

T-65 Engine and Cockpit 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 T-65 Engine and Cockpit Lighting Kit from Madman Lighting. This kit will let you quickly and easily light a most X-Wing™ kits 1/48 scale and larger, with minimal soldering and easy to use tools. This kit will NOT fit in a Fine Molds 1:72 scale X-wing.

What You Get:

1 Delux-Flasher 24 circuit card	3 ft of 0.25mm optical fiber	3 ft red and black hookup wire
4 five mm Red LEDs for Engines	3 three mm Blue LEDs for cockpit and R2 unit	Instructions on CD ROM
3 three mm Red LEDs for cockpit and R2 unit	3 three mm Green LEDs for cockpit and R2 unit	3 three mm White LEDs for landing lights, cockpit and R2
		10 inches of heat shrink tubing

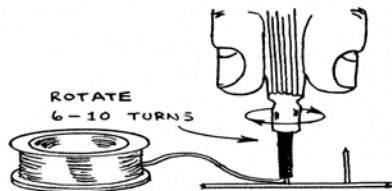
What you will need:

Tools: Xacto knife, Wire Wrap tool (Radio Shack), low wattage soldering iron and solder (Radio Shack), needle files, pin vise, set of precision drills including #75 and #80, small wire cutters, and a simple volt-ohm meter to measure voltage and continuity.

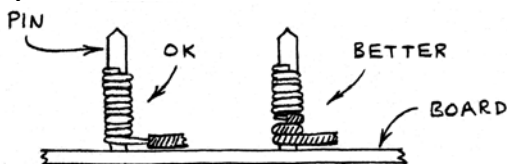
Supplies: Power supply, either an 18-volt battery pack (two 9V batteries) or an 18-volt DC wall transformer able to produce at least 100mA. Glue, putty, paint, etc.

No soldering is required when using the Delux-Flasher 24 circuit card. 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.



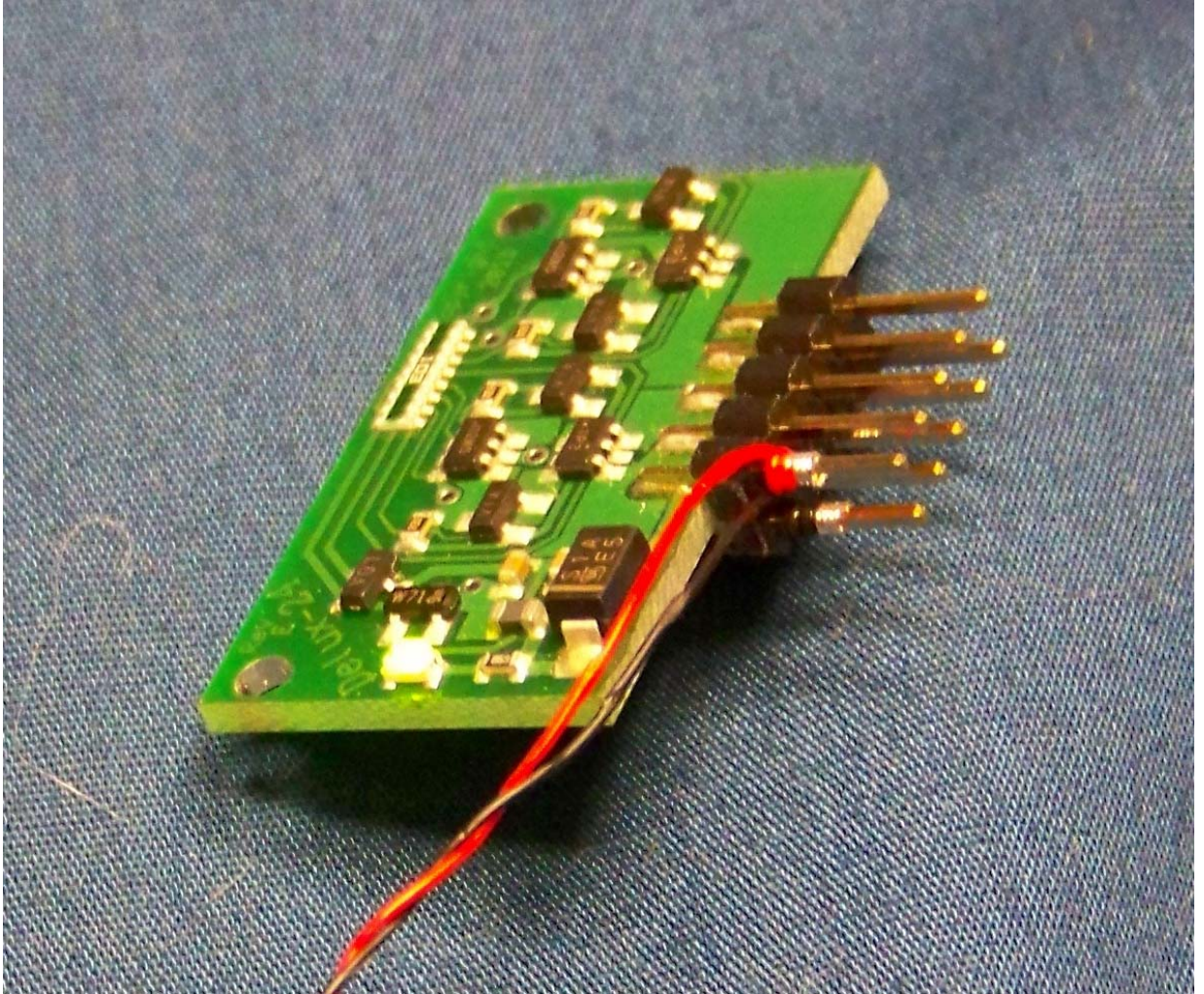
Power wires are provided as part of the kit. One length of twisted red and black wire is available for wiring your Delux Flasher to its LEDs and battery.

