SloanLED

LEDStripe Installation Guide

SloanLED **(888) 747-4LED** **www.SloanLED.com**

Scope: This procedure is designed to aid in the installation of SLOANLED's LEDStripe neon replacement and PowerLED Transformer products. Skilled trades people that are familiar with general construction, electrical and sign installation techniques should do installation. Licensed electricians should provide all installation and hook-up of both the primary and secondary input/outputs of the PowerLED Transformer. All installation and hook-up should be done in accordance with all National and Local codes and permits. In no way is this document intended to construe warranty or fitness of use of the products described, nor is it intended to provide safety instruction for those installing the product.

THE FIELD ASSEMBLY OF THIS SECTIONAL SIGN IS SUBJECT TO THE ACCEPTANCE OF LOCAL INSPECTION AUTHORITY.
LES ENSEIGNES MODULAIRES MONTEES SUR PLACE PEUVENT ENTRE VERIFIEES EN TOUT TEMPS PAR LE SERVICE D'INSPECTION LOCAL

CAUTION! TURN OFF ALL INTEGRAL DISCONNECTS BEFORE SERVICING
ATTENTION: METTRES HORS TENSION TOUS LES SECTIONNEURS INTEGRES AVANT D'ENTREPRENDRE LE DEPANNAGE

1.0 Product Description

1.1 LEDStripe Product

LEDStripe product is a low voltage, long life alternative to neon for exterior, perimeter applications. LEDStripe products are unique in that they use Light Emitting Diodes (LED's) instead of neon as a light source. This allows for low voltage (24 volts) and long life (10+ years) of maintenance free operation. LEDStripe products are available in 10', 8', 6', 4', 2' and 1' tube lengths. Depending on your installation requirements and your order, your shipment of LEDStripe can include any combination of these lengths. The different lengths can be connected to each other with a weather resistant connector.

1.2 PowerLED Transformer

PowerLED are transformers that step down the voltage from 120 or 277 (depending on model ordered) to 24 volts, the operating voltage of the LEDStripe system. Each transformer has 3 individual outputs. Each output powers 30 feet of LEDStripe for a total of 90 feet per transformer. PowerLED transformers draw a maximum of 3 amps each on the primary power side and in most cases draw considerably less current.

1.3 Tools Required

1. Cordless Drill
2. Drill Bits
3. #2 Phillips driver bits
4. Wire stripper
5. Measuring Tape
6. Chalk Line
7. Marking Pens
8. Power Miter Saw (Chop saw)
9. Volt / Ammeter

1.4 Supplies Required

1.4.1 Standard Hardware and Supplies

(Not supplied unless otherwise noted. UL listing may be required on certain items)

1. Butt Splices (22 – 18 AWG, Red).
2. Glue and primer (p/n 701422 & 701424) (supplied).
3. #8 Pan Head, Phillips screws for center mounting brackets (Length and thread type depend on mounting surface, masonry inserts may be needed for brick or concrete walls).
4. #8 Pan Head, Phillips screws for mounting buttons (Length and thread type depend on mounting surface, masonry inserts may be needed for brick or concrete walls).
5. Transformer Box with UL wet location or NEMA 3R rating, min. dimensions 12" x 12" x 6", vented (Hoffman p/n A12R126, Westrim TC18SO-UL or equivalent).
6. Nylon Cable Clamps (Panduit or 3M).
7. Silicone Sealant.
8. ½" Conduit (Water tight if mounting the transformer in a box outdoors).
9. ½" Conduit connectors (Water tight if mounting transformer in a box outdoors).
10. Disconnect switch, Red Dot S303E, Leviton 1451-ICP or equivalent (See fig. 21)
11. 100 foot Length of 18 AWG, UL Listed, PLTC (Power Limited Tray Cable). For transformer leads up to 15'.
12. 100 foot Length of 14 AWG, UL Listed, PLTC (Power Limited Tray Cable). For transformer leads up to 50'.

1.4.2 LEDStripe Product Line - Available from SloanLED

Part Number	Description
701189-1	1 Foot LEDStripe
701189-2	2 Foot LEDStripe
701189-4	4 Foot LEDStripe
701189-6	6 Foot LEDStripe
701189-8	8 Foot LEDStripe
701189-10	10 Foot LEDStripe
700940	Transformer 120VAC Source
700964	Transformer 277VAC Source
701156	LEDStripe Mounting Buttons
701160-3	"Y" Connector
701385	10’ Jumper Kit
701424	End Cap Primer
701422	End Cap Glue
701341-FC	Silicone End Cap
701361	Joint Cover
701362	Outside corner joint cover
701363	Inside corner joint cover
701364	Step corner joint cover
701158-120	10’ Transformer Lead Wire

2.0 Required System Components

2.1 Mounting Buttons (fasteners)

LEDStripe product is held in place using specially designed mounting buttons and brackets with standard screws. Do not use any mounting buttons or brackets other than those provided from SloanLED. Sufficient mounting buttons to support the LEDStripe product are included with each shipment. The following list shows the number of mounting buttons shipped with each LEDStripe unit. The installer must provide one screw per mounting button (Item 4 in section 1.4.1) along with one additional screw (item 3 in section 1.4.1) per LEDStripe unit for the center-mounting bracket:

10 ft LEDStripe assembly – 6 buttons
8 ft LEDStripe assembly – 5 buttons
6 ft LEDStripe assembly – 4 buttons
4 ft LEDStripe assembly – 3 buttons
2 ft LEDStripe assembly – 2 buttons
1 ft LEDStripe assembly – 2 buttons

2.2 PowerLED Transformers

PowerLED transformers are used to provide 24 VAC power to each LEDStripe leg. There are 3 separate power outlets available on each transformer.

