

*The **BIG***

Starship Lighting Kit

By Madman Lighting Inc
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WARNING: This product contains small parts not suitable for children less than 12 years of age. **DO NOT SWALLOW! MAY CAUSE CHOKING OR INJURY!**

WARNING: Madman Lighting products are shipped in good working condition and are not to be modified or changed by the purchaser. Any change or attempt to repair, change, alter, modify or enhance Madman Lighting products in any way will void any warranty, written or implied.

ESD WARNING: Madman Lighting products contain sensitive electronic components and may be damaged by electrostatic discharge (ESD). Avoid shock, sparks, and static electricity by working on a grounded surface or by using a wrist-grounding strip.

Thank you for purchasing a Big Starship Lighting Kit from Madman Lighting. This general-purpose kit will let you quickly and easily light most large model starships that use strobe and marker lights with minimal soldering and easy to use tools. It is originally intended to light the Polar Lights Enterprise NX-01 in 1/350 scale but will also light other large models.

This kit includes many Extra LEDs to allow a creative modeler many choices in lighting a big kit. A total of 48 LEDs are included, the max you can drive with a pair of Delux-24s.

What You Get:

1 Delux-Flasher 24	60" of 0.25mm jacketed fiber optic	micro-power connectors (male and female)
1 Delux-24 constant-on circuit card	60" of 0.5mm fiber optics	DC power plugs (male and female)
Instructions on CD ROM	15 feet wire	40" heat shrink tube
Four Red LEDs, 3mm	Four Green LEDs, 3mm	One Green LEDs, 5mm
Four Bright Blue LEDs, 3mm	Nine White LEDs, 5mm	Six White LEDs, 3mm
Four Blue LEDs, 3mm	Three Red LEDs, 5mm	Nine Bright Blue LEDs, 5mm
Reprint of "Light up the Enterprise NX-01" published in Sci-Fi Fantasy Modeler on instruction CD ROM		

What you will need:

Tools: Xacto knife, Wire Wrap tool (Radio Shack), low wattage soldering iron and solder (Radio Shack), needle files, pin vise, set of drills including #80, small wire cutters, and a simple volt-ohm meter to measure voltage and continuity.

Supplies: Power supply, either an 18 volt battery pack (two 9V batteries) or an 18 volt DC wall transformer, able to supply 200mA or more. Glue, putty, paint, etc.

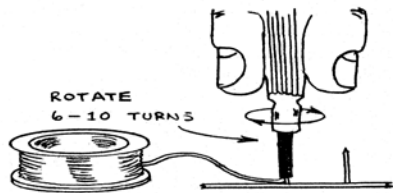
The Madman Lighting **BIG** Starship Flasher is designed to provide the user with a general-purpose lighting solution for most model starships and features four lighting “channels”. Each channel can drive up to 6 LEDs.

Delux Flasher Lighting Channels:

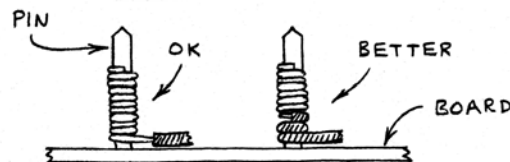
Strobe Channel	Short bright flash at about 1 flash per second.
Marker Channel	Steady blinker at about 1 blink per second, on about 30% of the time, with short “fade in – fade out” effect as it turns on and off. Meant to simulate red and green ship marker lights.

No soldering is required when using the Delux-Flasher 24. All connections are made with wire wrap wire, which is safer and easier than soldering. It is also easily changed.

Wire wrapping is easy! The wire wrap tool comes with a handy stripper you can use to remove the insulation from the wire. Remove about an inch of insulation, and then insert



