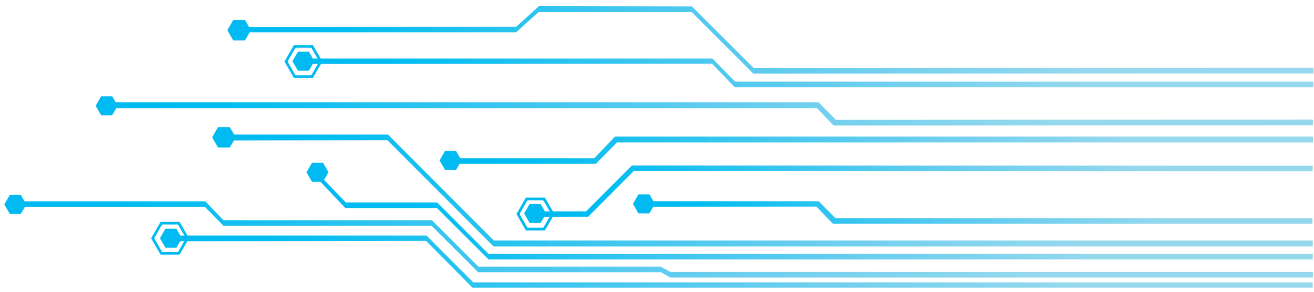
StepGuard®



# StepGuard™ Electrical Wiring Considerations

LightTape®
INSIDE

V1-11-01-2024

# Table of Contents

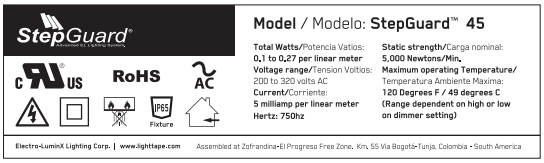


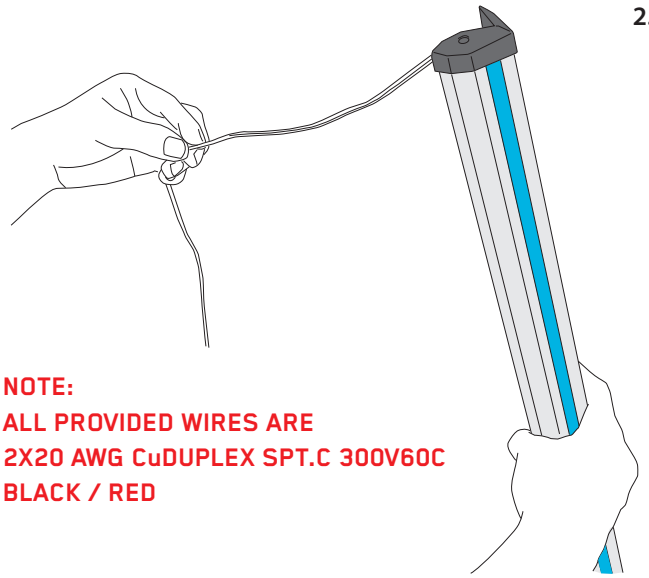
LightTape® INSIDE

StepGuard™ will arrive connected and ready for installation.
There will be two to four wires exiting each StepGuard product.
A black wire is for Light Tape™ with no polarity (it may come polarized depending on availability) and will use our Smart Drivers to power. Voltage drop and run lenghts are not a concern. If your unit comes with an integrated row number, there will be another separated wire for it (black or polarized)

A polarized wire are for our high bright LED solution and have a different wiring plan than Light Tape. Voltage drops in wiring must be taken into consideration.

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



**NOTE:**
**ALL PROVIDED WIRES ARE 2X20 AWG CuDUPLEX SPT.C 300V60C BLACK / RED**

### 2. Project and Product Detail


### 3. International Bar Code

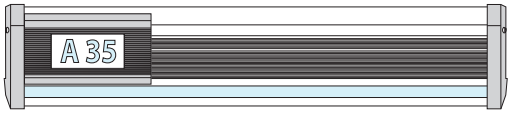

### 4. LightTape™ Hologram


### 5. StepGuard Tech Support

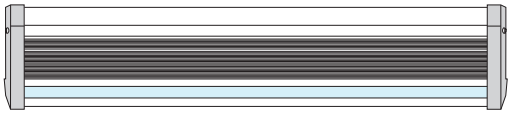

QR code

## TOP VIEW

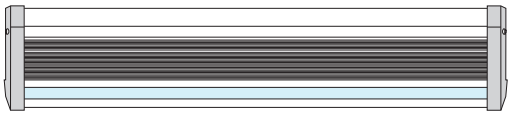
With integrated Row Number




Single Light

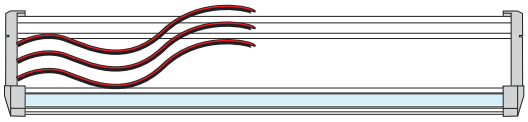


Duo Light (Light Tape or HB LED's)

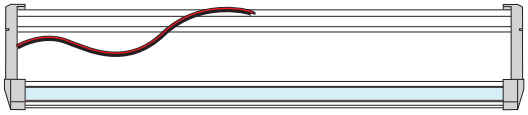


## BOTTOM VIEW

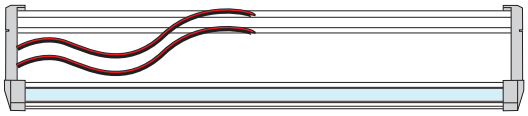
Row number
Top Light
Bottom Light



Top Light



Top Light
Bottom Light



After unpacking, check each step for a label that includes specific details: 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.