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-24/Flasher circuit cards



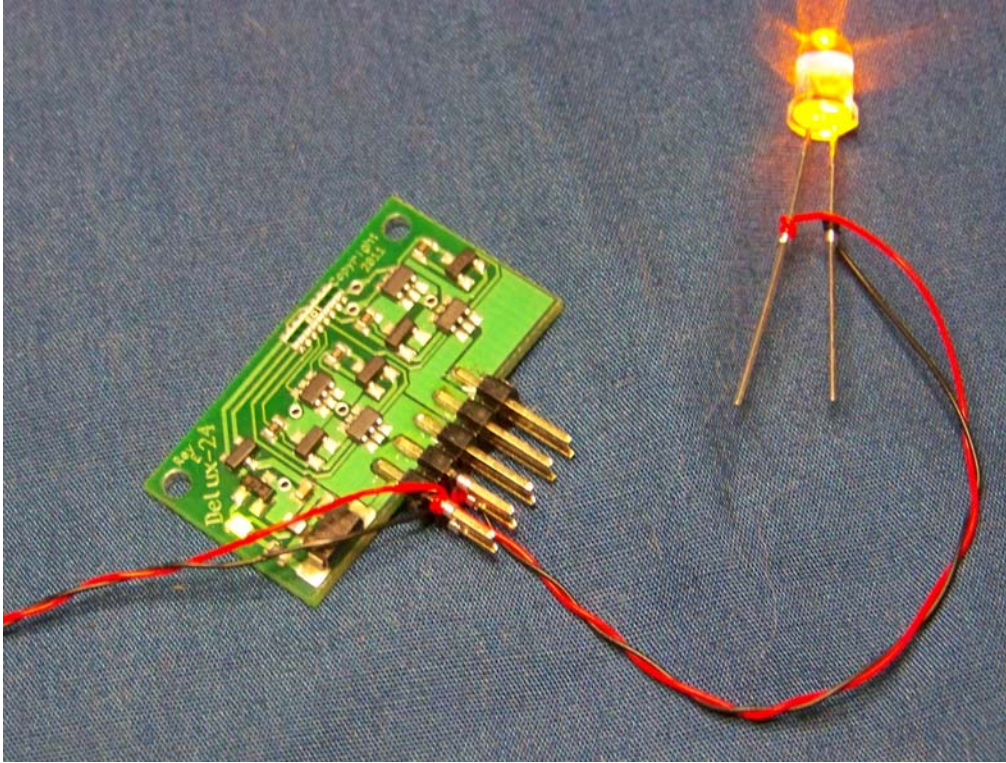
1. First, let's connect power to the Delux-Flasher 24. The Delux-Flasher 24 has a tiny power-on LED built-in to let you know you've hooked up power right. Once we've got power right we can take the power hookup apart and mount it in the model.
2. Turn it on! The tiny LED on-board the Delux-Flasher 24 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.



