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clipNslide™

Technical Bulletin #12

clipNslide™ Design Guide

LUMINAIRE AND LIGHTING SYSTEM DESIGN CONSIDERATIONS

1. Installation shall be done in accordance to the applicable electrical code and specific application regulations.
2. Luminaires installed in a damp or wet location shall be provided with a drain hole.
3. The user shall be the sole party responsible for the certification of the system in which the clipNslide™ is used.
4. The user shall be the sole party responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.
5. The user shall be the sole party responsible for the published technical, safety information and installation instructions pertaining to the luminaire and lighting system.

LED ARRAY DESIGN CONSIDERATIONS

1. The 7 watts (DC) limit of the clipNslide™ shall not be exceeded.
2. Load calculation shall be done according to the chart on figure 4. The number of LEDs that can be driven will vary according to each specific LED and the design of the LED array.
3. The LEDs comprised in the LED array shall be connected in series (figure 1), parallel (figure 2) or series and parallel combination (figure 3). The user is responsible for the proper design of the LED circuit and thermal dissipation properties.
4. Wire from the clipNslide™ to the LED array shall be 24 AWG minimum.

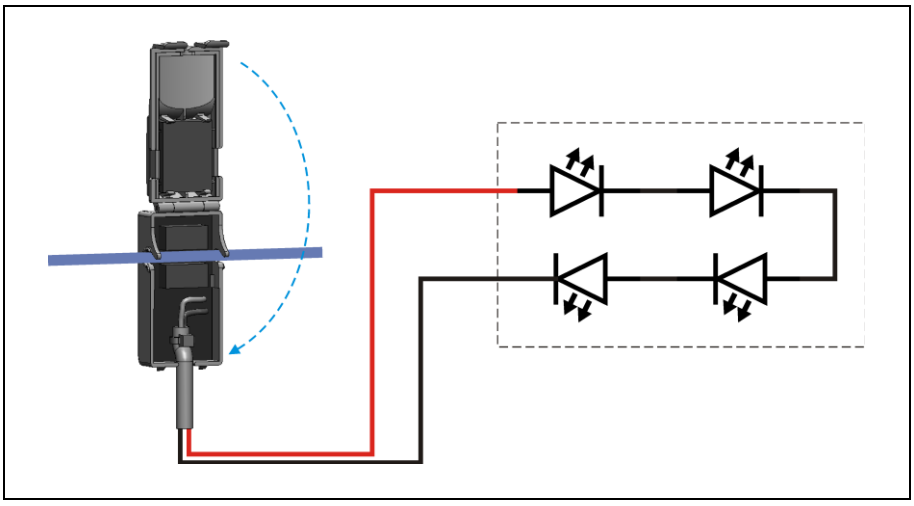


Figure 1: Series circuit

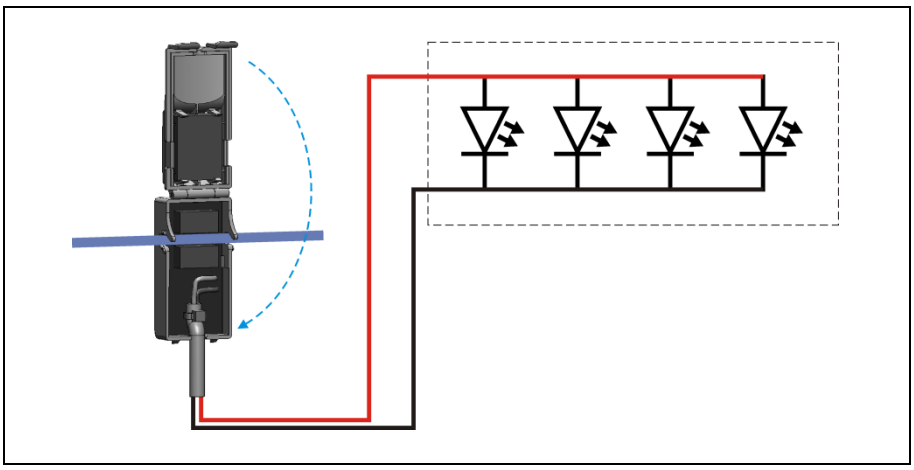


Figure 2: Parallel circuit

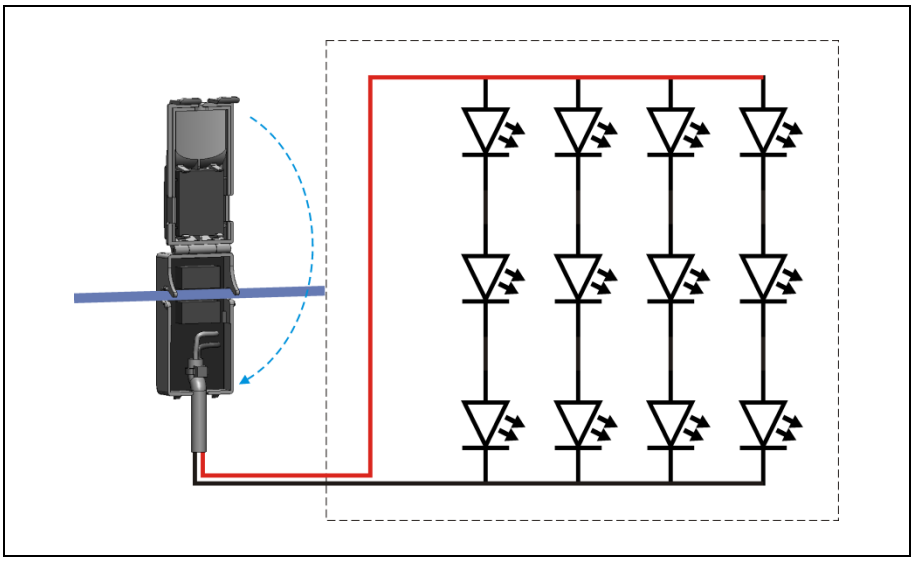


Figure 3: Series and parallel combination circuit

- The preceding schematics are only examples. Other configurations are possible.
- It is the responsibility of user to validate the reliability and performance of the LED circuit.

