

FiberLites by Superior Panel Technology
FiberLite Installation Instructions-LED Light Sources
Covered by patent # 5,934,781

A. Tools Needed

- Klein Tools wire stripper cat. #11045 (available from Home Depot) or similar very sharp wire stripper, used for cutting teflon tubing. See picture of this tool on page 3.
- Screwdrivers, hex keys, etc. for removal of instruments and knobs on instruments.
- X-Acto knife, single edged razor blade, or pocket-type fingernail clippers for cutting the end of the fiber-optics at the ferrule connector.
- Hot air gun for shrinking 3/8" heat shrink tubing.
- Crimping tool.
- Longer instrument mounting screws—we highly recommend the use of Superior Panel Technology's EZ Nuts).
- Dremel tool with small sanding drum.

B. FiberLite Bezel Installation

The **FiberLite** bezels are easily installed between the instruments and the panel once the installer has an understanding of the system. Before attempting the installation of the **FiberLite** bezels, lay out the parts supplied with a **FiberLite** instrument lighting kit. Compare the parts to the drawing below so that you understand how the parts go together.

Figure 1

FIBER CABLE AND BEZEL

NOTE-typically the fiber-optics from 2 or more instruments are fed through one crimp connector and connected to one LED light source.

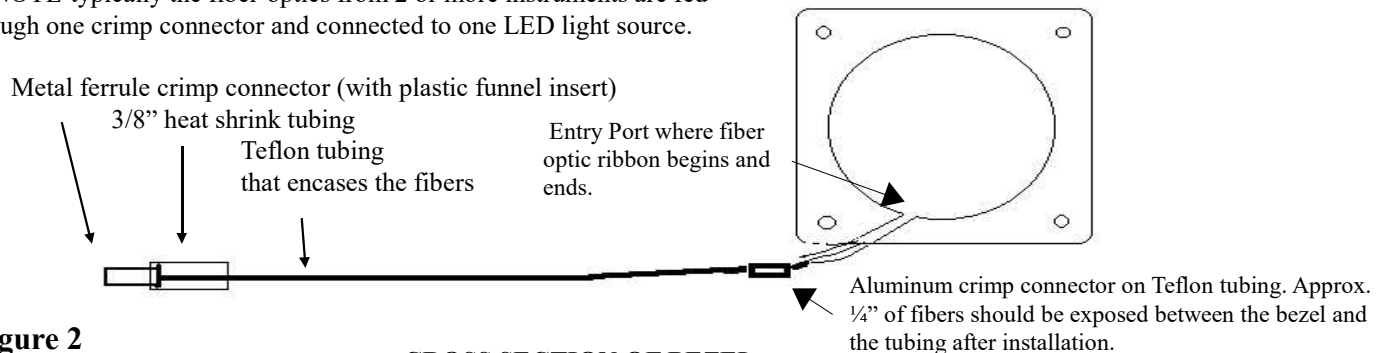
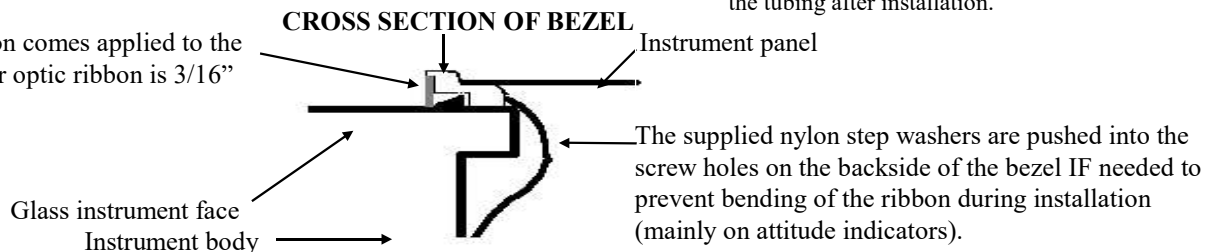


Figure 2

FiberLite ribbon comes applied to the bezel. The fiber optic ribbon is 3/16" wide.



FiberLites are designed to sandwich between the instrument and the panel as shown in Figure 2. This will recess the instrument approximately 3/16". The bezels come in three different sizes: 2-1/4", 3-1/8" and 3-1/8" with one cutout for knobs. The bezel with the cutout can be rotated to fit either a left or right knob.

Taking the appropriate bezel, confirm that it fits properly over the instrument. On some instruments the knob may rub against the bezel and it will be necessary to either modify the cut out space for the knob or to loosen the knob and pull the knob further out on the shaft so that it clears the bezel.

Installation tip: A brighter spot of light does project out of the end of the fiber optic ribbon. You will not even see this spot of light if you **place the bezel so that the entry port is at the top (12 o'clock position)**. It will automatically be at the top when the bezel with the cutout is used for a lower right knob. When used for a lower left hand cutout then the end of the ribbon will be on the right side. This is totally acceptable, however, if you want it to be at the top then you would need to modify the bezel with a Dremel tool and add a cut out in the appropriate corner.