PowerLED Transformer in box
Figure 1

PowerLED Transformer mounted in weatherproof enclosure
(Weather proof enclosure is only required when the transformer is mounted outdoors)
Figure 2

3.0 Planning Layout

3.1 Mechanical

3.1.1 Standard product layout

LEDStripe can be mounted to metal fascia, stucco, concrete, brick or any other surface that can be fastened to with conventional fasteners. Using the architectural drawings of the building or a field survey of the building, determine where LEDStripe is to be installed.

Note: Standard LEDStripe product can only be mounted to straight surfaces (For information on curved surfaces see section 3.1.2).

Using the drawings or field survey, determine the length of each side of the building or single continuous straight run where LEDStripe will be installed. Break these lengths into sections of 30 feet or less. (30 feet is the maximum length of LEDStripe that can be run on one leg of a transformer).

Determine the correct lengths of LEDStripe product needed to populate each run of 30 feet or less. Where ever possible use 10 foot sections (701189-10). These are the most efficient to install and result in a minimum of joints. Where a 10 foot sections is too long, use one of the smaller units. (Sections available are nominal lengths of 10', 8', 6', 4', 2' and 1') See section 4.1.1 for actual lengths.

Note: These units are field cutable. To fill an area that is longer than one section size, but smaller than the next size up, choose the larger section and have the installer cut it to fit in the field. See section 4.4

Transformers should now be located to power each of this 30 foot or less LEDstripe runs. It is generally most efficient to place a transformer at a joint where it can power a 30-foot run to the left and a 30-foot run to the right. The third leg of the transformer is left unused. To use the third leg of the transformer the installer would run 14 AWG cable along the 30 feet of LEDStripe to the beginning of a third run.

3.1.2 Radius LEDStripe Sections

LEDStripe sections can be formed to fit curved sections of an installation. It can be bent to form a radial section or flat bend sections.

Examples of a radial section would be:
-A building with radius corners. LEDStripe sections can be formed to follow the building corner radius.
-A column. LEDStripe can be formed to wrap around a column in sections.

Examples of a flat bend section would be:
-A round logo on the front of a building. LEDStripe sections can be formed to circle the logo and mount flat on the wall of the building.

-A sign or feature on the wall of a building with radius corners. LEDStripe can be formed to follow the radius of the sign or feature and mount flat on the face of the building.

Bending Details:

Gentle bends such as arch ways over a door or curved building facia can be followed with straight sections of LEDStirpe if the mounting radius is 19' or larger. To install LEDStripe on a curved surface with a radius of 19' or larger, install a mounting button every 12" and slide the LEDStripe on the mounting buttons. After positioning, secure the center mounting bracket.

-All bends with a mounting surface radius smaller than 19' are custom made to order.

- Custom made LEDStripe bending is only be done by SloanLED and on special order. It can not be bent or formed in the field.

-Minimum bending radius for LEDStripe is 8" mounting surface radius.

(Call SloanLED and speak with a sales representative about details, tooling and bend charges for custom bends)

3.2 Electrical

PowerLED transformers can be mounted anywhere on or in the building at a maximum distance from the LEDStripe of 50 feet (if 14 AWG UL Listed PLTC is used between the PowerLED and the LEDStripe). A distance of 15' or less when the 18 AWG UL Listed PLTC cables provided are used. Locate the transformers such that they are central to the LEDStripe sections they are powering. When laying out the location of the transformers, the location of available junction boxes and how to run the primary to them should be taken into consideration. When mounting outdoors, additional protection is required to prevent precipitation from entering the transformer enclosure. A UL Wet Location or NEMA 3R transformer enclosure is recommended. No more than 2 transformers should be mounted in one enclosure. In all outdoor installations, primary power (120 VAC) can be routed by using standard conduit and installation techniques (in accordance with codes and accomplished by a licensed electrician). **SEE SECTION 5.0 FOR HOOK UP DETAILS.**

3.3 Environmental Considerations

When installing LEDStripe, consider that each 10 foot section will expand or contract about ½" from one extreme of temperature to the other (From -20°F to +150°F). If the product is installed in temperatures below 40°F, leave a ¼" gap between large lengths (8' or 10') to allow for expansion when the weather warms. This gap will not be visible after installation of the joint covers (P/N 701361).