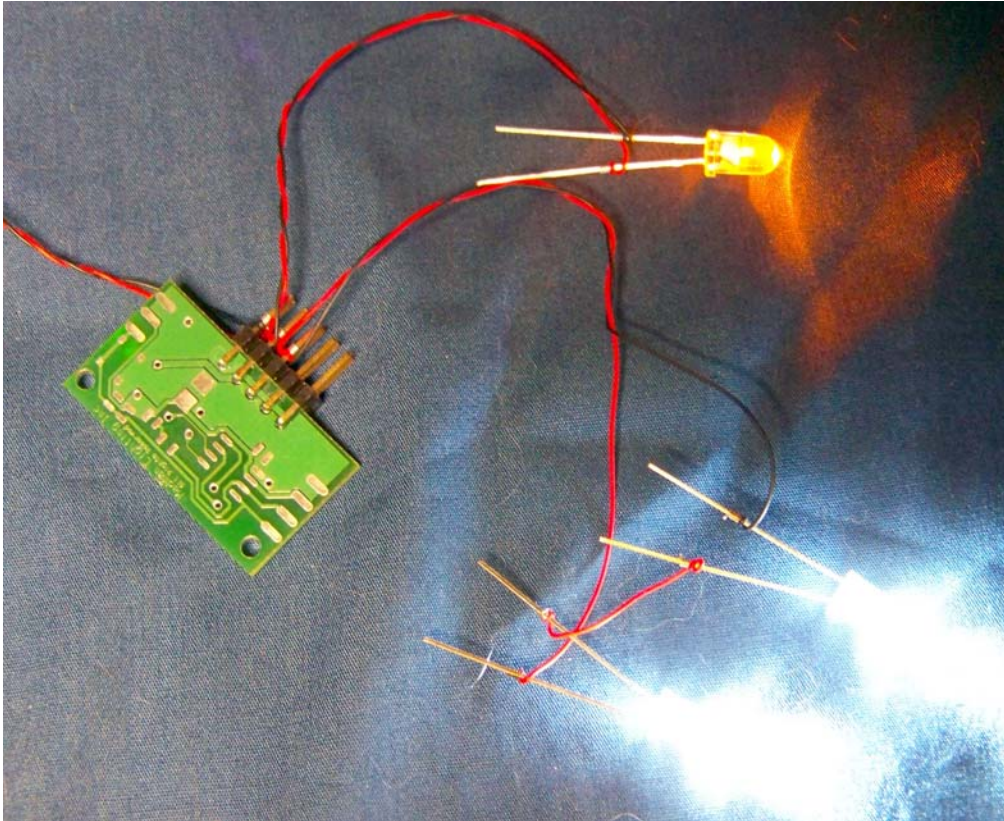
Power and Ground hookups, Red wire is battery positive (+) , Black is battery negative (-), ie ground