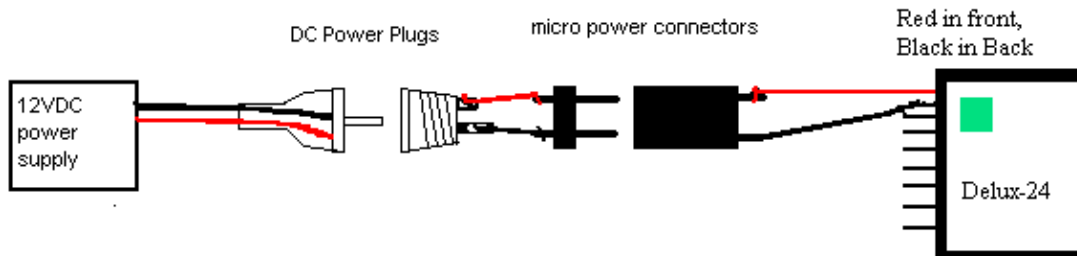
the bare end into the guide groove of the wrapping tool. Slip the tool down onto the post and rotate a few turns while letting it gently push itself upwards as the wire wraps around the post. The figure below shows some examples of finished wraps.



Power wires are provided as part of the kit. One length of twisted red and black wire is available for wiring your Delux-Flasher 24 to its LEDs and battery.

Black is for the Negative (-) connection, always the **SHORT** lead on the LEDs.
 RED is for the Positive (+) connection, always the **LONG** lead on LEDs.

Connecting Power to the Delux-Flasher 24



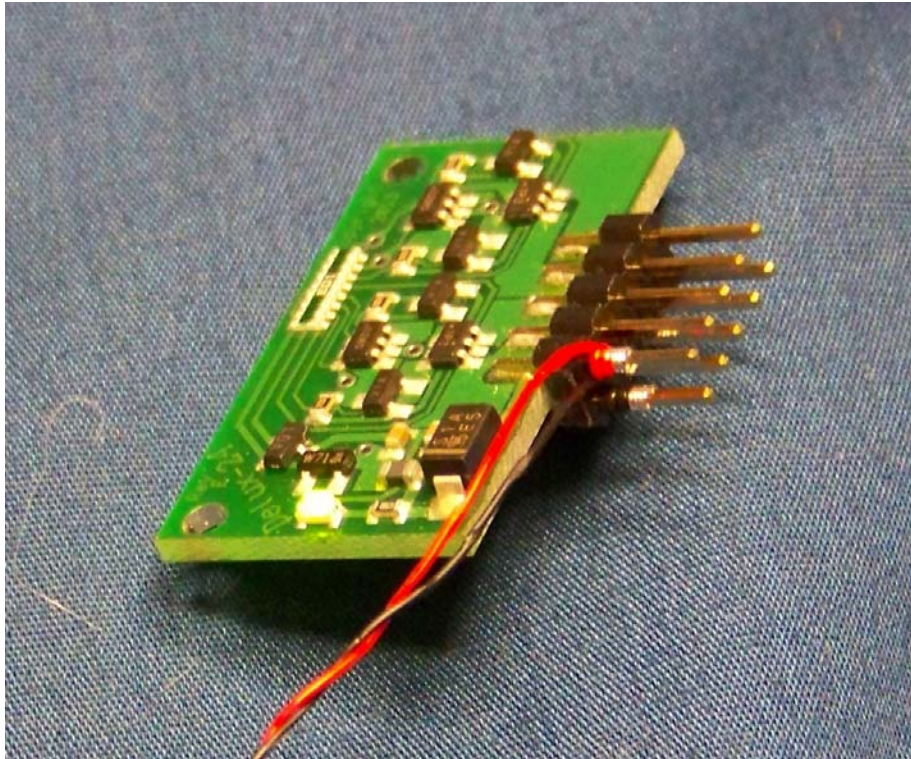
Power Sources to use with Delux-24 and Delux-Flasher-24

Source	Voltage	Min LEDs per Channel	Max LEDs per Channel
One 9V battery	9V DC	1	3
Two 9V batteries in series	18VDC	3	6
Eight AA, C or D cells	12VDC	1	4
12VDC wall transformer (good quality, regulated)	12V to 13VDC	1	4
12VDC wall transformer (cheap, unregulated)	12V to 16VDC	1	4
18VDC wall transformer (good quality, regulated)	18V to 19VDC	3	6
18VDC wall transformer (cheap, unregulated)	Not Recommended	May damage controller	

Delux-24 cards are meant to use the recommended number of LEDs for a given supply voltage. If you use a high supply (18V) with just one LED per output, the card will run hot and waste power. This will not give a longer running time.