If the ambient temperature around transformer exceeds 120°F and the transformer is fully loaded, nuisance tripping may occur. However once the ambient temperature drops below 120°F the transformer will return to normal operation. If extremely high temperatures are expected during regular operating hours, reduce the load on each leg to eliminate nuisance tripping.

4.0 Installing LEDStripe

4.1 Layout Locations on the Building

Using the LEDStripe layout you created or the layout SloanLED created for you, locate the mounting positions of your PowerLED transformers. Mount the transformers and notify the electrician to provide primary power to each transformer.

Note: If transformers are mounted in a location exposed to weather, they must be mounted in an appropriate, weather resistant, electrical enclosure.

The next step is to determine the location of the centerline of the LEDStripe product relative to the top or bottom of building or canopy. Snap a chalk line in the location of this centerline.

4.1.1 Mark for Fasteners

The recommended spacing for mounting buttons is 3" in from each end of the LEDStripe section and 2' on center for the length of the section. Marking a tape measure with these increments is helpful in ensuring consistency of installation (example - mark the tape measure at 3", 24", 48", 72", 96" and 118 3/8" points, which coincide with the mounting points recommended for the installation of a 10' section). Notice the last mounting button location is 118 5/8" not 10' minus 3". This is because the 10' section is actually 10' 1 3/8". (10' 1 3/8" = 121 3/8". Subtract 3" and you get 118 3/8").

LEDStripe Nominal Length	LEDStripe Actual Length
1 foot	12 7/8"
2 foot	24 7/8"
4 foot	48 7/8"
6 foot	73 3/8"
8 foot	97 3/8"
10 foot	121 3/8"

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Figure 3. Marking the mounting button location

4.2 Install Fasteners

Secure a mounting button on the center chalk line at each of the marks you just made. Use a #8 Pan head screw of the correct thread type and length for the mounting surface you are securing the product to. If the mounting surface is brick, stucco or concrete, a masonry anchor or insert should be used.

Drilling mounting button holes for an LEDStripe section
Figure 4

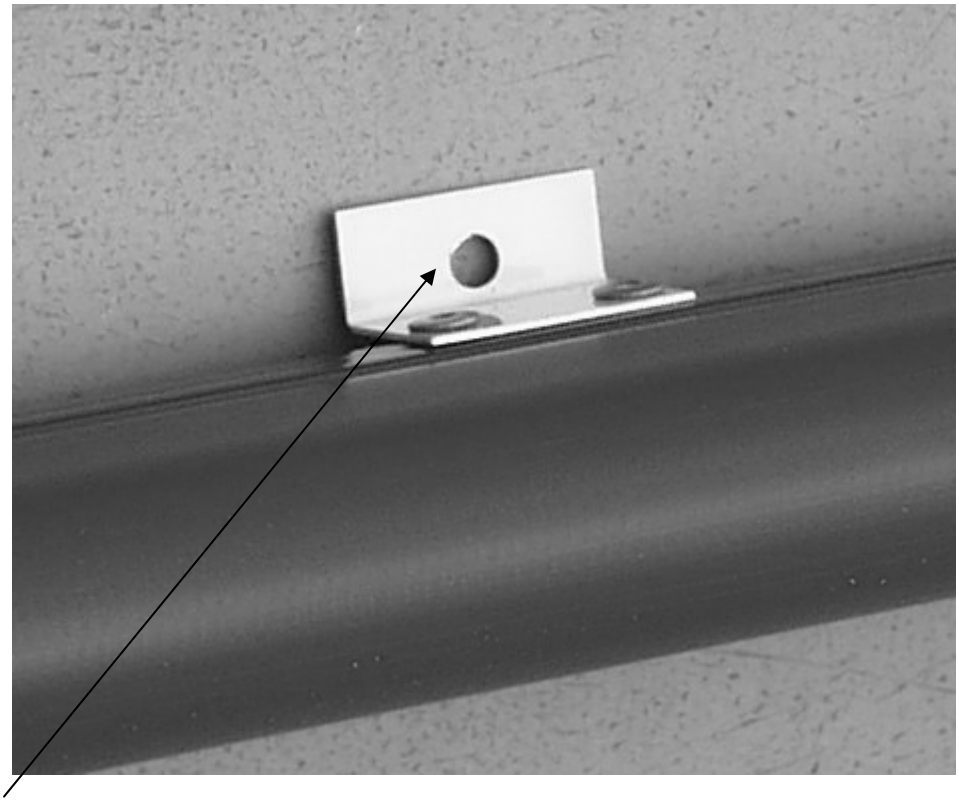
4.3 Slide or Snap LEDStripe into position

In most cases, the LEDStripe section can be slid into place on the mounting buttons. With the LEDStripe section oriented such that the large connector is located on the left side (as you are facing the building) and the bracket on top, guide the LEDStripe onto the buttons. If there is an obstacle to sliding the LEDStirpe unit onto the buttons, it can also be snapped on. Position the LEDStripe section such that the large connector is located on the left side (as you are facing the building) and the bottom lip of the LEDStripe tube-mounting track is inside the mounting button bottom groove. Then apply gentle upward pressure until the LEDStripe section “snaps” onto the buttons (as shown in Fig. 5).

