

StepGuard™ Electrical Wiring Considerations



V1-11-01-2024

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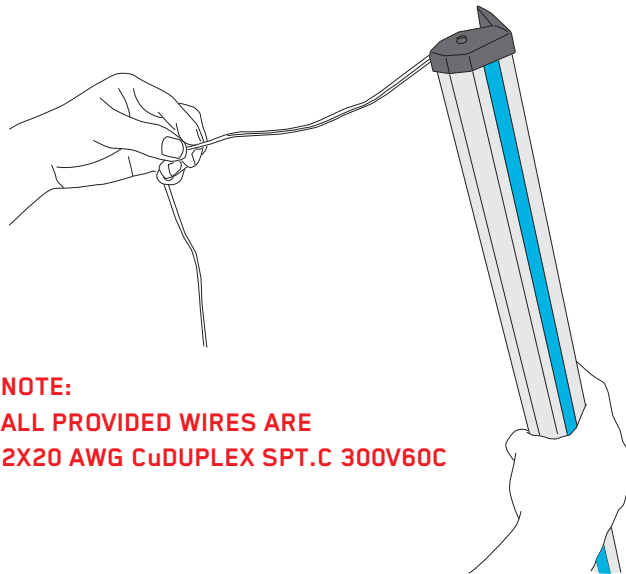
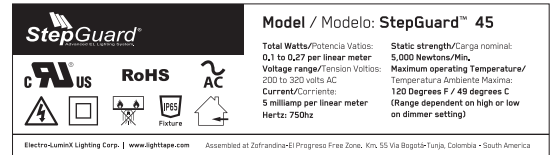
StepGuard™ Stair nosings will arrive connected and ready for installation.

Light Tape™ has no polarity and will use our Smart Drivers to power. One diver can illuminate an entire venue or can be broken into zones. Voltage drops and run distances are not a concern.

HB solutions with an LED downlight, will have a polarized wire and have a different wiring plan than Light Tape. Voltage drops in wiring must be taken into consideration.

Both lighting solutions can be controlled via 0 - 10vDC or DMX dimming.

1. Security label (Printed on Tamper evident paper revealing if removed)



NOTE:
ALL PROVIDED WIRES ARE
2X20 AWG CuDUPLEX SPT.C 300V60C

2. Project and Product Detail



3. International Bar Code



4. LightTape™ Hologram

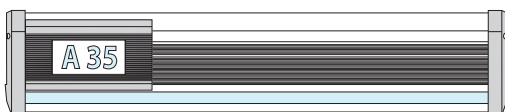


5. StepGuard Tech Support

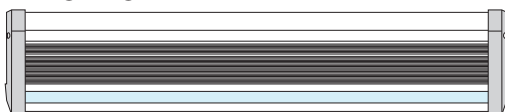


TOP VIEW

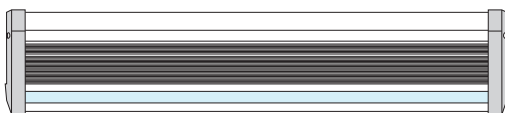
With integrated Row Number



Single Light

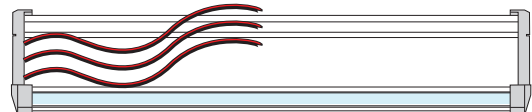


Duo Light (Light Tape or HB LED's)

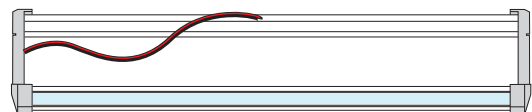


BOTTOM VIEW

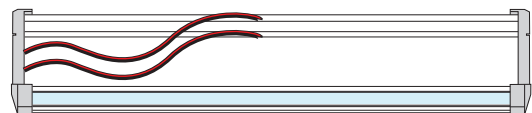
Row number
Top Light
Bottom Light



Top Light



Top Light
Bottom Light



QR code

After unpacking, please check the bottom of each step for a label that includes specific details. The project name and location, auditorium number, final size in mm, and Light Tape® color.

Ensure the connector is positioned on the correct side. The unit arrives fully assembled, except for the anti-slip insert, which should only be installed after securing the step to the floor with screws. Align rubber insert bottom slot with screw heads to hide.

Wiring your venue with Light Tape(r) vs LEDs

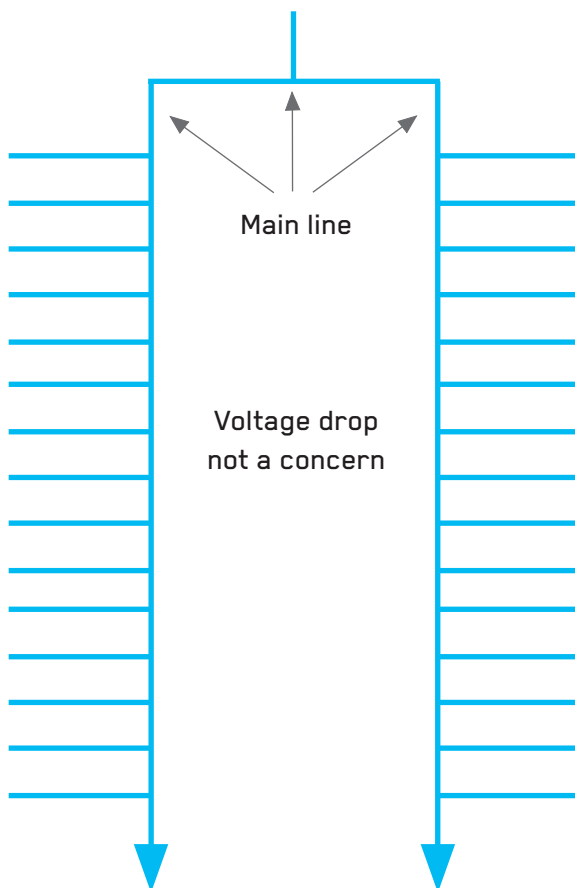
Light Tape(r)

- We manufacture Light Tape in the US
- Wired in parallel
- Negligible voltage drop over 100 meters
- No polarity
- Drivers work on load, not distance.
- One driver per venue is possible
- Full dimming control to zero without flicker

HB LEDs

- We offer LED ribbon and module solutions
- Wired in series
- Voltage drop considerations with wiring gauge
- Polarity
- Drivers work on load, one for venue is not possible
- Number of drivers dependent on venue layout
- Dimming control

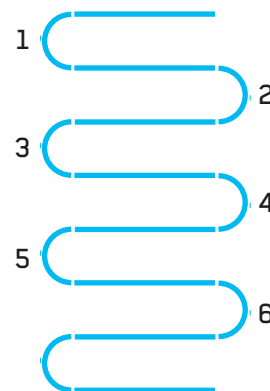
Smart Driver™ Power Supply



Distance of 100 feet or more

LED 24 or 12 vDC Driver

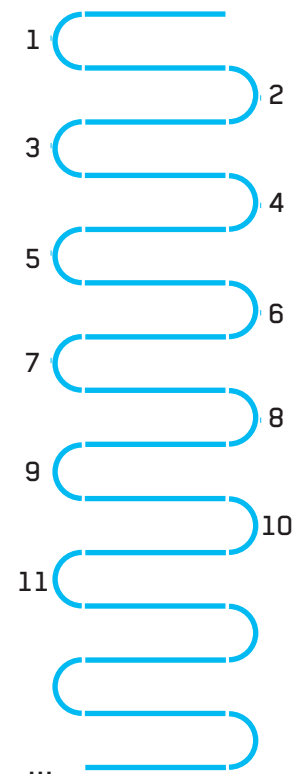
HB RIB 55
55 feet of Wire



Total distance from power supply to each LED module is dependent on gauge and voltage drop.