1. First, let's connect power to the Delux-Flasher 24. The Delux-Flasher 24 has a tiny power-on LED built-in to let you know you've hooked up power right. Once we've got power right we can take the power hookup apart and mount it in the model.
2. Connect your power supply to the DC male power plug. If using a wall transformer, clip off the plug it comes with, strip the ends, plug it in, and measure the voltage using a voltmeter. You should measure +12 volts with the red meter lead on the positive wire and the black meter lead on the negative wire. Unscrew the DC male power jack's cover and solder the power supply's positive wire to the Outer terminal, negative (or ground) wire to the Center terminal. (see above diagram)
3. Take the DC female power plug and about 6" of hook-up wire. Use the strip part of the wire wrap tool and remove about 1/2 inch of insulation from the wire ends. Solder the Red wire to the Outer terminal, Black to the Center terminal.
4. Plug in your power source and measure the voltage to make sure you've hooked it up right. Outer terminal, Red wire, should be Positive. You should measure +12 volts DC with the red meter lead on the red wire, black meter lead on the black wire.
5. Temporarily wire-wrap power to the male micro-connector's short leads. (see above diagram)

6. Take about 3" of hookup wire and wrap to the terminals of the female connector. Wrap the other end to the power pins of the Delux-Flasher 24. (see Delux-Flasher 24 hookup diagram, last page of these instructions)
7. Turn it on! The tiny LED on-board the Delux-Flasher 24 should now be lit. If not, reverse the wires and check that there are no breaks in the wires. The picture below shows power wires hooked to the Delux-Flasher 24 board and the green LED on.



Power and Ground hookups, Red wire is battery positive (+) , Black is battery negative (-), ie ground. (This is the front side of the card)

Connecting LEDs to the Delux-Flasher 24.

The Delux-Flasher 24 kit is general purpose, giving the modeler the flexibility to light any model needing strobe lights, marker lights and constant-on lighting.

The suggested hookup is as follows:

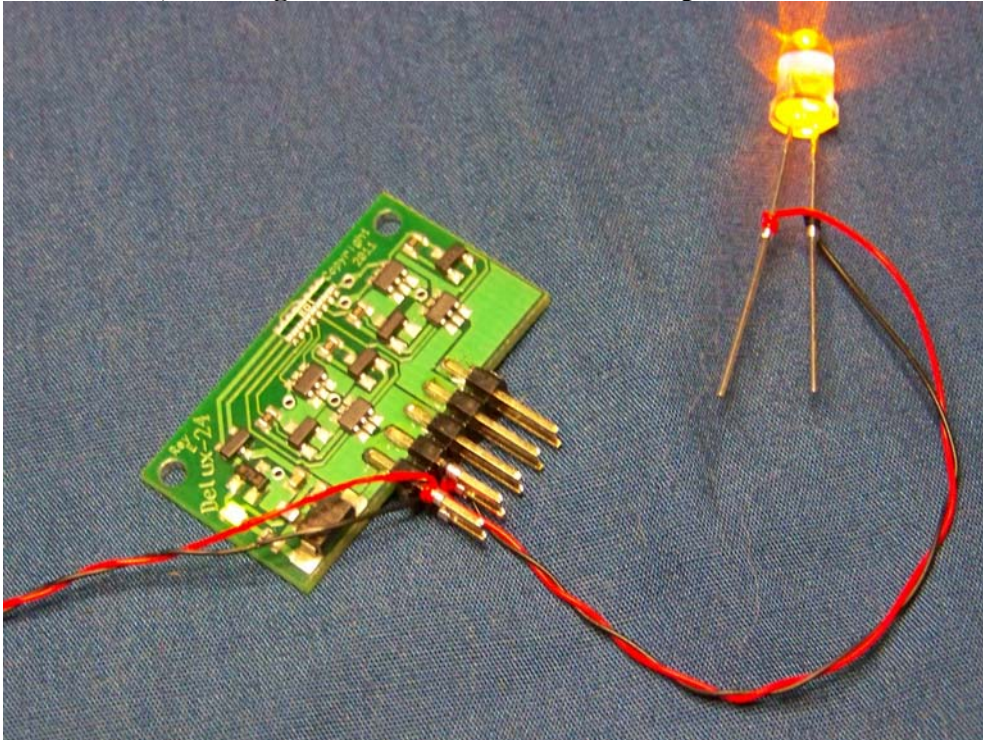
- 1 to 6 white LEDs on the Strobe channels, for white strobe beacons.
- 1 to 3 red and 1 to 3 green LEDs on the Marker Channel, for red and green navigational markers.