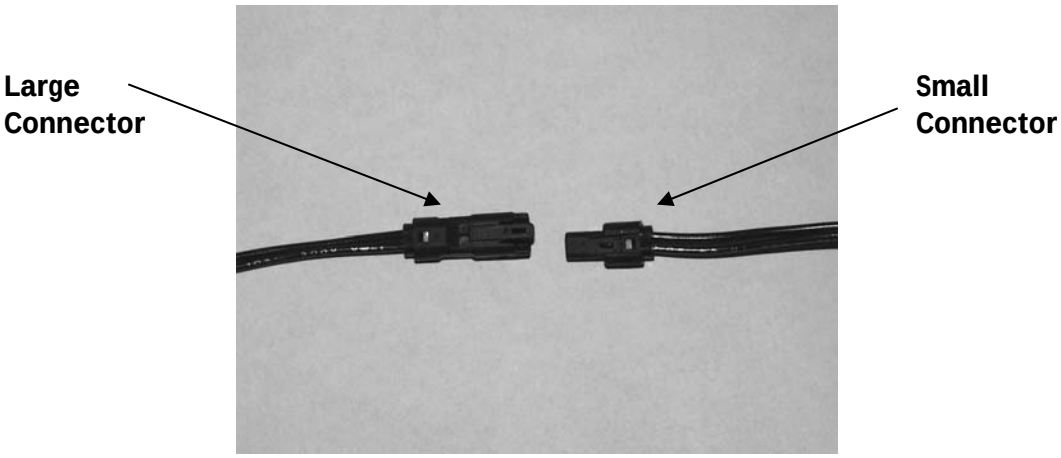
Diagram showing bottom lip of LEDStripe in bottom groove of mounting button
Figure 5

Correctly attached LEDStripe section to mounting button
Figure 6

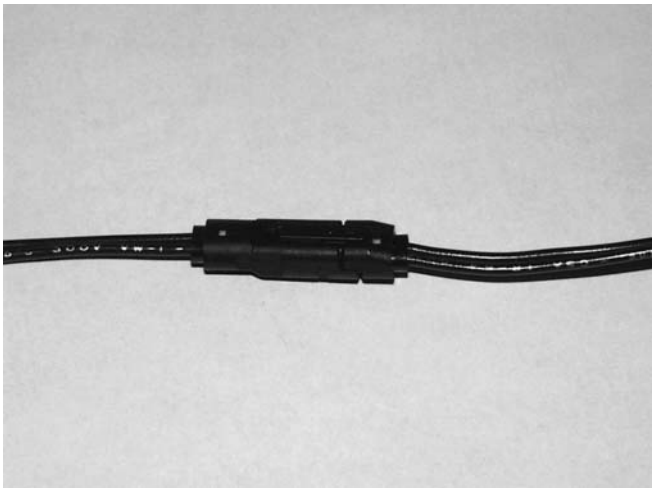
After the section is securely on the wall, slide it into its final position. When the LEDStripe section is in the correct location, secure it in place using the center mounting bracket with a #8 pan head screw of the correct thread type and length for the mounting surface you are securing the product to. If the mounting surface is brick, stucco or concrete, a masonry anchor or insert should be used. For the first section of a string, position the LEDStripe section in the correct location. For all subsequent units, slide the section up against the proceeding section after sliding or snapping it onto the buttons. Prior to sliding the section up against another section, fasten each connector assembly together and tuck the wires and connectors into the mounting button track so they are out of the way and not visible from ground level. When the electrical connection is made and the units are butted up to each other and secured in place at the center-mounting bracket, the joint cover can be installed. The joint cover is shown in figure 12. It snaps over the joint and is kept from sliding left or right by a plastic pin. The joint cover helps to hide the joint and give a continuous tube appearance to the LEDStripe installation. Corner joint covers are also available for inside corners, outside corners and step corners. The corner joint covers snap over the corner to give a finished mitered look to the corner (see Figures 19 thru 22). Follow installation layout drawings for number of sections to connect together and where the PowerLED transformer input connection will be located. Please check to make sure that no more than 30 continuous feet of LEDStripe is connected together on a single leg of the transformer.



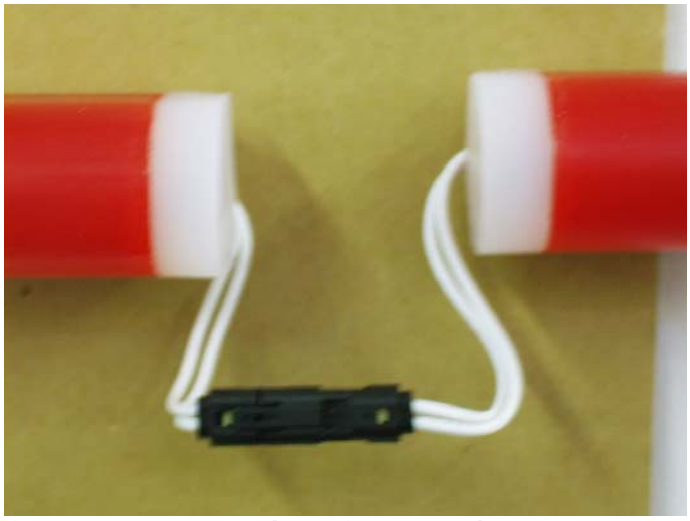
Secure section in place with a #8 pan head screw through bracket hole
Figure 7