$1+2+3+... < 55$ feet

HB MOD 100
100 feet of Wire

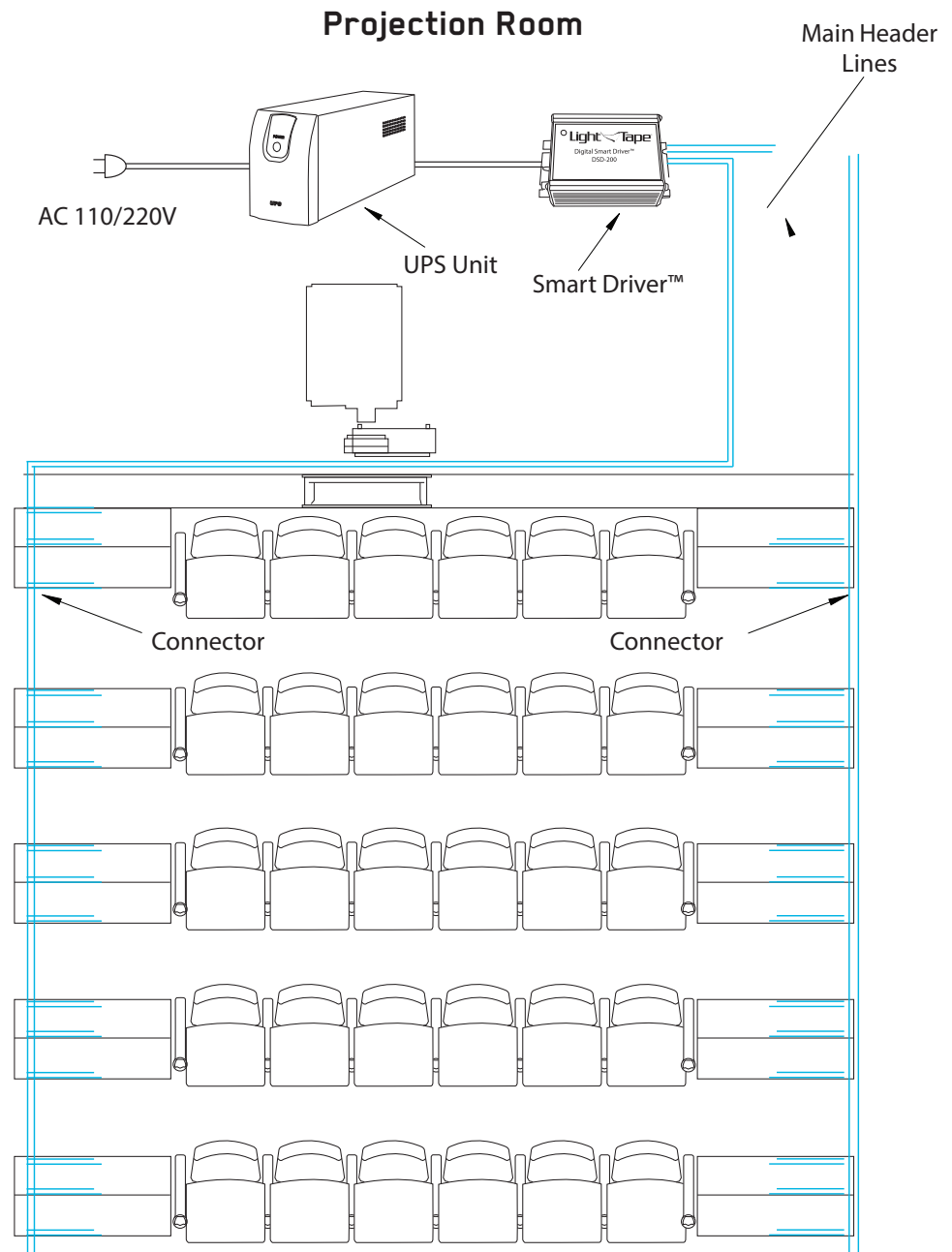


$1+2+3+... < 100$ feet

Remember if you have a DUO system, you may need to wire for both lighting options.

Light Tape wiring example for our StepGuard Stair nosings.

- Light Tape is connected in parallel.
- One Smart Driver can illuminate an entire venue.
- There is negligible voltage drop over long distances.
- There is no polarity.
- To control zones, break up into different loads.
- Controlled by 0-10 vDC or DMX 512 or integrated into DALI
- For DUO Light Tape, to control top light separately from bottom, two supplies and mains are needed.
- DO NOT put electrical connections on top between stair tread and floor. This will trip the power supply short circuit protection when stepped on regularly.



We recommend running main header lines and then connecting in parallel.

StepGuard stair nosing profiles will have a one meter lead to allow for connecting in junction box.

Determine location of the Smart Driver Power Supply and run main header from the first step back to the supply.

Connecting each step in parallel. There is no polarity.

Every step must be properly connected to the main wire following local electrical codes.

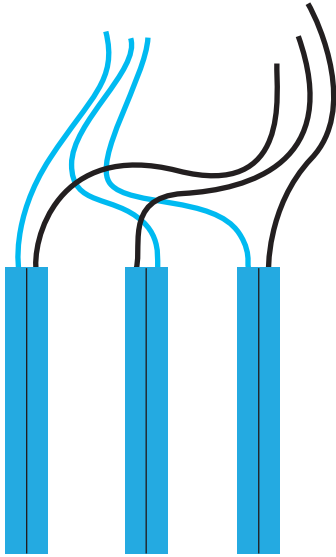
Please make sure all wire connections are sealed, and there are no loose or pinched wires.

For IP65: Dryconn medium waterproof wirenut (#62225) rated for 600V/5A

For standard installation: Ideal 73B orange wire nut rated for 600V/5A; or local equivalent.

Light Tape™ connections

- Light Tape™ electroluminescent lamps do not have polarity. There is no (+) or (-) side



Left or right side of center line does not matter, pick one.

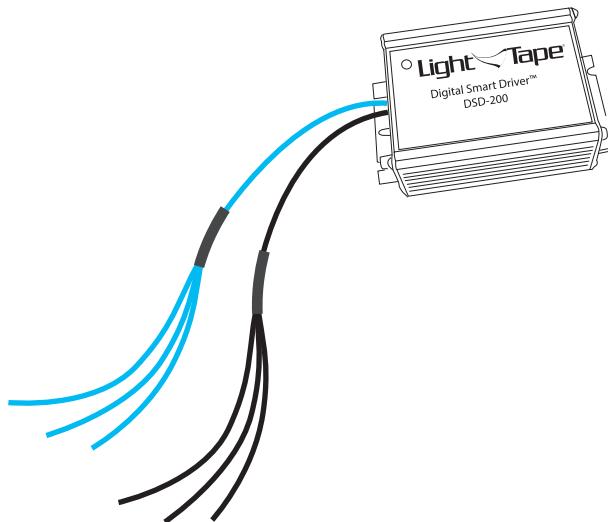
Smart Driver™ Power Supplies work on load



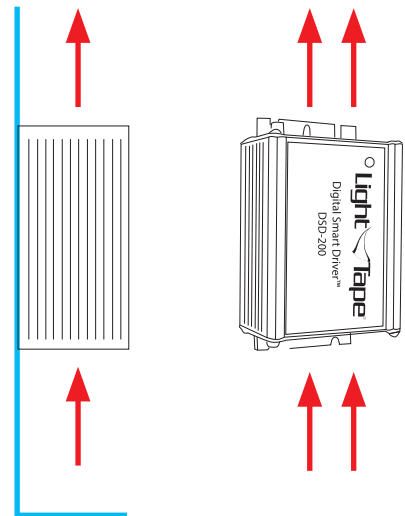
Smart Driver™	Top light only	Down light only	Duo
DSD-200	20 MT	10 MT	7 MT
DSD-400	40 MT	20 MT	13 MT
DSD-1000	100 MT	50 MT	33 MT
DSD-2000	200 MT	100 MT	15 MT
DSD-4000	400 MT	200 MT	133 MT