These are suggested connections. For different models the modeler needs to choose the configuration desired depending on the model being lit.

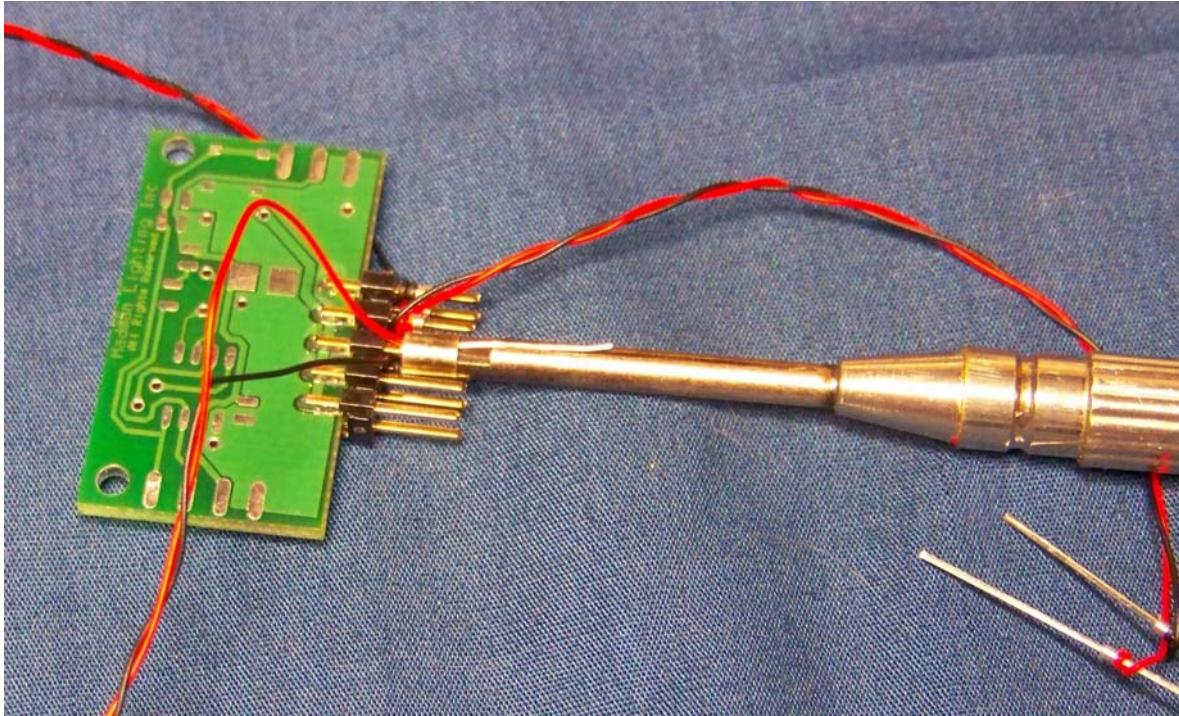
The Starship Flasher Hookup diagram on the last page shows all the channels for lighting and how to hookup LEDs to each channel.

The following pictures show how to hook up wire-wrap wire to the Delux-Flasher 24 board.