Connecting LEDs to the Delux-Flasher 24

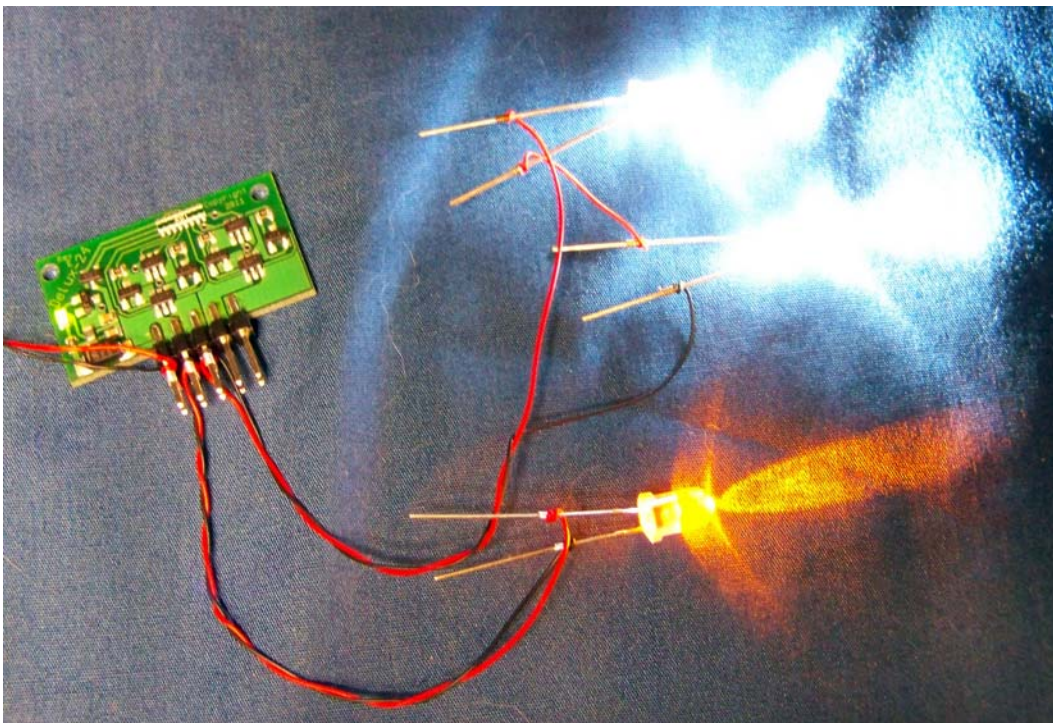
The following pictures show how to hook up wire-wrap wire to the Delux Flasher board.



Hookup for one LED, showing the red and black wires for the LEDs. Notice that the wires for the LEDs have the BLACK wire on TOP side and RED wire on BOTTOM side.



Hookup for two LEDs on the BACK side of the card. LED RED wires connect on the BACK side of the card.

