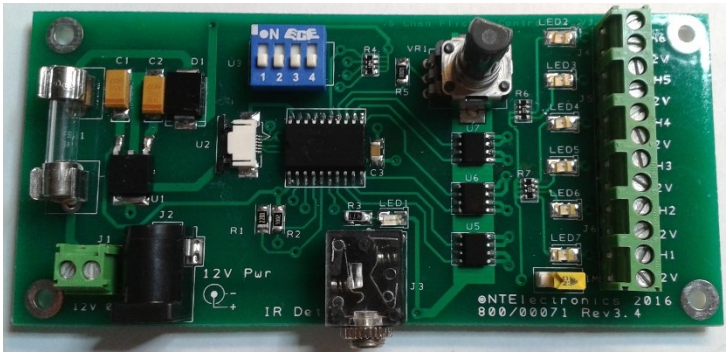
6 Channel Lighting Flicker Board

Introduction



The six-channel flicker unit can control up to 36off 60 milliamp lights with up to 6 lights per channel. Please refer to the exact capacity ratings further down this document.

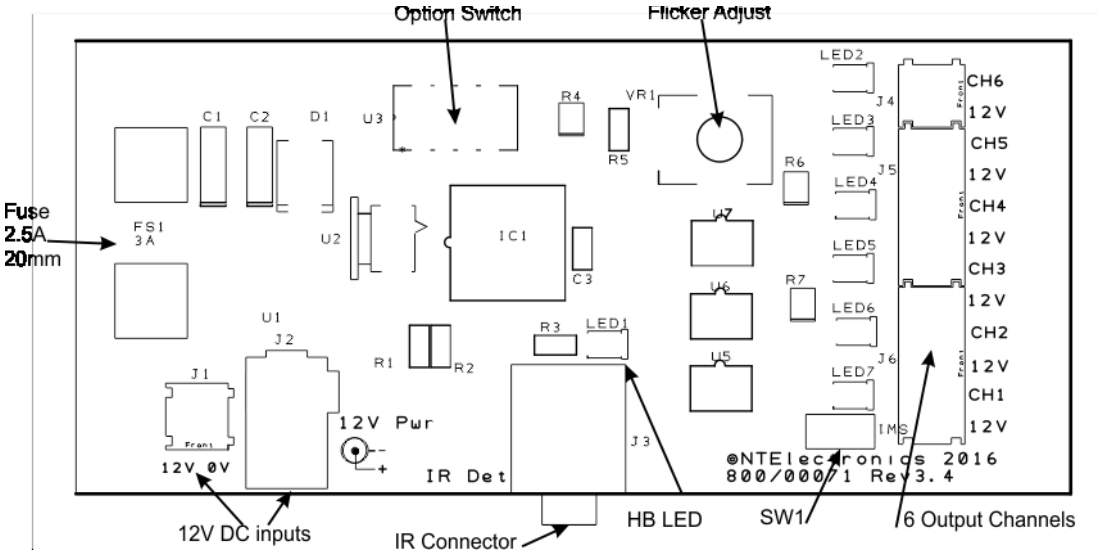
The flicker effect on each channel is randomly controlled so that no two channels flicker at the time. This provides realistic flickering to enhance your model's appearance.

The speed of flickering for all channels can be changed using the on-board adjuster. Additionally the rate for channels 1-3 and 4-6 can be set differently so you can mix effects for candle lights and fires for example.

For Candle effect lights you may want to set the flicker quite fast, while for fires you may need a slower type of flicker. The flicker rate is up to you and what makes your model look best.

Board Layout

Familiarise yourself with the board in the picture board picture below.



Option Switch – this is a four position switch used to select various options refer to the Option Switch section

Flicker adjuster – rotary potentiometer turning clockwise will increase the flicker rates on all channels, but only when one Option Switch is set to ON.

Output Channels – 6 output channels marked 12V CH1 to 12V CH6. Each light needs two wires the 12V supply and the switched wire.

SW1 – this is used to turn off all the channel indicator LED's, so the board stays dark when in use, the channels will still be active.

HB LED – This is the Heart Beat LED and should be flashing slowly when the board is first powered up to indicate that it is working correctly. After approx. 30 seconds it will stop flashing but the board will continue to work as long as the 12V DC power is on.

IR Receiver. Connection – this is where an optional Infra-Red receiver may be connected to allow the board to be remotely controlled. This is an upgrade option that can be purchased please contact us for details.