Correct connector orientation – note that tab is aligned with locking clip
Figure 8

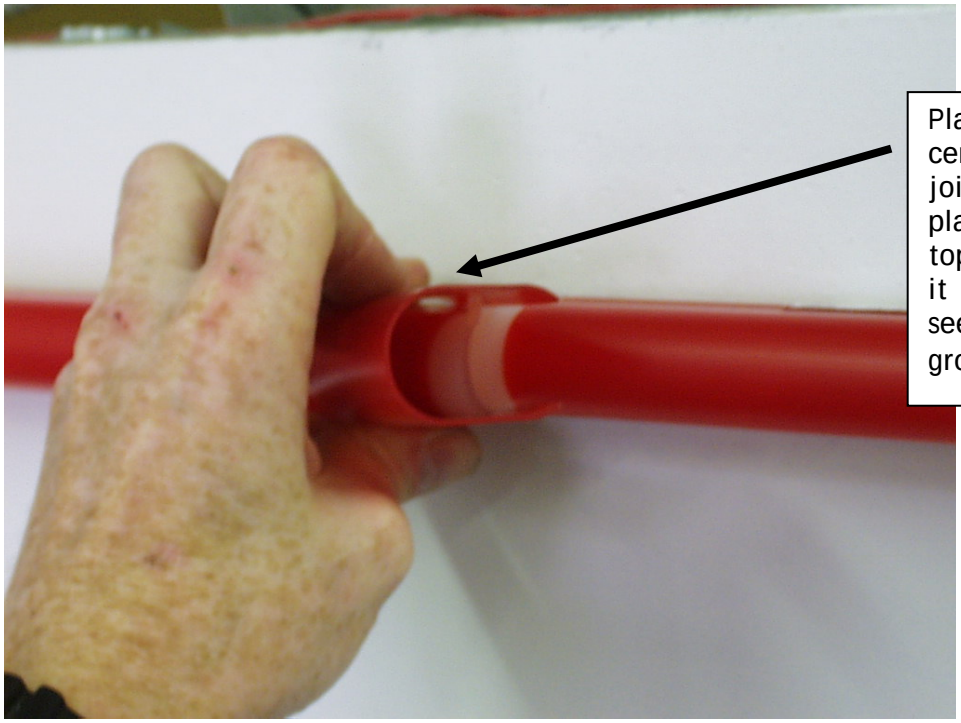


Correct connector insertion
Figure 9

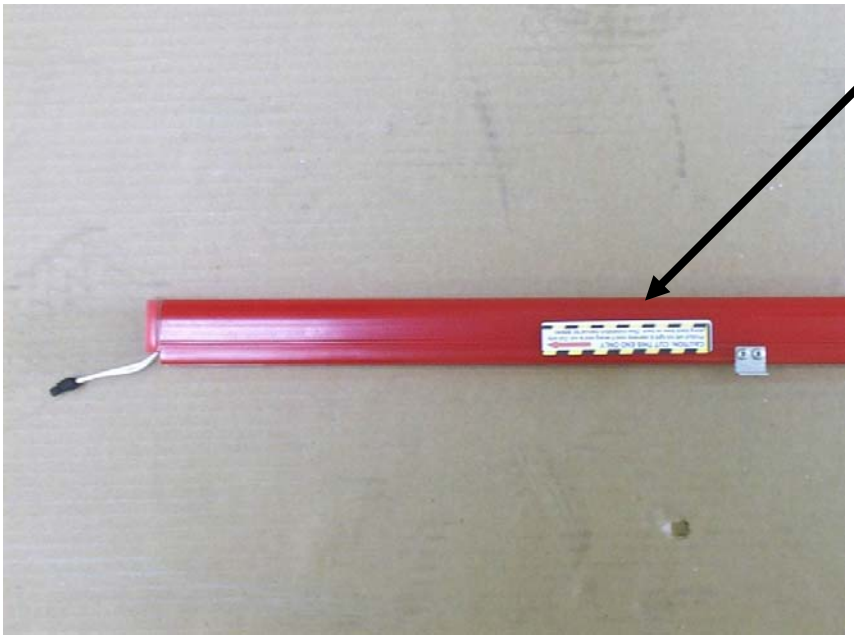


Connection of two sections
Figure 10

Finished connections with wires and connector hidden in mounting track
Figure 11



Cover snaps over end-to-end joint.
Figure 12



Warning Sticker: Cut off this end only. Once cut this end (small connector) will not light and is scrap. See Section 4.4
Figure 13

4.4 Complete String/Cut to Fit

All LEDStripe products are field adjustable for length. By using a hand or power miter saw. (A miter saw must be used to give a straight clean cut. A straight clean cut is required to bond a field replacement end cap to). Each unit has separation marks indicated on the PCB that are visible through the mounting track. The 10', 8', 6', 4' and 2' sections can be adjusted in roughly 3" increments. One-foot sections can be adjusted in approximately 1" increments. To cut a section, measure the length you need from the **large** connector to the nearest cutting mark. **This is very important, as only the section with the large connector will light. The leftover section with the small connector will not light and is scrap. See fig. 13.** The cutting mark is a black line visible through the mounting track. Using a cutoff or miter saw, position the blade such that it cuts on the desired cutting mark. Discard the section that will not be used (ie: the section with the small connector on it). See figure 14.

