

Plexineon®

Installation Manual



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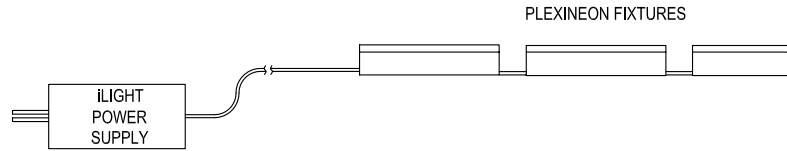
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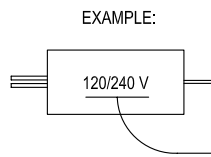
PLEXINEON QUICK INSTALL TIPS

PLEASE NOTE: THIS IS NOT INTENDED TO SUBSTITUTE THE INSTALLATION GUIDE.
PLEASE REFER TO INSTALLATION GUIDE FOR COMPLETE INSTRUCTIONS PRIOR TO INSTALLATION.

1. OVERVIEW



2. POWER



NOTE: CONNECTING iLIGHT SUPPLIED POWER SUPPLY TO HIGHER INPUT VOLTAGE WILL RESULT IN POWER SUPPLY FAILURE AND DAMAGE TO PLEXINEON, VOIDING WARRANTY

→ VERIFY VOLTAGE ON LABEL BEFORE INSTALLING

3. POWER SUPPLY CAPACITY

ONE POWER SUPPLY WILL OPERATE ONE LINE ITEM FROM TABLE "A" AND ONE FROM TABLE "B"

A. PLEXINEON MAX. LENGTH

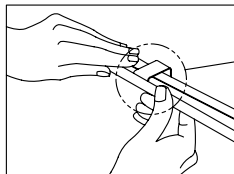
MAX LINEAR FEET	PLEXINEON COLOR
48 FT (14.6m)	RED, ORANGE, AMBER
32 FT (9.8m)	BLUE, GREEN, TEAL, WHITE 1X, MAGENTA
20 FT (6m)	WHITE 2X

B. LEAD WIRE

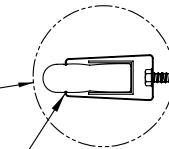
DISTANCE	WIRE GAUGE
100 FT (30.5m)	10
60 FT (18.3m)	12
40 FT (12.2m)	14

4. MOUNTING

A. CLIPS

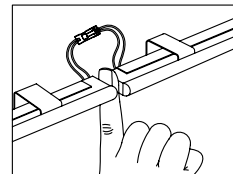


SPACE CLIPS EVERY 18" (457mm)



CLIP HAS TO CATCH GROOVE

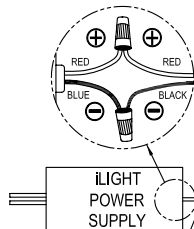
B. SPACING



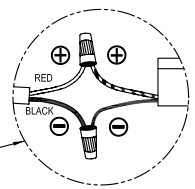
3/8" (10mm) SPACING BETWEEN PIECES

5. PLEXINEON WIRE

A. CONNECTION TO PS

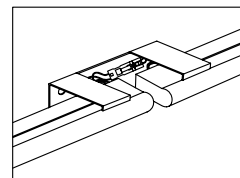


B. CONNECTION TO PLEXINEON



BLACK WIRE - NEGATIVE
BLACK W/WHITE STRIPE - POSITIVE

C. PLEXINEON TO PLEXINEON



USE JOINER CLIP

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Copyright, Trademark, and Patent Laws

Unauthorized modifications may be illegal under international law. This principle also applies to iLight Technologies' logos, designs, publications, and assemblies.

MET Laboratories Listing

The MET Laboratories Listing has been completed and appears on all luminaires. iLight's Plexineon is compliant to UL 1598 and CSA c22.2 No. 250 in Luminaires for installations in wet environments.

Partnerships

Partnerships have been established with the following companies:

- Pathway Connectivity
<http://www.pathwayconnect.com/>
- Fleenor Design
<http://www.dfd.com/>
- OSRAM
http://www.osram.com/osram_com/index.html

Customer Service

iLight Technologies is ready to help. Contact our service number at **312.876.8630** or at **support@ilight-tech.com**.

Services

The following service is offered from iLight Technologies, Inc:

- **Technical Support:** A service technician can be provided for teleconference, on-line or on-site to instruct your installation team on how to properly install Plexineon and Hypnotica products. This training includes review of the site plan, proper layout of iLight product, power supplies, clip placement, cable dress issues, proper techniques for cutting the cuttable fixtures and troubleshooting. This does not include actual installation of the iLight product or connection to the main power supply systems.







Conventions

For clarity, this Service Manual uses the following conventions:

Safety Symbols and Information

When required, information is provided in procedures about potential challenges and dangers. The terms WARNING, CAUTION, and NOTICE are used for specific safety reasons. For emphasis, WARNING and CAUTION appear beside the characteristic triangle symbol. [Table 1](#) lists notice icons used in this guide.

Table 1 Notice Icon Descriptions

Icon/Format	Description
 NOTE:	Information note about important features or instructions but is not critical data.
 NOTICE:	Notice indicates a situation that requires special attention.
 CAUTION:	Caution alerts you to potential damage to a program, system, or device.
 WARNING:	Warning indicates a situation the may cause personal injury or death.
 WARNING:	Warning indicates a situation the may cause personal injury or death due to a potential electrical hazard.
 ESD:	ESD alerts you to take proper grounding precautions against electrostatic discharge (ESD) before handling a product.

Warranty Notice

This product is sold pursuant to iLight Technologies, Inc.'s standard terms and conditions as stated in the warranty. The warranty can be found at:

http://www.ilight-tech.com/tech_warranty.htm

Plexineon Product Description

Plexineon is the next generation LED lighting solution that creates a bright, even glow across the surface of the product. Designed to go outdoors in wet locations, Plexineon offers unsurpassed durability for both exterior and interior applications. Available in standard straight lengths, custom lengths, field cuttable fixtures, and specialty bends and corners, Plexineon will meet your lighting needs. The Plexineon fixtures are easy to install and mount with our all-weather connectors, mounting clips, and low voltage power supplies.

Terminology

Table 2-1 Terminology Used in the Manual

Term	Description
Lead-in Wire	The total length of wire that can be used to connect the power supply to the Plexineon fixtures.
Run	Composed of lead-in wire and fixtures of Plexineon connected to a single output on the power supply.