Number of meters on one power supply

- Group wires when needed with one main back to power



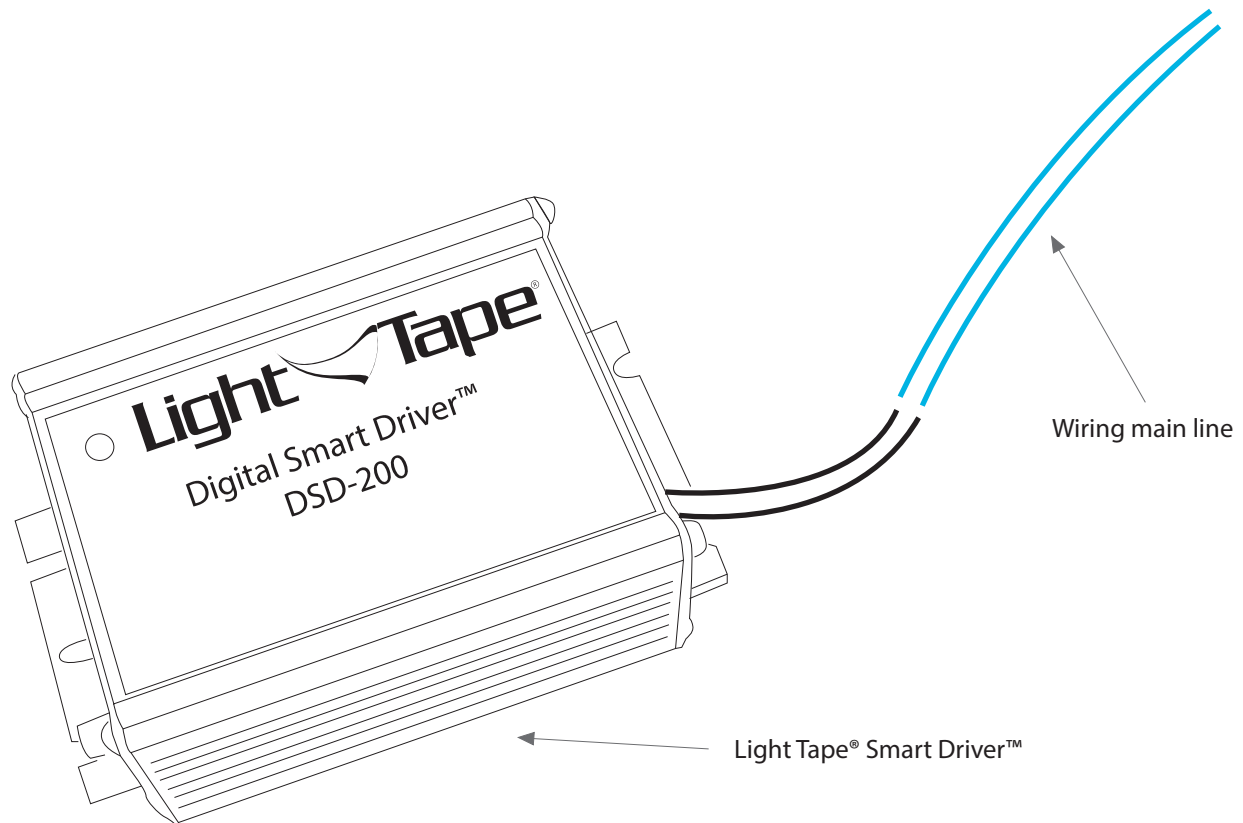
- Mount power supplies vertically fan on the bottom



The Digital Smart Driver™ is required to power the Light Tape®.

Please make sure you are using the properly sized Driver and that is within the illumination range. Drivers work on load and not number of steps or distance.

The driver comes with a dimming button and it should be turned to minimum before powering . Once turned on, you can adjust dimmer slowly to desire brightness. We recommend low level as driver can be increased as lamps age.



► CAUTION:

Never turn on power supply without output to lights until fully loaded or within load range. Do not operate small loads for long periods. Under-loading powers supply can cause it fail. The DSD200 model can handle small loads for testing.

NOTE:

Light Tape® has no polarity. Please ensure exit wiring is not touching when powered, the short circuit protection will not work on start-up, but will after system is in operation and in protection mode.

▶ Light Tape™ Smart Driver Power Supply Instructions

While durable, always treat Light Tape products with respect.
DO NOT FOLD OR MAKE HARD CREASES, this will cause Light Tape short.
Contact Electro-LuminX at 804-355-1692 if you have any questions after reviewing this manual.

▶ Handling Guidelines

Always disconnect power before servicing any electrical equipment.
When wiring, follow all local electrical codes.
Always turn off power using the power switch on the unit. Allow five minutes for capacitors to drain to the 120 or 240 VAC branch circuit grounding system before disconnecting supply to the unit.
All power supplies must be grounded by connecting to the building's grounding system.
Do not operate lamp with an oversized power supply. Excessive current will destroy electrical connections and possibly the power supply.
In some cases a dual connector and shielded wire may be necessary. We recommend a minimum of 600 VAC rating on the wire. Always consult local electrical codes for official requirements.
Light Tape lamps do not have polarity and wires can be attached to either side of the lamp.
Light Tape lamps can be connected in parallel so that multiple lamps can operate from one power supply.
We do not recommend connecting in series or daisy chains.

▶ Operating Procedure

1. Verify that the total illuminated area of the light Tape is within the specified operating range of the Smart Driver. For DSD-200 units, we recommend 1-250 square inches. If the area of the lamp is too high, contact Light Tape for the appropriate model.
2. Verify the correct input voltage power supply connector (120 or 240).
3. Verify that the power supply power switch is in the OFF position before connecting to a power source.
4. Attach the total amount of Light Tape load to the power supply. Do not power the DSD-200 model without attaching lamp.
5. Check all connections to ensure all electrical codes are followed.
6. Turn the brightness knob to the low position by turning the knob completely counterclockwise.
7. Plug the DSD-200 into the power source.
8. Flip the power switch to the ON position and turn brightness knob clockwise to desired brightness.
9. Use a voltage meter to determine volts and hertz

10. Set power supply output per recommended factory settings:

- a. Low: 200 Volts
- b. Medium: 250 Volts
- c. High: 270 Volts

250 Volts output is the recommended set point. Over the years, voltage may be increased to maintain brightness.

► Trouble Shooting

All Smart Driver Lighting Ballasts have an automatic overload protection designed to shut down at a certain output level. As the output power exceeds 280 Volts, the ballast will automatically shut down. If the Light Tape lamp begins to “blink”, there is too much lamp load on the DSD-200 unit. There is no blink setting on the DSD-200 power supply model.

If the DSD-200 shuts down:

- 1. Shut the power switch off and wait 15 seconds.
- 2. Turn the brightness knob counterclockwise an eighth.
- 3. Flip the power switch into the ON position, turn the brightness knob clockwise to increase brightness, stopping before reaching the voltage where the unit automatically shuts down.
- 4. If the unit shuts down while turning the knob clockwise, start over with Step 1.

► Mounting

Power should be mounted vertically with the power supply in up/down position.