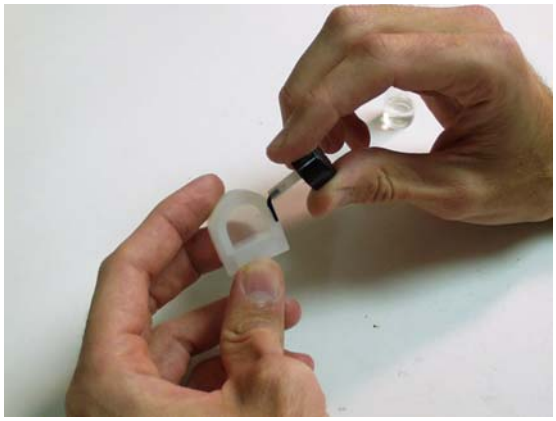
In order to properly protect the cut end from the environment, bond a new end cap (p/n 701341-FC) in place using supplied adhesive and primer. Apply primer (p/n 701424) to bonding surface of silicone end cap and allow to dry (approximately 30 seconds). Apply adhesive (p/n 701422) to bonding surface on the open end of the tube and place the primed end cap on it. Hold the end cap in place until the adhesive cures (approx 15 seconds). Inspect the bond line to make sure that it is continuous and complete so that moisture cannot enter the tube. See Figures 15 thru 18.

Position the cut section onto the end of the run and connect. If power from the same leg must be provided to units after a cut piece, a jumper kit P/N 701385 must be used since the small connector has been cut off the field adjusted unit. Each jumper kit comes with an instruction sheet showing how to make the connection.

If you have questions or concerns about cutting LEDStripe in the field, it is recommended you call SloanLED at (888)-747-4LED for clarification before you make any cut.

Cutting a LEDStripe section to length to fit the end of the building
Figure 14

LEDStripe tube, Primer, Glue, and Silicone End Cap
Figure 15



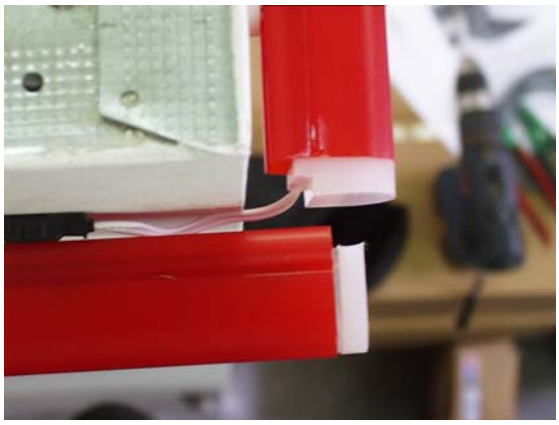
Apply primer all around the edge of the Silicone End Cap.
Figure 16

Apply glue around end of cut LEDStripe tube.
Figure 17

Hold end cap in place with pressure until the glue sets. Approximately 15 seconds.
Figure 18

4.5 Corners

Corners should be installed as shown in Figures 19 and 20. One section should overlap the other leaving a minimum ¼" space as shown. Figures 21 and 22 show the optional covers snapped in place.



Outside corner detail showing a ¼" gap for expansion.
Figure 19

Inside corner detail showing a ¼" gap for expansion.
Figure 20

Outside corner detail showing the corner joint cover snapped in place.
Figure 21

Inside corner detail showing the corner joint cover snapped in place.
Figure 22

5.0 PowerLED Mounting and Connection

Mount the transformer directly to the wall, in a vertical position with label at the top (or in a weatherproof enclosure for outdoor locations) with #8 pan head screws at the top and bottom of the transformer. The transformer must be mounted in an area that allows for accessibility after installation and must not be in an area that is adjacent to combustible materials or that will be allowed to exceed temperatures of 90° C (194° F). After securely mounting the transformer, remove the front cover to expose the primary and secondary hook-ups. Have the primary connected by a licensed electrician, following the instructions on the inside of power supply cover and in accordance with codes.

NOTE ABOUT BOOST TAP HOOK UP: The PowerLED transformer is designed to reduce primary input voltage (120VAC to 110VAC) to secondary output voltage of 24VAC. It is provided, however, with a boost tap for lower primary voltage applications. For primary hook up in the range of 120VAC to 110VAC, use the black wire and leave the blue, boost tap, wire capped. If primary voltage is and will remain below 110VAC, connect the blue, boost tap, wire to the supply wire and cap the black wire.