Installation Qualification Area

This installation guide is designed to instruct and aid in the installation of Plexineon products. Installation of Plexineon should be done by a skilled tradesperson familiar with construction and electrical installation techniques. Licensed electricians should provide all installation and electrical primary inputs for the Plexineon power supply. Installation should be done in accordance with all National and Local codes and ordinances.



NOTE: Installation of Plexineon systems in harsh environments where there are chemicals, high winds or vibrations has not been tested and may result in failure and void warranty.

NOTE: Please refer to Product Specification Sheets for allowable operating conditions on the iLight Web site.

Tools Required for Installing Hardware

- Cordless Drill
- 3/16" Drill Bit
- 3/16" Stainless Steel Screws (#10 or #12), masonry anchor or short rivets (depending on the mounting surface)
- Masonry Anchor or Insert (for installation into brick, stucco or concrete)
- Rivet Gun (for installation in metal)
- 3/16" x 1/4" rivets (if installing into metal)
- # 2 Phillips Driver Bits (recommended 1 1/2" long bits for screw guns)
- Wire Stripper
- Flathead Screwdriver
- Needle Nose Pliers
- Measuring Tape
- Chalk Line (or other marking mechanism)
- Power Miter Saw / Chop Saw / Hack Saw
- Silicone Sealant (electronic grade, non-conductive, non-corrosive)
- Wire Nut Connectors or Electrical Tape
- AC / DC Volt Ammeter (multimeter)

Prepare Installation Area

Layout of Installation

Layout of the product should be considered prior to installation. Consider the following points when creating the layout.

- This lighting system, including the power unit, AC cord, lead-in wire and Plexineon product can not be installed in environmental air handling systems (i.e. the area above a drop ceiling used for supply or return).
- Each fixture length has a recommended amount and location of clips that should be used to properly install the fixture. Review [Table 2-2](#) and [Figure 2-1](#) for those specifications.

Table 2-2 Plexineon Length and Amount of Clips with and without C-Channel

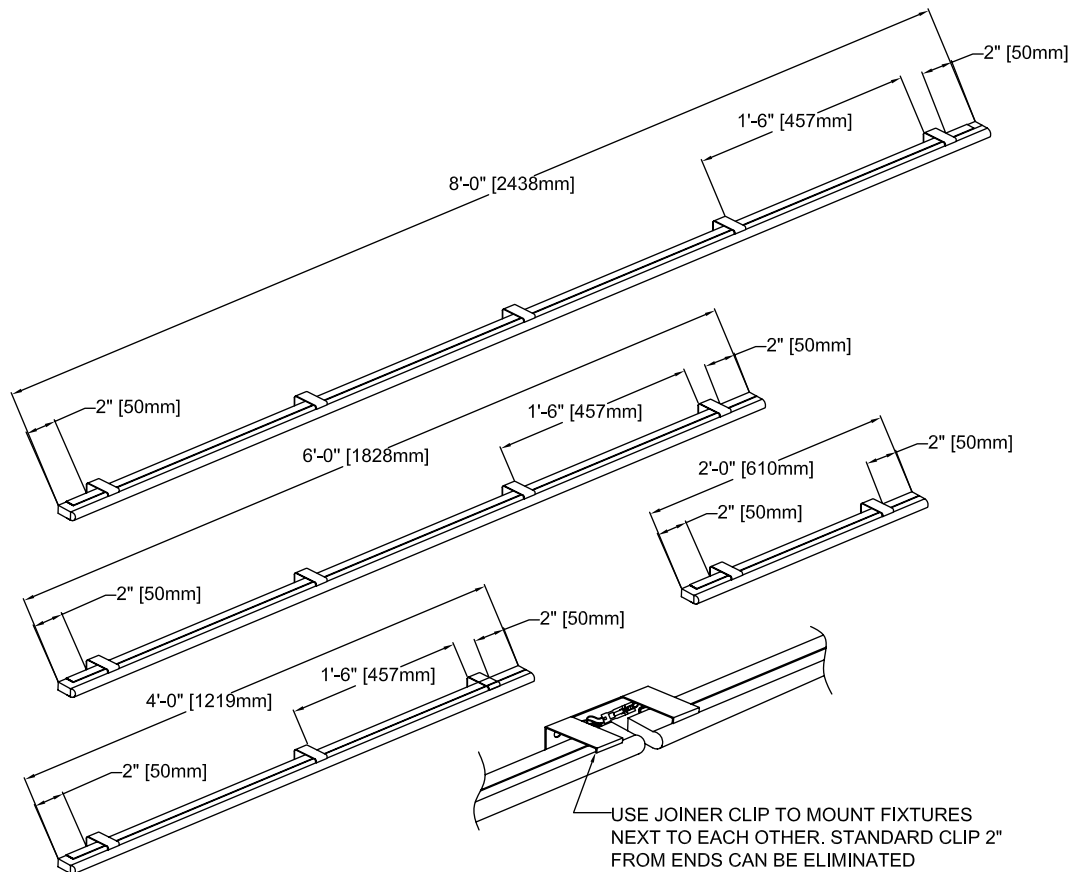
Plexineon Length	Amount of Clips with Channel	Amount of Clips without C-Channel
8'-0" (2.438 m)	5	8
6'-0" (1.828 m)	4	6
4'-0" (1.219 m)	3	4
2'-0" (609 mm)	2	3
Outside Corner	3	3



NOTE: Do not install the Plexineon fixtures flat so they will be submerged when it rains. iLight offers a specialty "L" tab clip to lift fixtures off of surface to prevent submersion.

WARNING: Removal of C-Channel voids warranty.

Figure 2-1 Location of Clips





NOTE: When using 3" Joiner clips, standard clips are not required between Plexineon fixtures.

- Power supplies must be mounted within forty feet (12.19 m) of the first Plexineon fixture (if 14 AWG wire is used). The calculation of 40 feet (12.19 m) is only good if the Plexineon is installed "end to end." If a large jump needs to be made from one fixture to another, (i.e. around a corner) then that distance needs to be subtracted from the forty feet (12.19 m).
- The total length in wire used on any given run is 40 feet (12.192 m) when using 14 AWG wire. However, if using a larger gauged wire, the lead-in wire length can be greater. Refer to [Table 2-3](#) for more information.

Table 2-3 Power Wire and Total Allowable Length

Gauge of Wire	Total Lead-in Wire Allowable Length
10	100 Ft (30.48 m)
12	60 Ft (18.29 m)
14	40 Ft (12.19 m)

- The maximum amount of Plexineon fixtures can be used for each lead-in wire per 100 watt power supply. Refer to [Table 2-4](#) for specifications.
- iLight Technologies supplies 14 AWG wire. If the lead-in distance is longer than 40 feet (12.19 m) then a larger gauge (UV rated/outdoor rated) wire is needed.