# Wiring your venue with Light Tape™ vs LEDs

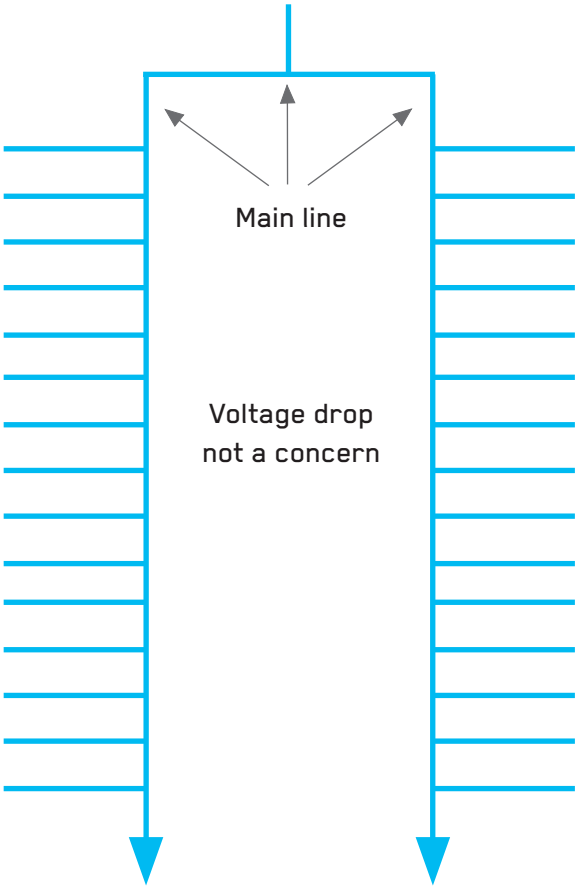
## Light Tape™

- Wired in parallel
- Negligible voltage drop over 100 meters
- No polarity
- Drivers work on load, not distance.
- One for venue is possible
- Full dimming control without flicker