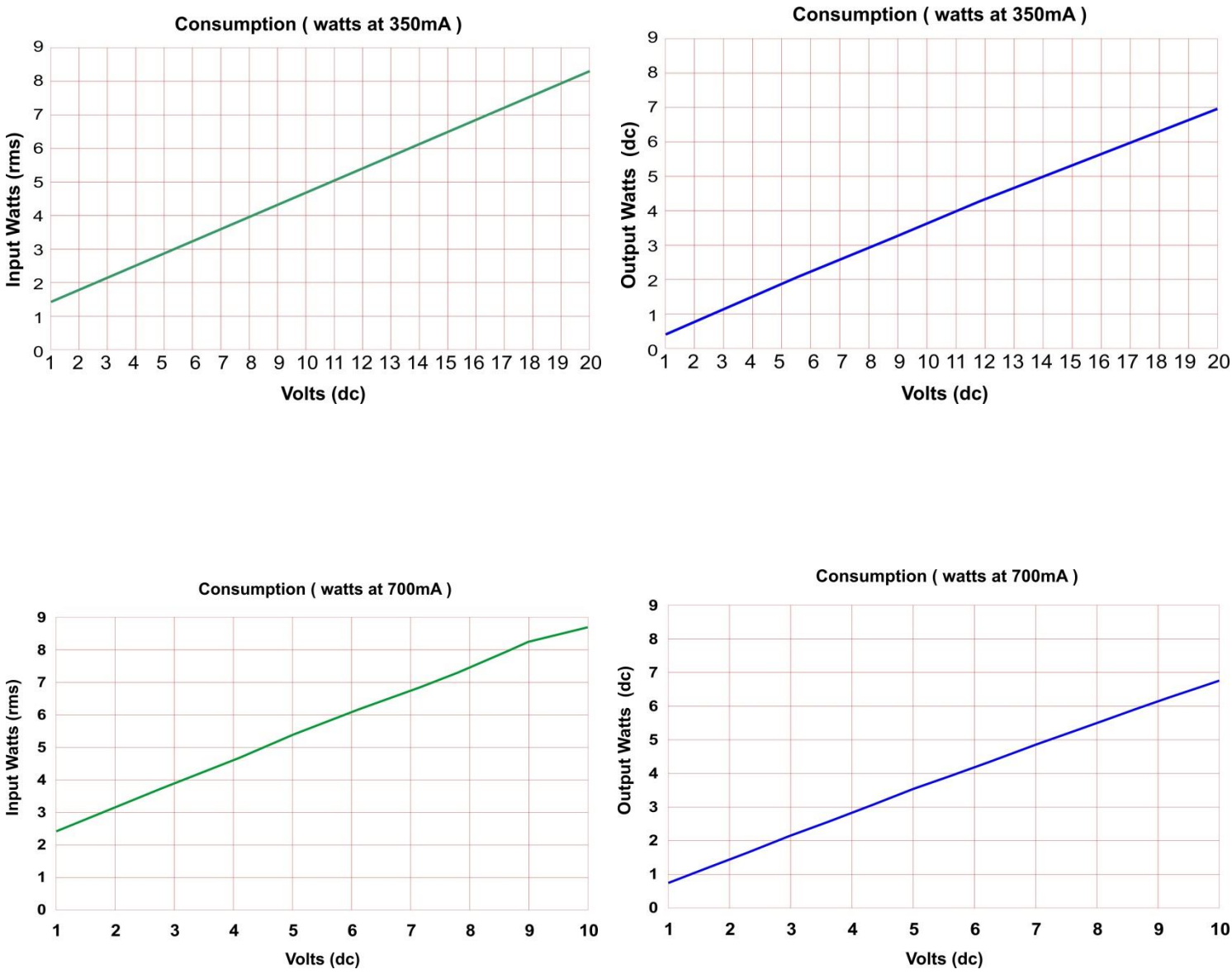


Figure 4: Loading chart

5. • To calculate the watts that LEDs will take on the clipNslide™ dc circuit use the "output (watts dc)" curve on figure 4.
   • Do not exceed the 7watt (dc) limit of the clipNslide™, if the limit is exceeded the overload protection will cut the circuit and the LEDs will not light up.
   • Once turned on the overload protection will prevent any power of going to the LEDs. To reset the protection the main power supply needs to be shut off and then back on or the clipNslide™ needs to be physically opened and then clipped again.
   • Overloading will not damage the clipNslide™ but will prevent correct operation.
   • Depending on the load that is put on the clipNslide™ the mA to the LED will vary. Validate with the "mA to LEDs" curve of figure 4.

   Example 1: • *3 LEDs at 3.3 volts on a 350 mA* clipNslide™ *will take 3.5 watts dc*
   This is within the 7 watts (dc) limit of the clipNslide™ *and there will be 362 mA through the LEDs*

   Example 2: • *3 LEDs at 3.3 volts on a 700 mA* clipNslide™ *will take 6.8 watts dc*
   This is within the 7 watts (dc) limit of the clipNslide™ *and there will be 677 mA through the LEDs*

6. To calculate the watts that the finished luminaire will take on the LMPS use the "input (watts rms)" curve
   Example 1: • *3 LEDs at 3.3 volts on a 350 mA* clipNslide™ *will take 4.6 watts on the power supply*
   Example 2: • *3 LEDs at 3.3 volts on a 700 mA* clipNslide™ *will take 8.7 watts on the power supply*

7. Validate the finished design by measuring with a voltmeter and an ammeter on the dc side of the circuit and with a true RMS meter or power meter on the ac side of the circuit.

8. Validate the total consumption of the system (including the power supply overhead) with a true RMS meter or power meter on the ac side of the circuit.