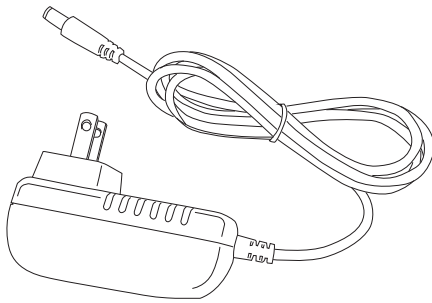
Power supplies can operate remotely, preferably indoors. The power supplies should never be located outdoors without a NEMA 3R enclosure. Maximum distance from the power supply to the lamp is 50 feet.

In areas where excessive shock or movement occur, we recommend vibration dampers be installed under the mounting screws.

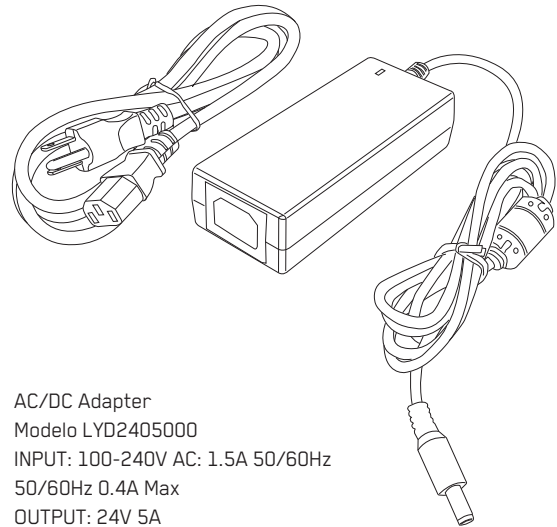
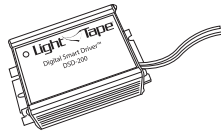
If your location is susceptible to power surges or inconsistent power, it is important to have a surge protection system in place to protect against power spikes.

► Type X Connection

The Smart Driver™ Power Supplies, depending on reference, may come with two types of adaptors and/or cables to connect to power outlet. In case of damage of cable, this can be easily replaced by user, however the connector or adaptor can only be supplied by manufacturer. To request spares or technical service, please contact: thelighttapeteam@lighttape.com in U.S.A. Please make sure to always include on your request the reference of the Smart Driver™ and/or adaptor-cable.



Switching Adaptor
Modelo FJ-SW1262400500DU
INPUT: 100-240V
50/60Hz 0.4A Max
OUTPUT: 24V 500mA



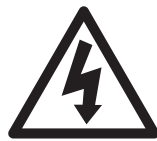
AC/DC Adapter
Modelo LYD2405000
INPUT: 100-240V AC: 1.5A 50/60Hz
50/60Hz 0.4A Max
OUTPUT: 24V 5A

► Replacement of Light Source (Light Tape®)

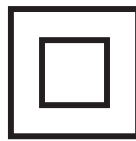
The Light Source of this Luminaire (EL Light Tape®) must be replaced only by the manufacturer, technical service or equivalent qualified personnel. To replace it, simply unscrew the end cap, carefully pull the Light Tape® inside by its cable and push back the new Light Tape® within the insert. Spare connectors and Light Tape® are included with your order.



THIS PRODUCT
CANNOT BE USED ON
INSTALLATIONS OR
FLAMABLE
SURFACES



RISK OF
ELECTRIC SHOCK



CLASS II



AC CURRENT



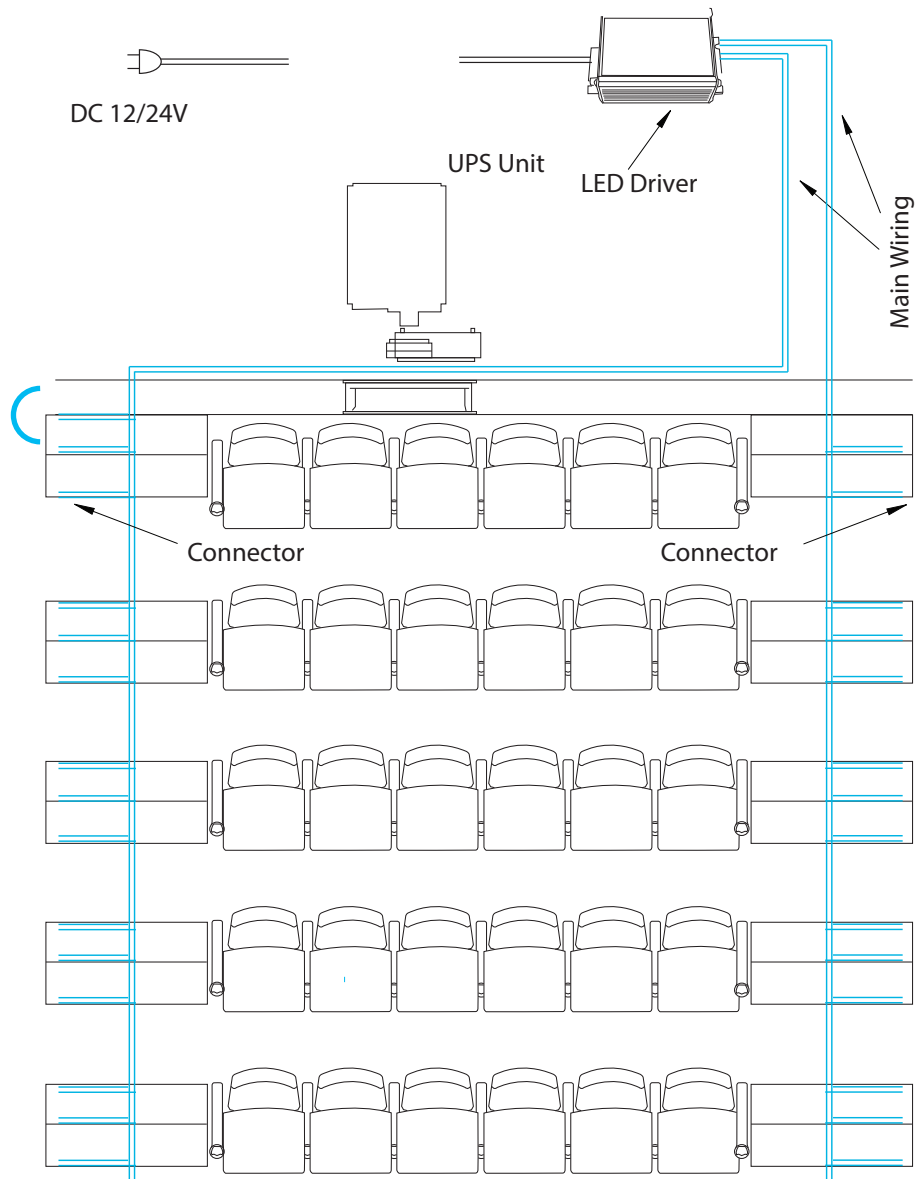
INDOOR USE ONLY

► Follow all Electrical Codes when installing and wiring

HB LED wiring example for our StepGuard downlighting systems.

- Our HB LEDs are run in series.
- We offer two LED solutions, ribbon versus modules.
- Power supply location is based on total wiring length and voltage drop.
- We offer 12 vdc and 24 vdc input options.
- We will recommend the best lighting solution based on design and functionality
- Controlled by 0-10 vDC or DMX 512 dimming

Projection Room



We recommend running main header lines and then connecting in parallel. StepGuard stair nosing profiles will have a one meter lead to allow for connecting in junction box.

Determine location of the Smart Driver Power Supply and run main header from the first step back to the supply.

Connecting each step in parallel. There is no polarity.

Every step must be properly connected to the main wire following local electrical codes.

Please make sure all wire connections are sealed, and there are no loose or pinched wires.