## HB LEDs

- 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

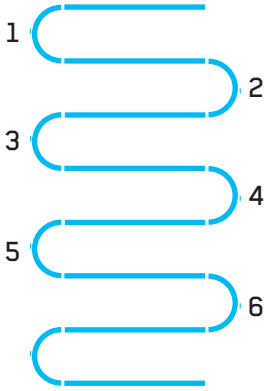
Smart Driver™ Power Supply




Distance of 100 feet or more

LED 24 or 12 vDC Driver

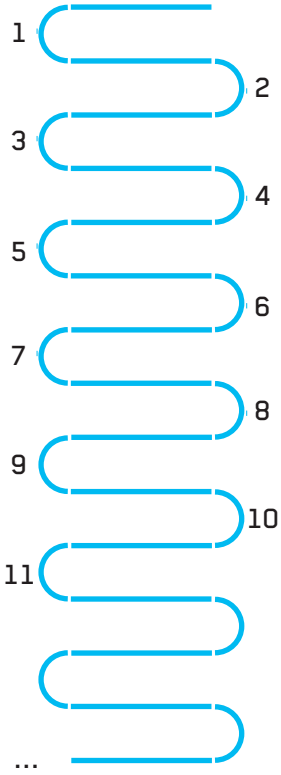
HB RIB 55
55 feet of Wire




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

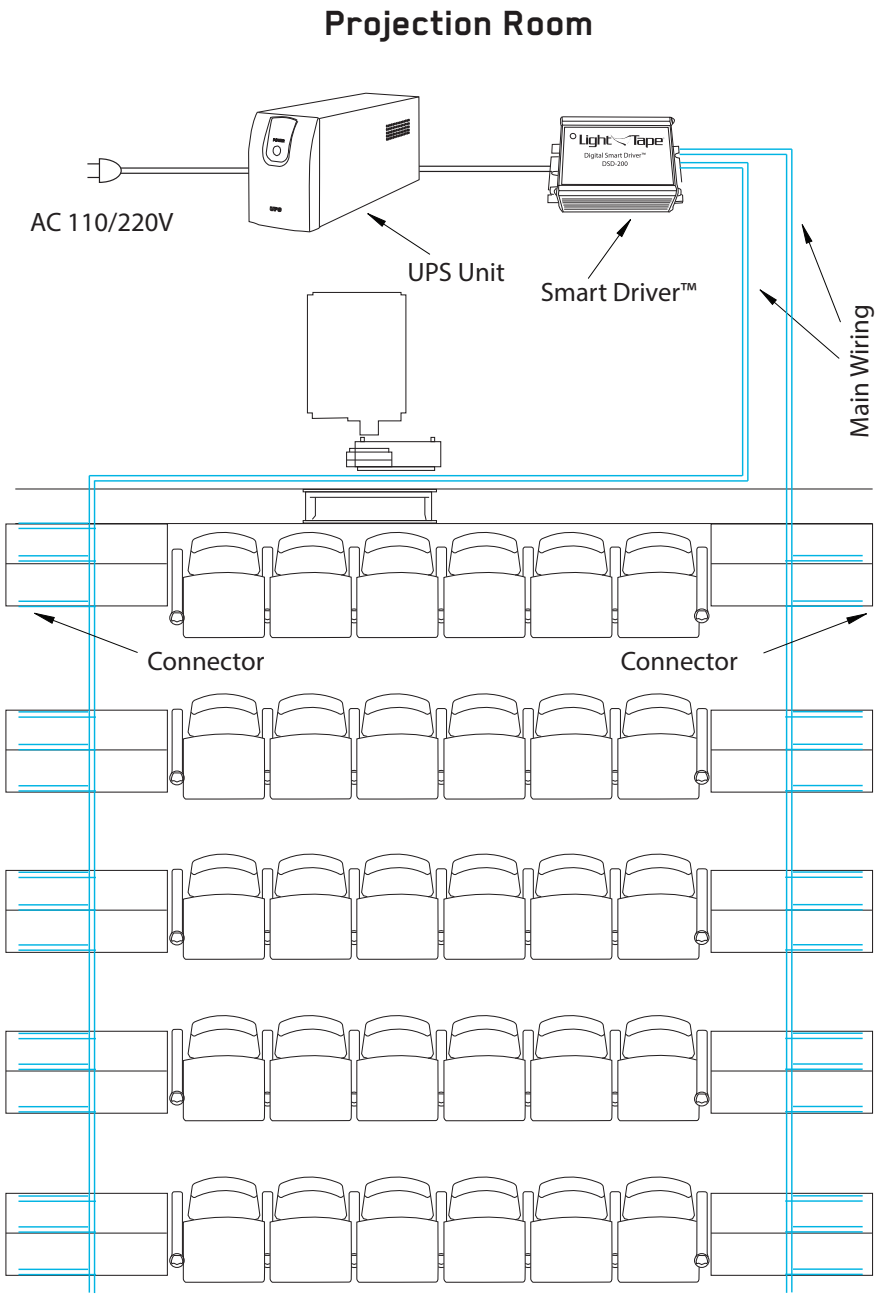



1+2+3+...< 100 feet

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

**Light Tape wiring diagram for our Stepguard Stair nosings.**

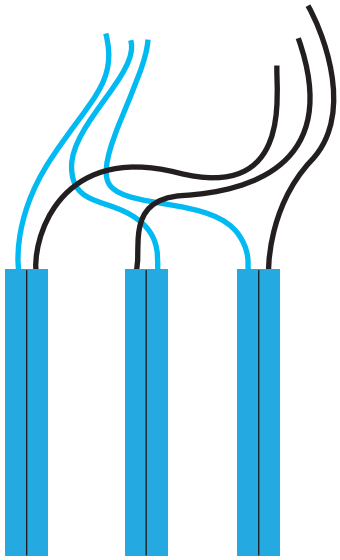
- Light Tape is connected in parallel.
- One power supply can illuminate an entire venue.
- Or to control zones, break up into different loads.
- Controlled by 0-10 vDC or DMX 512




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®.

# Light Tape™ connections

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



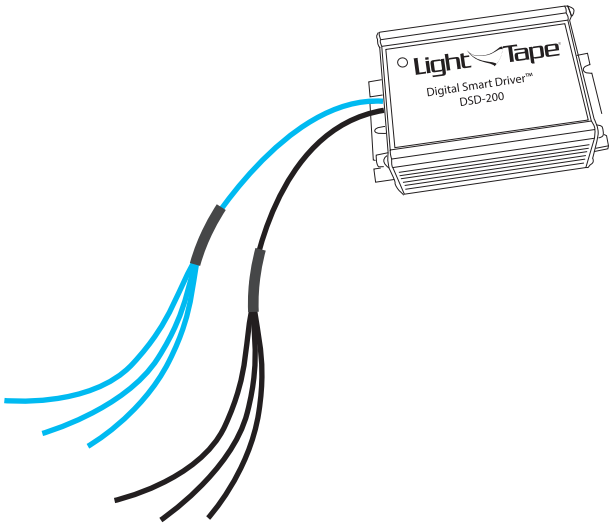
Left or right side of center line
does not matter, pick one.

Smart Driver™ Power Supplies
work on load

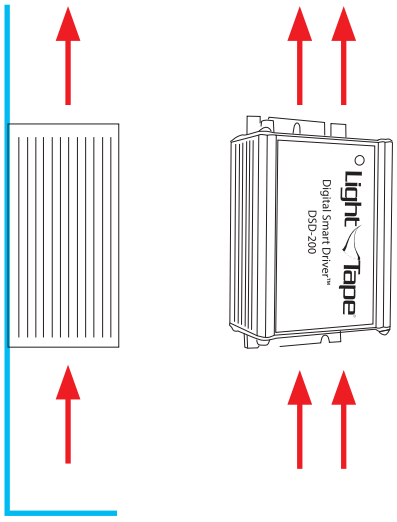

| Smart Driver™ | Top light only | Down light only | Duo |
|---|---|---|---|
| DSD-200 | 20 MT | 10 MT | 7 MT |
| DSD-400 | 40 MT | 20 MT | 13 MT |
| DSD-1000 | 100 MT | 50 MT | 33 MT |
| DSD-2000 | 200 MT | 100 MT | 15 MT |
| DSD-4000 | 400 MT | 200 MT | 133 MT |