CONSUMPTION CALCULATION

clipNslide™ POWER CONSUMPTION

1. • If the power supply is going to be installed at a distance of the LEDs apply a distance factor to the wattage of the power supply (table 1, 2 and 3).
   • Select the distance factor according to the configuration that will be used, refer to the LMPS secondary circuit configurations section. Possible configurations are twisted pair extension (figure 7), BX extension (figure 8), straight pair extension (figure 9), single wire loop (figure 10), single wire loop with return (figure 11), Twisted pair with single wire loop (figure 12) and twisted pair with single wire loop with return (figure 13).
   • The length of wire to use for the distance factor is the total length of the transport wire and/or the length of the wire in the loop that doesn't pass through a module:
   • A larger wire size will not permit a longer run.

   Watts available for the clipNslide™ LEDs = wattage of the power supply X distance factor

   Example 1: • One LMPS-750 with LEDs at 100 feet (twisted pair extension)
   75 watts X .69 = 51.75 watts available for the LEDs

   Example 2: • One LMPS-350 with LEDs at 100 feet (single wire loop)
   35 watts X .32 = 11.20 watts available for the LEDs

2. Calculate the number of clipNslide™ that can be installed on a power supply:
   number of clipNslide™ = wattage of the power supply / wattage of one luminaire
   - If using a distance factor use the "*watts available for clipNslide™*" instead of the "*wattage of the power supply*"
   - Round the result down to the next unit

   Example 1: • Modules near the power supply $\frac{75 \text{ watts}}{4.6 \text{ watts}}$ = *16 clipNslide™* • Modules at 100 feet of the power supply $\frac{51.75 \text{ watts}}{4.6 \text{watts}}$ = *11 clipNslide™*

   Example 2: • $\frac{35 \text{ watts}}{8.7 \text{ watts}}$ = *4 clipNslide™* • $\frac{11.20 \text{ watts}}{8.7 \text{ watts}}$ = *1 clipNslide™*

3. Calculate the total wattage of the LEDs:
   Total wattage = number of clipNslide™ X watts for one clipNslide™

   Example 1: • *16 clipNslide™ X 4.6 watts* =*73.6 total watts*

   Example 2: • *4 clipNslide™ X 8.7 watts* =*34.8 total watts*

SYSTEM POWER CONSUMPTION

4. To calculate the system wattage, take the number of watts of LEDs at the output of each power supply and use the appropriate power curve on figure 5 to determine the system power consumption. The average output power can also be used if the load is distributed evenly throughout the power supplies:

   Example 1: • *73.6 watts of LEDs per LMPS-750* *=78 watts system power consumption*

   Example 2: • *34.8 watts of LEDs per LMPS-350* *=43 watts system power consumption*

5. To calculate the total system power consumption, add the system power consumption of each power supply together.

   Example 1: • *78 watts of LEDs on 2 LMPS-750* *=156 watts system power consumption*

   Example 2: • *43 watts of LEDs on 1 LMPS-350* *=43 watts system power consumption*

6. Calculate the cost of electricity for a year for the complete architectural lighting project:

$$\text{Price of electricity per year} = \frac{\text{total system wattage X hours of usage per day X 365 days per year X price of electricity per kw/h}}{1000}$$

   - "*Price of electricity per kW/h*" according to electricity distributor

   Example 1: • $\frac{\text{156 watts X 10hrs/day X 365 days/year X 0.07\$ per kw/h}}{1000}$ *=39.86$ of electricity per year*

   Example 2: • $\frac{\text{43 watts X 10hrs/day X 365 days/year X 0.12\$ per kw/h}}{1000}$ *=18.84$ of electricity per year*

INTERPOLATION OF THE DISTANCE FACTOR

7. The values given in tables 1, 2 and 3 are usually enough to do proper distance factor calculations. For certain scenarios it is possible to calculate the distance factor in between the values given in the distance factor table by linear interpolation.