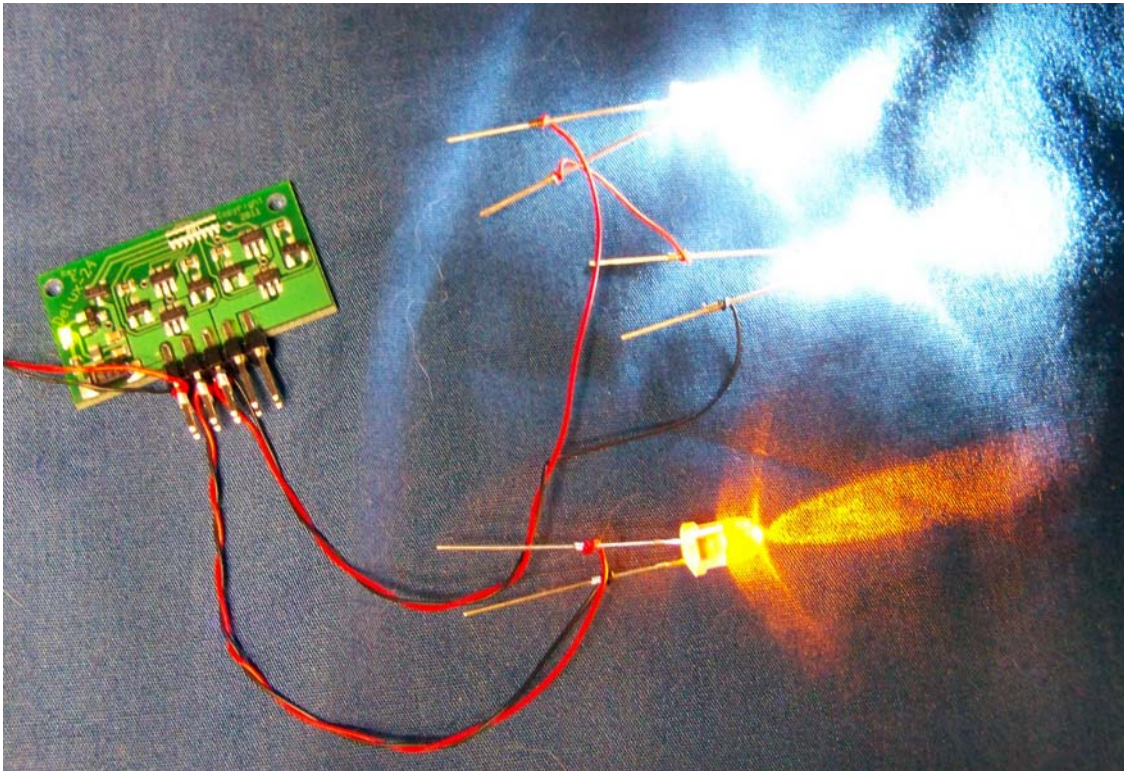
Hookup for one LED, showing the red and black wires for power and the LED.



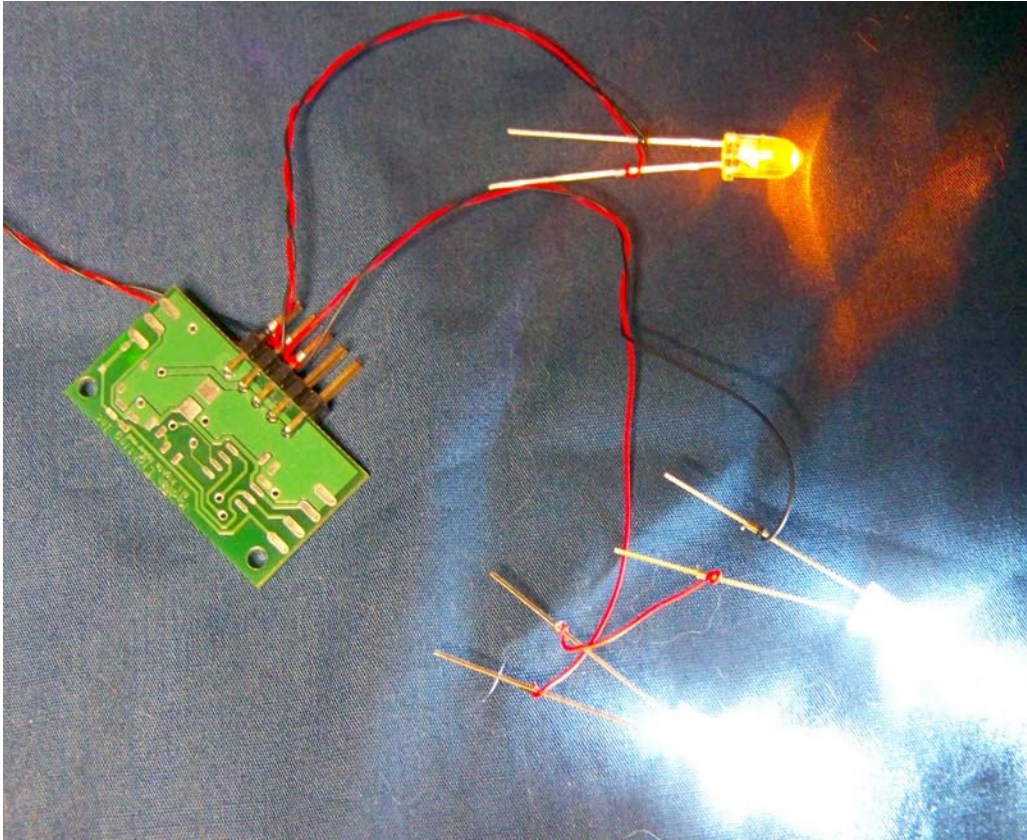
One LED hooked to the Delux-24. Notice the RED POWER wire connects to the FRONT side of the card and the RED LED wire connects to the BACK side of the card.