Table 2-4 Maximum Amount of Feet per Run Using a 100 Watt Power Supply

Linear Dimension of Plexineon Run	Plexineon Light Color
48 Feet (14.6 m)	Red, Amber and Orange
32 Feet (9.8 m)	White 1X, Blue, Teal, Green and Magenta
20 Feet (6.10 m)	White 2X

- For all fixtures a 3/8" (10 mm) gap (which is one finger width) should be placed between Plexineon fixtures. Temperature changes cause expansion and contraction of the fixtures which may cause the fixtures to break if they are too close to each other and will void warranty.

Installation

Mark Area Use the layout (as a reference) and the chalk line (or other marking mechanism) to mark the location for the power supplies, fixtures and clips.

Plexineon Fixtures **Clip Placement with Drill**

Plexineon fixtures are mounted using stainless steel spring clips. A 3 inch (76.2 mm) joiner clip can be used to connect the ends of two fixtures. If not using the joiner clip, the recommended spacing for the clips is 2 inches (51 mm) in from each end of the fixture, and one every 18 inches (457 mm), based on the length of Plexineon fixture. See [Figure 2-1](#) and [Table 2-2](#) for placement diagram. The Plexineon clips come with a 3/16" (4.8 mm) screw hole. Slip the screw inside clip hole and fasten tightly to surface (as shown in [Figure 2-2](#)).

NOTE: Clips should be mounted at an equal height to make sure Plexineon fixtures are installed straight.



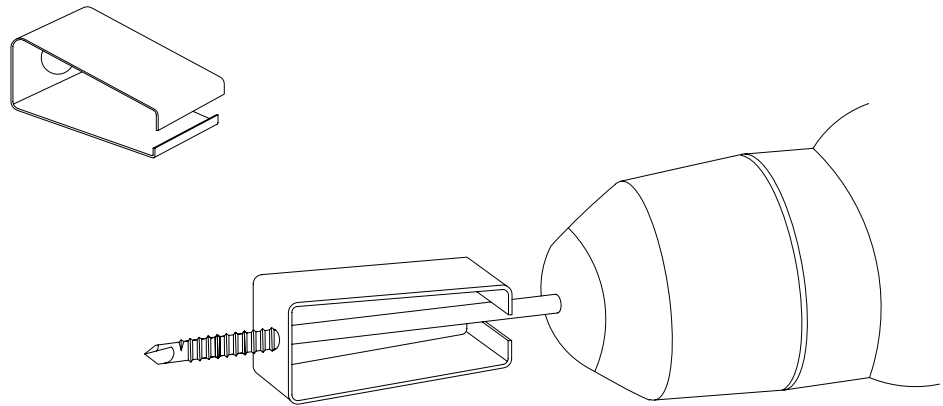
CAUTION: Clips can have sharp edges and drill operator should use care when mounting clips to the wall.

NOTE: Refer to iLight Web site for different specialty clips.

Fastening Tips

- It is recommended to use an exterior grade fastener (e.g. stainless steel screws).
- If the mounting surface is brick, stucco, or concrete, a masonry anchor should be used (i.e. Tapcon).
- If clips are attached to metal, it is recommended that 3/16" (4.8 mm) short rivets be used instead of screws.

Figure 2-2 Clip Fastening Illustration



Install Plexineon Fixtures into Clips



NOTE: Before beginning the installation of Plexineon fixtures, the installer should dissipate any static charge by touching a grounded metal object.

Prepare Plexineon fixture for installation. Position the bottom end of the Plexineon fixture at an angle and snap into the groove on the lower end of the clip, as the fixture is being positioned within the clip (as shown in [Figure 2-3](#)).



NOTE: Catching the clip in the groove is important. The groove is considered the part between the frosted curved portion of the front and the side plastic channel. Do not allow the clip to go over the end of the product.

Push in until the clip catches the groove (as seen in [Figure 2-4](#) and [Figure 2-5](#)). Make sure that the connector(s) are oriented properly. When clips are appropriately mounted, the Plexineon length can be inserted into the clips. Insert Plexineon one clip at a time.

Figure 2-3 Initial Position of Plexineon

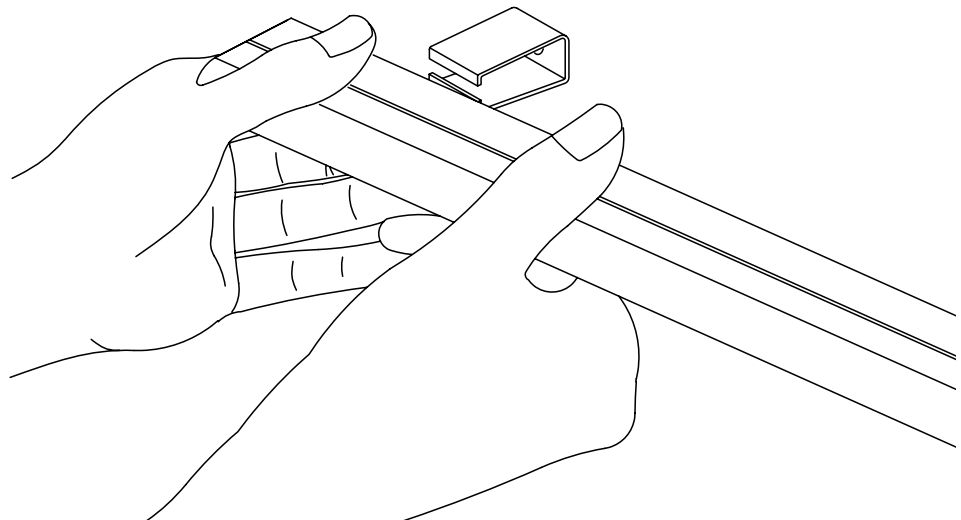


Figure 2-4 Plexineon in Groove

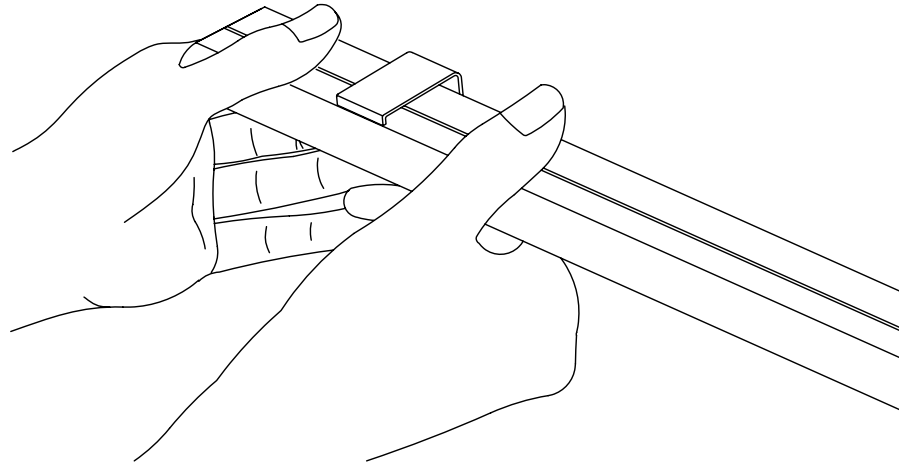
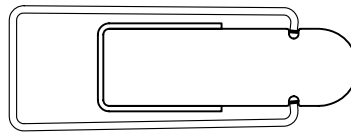


