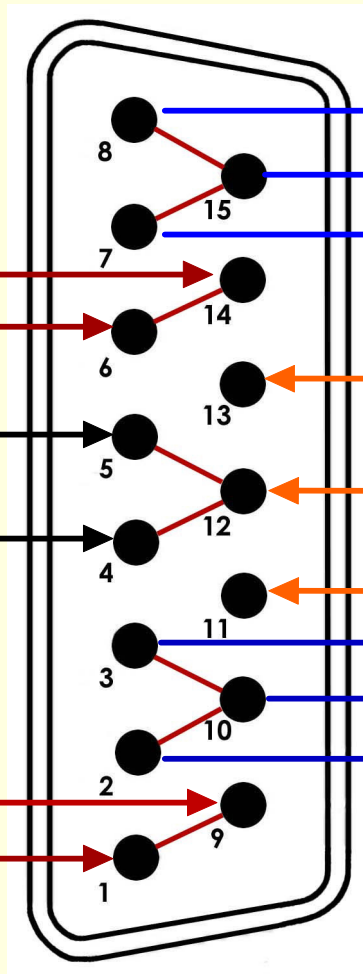
Actual plot of the smooth linear output of the TCVR -2.



CHANNEL 2
COMMON
POWER IN
(SEE NOTE A)

COMMON
GROUNDS
(SEE NOTE B)

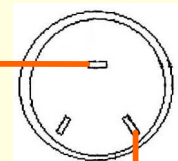
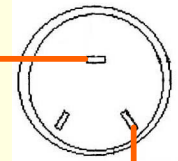
CHANNEL 1
COMMON
POWER IN
(SEE NOTE A)



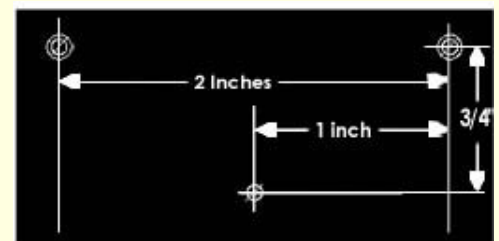
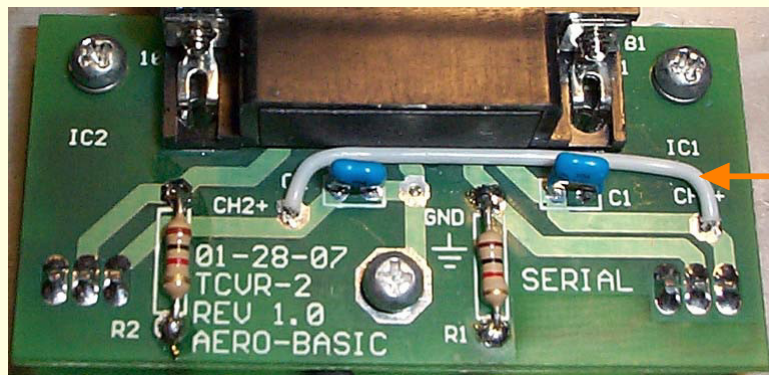
CHANNEL 2
COMMON
OUTPUTS

CHANNEL 1
COMMON
OUTPUTS

REAR VIEW OF
CHANNEL 2
CONTROL POT



REAR VIEW OF
CHANNEL 1
CONTROL POT



Mounting Hole Dimensions
Drill 3 holes using 1/8" bit and chamfer to provide a smooth flat mounting surface.
IMPORTANT NOTE
Mount module on a unpainted metal surface

NOTE A
Power for channel 1 input pins 1 and 9 are wired together on the board
Power for channel 2 input pins 6 and 14 are wired together on the board

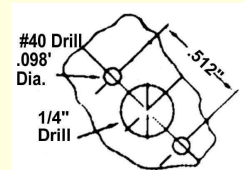
Both channel 1 and channel 2 input power are jumpered together with a white wire on the board. To independently power channel 1 and 2, remove the on-board jumper.

With the on board jumper installed, power may be supplied to the dimmer using either pin 1,9,6 or 14.

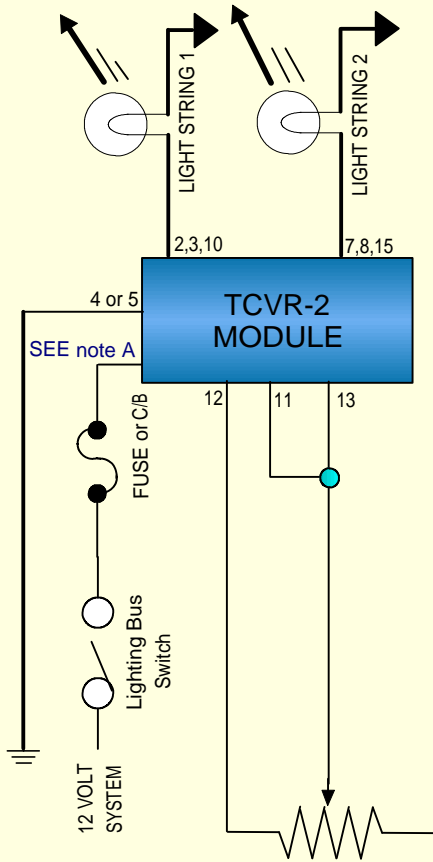
With the jumper removed, channel 1 can be powered by pin 1 or 9 and channel 2 by pin 6 or 14.