**Hooking up a Second LED by wrapping the wire around the posts.
Notice the RED LED wire connects to the BACK side of the card.**



Three LEDs hooked up, Lights ON! (top side)



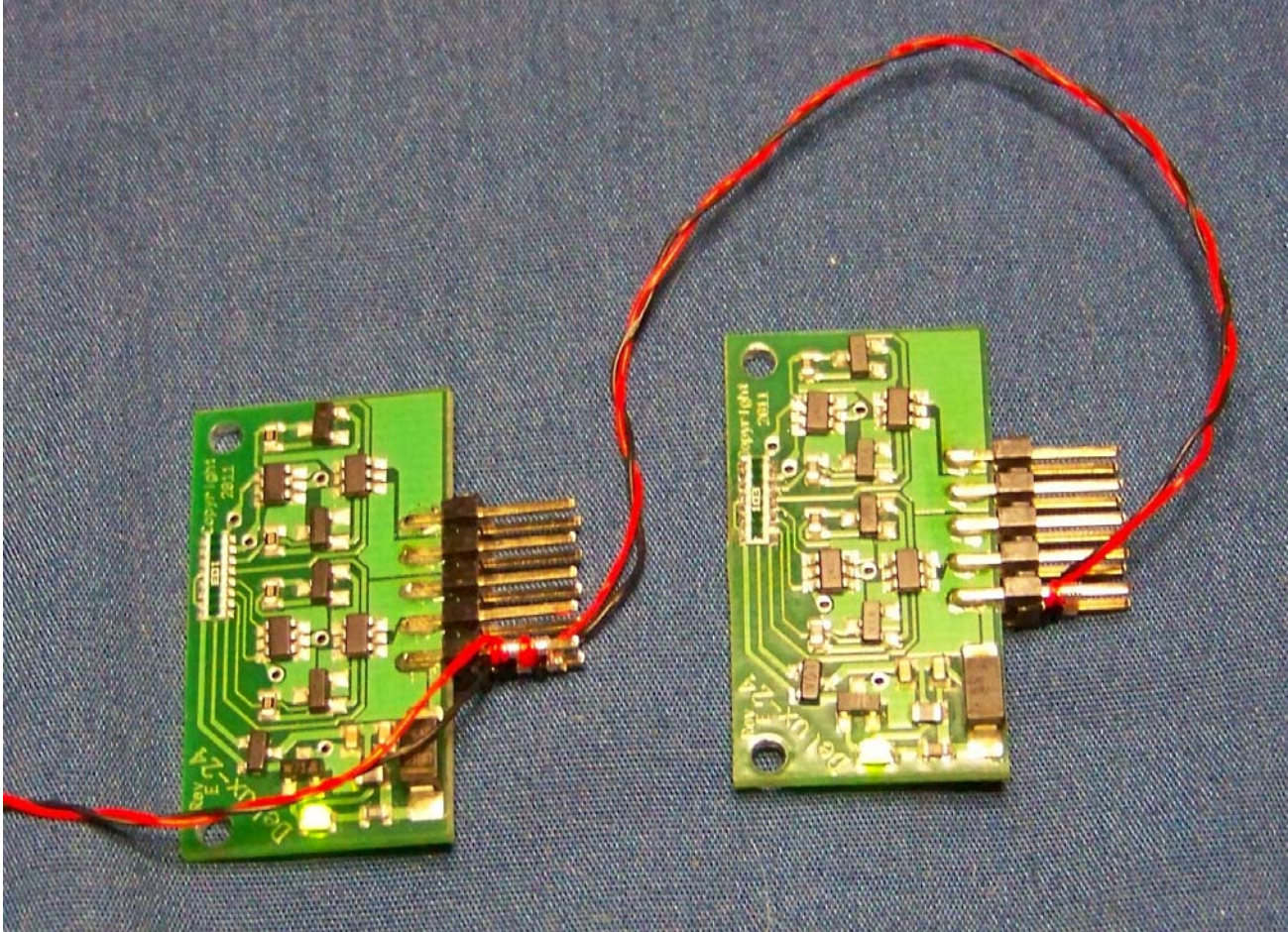
Three LEDs hooked up, Lights ON! (back side)