For IP65: Dryconn medium waterproof wirenut (#62225) rated for 600V/5A

For standard installation: Ideal 73B orange wire nut rated for 600V/5A; or local equivalent.

There is no polarity on Light Tape®.

6

HB LED VOLTAGE DROP CHART

FINDING THE CORRECT WIRE

WHAT IS VOLTAGE DROP?

Voltage drop is the amount of voltage loss that occurs through all or part of a circuit due to resistance. Consider voltage drop when specifying your next project.

Use the chart below by first calculating the total wattage load, then selecting the length of wire needed.

24V voltage drop & wire length distance chart (3% drop or 23.28V)*

WIRE GAUGE	5W .2 A	10W .42 A	20W .83 A	30W 1.3 A	40W 1.7 A	50W 2.1 A	60W 2.5 A	70W 2.9 A	80W 3.3 A	90W 3.75 A	100W 4.2 A
22 AWG	107 ft.	52 ft.	27 ft.	17 ft.	13 ft.	10.5 ft.	9 ft.	7.5 ft.	6.8 ft.	6 ft.	5.3 ft.
20 AWG	170 ft.	85 ft.	43 ft.	27 ft.	21 ft.	17 ft.	14 ft.	12 ft.	11 ft.	9 ft.	8 ft.
18 AWG	270 ft.	134 ft.	68 ft.	45 ft.	33 ft.	27 ft.	22 ft.	19 ft.	17 ft.	15 ft.	14 ft.
16 AWG	430 ft.	215 ft.	109 ft.	72 ft.	54 ft.	43 ft.	36 ft.	31 ft.	27 ft.	24 ft.	22 ft.
14 AWG	680 ft.	345 ft.	174 ft.	115 ft.	86 ft.	69 ft.	57 ft.	49 ft.	43 ft.	39 ft.	36 ft.
12 AWG	1090 ft.	539 ft.	272 ft.	181 ft.	135 ft.	108 ft.	90 ft.	77 ft.	68 ft.	61 ft.	56 ft.
10 AWG	1730 ft.	784 ft.	397 ft.	263 ft.	197 ft.	158 ft.	131 ft.	112 ft.	98 ft.	97 ft.	82 ft.

12V voltage drop & wire length distance chart (3% drop or 11.64v)*

WIRE GAUGE	5W .42 A	10W .83 A	20W 1.7 A	30W 2.5 A	40W 3.3 A	50W 4.16 A	60W 5 A
22 AWG	27 ft.	14 ft.	7 ft.	4.5 ft.	3.5 ft.	2.8 ft.	2.2 ft.
20 AWG	43 ft.	18 ft.	9 ft.	6 ft.	5 ft.	4 ft.	3 ft.
18 AWG	68 ft.	34ft.	17 ft.	11 ft.	8 ft.	6 ft.	5 ft.
16 AWG	110 ft.	54 ft.	27 ft.	18 ft.	13 ft.	10 ft.	9 ft.
14 AWG	170 ft.	86 ft.	43 ft.	29 ft.	21 ft.	17 ft.	14 ft.
12 AWG	275 ft.	134 ft.	68 ft.	45 ft.	34 ft.	27 ft.	22 ft.
10 AWG	430 ft.	199 ft.	99 ft.	66 ft.	49 ft.	39 ft.	33 ft.

3% voltage drop rule

This condition causes the load to work harder with less voltage pushing the current. The National Electrical Code recommends limiting the voltage drop from the breaker box to the farthest outlet for power, heating, or lighting to 3 percent of the circuit voltage.

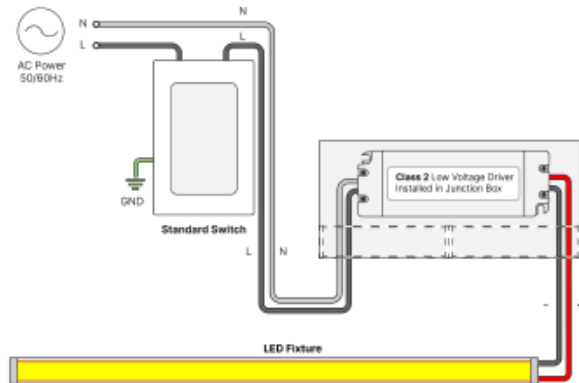
VLM Series 12V / 24V / 48V

Constant Voltage Driver

Compact driver for on/off, PWM dimming, and color-changing applications.

SYSTEM DIAGRAMS

STANDARD SWITCH



CERTIFICATIONS

Safety

- Driver Only: E343741 cULus R/C 8750, CAN/CSA C22.2 No. 250.13-14, CE Certified, Class 2, Class P Driver.
- Driver in Junction Box: E469769 cULus Listed 2108, LED Low Voltage Power Units, CAN/CSA C22.2, Class 2 Power Supply, Nema1 Enclosure. Patent: <https://led-patent.com/>

Environmental

- Indoor/Damp Location

Safety / Warnings / Disclosures

1. Install in accordance with national and local electrical code regulations.
2. This product is intended to be installed and serviced by a qualified, licensed electrician.
3. Only use copper wiring. Use wires rated for at least 176°F (80°C) and certified for use with external connection of electrical equipment.
4. Tape light, attached wire leads, and additional extension cables, connectors, etc., are not rated for in-wall installation unless otherwise noted. Tape light and attached wire leads are field-cuttable.
5. Ensure applicable wire is installed between driver, fixture, and any controls in-between. When choosing wire, factor in voltage drop, amperage rating, and type (in-wall rated, wet location rated, etc.). Inadequate wire installation could overheat wires, and cause fire.
6. Do not install in environment where excessive heat may exist (ex. close proximity to fireplace, etc.) See Ambient Temperature ratings.
7. Do not modify product beyond instructions or warranty will be void.
8. Tape light must be handled with care. Excessive handling, bending, and pressure may damage the product, voiding the warranty.
9. Actual color may vary from what is pictured on this sheet and other print materials due to the limitations of photographic processes.
10. We reserve the right to modify and improve the design of our fixtures without prior notice. We cannot guarantee to match existing installed fixtures for subsequent orders or replacements in regards to product appearance, CCT, or lumen output.