NOTE B
Ground Pins 4, 5, 12 and the rear mounting post on the board are electrically connected together on the board.

Control Panel Mount Detail



Title:	
TCVR-2	
TVCR-2 DA-15 Connector Pin out	
Date: 9-7-07	Sheet: 1 of 1
Revision: B	



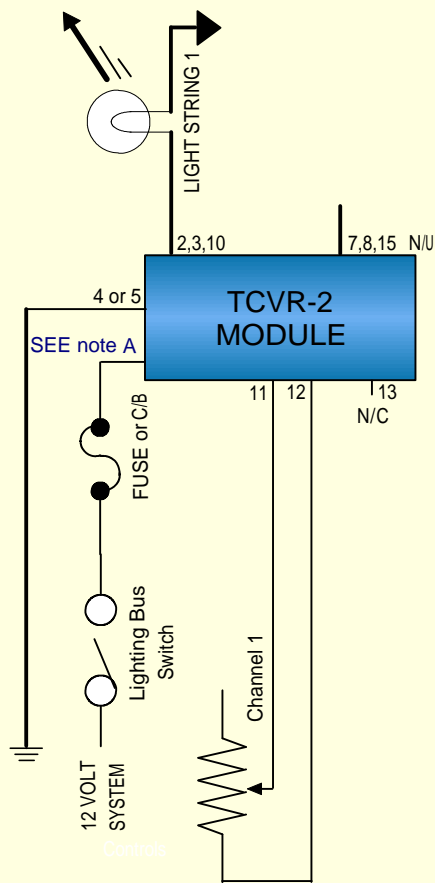
Single control for both channels
(Slave Mode Operation)

Special Note:

Remove one of the two resistors from the board to make it the slave channel.

NOTE A

See the pin out diagram for power input pins. Select the fuse value for 125% (normal current x 1.25) over the normal circuit load.



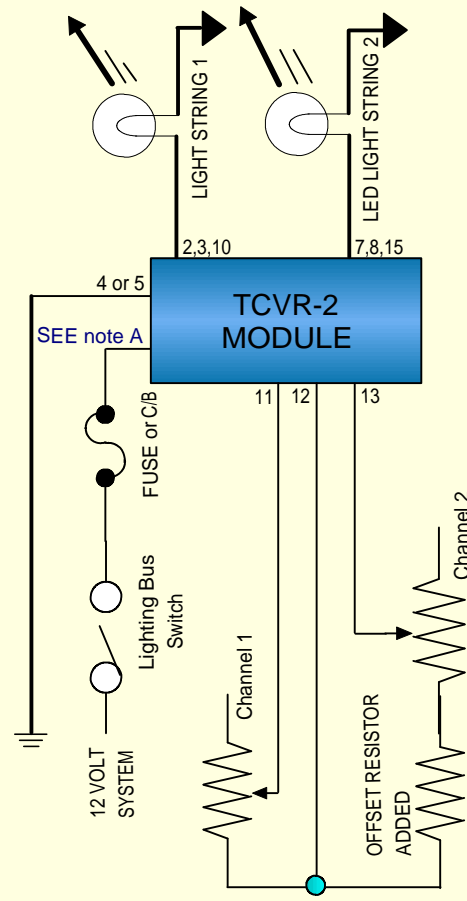
Controls

Single Channel Operation

If single channel operation is desired, simply remove the white wire jumper from the circuit board and connect power only to the channel desired.

This will leave the other channel (In this case, channel 2) un-powered.

The unused channel may be connected later by using the pins on the connector to jumper the input power.



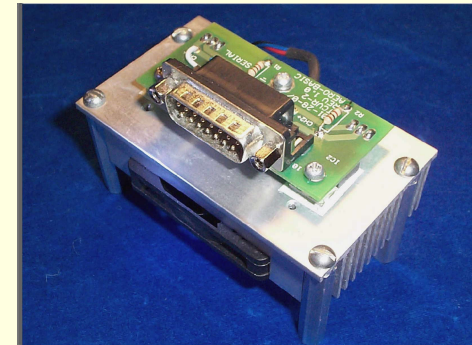
Controls
Controls

Offsetting channel 2 by adding a resistor in series with the control will cause the voltage at the off (or dim) position to be raised higher to give a more balanced lighting effect. Very effective when using LED strip lighting.

Typical resistor values for the STEIN AIR LED modules

No. of LEDs	Resistor value
45	470 ohms
32	560 ohms
21	680 ohms
12	820 ohms

OPTIONAL HEAT SINK



The TCVR-2 dimmer unit is shown here mounted to its custom heat sink for installation in composite body vehicles.

The heat sink is approximately 3 5/16 by 2 inches and has a quiet brushless fan which is automatically powered to keep the dimmer cool even under maximum loads.

The heat sink may also be used with up to two of the TCVR-1 modules.

As an alternative, the module may be mounted to a flat unpainted metal plate. You will need to verify the size is adequate by monitoring its temperature after running it under full load for about 5 minutes with the controls adjusted for a dim setting.