Connecting Power to Multiple Cards

Power comes from any 18 volt DC source that can supply at least 200 milliAmps of current. This can be a pair of 9V batteries in series or an 18 volt wall transformer. All Madman Lighting products are protected from minor surges, spikes, etc in power and are reverse hookup protected.

Connect power from your source to each card in parallel. This means that all Red power wires are hooked to the Positive lead of your source, and all the Black wires are hooked to the Negative lead of your source, sometimes called ground.

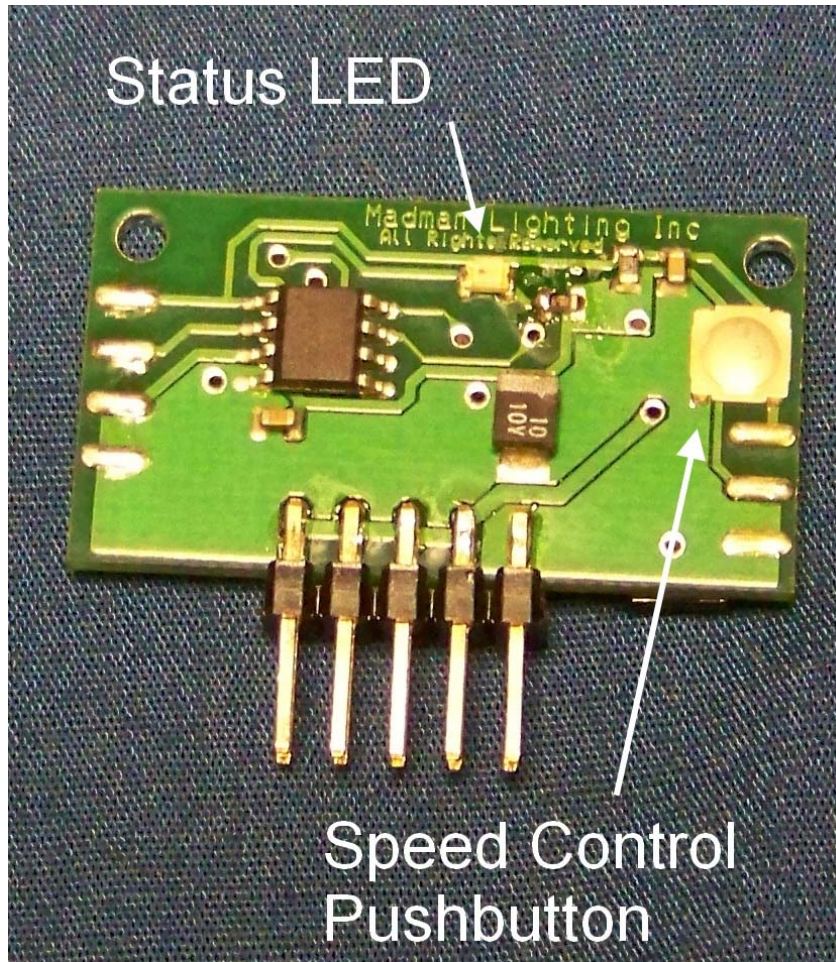
This picture shows three units powered in parallel. The large connector in the top left is the external power plug.