Figure 2-5 Plexineon in Groove (Side View)

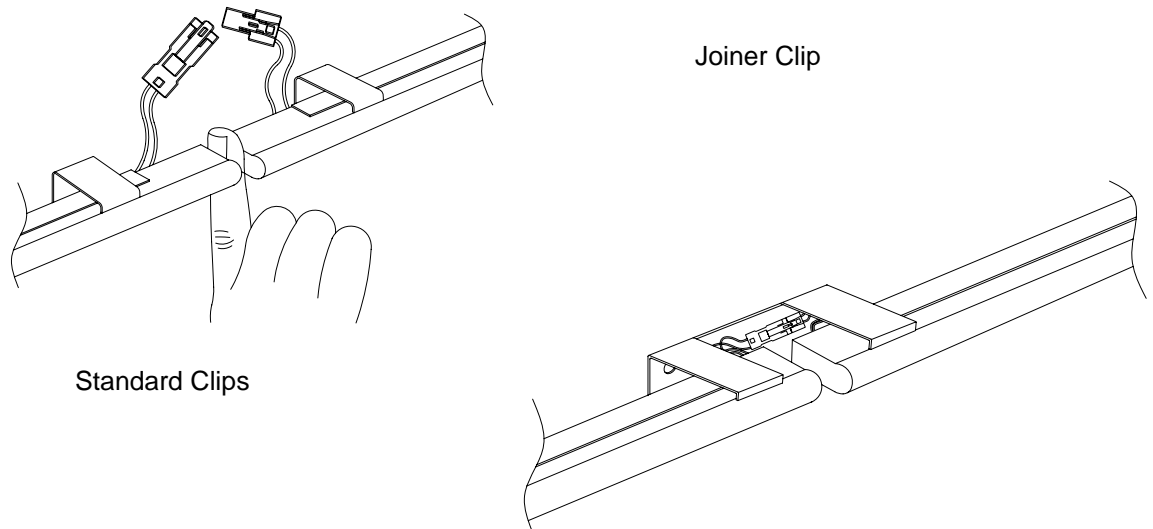


During installation, verify that the Plexineon has space to expand or contract by leaving a 3/8" (10 mm) gap (about a finger width) between fixtures (as shown in Figure 2-6). This is especially important if the product is installed in cooler temperatures.



CAUTION: Do not butt the fixtures next to each other for any layout. This will cause service problems and will void warranty.

Figure 2-6 3/8" (10 mm) Spacing Between Fixtures



Plexineon Bends iLight Plexineon fixtures are field bendable. Make sure that the proper bending procedures are used for the fixture. These fixtures can be field bent in the "easy" direction. The "easy" direction is the bend axis parallel to the light direction.



NOTE: *Bending of fixtures is done without the supportive C-Channel.*

Table 2-5 Minimum Radius for Field Bending of Fixtures

Fixture Type	Minimum Radius For Field Bending*
Plexineon Colors and White 1X Series	48 inch (1219 mm)
Plexineon White 2X Series	72 inch (1829 mm)

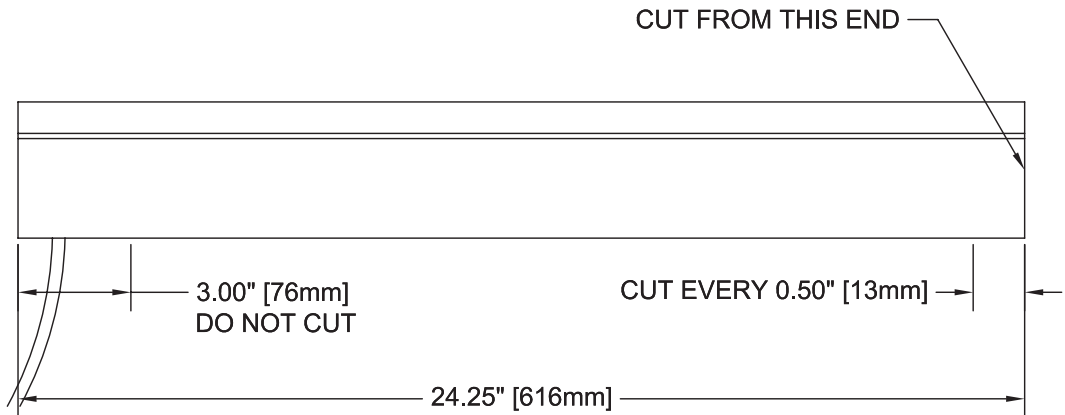
* Diagram available on Web site.



NOTE: *For more information about bend radii, please refer to the iLight Web site.*

Cuttable Plexineon iLight's cuttable fixtures come in a variety of colors and are designed to be easily and safely field cuttable to fit any spaces and gaps remaining after the standard lengths have been installed. The 2' (610 mm) Plexineon cuttable fixtures are the only Plexineon products designed to be safe field cuttable fixtures.