WARNING: Whichever option is used, the wire left unconnected must be capped with a wire nut. It is a live primary voltage potential.

Note: a switch or other disconnect device, which carries the correct rating per UL 48 and is UL Listed, needs to be wired between the primary power input and the transformer (see figure 25). This disconnect switch or device must meet the following criteria:

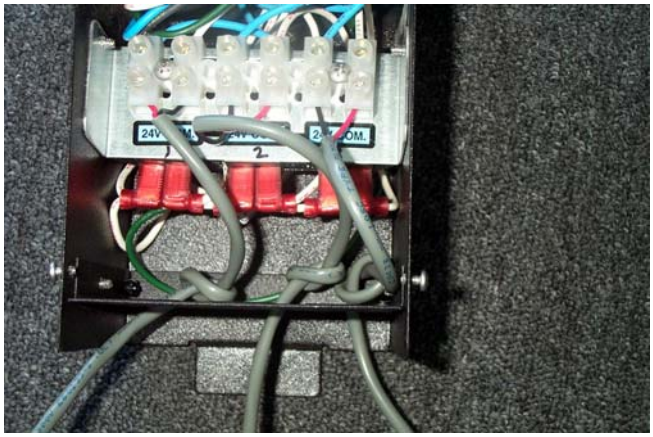
1) Must be provided with each transformer (if multiple transformers are mounted next to each other and powered on the same primary circuit, one switch can be used to cut off power to all of them).
2) Must be mounted at or near each transformer.
3) It must have a manual actuator, which shall be protected against mechanical injury and shall be operable before entering the electrical enclosure of the transformer.
4) It must be marked with an ON and OFF position.
5) It must have no energized parts accessible to contact when in the OFF position and not be of the solid-state type.

To hook up the secondary power output (to the LEDStripe product), remove one or more of the plastic hole plugs in the bottom of the transformer. Insert PLTC wire through hole. Cut and strip the end. (Strip back about 2" of cable jacket and strip about 3/8" of insulation off each wire.) Tie a knot in the cable so if it is pulled on from the outside, the force will not be transmitted to the terminal block. Slide each wire into one output of the terminal block and secure with the screws supplied. (See figure 24.) When all secondary outputs are correctly and securely connected, replace the cover and secure with supplied screws. A licensed, experienced electrician, in accordance with all codes and regulations should do all electrical connections, both primary and secondary. When passing through a wall with the transformer output cables, UL Listed, Power Limited Tray Cable (PLTC), seal the hole in both sides of the wall with silicone. PLTC can be passed through a wall and be routed inside and outside the building without conduit.

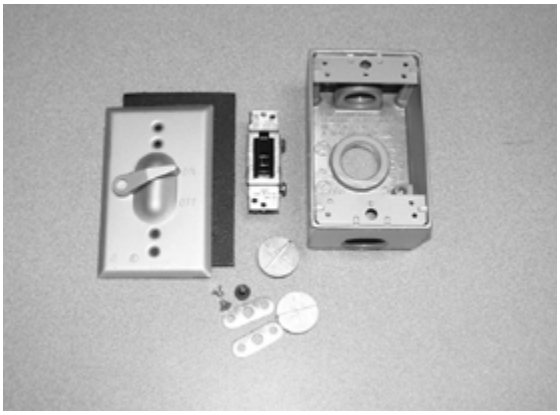
To connect secondary output to LEDStripe product, cut PLTC cable coming from PowerLED transformer to required length, strip the end, and butt splice connector assembly to cable. See figure 26. (Use male or female connector as necessary.) The maximum allowable cable length is 15' if 18AWG is used or 50' if 14 AWG is used. After butt splicing the cable and connector assembly together, seal butt splice with liquid

electrical tape. (Figure 27) Finally, connect this end of PLTC cable to beginning of LEDStripe leg.

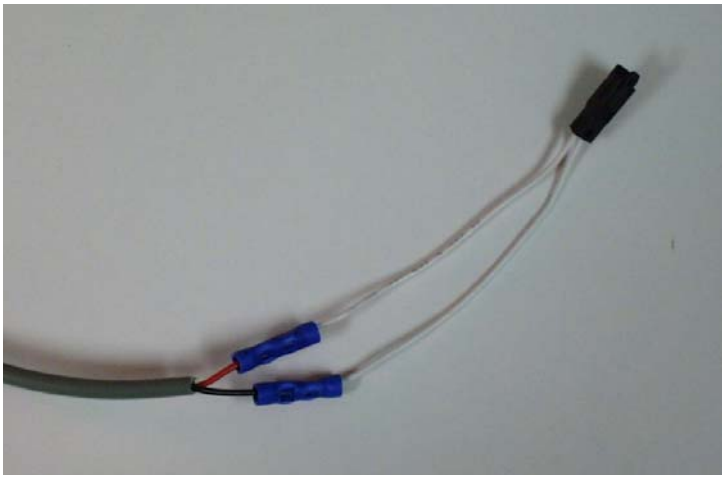
Inside of cover- Primary hook-up instructions
Figure 23



Correctly wired secondary outputs with knot as strain relief
Figure 24



Example of disconnect switches and enclosure
Figure 25



Butt splicing a connector to end of PLTC
Figure 26

Covering butt splices with liquid electrical tape
Figure 27

6.0 Troubleshooting

Problem: One complete length of LEDstripe won't light.
Solution: Most likely a connector or connection problem. Check connections and voltage at the connector. It could be a loose connection, wire or connector.