Connecting power to multiple cards.

Flashing Speed Control

The Delux-Flasher 24 features adjustable speed control that is easy to use and stays set even after a power loss. Just press and hold the speed control button on the back of the board



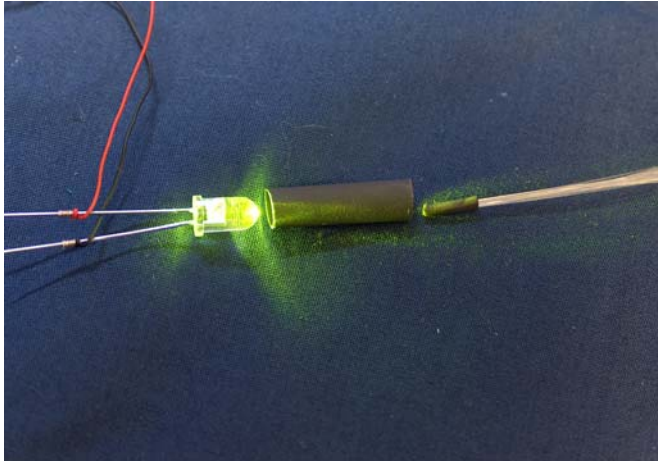
Closeup of backside of Delux-Flasher 24 board, Speed control button in upper right corner.

The speed control button works like a clock radio button: Hold it and the speed will slow more and more until it's released. Each time the button is pressed, the Status LED on the backside of the board will light. Blinking will slow more and more with each press until it suddenly is blinking at full speed again. This is a simple loop: blinking starts at full speed, goes slower, slower, slower, then full speed again as the button is pressed and held. You do not have to set this each time you turn it on, the Delux-Flasher 24 will remember your chosen speed until you change it by pressing the button again.

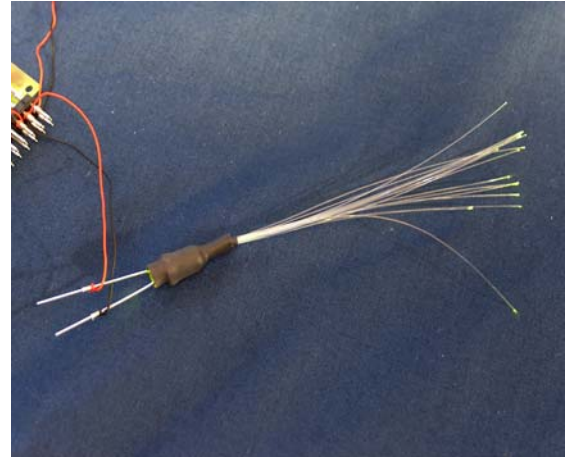
Connecting Fiber Optics to LEDs

To light windows, portholes, or other small round lights use fiber optics. Cut the fiber a little longer than what you need and remove the black plastic covering by slitting it lengthwise and remove the fibers. *Gently* warm up the ends of the fiber with a low wattage soldering iron or other modest heat source by bringing the heat CLOSE, but NOT TOUCHING the fiber ends. This will smooth them and form a lens at the end of each fiber, greatly improving light transmission.

Cut a length of heat shrink about 3/4" long for each LED you use. Stretch one end open so it fits over the LED easily. Join the LED to the fiber by butting them end to end and slipping the heat shrink over them both. (see pictures below) Heat the heat shrink with a low wattage soldering iron or hair dryer to shrink it and hold the fiber to the LED. Matches or flame are not recommended for heating.



LED, and heatshrink tube, and fibers, ready to join.



Fibers joined to LED with heatshrink tubing.

Painting with Fiber Optics and Lighting

It's easy! Any place you have a fiber, leave a little extra, maybe 1/4", sticking out, and paint the entire area, including the fiber. Once you're all done painting, cut the fiber flush with the surface. Light will shine from the flush cut fiber. Now you've got a great fiber optic lighting effect.