WARRANTY

Limited Warranty

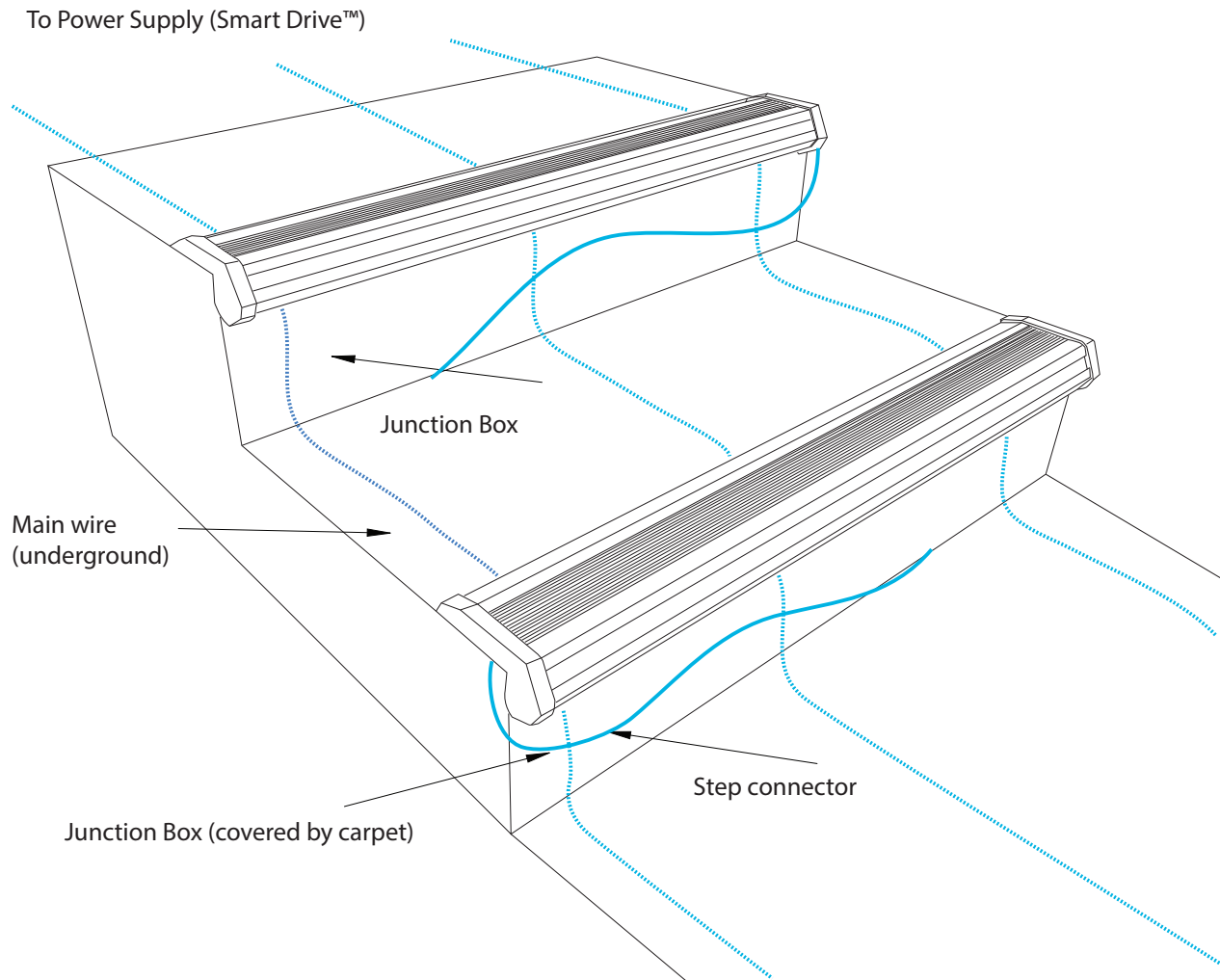
- 3 Year / 5 Year / See Individual Components

This warranty does not include the additional accessories referenced in this specification sheet. Complete warranty details for fixtures and additional accessories are available at www.dioleed.com/limited-warranty/ within the Policies section. For warranty related questions please contact product support.

Consumer's Acknowledgment

Elemental LED, Inc. stands behind its products when they are used properly and according to our specifications. By purchasing our products, the purchaser agrees and acknowledges that lighting design, configuration and installation is a complex process, wherein seemingly minor factors or changes in layout and infield adjustments can have a significant impact on an entire system. Choosing the correct components is essential. Elemental LED is able to work with the original purchaser to make an appropriate product selection to the extent of the limited information that the customer can provide, but it is virtually impossible for Elemental LED to design a system that foresees every unknown factor. For this reason, this Warranty does not cover problems caused by improper design, configuration or installation issues. Any statement from a Elemental LED employee or agent regarding a customer's bill of goods and/or purchase order is NOT an acknowledgment that the products purchased are designed and configured correctly. The purchase agrees and acknowledges that it is the customer's responsibility to adhere strictly to all information contained in the Product Specification Sheets.

There is often more than one way to design, configure and layout an LED lighting application properly to achieve the same lighting effect. Elemental LED strongly recommends that licensed professionals be used in the design and installation of lighting systems that include Elemental LED products. The specifications include important information that a designer and installer should carefully review and strictly follow. Qualified designers and certified and/or licensed installers, with access to the final installation environment, customer goals, and Elemental LED product specifications can make the requisite decisions appropriate for a successful finished lighting application.



The StepGuard™ step system's connector is pre-wired to the requested side during assembly at the factory, based on customer preference for left or right side connection. However, the main wire can be routed through either side or the center of the step rows.

If the step connector ends up on the wrong side and there isn't enough cable to reach it, you can simply add more cable to the connector. This adjustment is recommended to avoid having to disassemble the unit and change the connector side.

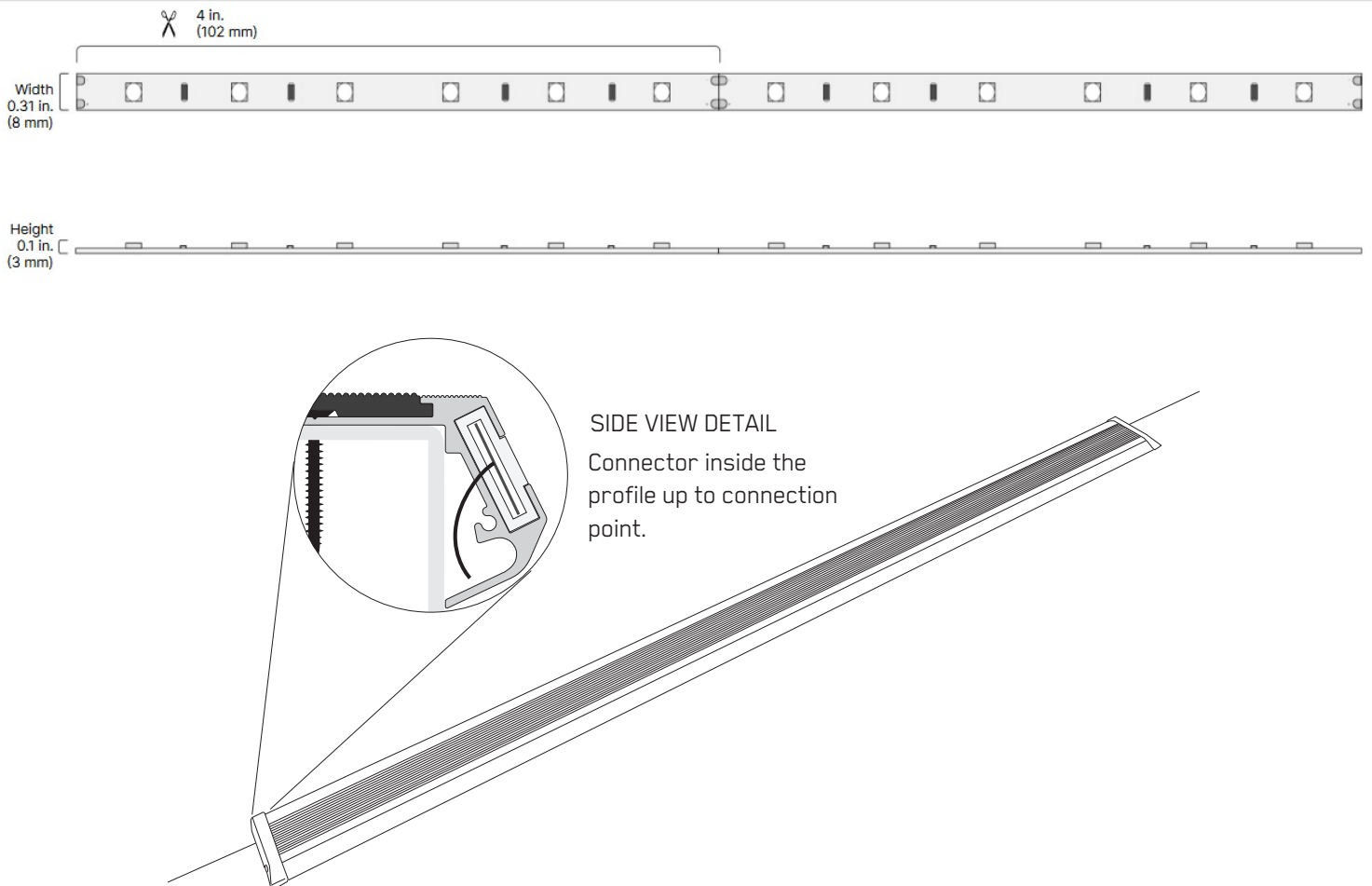
After installing the unit, perform a thorough quality check by stepping on both the center and sides of the profile to ensure it is securely installed. Verify that the connector is concealed inside the profile as shown in the detail below, and ensure there are no loose parts. This ensures everything is properly secured and in place.