Number of meters on one power supply

- Group wires when needed with one main back to power



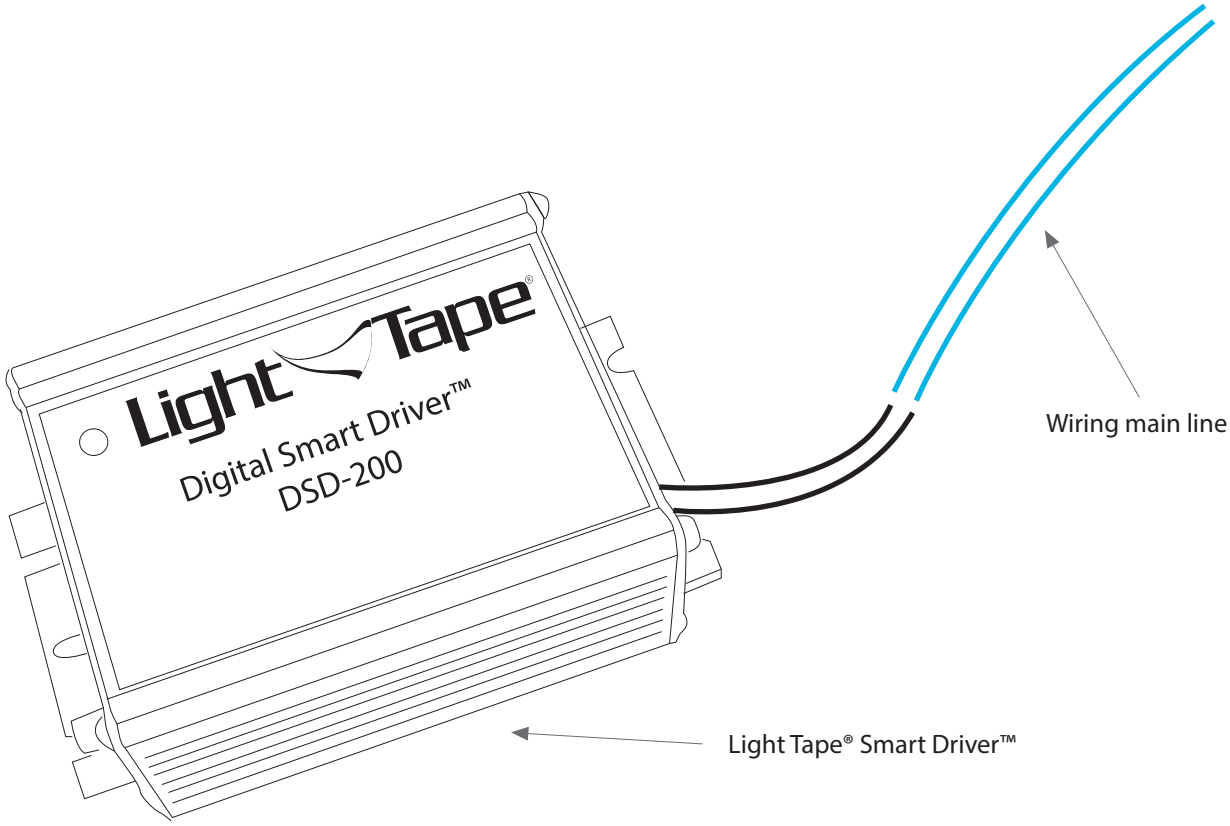

- Mount power supplies vertically fan on the bottom



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.
Under-loading powers supply can cause it fail.
The DSD200 model can handle small loads for testing.

**NOTE:**

Light Tape® has no polarity. Please check wiring for shorts before powering, 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.
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.

## 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.

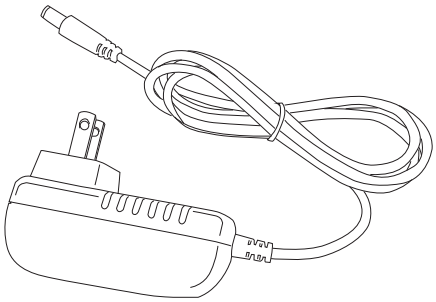
## Mounting

Power 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.

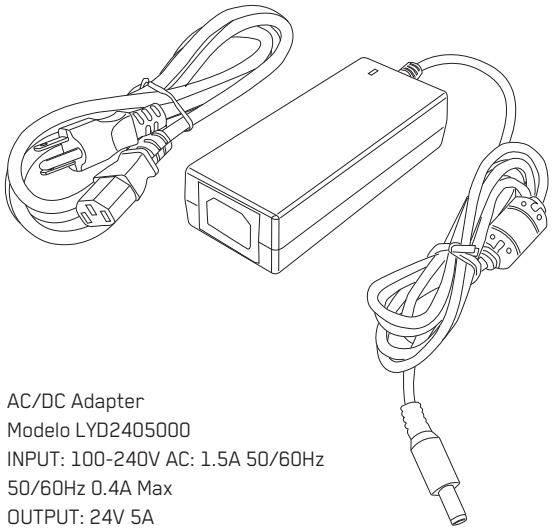
In areas where excessive shock or movement occur, we recommend vibration dampers be installed under the mounting screws.
If your location is susceptible to power surges or inconsistent power, it is important to have a surge protection system in place to protect against power spikes.

## 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 adaptador-cable.



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



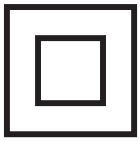
AC/DC Adapter
Modelo LYD2405000
INPUT: 100-240V AC: 1.5A 50/60Hz
50/60Hz 0.4A Max
OUTPUT: 24V 5A

## 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 equivalente 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.