Figure 2-7 Plexineon Cuttable Fixture

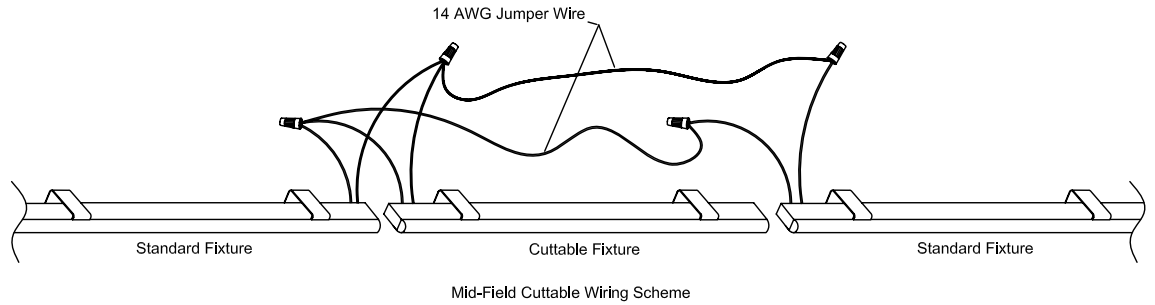


Cutting Fixtures

- 1 After installing the standard lengths, the remaining gaps should be less than 2' (610 mm).
- 2 All cuttables can be cut from one end only and in 1/2 inch (13 mm) increments.
- 3 Before cutting the fixture, measure the remaining space to the nearest 1/2 inch (13 mm) and disconnect the power. The fixture may be cut to the nearest 1/2 inch (13 mm) down to 3 inch (76 mm) where the wires are protruding.
- 4 Dispose of the remaining fixtures as this portion is no longer usable.
- 5 **CAUTION:** After cutting the fixture, seal the exposed circuit on the cut end with the non-conductive, non-corrosive silicone sealant provided.
- 6 If the fixture is to be used at the end of a run there is no extra wiring required.
- 7 If the fixture is to be used in the middle of a run, use a jumper cable and jump to the adjacent Plexineon. Silicone filled, waterproof connectors provided will be used as shown in [Figure 2-8](#).



Figure 2-8 *Cuttable Wiring Scheme*



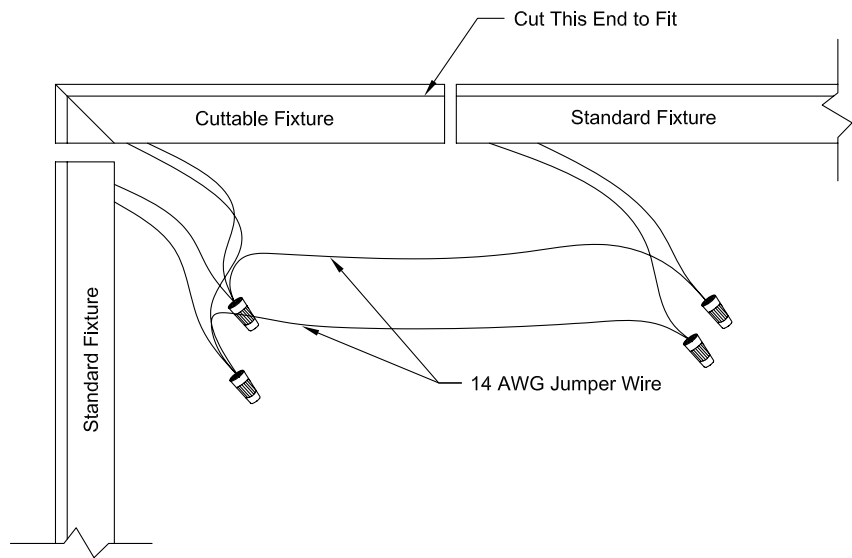
NOTE: A 16 inch (406 mm) long plastic C-Channel has been provided to hold any jumper wires.

Corner Cuttable

iLight has designed a new Plexineon cuttable corner fixture for easy field installation. The cuttable corner fixture is designed to function as a dual cuttable and outside corner fixture in one piece. The 2' (610 mm) Plexineon cuttable corner is the only Plexineon product designed to be a safe field cuttable corner fixture.

Figure 2-9 *Corner Cuttable fixture*

Mid-Field Corner Cuttable Wiring Scheme



NOTE: A 16 inch (406.4 mm) long plastic C-Channel has been provided to hold any jumper wires.

Install Power Supplies

iLight offers three different power supplies, the wiring diagrams are shown in [Figure 2-10](#), [Figure 2-11](#) and [Figure 2-12](#).

Figure 2-10 *Advance 100 W Electronic Power Supply (ADV100W24V)*

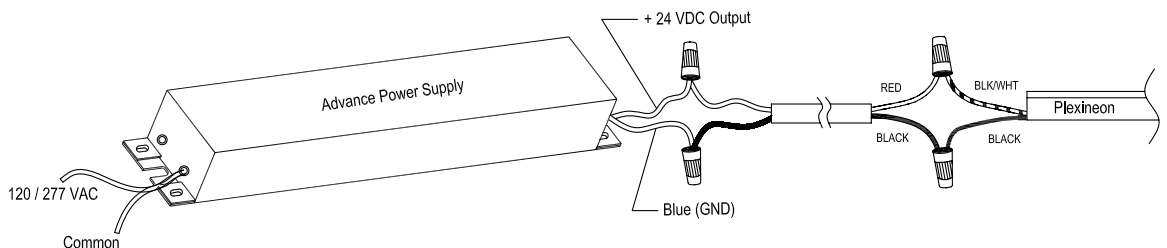


Figure 2-11 *iLight 120 VAC/100W Magnetic Power Supply Wiring Diagram (PN10124DCR-3R)*