12V DC Power In – there are two connections and either may be used to provide the 12V DC power to the board. The two way rising clamp connector or alternatively a standard 2.5mm socket with a centre positive. You only need to connect either one of these. The second unused connection could be used to send power to another board but this will not go through the on-board fuse.

Fuse – the on board fuse is rated at 2.5 amps and is 20mm long. Before replacing the fuse turn off the power. Always replace the fuse with the same type and rating. **Increasing the fuse size could be hazardous please don't short circuit the fuse holder, or change the fuse for one with a higher rating.**

Connecting your lights

Tools required. Small screwdriver that fits the cage clamp connector terminals and a small pair of wire cutters or scissors.

Each light bulb has two wires – one is used to supply 12V to the bulb whilst the second is switched on, or off by the boards channel driver. The 12V supply and channel terminals are marked on the board. Each channel therefore needs two wired connections.

The channel connectors are called "rising clamp" connectors. They are specially designed to grip the small wires that are used in most models.

Examine the picture which shows two connectors, one not ready for a wire, and the second ready to accept a wire.

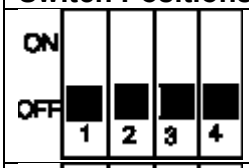
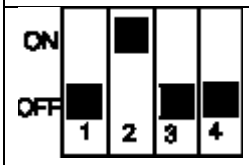
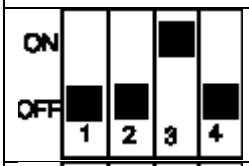
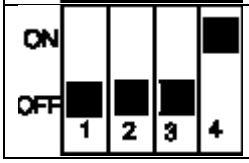
Before attempting to insert your wire/s into a cage connector please make sure that the screw has been turned anti-clockwise until the clamp is at the bottom of the connector.

Remove about ½" insulation from the end of the wires and then twist the individual wires so there are no loose strands. Insert each of the wires into the connector, (12V & switched wire), and then use your screwdriver to turn the clamp screw clockwise until the wire/s are firmly clamped. It's best to give a small tug on the wires to make sure they have been firmly clamped. Check the wires as we don't want any loose wires or stray ends shorting the channel.

If you want to wire more than one light into a channel the lights should be wired in parallel.

Option Switch

The option switch has four slide switches and are used to change various settings of your lights. The table below shows the combinations that can be used.

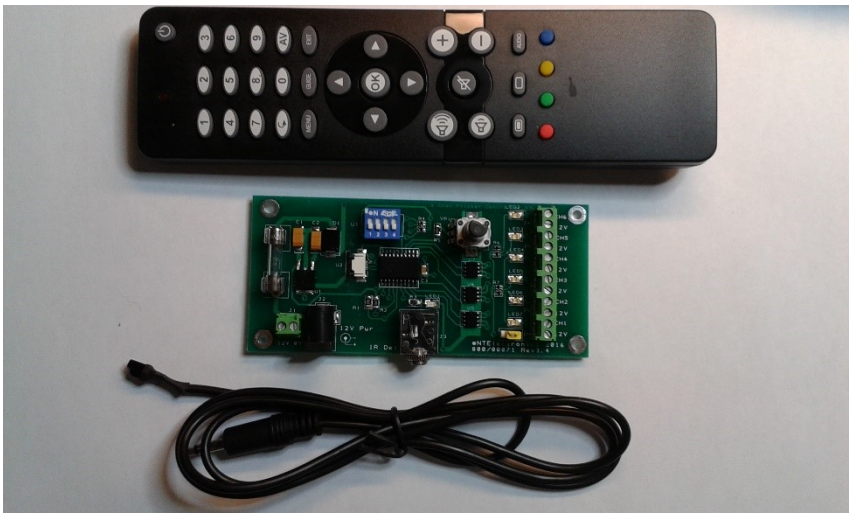
Switch Positions	Operation
	All switches are OFF. Channels 1-3 and 4-6 have their flicker rate set to any previously stored values. The rates for 1-3 and 4-6 may be set independently by using the switch positions below.
	Switch 1 is ON all others are OFF. Channels 1-3 will be on, channels 4-6 are off. The flicker rate for channels 1-3 can be set using the rotary potentiometer. After setting the flicker rate returning SW1 to off will store the rate for channels 1-3 and all channels will turn back on.
	Switch 2 is ON all others are OFF. Channels 4-6 are on, channels 1-3 are off. The flicker rate for channels 4-6 can be set using the rotary potentiometer. After setting the flicker rate returning SW2 to off will store the rate for channels 4-6 and all channels will turn back on.
	In this position all flicker channels are controlled by the rotary potentiometer. Nothing is stored so the adjuster always controls the flicker for all channels. Switching this back to off will revert channels to the previously stored values.
	All channels will be on with no flicker effect. If the IR remote control option has been purchased the remote handset may be used to switch individual channels on and off.