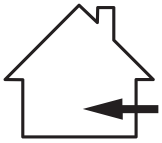
THIS PRODUCT CANNOT BE USED ON INSTALATIONS OR FLAMABLE SURFACES

RISK OF ELECTRIC SHOCK



CLASS II


AC CURRENT



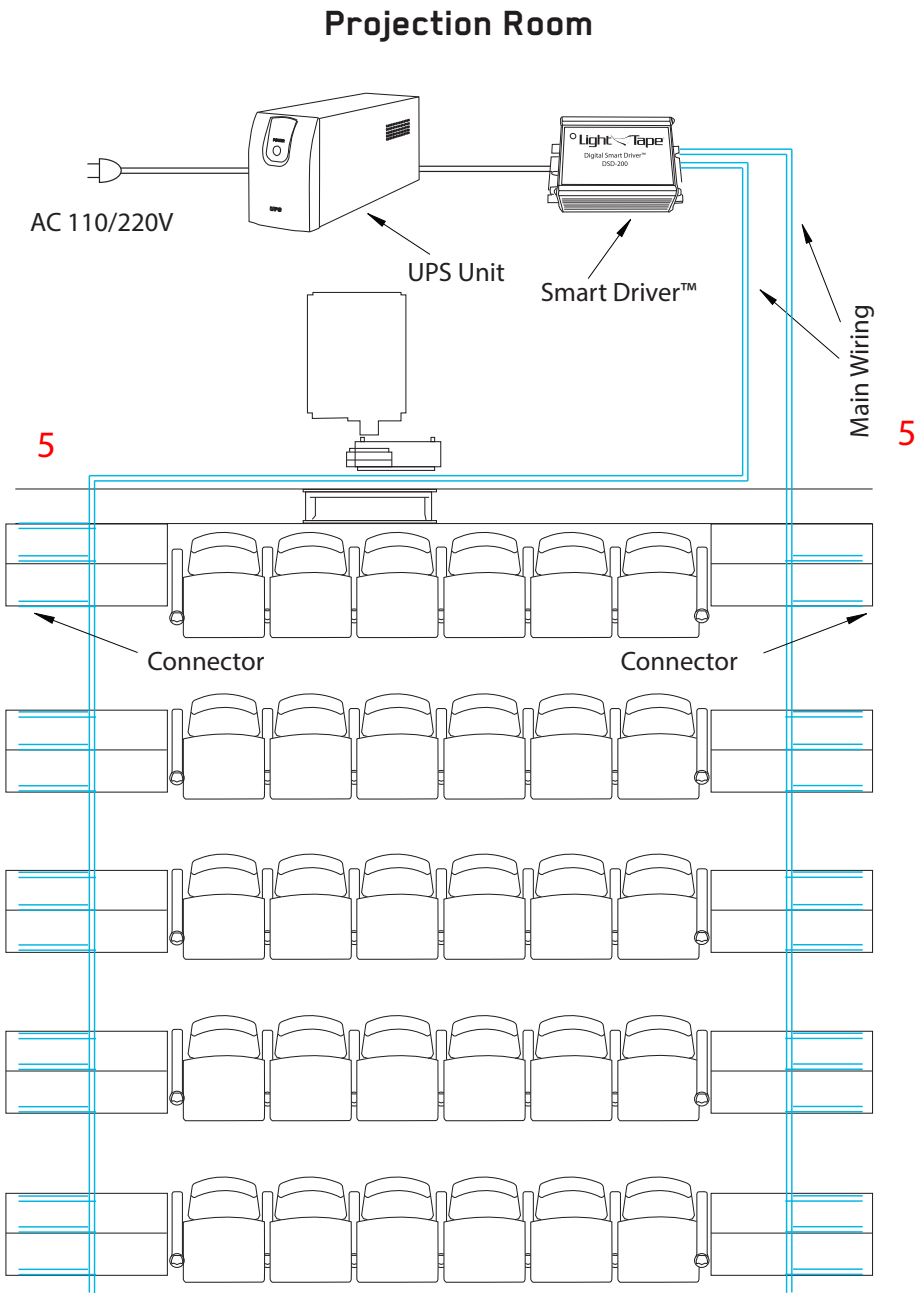
INDOOR USE ONLY

## Follow all Electrical Codes when installing and wiring

**HB LED wiring diagram for our Stepguard downlighting systems.**

- Light Tape is connected in parallel.
- One power supply can illuminate an entire venue.
- Or to control zones, break up into different loads.
- Controlled by 0-10 vDC or DMX 512

4




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)***

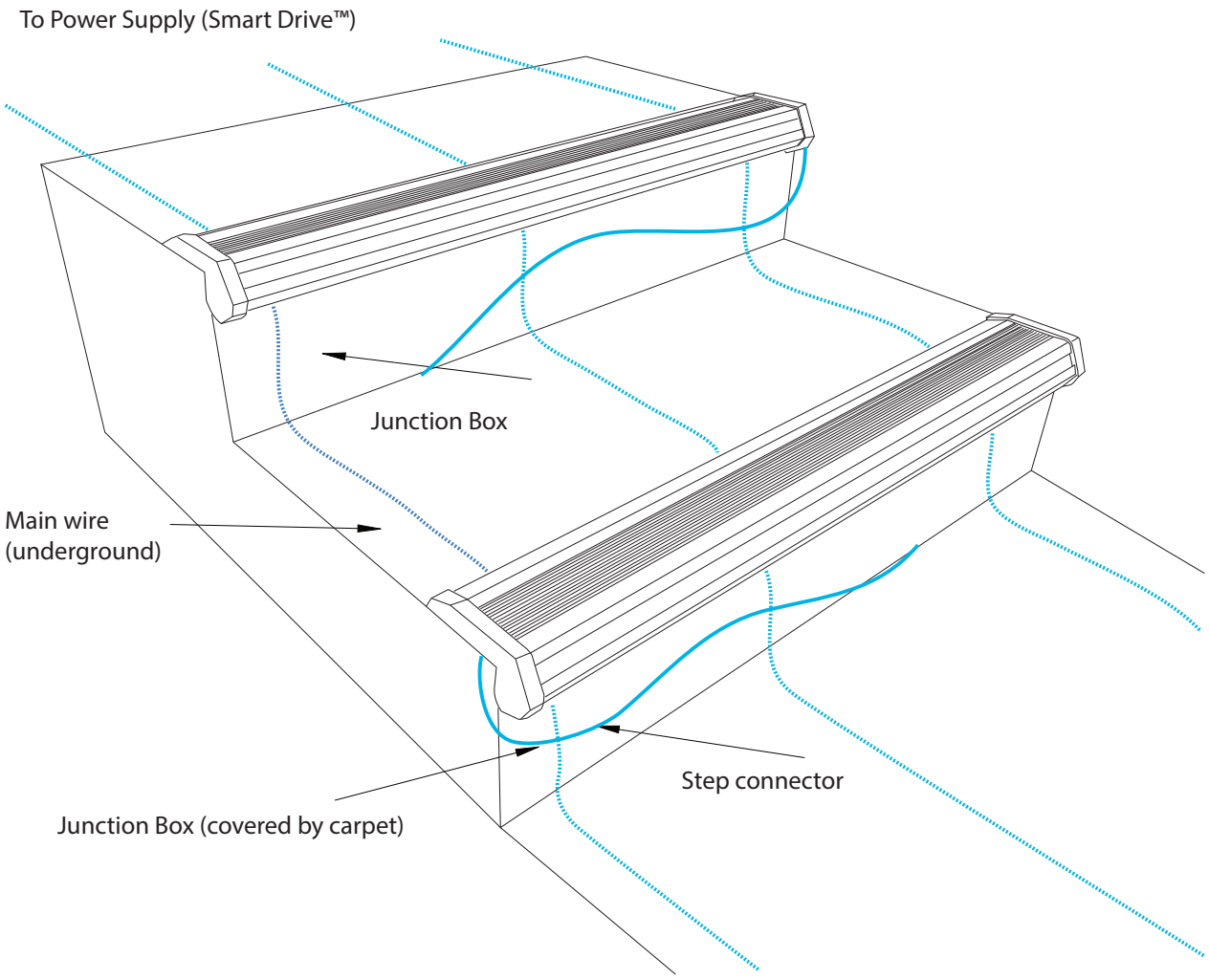
| WIRE GAUGE | 5W .2 A | 10W .42 A | 20W .83 A | 30W 1.3 A | 40W 1.7 A | 50W 2.1 A | 60W 2.5 A | 70W 2.9 A | 80W 3.3 A | 90W 3.75 A | 100W 4.2 A |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **22 AWG** | 107 ft. | 52 ft. | 27 ft. | 17 ft. | 13 ft. | 10.5 ft. | 9 ft. | 7.5 ft. | 6.8 ft. | 6 ft. | 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.*