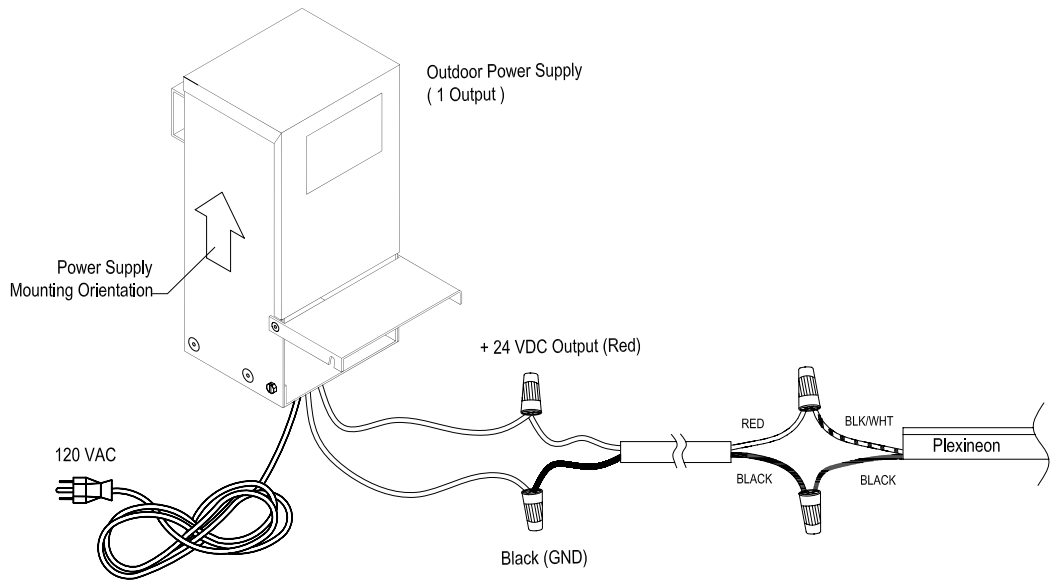
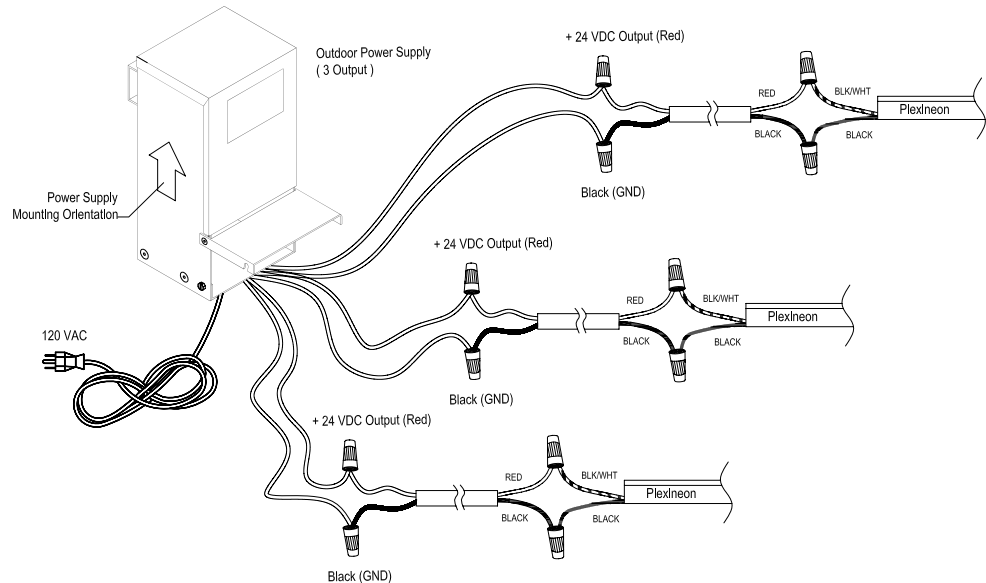


Figure 2-12 *iLight 3 Output 300 W Universal Magnetic Power Supply (PNC224024DCR-3R)*



The correct mounting orientation is dependent upon the amount of power supplies that are used as shown in [Figure 2-11](#) and [Figure 2-12](#).

Using the Plexineon layout created, place the power supplies in their proper locations. Work with the General Contractor or building owner to ensure appropriate placement. It is recommended to locate two power supplies together to make the AC connection and installation easier. Never interconnect multiple power supplies to a single run of Plexineon.

Mount the power supplies and notify the skilled tradesman to provide primary power to each power supply. Installation must be in accordance with all applicable codes, including but not limited to the National Electric Code and other local codes.



NOTE: *Twenty two (22.5) volts of DC power is required in the beginning of the first fixture of Plexineon. Measuring the voltage at the first fixture is a good check that the required voltage is reaching the product.*

Connecting the Plexineon Fixtures

Plexineon fixtures are supplied with two wires connected to each fixture. There is a positive (+) and a negative (-) wire. The positive wire will be black with a white strip, the negative wire will be black.

- 1 Make sure the power supply is turned off.



NOTE: Verify when installing in an outdoor or damp / wet environment, that the proper exterior rated connectors are used. Otherwise, this may void the warranty.

- 2 Connect all the positive wires from each fixture of the Plexineon run together. They can be connected with wire nuts, crimp connectors, solder joints or any other sound electrical connection (like Molex connectors which are outdoor rated as shown in [Figure 2-13](#) or wire nut connectors which are outdoor rated in [Figure 2-14](#)). If the connections are outdoors or in an area where wet or damp contact is likely, use silicone filled wire nuts or Scotchlok™ connectors. Ensure all connections are insulated to prevent shorting, possible shock or fire hazard.
- 3 Connect the positive output on the power supply to the positive wires from the Plexineon. Use the information for the power supply provided by the manufacturer to identify the positive and negative input / output.
- 4 Connect all of the negative wires from each fixture of Plexineon together as was done with the positive wires.
- 5 Connect the negative output on the power supply to the negative wires from the Plexineon. The outputs from the power supply are intended to be isolated from earth ground.



WARNING: Do not ground the power supply outputs.

- 6 Once the connections have been made for both the positive and negative connections, power may be applied. If any fixtures do not work, check the electrical connections. If they still do not work, ensure the polarity of the Plexineon and transformer were maintained.



NOTE: If it is decided to cut off the wires at the end of a run, they must be sealed with silicone. This fixture is now a permanent end fixture without power pass-through.

Figure 2-13 Molex Splashproof (Outdoor Rated)

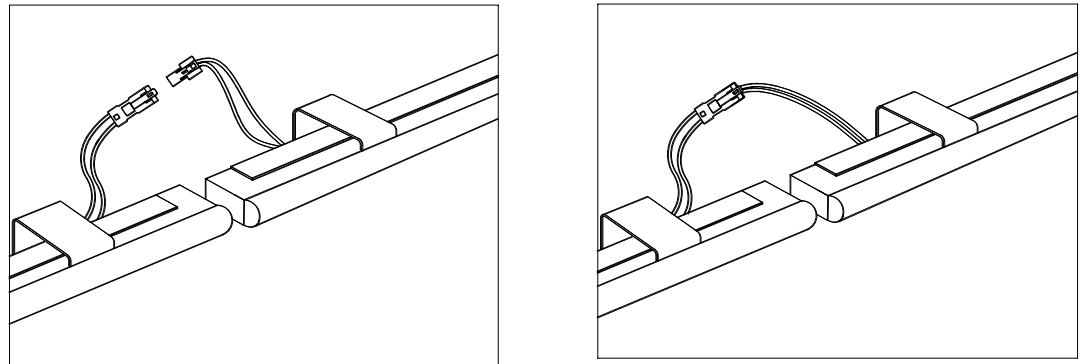
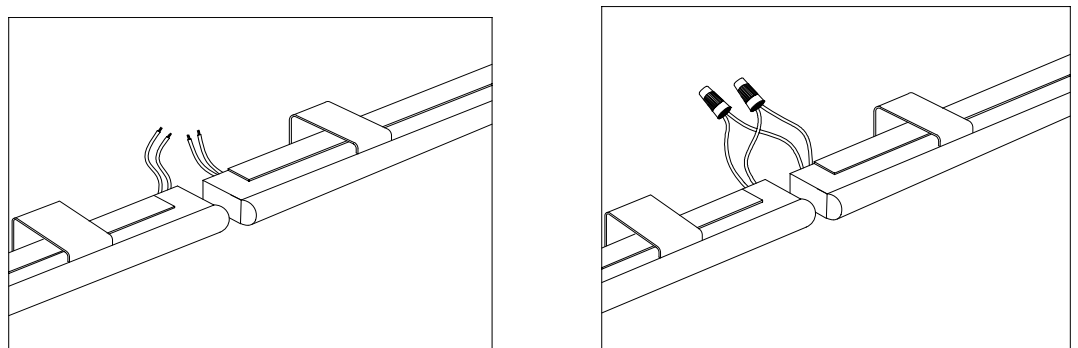