The bezel is sandwiched between the instrument face and the backside of the panel. Normally, it is easier to just remove all the instruments and then begin to install the top row and work down. You can use the holes in the panel of the lower instruments as access holes to help align the instrument above it. **IMPORTANT!** A few instruments (primarily Attitude Indicators) have a plate that stands off the glass dial face of the instrument and may wrinkle the fiber-optic ribbon when tightening the screws. In this case, insert the step washer into the screw holes of the bezel to space out the bezel to avoid wrinkling the fiber-optic ribbon. Press

the step washers into the holes on the backside of the bezel by placing the step washer on a table and pressing the bezel down on to the washer. If more space is needed, place a flat washer over the step washer before inserting into the screw hole in bezel.

Install the instruments back in the panel. **The ribbon should be flat and smooth around the bezel. If it is being bent or crushed, this is an indication that the spacing inserts are needed.**

C. FiberLite LED Light Source Installation

The steps for connecting the bezel tails to the LED light sources once all of the bezels are mounted, are as follows:

1. Trim the fiber-optic tails and teflon tubing to the correct length.

To trim the fibers and teflon tubing to correct length you will need to decide which bezel tails will go to each LED light source and route them accordingly. There are three funnel sizes. Each has a different inside diameter. **(Use the smallest one possible.)** The number of FiberLite bezels each will accommodate is listed below:

Funnel #2 will accommodate the fibers from 1 or 2 FiberLite bezels

Funnel #3 will accommodate the fibers from 3 FiberLite bezels

Funnel #5 will accommodate the fibers from 4-5 FiberLite bezels

(Slip metal crimp connector over narrow funnel end—see pictures)

Bring all the bezel tails going to the same LED together and mark the teflon tubing so that the ends will be even. When taking the measurement, remember that it is better to be too long than too short. You cannot splice on more fibers if you cut them short. Once you have marked the teflon tubing to the desired length, use the Klein Tools wire stripper (or other very sharp wire stripper) to cut the teflon tubing. It is best to start the cut of the tubing by placing the tubing in the 10-gauge wire size notch and then twist the end of the tubing that is being cut off. Then place the tubing in the 12-gauge wire size notch and twist the end of the tubing a couple more times. While holding the wire stripper in one hand, you should be able to pull off the end of the tubing that you wish to remove. By pulling on the tubing end that is being removed rather than pulling on the wire stripper, you should not cut any of the optical fibers. (We suggest that you do a practice cut on the end of tubing that will be cut off.)

Trim the fiber-optics so that they are approximately two inches longer past the end of the teflon tubing. This will make it easier to thread the funnel/ferrule piece on for crimping. (See pictures on last page.)

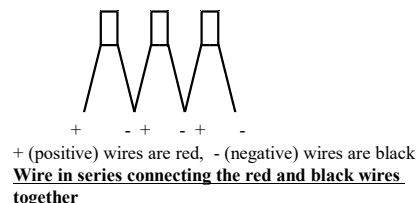
2. Thread the respective fibers through the appropriate funnel/ferrule piece and crimp and trim. (See picture on last page. You will thread into the widest end.) Place metal ferrule onto funnel, collar first. When threading fibers through, make sure all of the fibers protrude out past the smallest end of the funnel. Before and while crimping, make sure the funnel is butted up as close as possible to the teflon tubing. Crimp the aluminum ferrule near the collar. (See pictures on last page). Crimp snugly, but do not use excess force as this can damage the fibers and trim.

3. Place heat shrink tubing over connection.

Slide the heat shrink tubing onto the teflon tubing and funnel (see pictures). Shrink the tubing using a hot air gun with minimal heat needed to shrink the tubing. Excessive heat can damage the fibers.

4. Wire ALL 3 LEDs in series (IMPORTANT) using the appropriate resistor (supplied in kit). Review the wiring diagram to which the resistor is attached for how to wire in the resistor (to positive wire). Wiring in series provides more even lighting of the LEDs. Even if you do not use all 3 LEDs you must wire them in series as shown below and tape off the LED not used.

CAUTION! The FiberLite LED light sources are extremely bright. Do not look directly at the LEDs.



5. Press LED boot over crimped aluminum ferrule.

After wiring up the LEDs as shown previously, press the vinyl boot of the LED onto the crimped aluminum ferrule as far as possible. Connect the red wire from the first LED to a power input and the black wire from the third LED to a secure ground. LEDs are dimmable with the use of Superior Panel Technology's solid state or PWM dimmers. (Part # SPTPWMLEDS or SPTPWMLED) They have been specifically designed to dim LEDs. A rheostat will not adequately dim LEDs.

NOTE: The optical fibers are flammable (that is why we encase them in the teflon tubing, which is very flame resistant). Keep away from sources of heat such as a cigarette lighters and rheostats.

Tell Us What You Think

We hope that you have found the installation of the **FiberLite** lighting system neither too difficult nor too time consuming. If you have any suggestions on how we can improve the lights, the instructions, or anything, please give us a call or drop us a note so we can improve our product for the next builder/user. Our address and telephone number is listed below.

Superior Panel Technology
Telephone 562-776-9494 email sales@sptpanel.com

Use a sharp wiring stripping tool like the shown below to cut the Teflon tubing without cutting the fiber optics. Start the cut using the 10 gauge wire size and then go to the 12 gauge wire size. Twist the tubing in the cutter to make a cut and pull off the tubing to be removed.