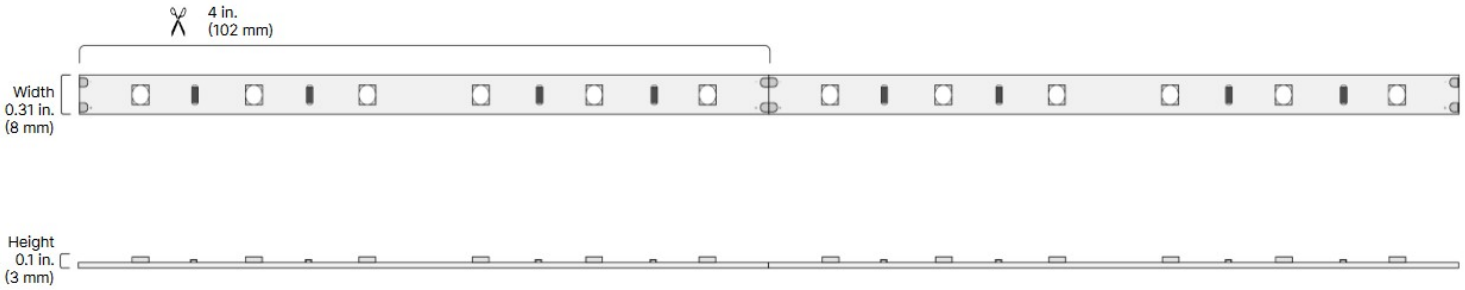

The StepGuard™ step system's connector is pre-wired to the requested side during assembly at the factory, based on customer preference for left or right side connection. However, the main wire can be routed through either side or the center of the step rows.

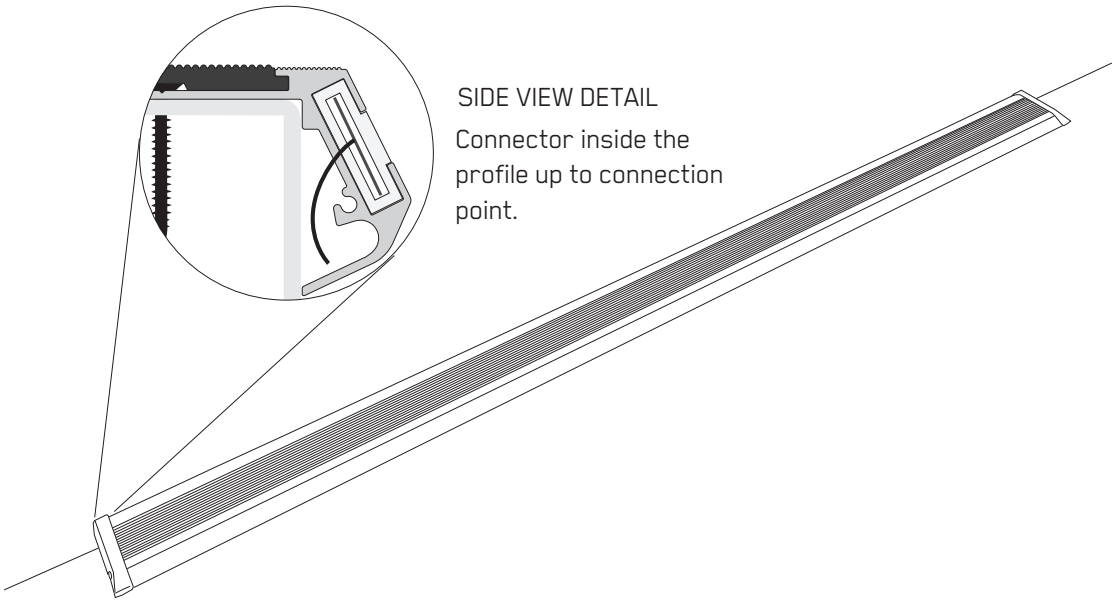
If the step connector ends up on the wrong side and there isn't enough cable to reach it, you can simply add more cable to the connector. This adjustment is recommended to avoid having to disassemble the unit and change the connector side.