Figure 2-14 Silicone Filled Wire Nut Connectors (Outdoor Rated)



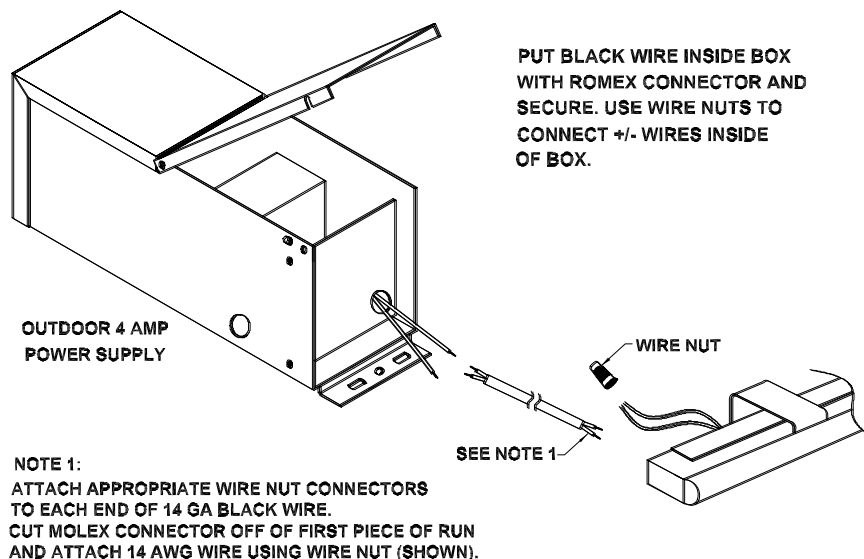
Connect the Plexineon Fixtures to the Power Supplies

- 1 After mounting the power supplies, run the lead-in wire from the power supply to the first fixture of Plexineon. This is shown in [Figure 2-15](#).



WARNING: Turn off power before installing or removing the connector. The wire nuts must be used in accordance with local and national codes.

Figure 2-15 Wiring Diagram for the Power Supply



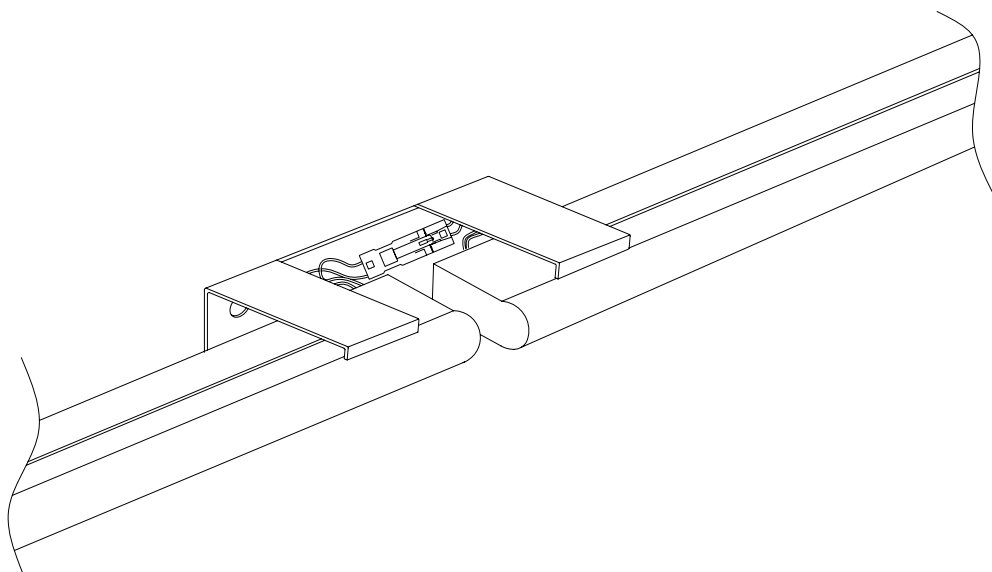
- 2 Strip # 22-18 AWG wires ½ inch (13 mm) and #16-14 AWG wires 3/8 inch (10 mm).
- 3 Align the frayed strands or conductors.
- 4 Place the stripped wires together with the ends even.
- 5 Pre-twist the wires.
- 6 Twist connector onto wires, pushing firmly until hand-tight (approximately 2 twists of the wires).
- 7 Swipe excess sealant in and around the connectors.



NOTE: *iLight Technologies* requires waterproof wire nuts filled with silicone sealant for connections where a connector cannot be used. Wire nuts are provided for these instances, however, if more are needed they may be purchased at your local hardware store: IDEAL Weather Wire Nut #30-161 or equivalent. For 10 gauge wire, use IDEAL Weather Wire Nut #30-262 or equivalent. The wire nut connectors must also be UL 50 or UL 486D compliant.