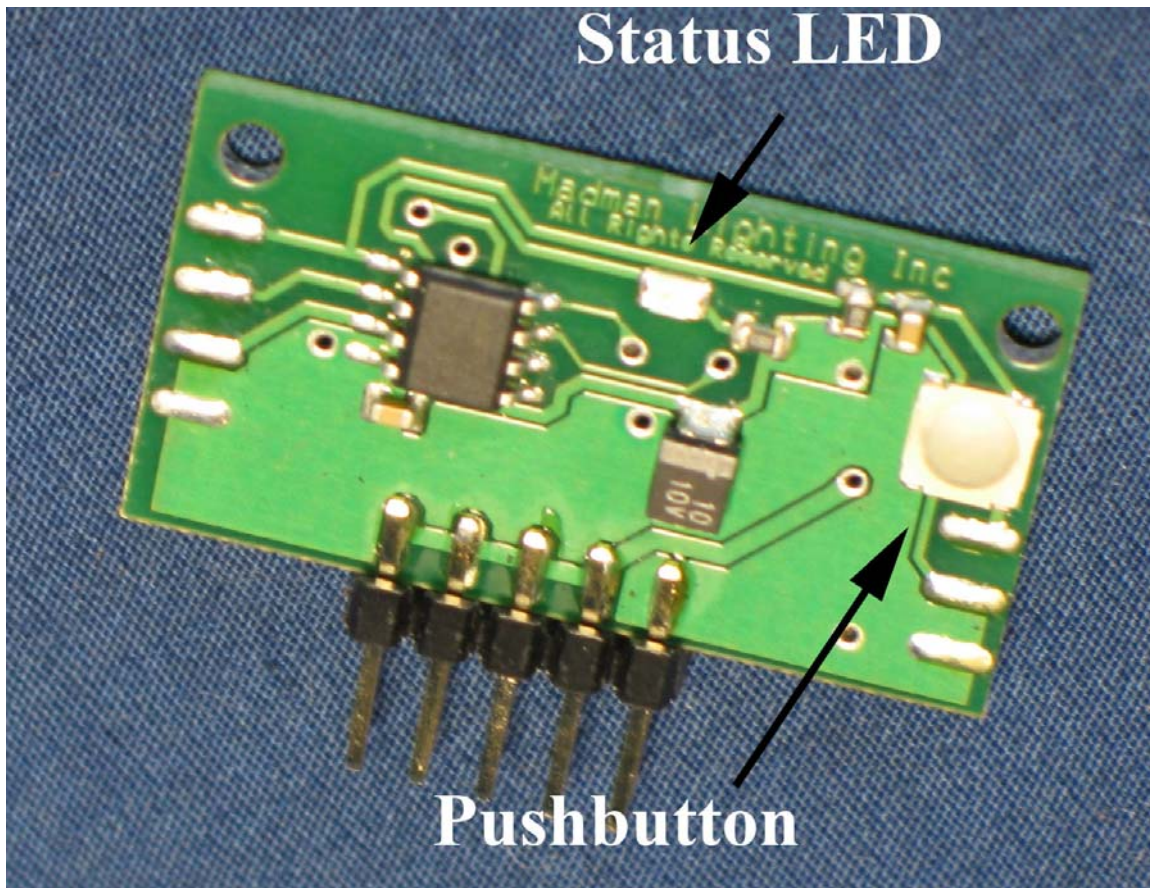


Flashing Speed Control

The Delux Flasher 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

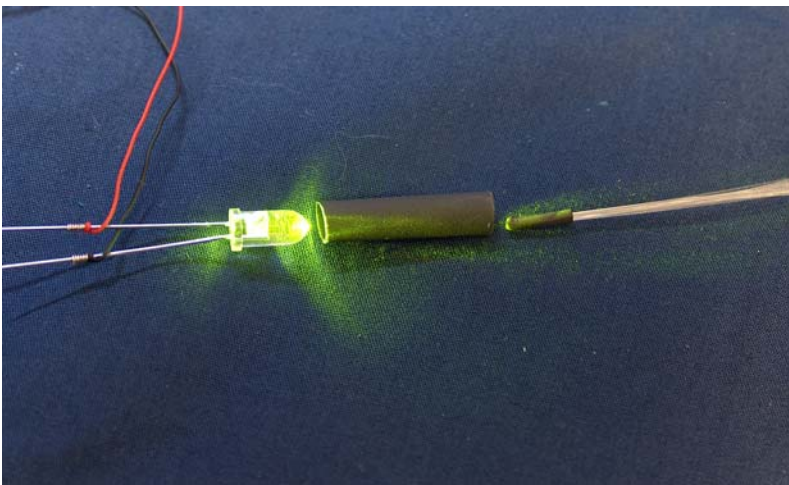
Closeup of backside of Delux Flasher board, Speed control button in upper right corner.

The speed control button works like a clock radio button: Hold it and the speed slows more and more until its released. Each time the button is pressed, the Status LED on the back side of the board will light. The lighting effect will slow more and more with each press until it suddenly is going 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 will remember your chosen speed until you change it by pressing the button again.

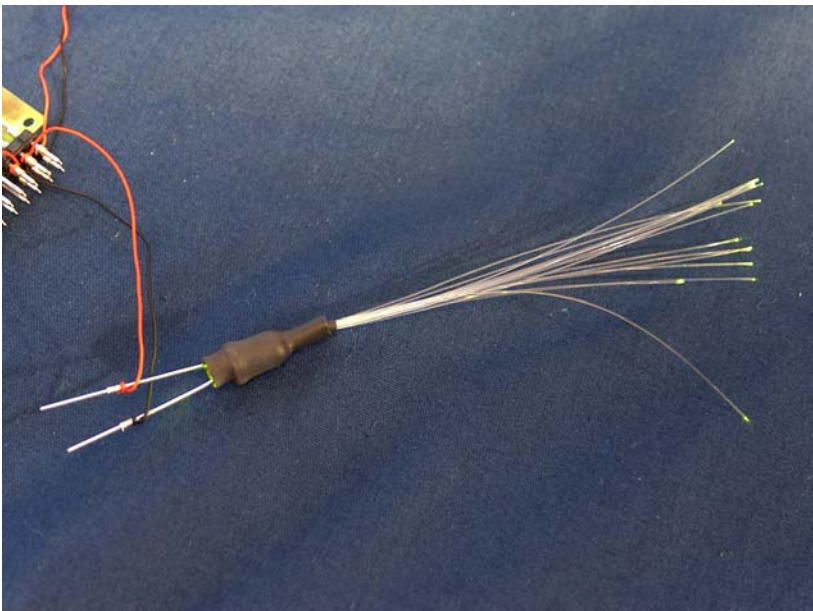


Connecting Fiber Optics to LEDs

1. 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.
2. 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 ¼", 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.