Problem: More than one length of product does not light.
Solution: Most likely a connection problem. Check connections where the product stops lighting. Another cause could be that the transformer is overloaded and the secondary output circuit breaker is tripping. Check how many feet of product are on each leg of the transformer. Each leg should not exceed 30 feet of product checking the voltage on the secondary side of the transformer will also help isolate the problem. If the voltage at the secondary side of the transformer is less than 22 volts AC then the primary wiring could be the problem or the transformer could be bad.

Problem: The product flashes on and off.
Solution: The transformer is overloaded. Check the number of feet on each leg of the transformer (not to exceed 30 feet). If the ambient temperature around the transformer is higher than 120° F then this could also be the cause. Flashing is caused by the circuit breaker switching on and off. See section 3.3 Environmental Considerations.

Problem: One small 3" section is dark
Solution: Problem inside the product. Replace entire LEDStripe unit. Call SloanLED for return and replacement instructions.

Problem: After cutting, the product does not light.
Solution: Most likely the wrong end was cut. When cutting the product make sure that the end with the big connector is the end that is kept. After cutting, the end with the small connector is scrap and will not light. See Section 4.4 Cutting to Fit.

7.0 Glossary of Terms

LEDStripe

Low voltage lighting system consisting of an extruded acrylic tube that contains printed circuit boards and attached LEDs (Light Emitting Diodes). LEDStripe units are available in 1', 2', 4', 6' and 8' lengths. All of these lengths can be field adjusted to fit your application.

Section

A single piece of LEDStripe product, characterized by its length, color and connectors.

Chain

Two or more sections of LEDStripe can be connected together, or daisy-chained, to form a "chain" or "string" or "run" or "leg" of lights.

Circuit

The term circuit normally refers to the individually switched lines coming from the electrical panel.
A second use of the term can be to refer to the chains of LEDStripe, which are powered by the same transformer.

System

Complete LEDStripe installation including all LEDStripe chains, PowerLED Transformers, connecting cables and ancillary hardware.

PowerLED Transformer

Standard PowerLED transformers are designed and built to convert 110-120 VAC to 24 VAC. There are 3 available power outlets that can each support 30' chains of LEDStripe product.

By special request, 277 VAC versions are also available.

GPO

General purpose 110-120 VAC outlets – usually switched with existing signage lighting.

PLTC Transformer Lead Wire

Power Limited Tray Cable (PLTC) UL Listed. Used as hook up cable from transformer output to first LEDStripe unit of a run.

Large Connector

Characterized by a larger, longer black housing and thin metal protruding contacts.

Small Connector

Characterized by a smaller, shorter black housing and metal cavity contacts.

Bridge Rectifier

Each LEDStripe PC board includes a small circuit at one end, which converts the 24 VAC from the power supply to 24 VDC, which is required to power the LEDs. The bridge rectifier is normally located at the same end as the large connector.

8.0 Safety Information

Primer

Warning! Harmful or fatal if swallowed. Flammable liquid. Contains heptane, which is irritating by inhalation. May cause skin or eye irritation. Do not use near heat, spark, open flame or other sources of ignition. Avoid prolonged or repeated contact with skin. Avoid contact with eyes or breathing vapors. Use only with adequate ventilation.

First Aid: In case of eye or body contact, flush with water. Obtain medical for any eye or internal contact. If swallowed, DO NOT induce vomiting. KEEP AWAY FROM CHILDREN. FOR INDUSTRIAL USE ONLY.

Storage and Usage: Store below 80° F (27° C). ONLY USE WITH SUPPLIED ADHESIVE. 1. Clean surfaces. 2. Apply primer sparingly to polyolefin surfaces. 3. Allow Primer to dry. 4. Apply adhesive to one surface. 5. Assemble parts and hold in place until set.

Contents: n-Heptane (142-82-5); and substituted amidine (6673-22-2).

MSDS available upon request.

Adhesive

Warning! Irritating by inhalation. Eye irritant. Combustible liquid. Contains cyanoacrylate ester, which may cause allergic skin reaction. Skin contact through clothing may cause burns. BONDS SKIN IN SECONDS. Use with adequate ventilation. In case of eye or skin contact, flush with water. Get medical attention for any eye or internal contact. KEEP AWAY FROM CHILDREN. FOR INDUSTRIAL USE ONLY.

Storage and Usage: Refrigerate for storage. 1. Clean surfaces. 2. Apply adhesive to one surface. 3. Assemble. 4. Hold parts in position until set.

Contents: Hydroquinone (123-31-9); ethyl cyanoacrylate (7085-85-0); poly (methyl methacrylate) (9011-14-7).

MSDS available upon request.