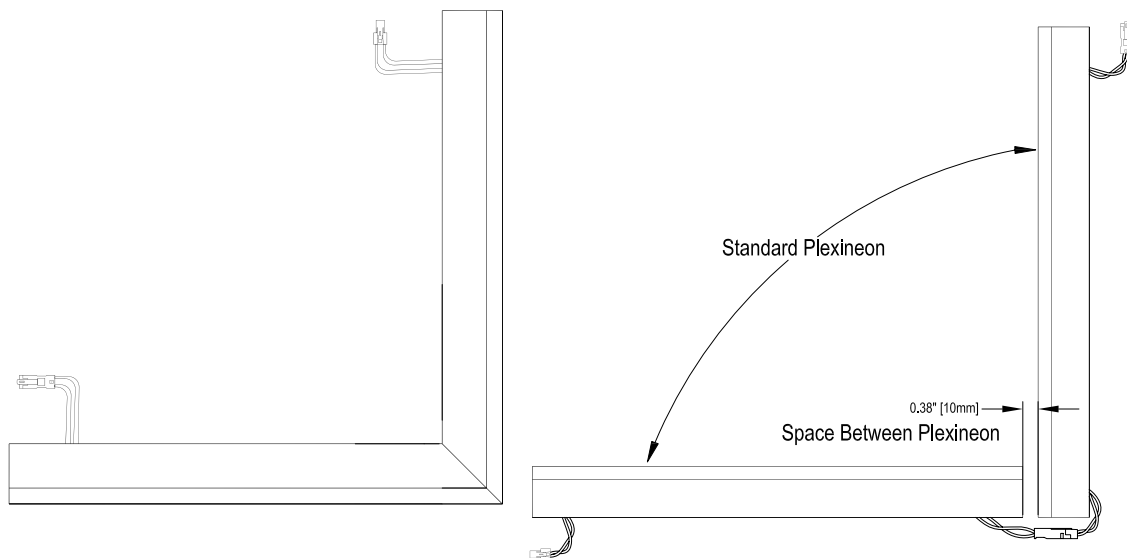
- 8 Once the lead-wires have been connected, they need to be concealed. Tuck wires between the Plexineon product and the clip or wall as shown in [Figure 2-16](#).

Figure 2-16 Wire Management



Corners The outside corner fixture [Figure 2-17](#) is designed for installation on 90 degree outside corners. Use three clips for every corner fixture (one on each leg located 2 inches (50.8 mm) from the end and one clip on one side 1 or 2 inches (25.4 or 50.8 mm) from the corner joint).

Figure 2-17 Outside and Inside Corners (Please refer to technical sheets for exact corner sizing.)



To create an inside corner, two separate fixtures should be used and positioned so there is no overlap or contact with each other. This can be seen in [Figure 2-17](#).

Installation Tips

Timer When installing Plexineon, it is beneficial to add a timer or a photocell switch to turn off the Plexineon during the day to increase the lifetime of the product and save energy. In installations where the temperatures can climb higher than 140°F, such as a black building in Phoenix, Arizona, this is required to protect the product warranty. Plexineon Color and White 1X fixtures have an operating range of -25°C to 50°C (-13°F to 122°F) and Plexineon White 2X -25°C to 40°C (-13°F to 104°F).

Storing Plexineon Before Installation

Plexineon fixtures should be stored at a temperature range of -25°C to 75°C (-13°F to 167°F) and out of direct sunlight prior to installation. In some cases, if Plexineon is exposed to excessive sun it may experience some bowing. The product can be installed even in a bowed condition by verifying the clips have properly grabbed the groove.

Starting Installation

- **Straight Lengths Only:** Start with the outside edge/corner and work towards an inside corner or end of fixture.
- **Outside Corner Pieces:** Start with the outside corner pieces and work towards an inside corner or end of fixture.
- **Corner Cuttables:** Start at the opposite end of the corner and use the corner cuttable fixture to fit the remaining gap.

Maintenance and Cleaning



Cleaning of Plexineon

Plexineon is a plastic product. Do not use solvents to clean it. It should be cleaned as necessary with an environmentally safe detergent.

Checking on Power Supply

The power supply should be checked approximately every 6 months to ensure continuous operation. Check the power supply by using a multimeter to check the input and output voltages at the power supply. Make sure that there aren't any signs of corrosion at all connection points.

Troubleshooting

An Entire Run of Plexineon Won't Illuminate

- 1 Make sure the power supply is connected properly.
- 2 Check the power supply.
 - Use a multi-meter to check the input and output voltages of the power supply.
 - If the input reads (120 VAC for example) and the output has no reading or is less than 24 VDC disconnect the power supply from the Plexineon, cycle the AC power going to the power supply and measure again.



NOTE: All magnetic power supplies purchased after July 1, 2008 have a manual reset inside the wiring compartment. If your supply has no output please check this manual reset.

- a If the output measures 24 VDC there is a problem with the wiring of the Plexineon or a short in one of the Plexineon fixtures.
 - b If there still is no output from the power supply but there is input power (120 VAC) replace the power supply.
 - c If the power supply output generates 24 VDC, verify that there aren't faulty or reversed polarity connections or excessive lengths of fixtures.
- 3 Turn off power supply.
 - 4 Reconnect the Plexineon to the supply.
 - 5 Turn power back on. If Plexineon does not light measure output again. If there is no output voltage, the power supply is in overload protection mode.
 - 6 If a voltage does not register at the input, check the electrical panel.

Half a Run of Plexineon Won't Illuminate

- 1 Disconnect all fixtures that have failed.
- 2 Use a jumper wire set to bypass the first failed fixture.
- 3 If the fixture lights up reconnect the subsequent fixtures.

- 4 Repeat this process if necessary. If the fixture does not light then jump the first and second fixture after the failure.
- 5 Repeat until all fixtures have been tested or failure is discovered.

Plexineon Flickers If the Plexineon is going on and off, or flickering, there is a loose contact somewhere throughout the runs. Check to make sure the connection points are securely fastened.

Plexineon Cycles On and Off This could indicate that the power supply has been overloaded – there may be too many feet of Plexineon on one power supply. Recount the lengths and reconnect to power supply. All iLight approved architectural power supplies have built in over current protection. When load exceeds the Class 2 rated output of 4.17 amps at 24 volts the power supply will shut itself off for about 20 seconds then turn on again and re-test for overload. The on / off cycling does not hurt the power supply. Test each fixture individually. This method will enable the technician to isolate the area in the run that is causing a problem.

- 1 Disconnect the lead-in wire from the first fixture and all connections in the run.
- 2 Now plug in the first fixture, if the fixture lights up, reconnect the next fixture in the run and continue this process until the failure is found.
- 3 If the failure occurs at the beginning or in the middle of the fixture, use the jumper wire to connect the output of the good fixture, jump over the suspect fixture and connect to the next fixture on the run. This will enable the technician to jump the shorted section of the run and continue testing the rest of the layout.
- 4 Once the Plexineon causing the failure is identified, replace the faulty Plexineon.

Individual Fixture is Inoperable When a particular fixture of Plexineon won't illuminate, verify if it is the entire fixture.

- 1 If so, check the connections to the right and left of the fixture.
- 2 If it is a small section within a fixture (a 1 inch or 25.4 mm color difference could be a failed LED) this indicates a failure.



NOTE: Plexineon *may be factory repairable. Whether fixture is in or out of warranty, contact iLight's customer service for instructions to return fixture for repair.*