After adjustments have been made all the switches can be returned to the off position. The flicker rates for 1-3 and 4-6 may be different. If you want the same flicker rate on all channels leave SW3 on and control the rate for all channels using just the rotary potentiometer.

The on-board processor safely stores your set values even while the power is off.

Infra-Red Remote Control (IR)

The IR connector detector is used to connect the IR receiver, (shown above). Before connecting the IR receiver make sure the board is switched off. The IR detector must be positioned at the front of your model in a position where it can receive the signal from the remote control handset. Just like your TV remote control if the signal from the remote cannot be seen, the control will not work. The plug on the end of the IR receiver cable is plugged into the IR connector on the board.



The IR remote control is only used to turn static lights on/off so the option switch 4 must be on for this to work. The IR is not used to control flickering effects.

Ratings

The unit must only be powered from a 12V DC power supply. The 12V DC supply must be capable of suppling a minimum of 2.5 Amps.

Each channel of the flicker unit is rated at 360 milliamperes, (mA for short) or 0.36 Amps.

Total maximum load for the board is 6 x 0.36Amps = 2.16 Amperes.

The unit should only be connected to incandescent light bulbs; usually referred to a “Grain of Wheat”, or GOW bulbs. These bulbs come in different mA ratings. Typical ratings are 30mA, 60mA and 80mA.

If you wish to drive LED type light units then a suitable resistor must be connected in series with the LED to limit the current for that LED and channel rating. Also note that LED’s are polarity sensitive so must be connected correctly or damage to the LED could result. 12V is +ve and switched is -ve.

To calculate the number of lights that can be driven on an individual channel add up the mA ratings for all bulbs on the channel. If you don’t know the mA ratings it is best to assume they are all 80mA and work with that figure. If a channel is overloaded or shorted out that channel will shut down until the fault is removed.

Rating Examples

If we have 6 off 60mA lights, this could be two 3 bulb chandeliers (i.e. 6 bulbs), or 6 single wall lights.

Channel load is 6 lights x 60mA each = 360mA the maximum allowed.

If you have 12 off 30mA bulbs this would be 12 lights x 30mA each = 360mA a maximum.

Remember this is the maximum load on each channel and as the unit has 6 channels we could drive 36 off 60mA bulbs or 72 off 30mA bulbs as long as we **don't exceed the limit on each individual channel!**

You can of course mix bulb ratings on a channel they don't all have to be the same mA as long as the total mA **doesn't exceed** 360mA. Bulbs still need to be wired in parallel though.

Temperature and Ventilation

If the unit is driving a lot of bulbs, certain components on the board, like the driver chips, can run extremely hot. In these circumstances the board must be mounted in a well-ventilated position. The board must be mounted on an insulated surface to avoid damaging the board by shorting out the back of the board.

WARNING: Be careful not to let anyone, especially children or vulnerable adults, touch the board, even after switching off, as it may be hot!

Fault finding

Always turn the power off at the wall socket before removing the board fuse or changing any wiring, or other parts.

The board contains a microcontroller, which is a small computer chip. This chip has a Red "Heart Beat" (HB), LED situated just behind the large driver chip. If the board is being correctly supplied with power Heart Beat LED will begin blinking for about 30 seconds after first switching on.

If the HB LED is not blinking when the power is first turned on, check the power supply to the board is plugged in, switched on at the wall socket and working.

If the Power supply is OK, check or replace the 2.5A board fuse. If the fuse has gone you should check for other faults before replacing the fuse. Always replace with the same rating fuse.

SW1 on the board can be set to the off position so that none of the channel LED's will be ON. This is switch is provided so that the channel LED's do not light up the back of your model. For the same reason the HB led goes out after 30 secs.

Each channel also has its own individual LED indicator on the board, to help you with fault finding. If a particular light in your model is not working first make sure that SW1 is on, checking the channel LED is lit will let you know that the channel is supplying power to that light.

If the channel LED is not lit when SW1 is on, then either that channel is not turned on (IR option), or you may have a short circuit in your wiring, or a faulty bulb. Disconnect that channel wiring, and check the channel LED is lit. If the LED is on then examine your wiring and lights for faults, replace any suspect bulbs.

If the channel LED is still not lit check that all other channel LED's are lit.

Contact Details

Ray Storey Lighting Tel: +44(0)7599 807484

Email: sales@raystoreylighting.com