Do not put electrical connections under the StepGuard tread -

Show an image of this and then beside it show it under the tread with a red circle around.

Show connection in junction box.

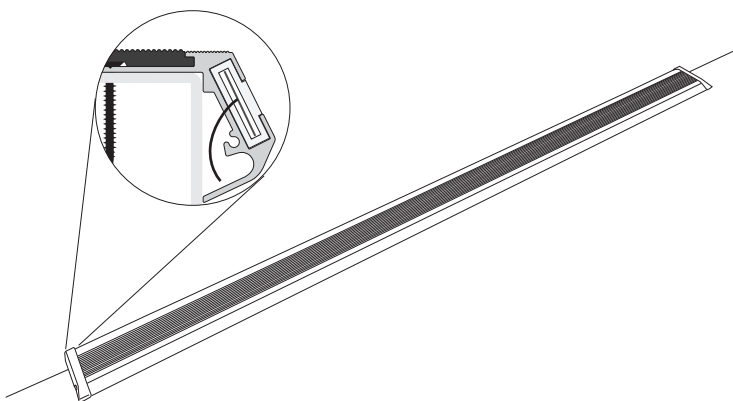
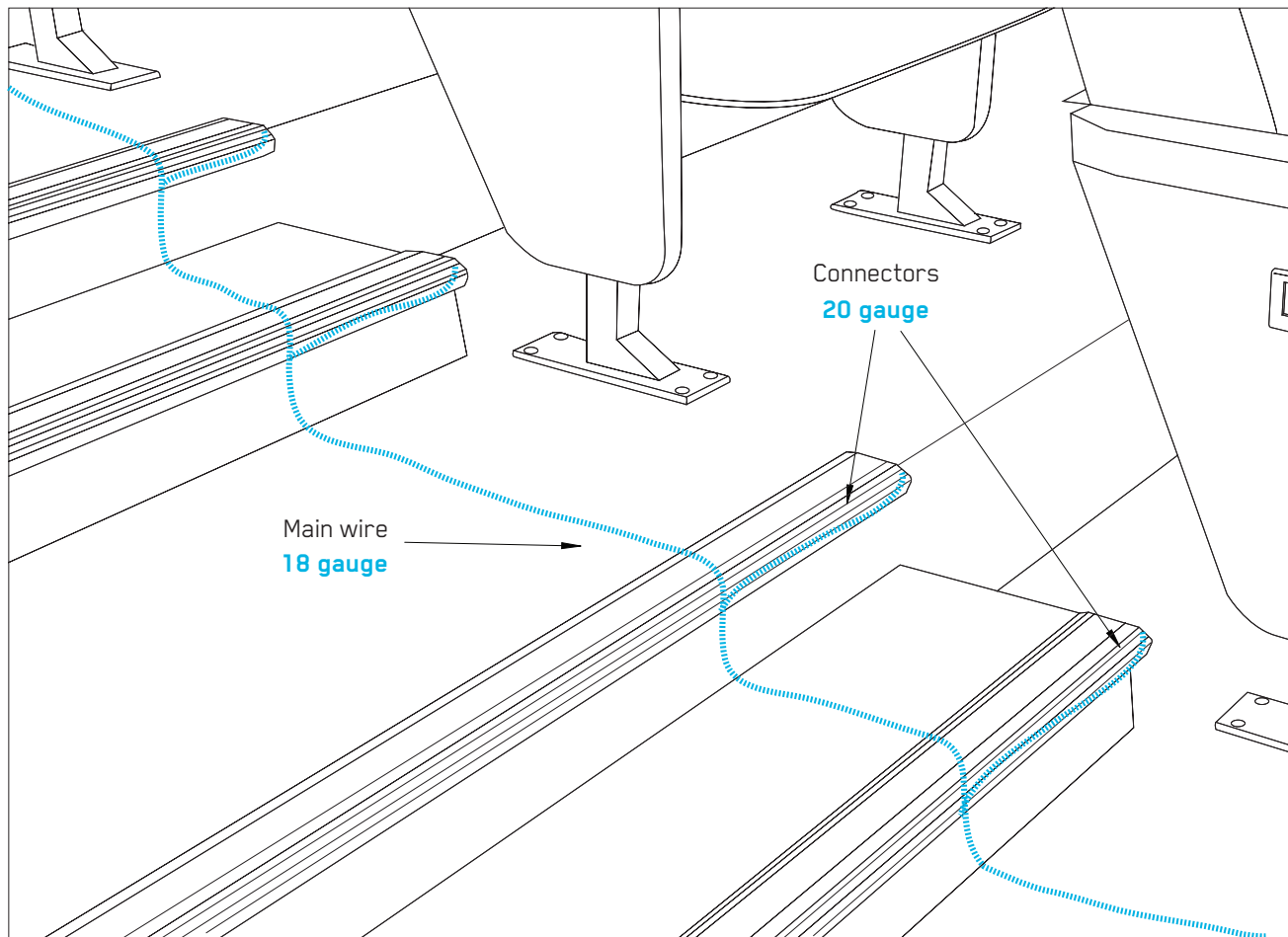
LED Cutting



The StepGuard™ connectors are supplied with 2x20 gauge cables. Even if polarized wire is supplied, remember there is no polarity when connecting Light Tape™.

For the main wiring, we recommend using an 18 gauge cable. Follow all electrical codes when wiring and connecting.

For LEDs, similar concept but in series, and follow voltage drop guide for wiring.



SIDE VIEW DETAIL

Connector inside the profile up to connection point.

Do not run wiring under the stair tread where connection points are pinched.

▶ IMPORTANT INFORMATION WHEN WIRING LED PROFILE LEADS TO MAIN LINE:

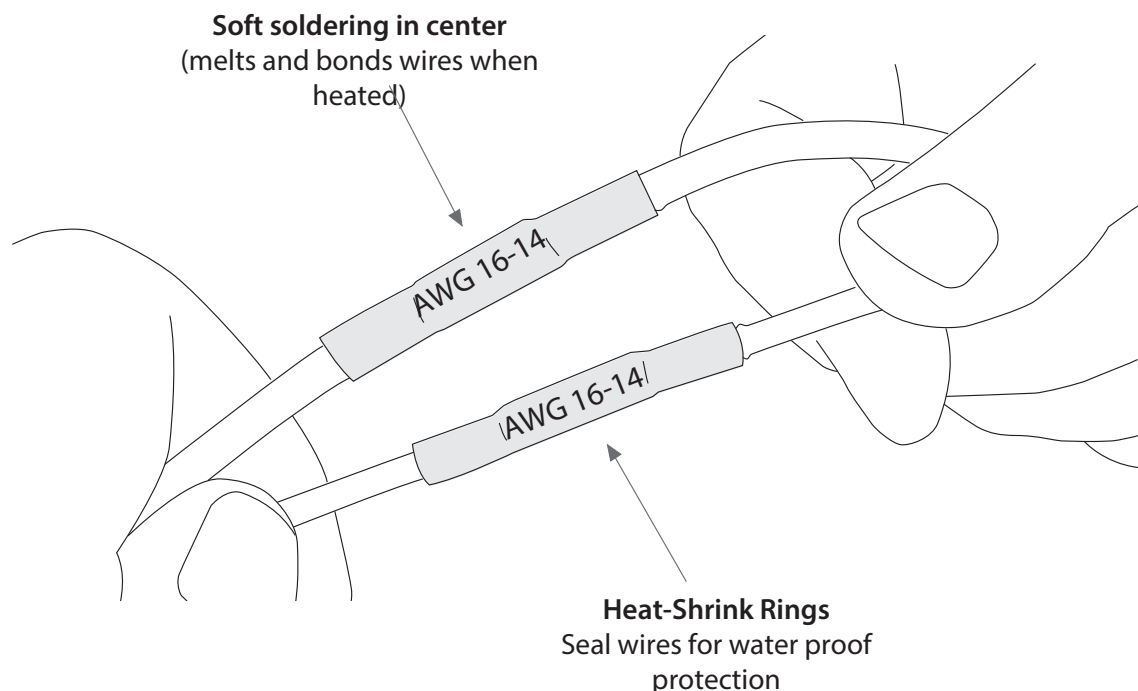
Always use Heat Shrink Tubing Thin Wall, 2:1 Shrink Ratio or 16-14 AWG Clear Seal Heat-Shrink Butt Splice Terminal to seal connections between profile lead and your main wiring (shown below).

Electrical tape is not recommended as it may wear or begin to lose adhesion over time exposing wires.
16-14 AWG Clear Seal

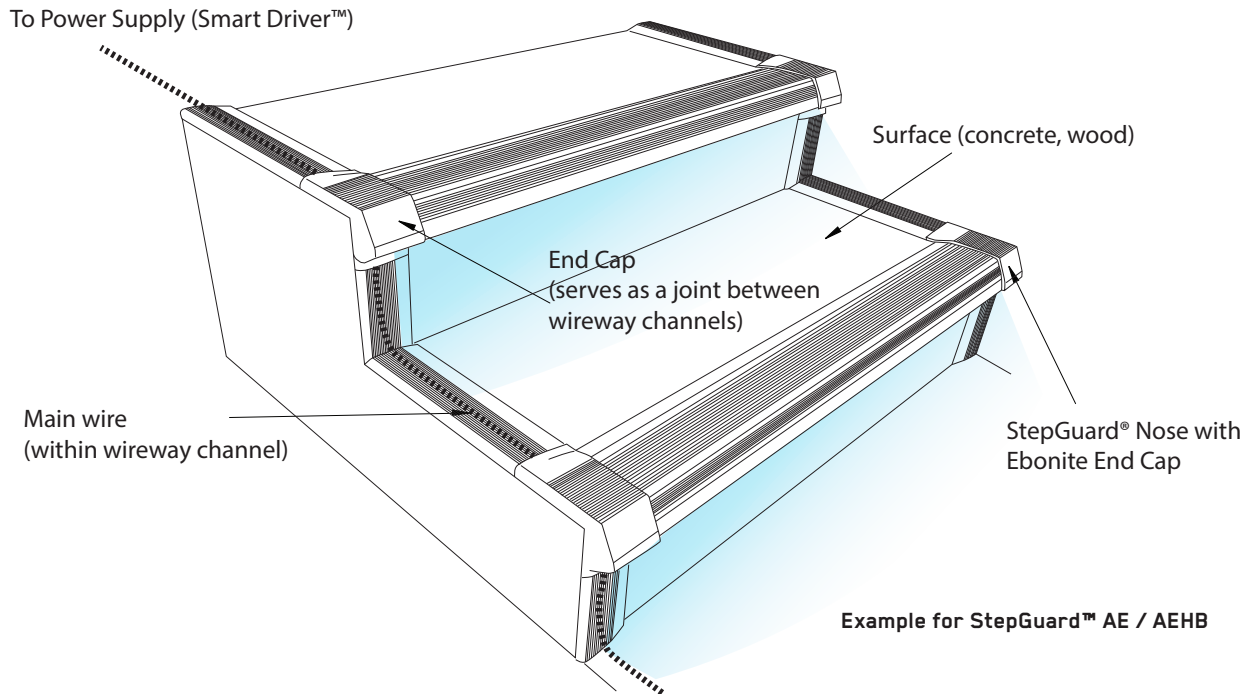
LEDs, attached wire leads, and additional extension cables, connectors, etc., are not rated for in-wall installation unless otherwise noted. LED ribbon and attached wire leads are field-cuttable

Ensure applicable wire is installed between driver, fixture, and any controls in-between. When choosing wire, factor in voltage drop, amperage rating, and type (in-wall rated, wet location rated, etc.). Inadequate wire installation could overheat wires, and cause fire from LEDs.

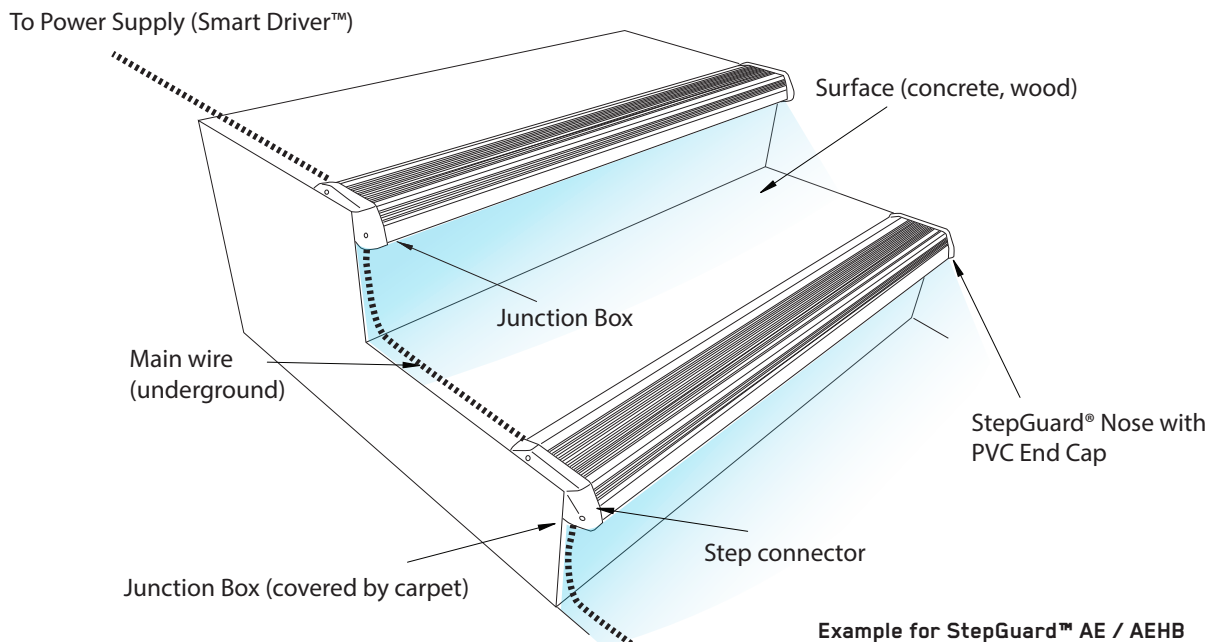
Only use copper wiring. Use wires rated for at least 176°F 80°C and certified for use with external connection of electrical equipment.



► System Configuration for surface wiring with our raceway system



► System configuration for pre-installed underground wiring





Electro-Luminx Lighting Corporation

1320 North Arthur Ashe Boulevard	1.804.355.1692
Richmond, Virginia 23230	thelighttapeteam@lighttape.com