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

## LED Cutting



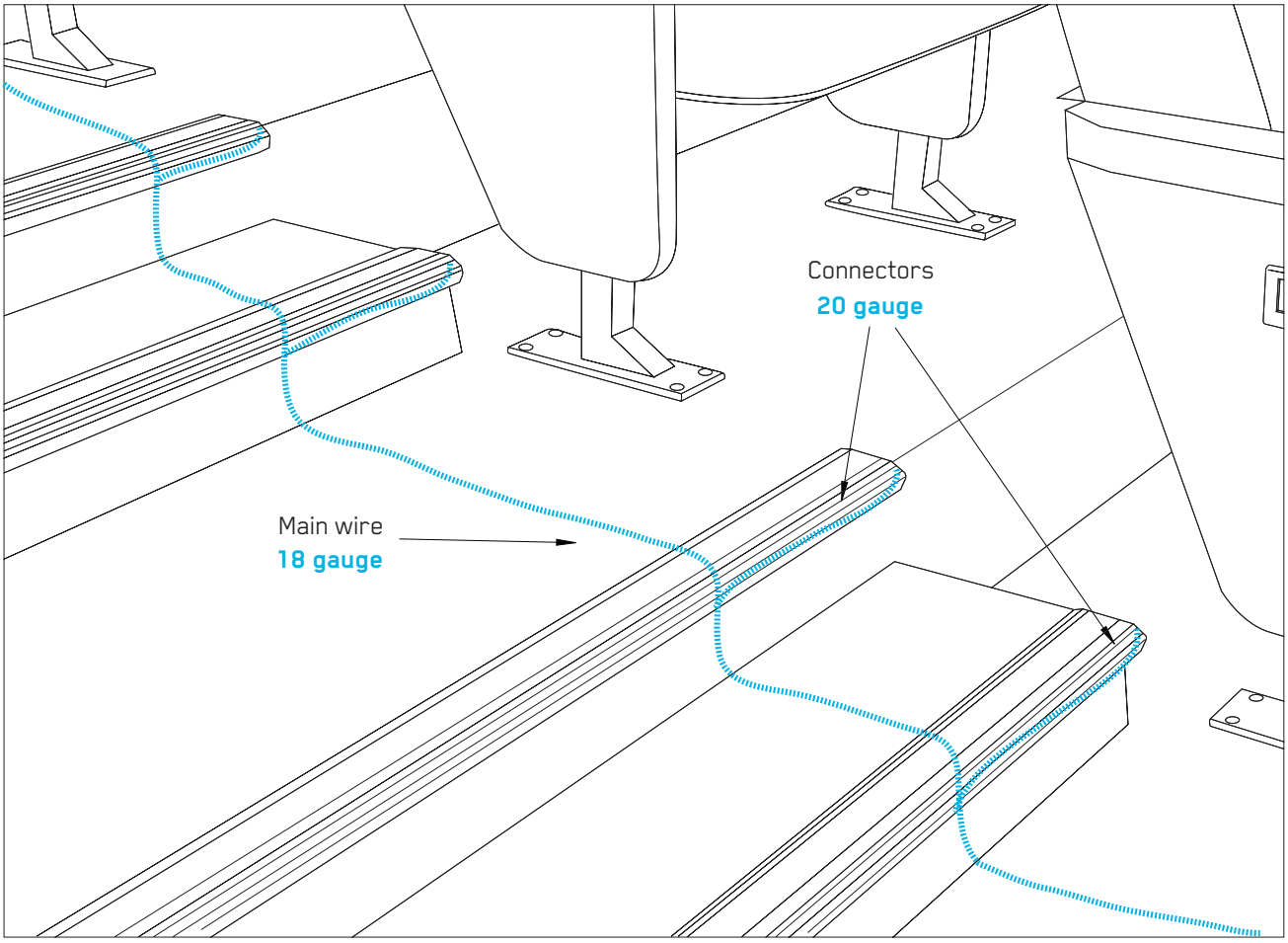



SIDE VIEW DETAIL

Connector inside the profile up to connection point.

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.



## IMPORTANT INFORMATION WHEN WIRING 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).

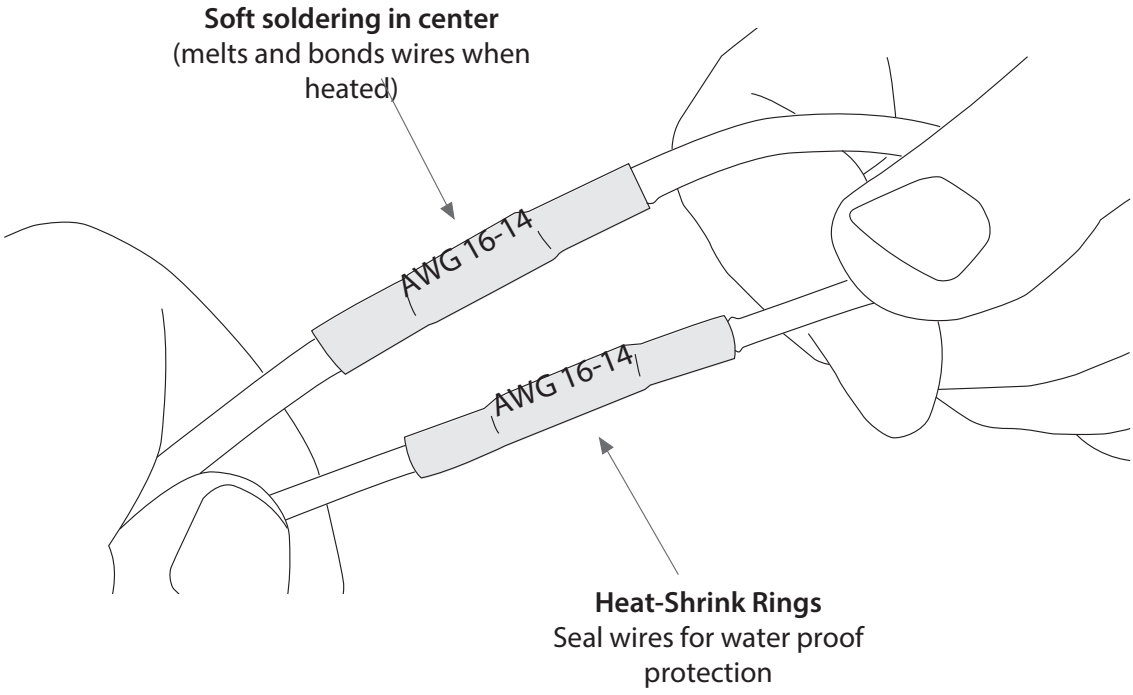
Electrical tape is not recommended as it may wear or begin to lose adhesion over time exposing wires.
16-14 AWG Clear Seal

Each maximum run requires a dedicated power feed from the driver. Do not extend beyond the recommended maximum run length.

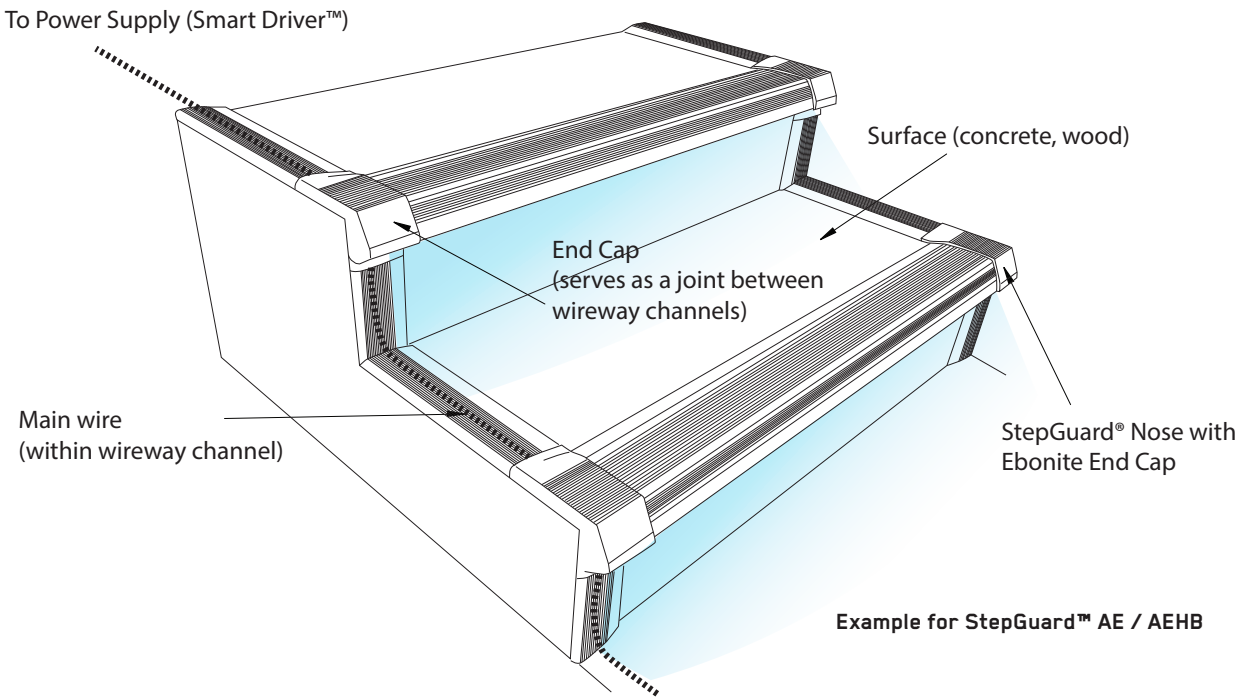
LEDs, attached wire leads, and additional extension cables, connectors, etc., are not rated for in-wall installation unless otherwise noted. Tape light and attached wire leads are field-cuttable

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.

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

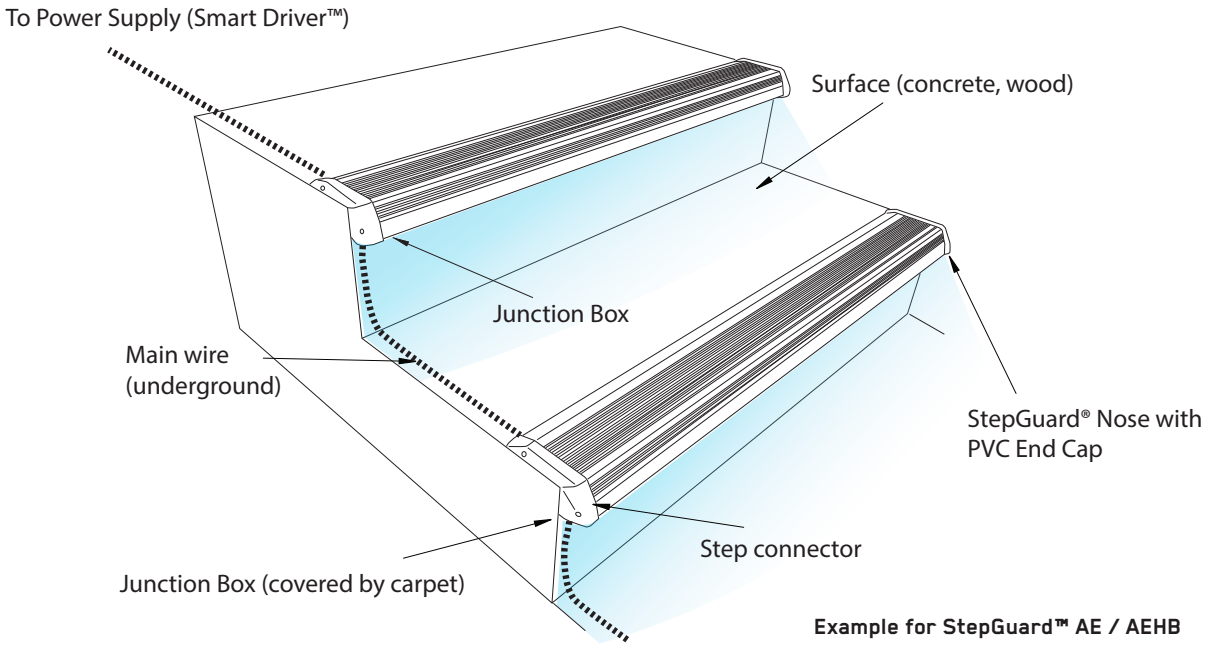


## System Configuration for surface wiring




**Example for StepGuard™ AE / AEHB**

## System configuration for pre-installed underground wiring




**Example for StepGuard™ AE / AEHB**