   - Portion of Table 1 "Distance Factor"

Configuration	Power supply	Feet		
14AWG Twisted pair extension	LMPS-350	length 1	target length	length 2
		distance factor 1	target distance factor	distance factor 2

$$\text{target distance factor} = \frac{(\text{target length} - \text{length 1})\,(\text{distance factor 2} - \text{distance factor 1})}{(\text{length 2} - \text{length 1})} + \text{distance factor1}$$

Example : •

Configuration	Power supply	Feet		
14AWG Twisted pair extension	LMPS-350	75	88 (target length)	100
		.91	target distance factor	.66

$$\frac{(88 - 75)\,(.66 - .91)}{(100 - 75)} + .91 = .78$$ *is the distance factor at 88 feet of 14 AWG Twisted pair extension*

The values of the distance factor found by interpolation are estimated values and have not been validated in laboratory.

SYSTEM EFFICIENCY

8. Due to the high frequency nature of the output of the LMPS power supplies; the input power factor must be used to know the system efficiency. Take the input watts of each power supplies and use the appropriate power factor curve on figure 6 to determine the system efficiency.

9. Additional considerations
    - Distribute the load equally between multiple power supplies. This ensures a uniform level of light across power supplies.
    - Contact TFT Transfotec™ for more details about power consumption calculations when using a distance factor.
    - All calculations are theoretical. Measurements made on the real life installation can differ from the calculations.

Table 1: Distance Factor

Configuration	Power supply	Feet							
		0	15	25	50	75	100	125	150
14 AWG Twisted pair extension (figure 7)	LMPS-350	1	1	1	.95	.91	.66	.41	N/A
	LMPS-DC350	1	1	.95	.86	.74	.62	.45	N/A
	LMPS-750	1	.85	.81	.77	.73	.69	.57	.50
14 AWG BX (figure 8)	LMPS-350	1	1	.95	.86	.62	.45	N/A	N/A
	LMPS-DC350	1	1	.95	.82	.66	.49	.24	N/A
	LMPS-750	1	.84	.79	.73	.69	.63	.52	.36
14 AWG straight pair extension (figure 9)	LMPS-350	1	1	1	.95	.74	.41	N/A	N/A
	LMPS-DC350	1	1	.95	.82	.57	.33	N/A	N/A
	LMPS-750	1	.77	.73	.69	.61	.54	.34	N/A
16 AWG & 18 AWG straight pair extension (figure 9)	LMPS-350	1	1	.95	.74	.41	.20	N/A	N/A
	LMPS-DC350	1	1	.95	.74	.49	.24	N/A	N/A
	LMPS-750	1	.73	.69	.61	.54	.42	.23	N/A
14 AWG single wire loop (figure 10)	LMPS-350	1	1	1	.87	.61	.34	N/A	N/A
	LMPS-DC350	1	1	1	.78	.61	.26	N/A	N/A
	LMPS-750	1	1	1	1	.65	.32	.20	N/A
16 & 18 AWG single wire loop (figure 10)	LMPS-350	1	1	.95	.74	.24	N/A	N/A	N/A
	LMPS-DC350	1	1	.95	.74	.24	N/A	N/A	N/A
	LMPS-750	1	.77	.73	.69	.54	.27	N/A	N/A
14 AWG single wire loop with return (figure 11)	LMPS-350	1	1	1	1	1	.95	.95	.66
	LMPS-DC350	1	1	1	.96	.74	.49	N/A	N/A
	LMPS-750	1	1	1	.77	.73	.65	.54	.34

- Factors such as wire construction and the layout and length of the electrical circuit can affect the loading of the power supply. As those factors are beyond the control of TFT Transfotec™ it is the responsibility of the installer to ensure that maximum loading will not be exceeded.
- In wire loop with return configurations the return wire needs to be routed as close as possible from one another and they need to be tied together at least each foot.
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application; see the requirements in technical bulletin #27 “Wiring for architectural applications”.
- Contact TFT Transfotec™ for other wire types and distances usage.

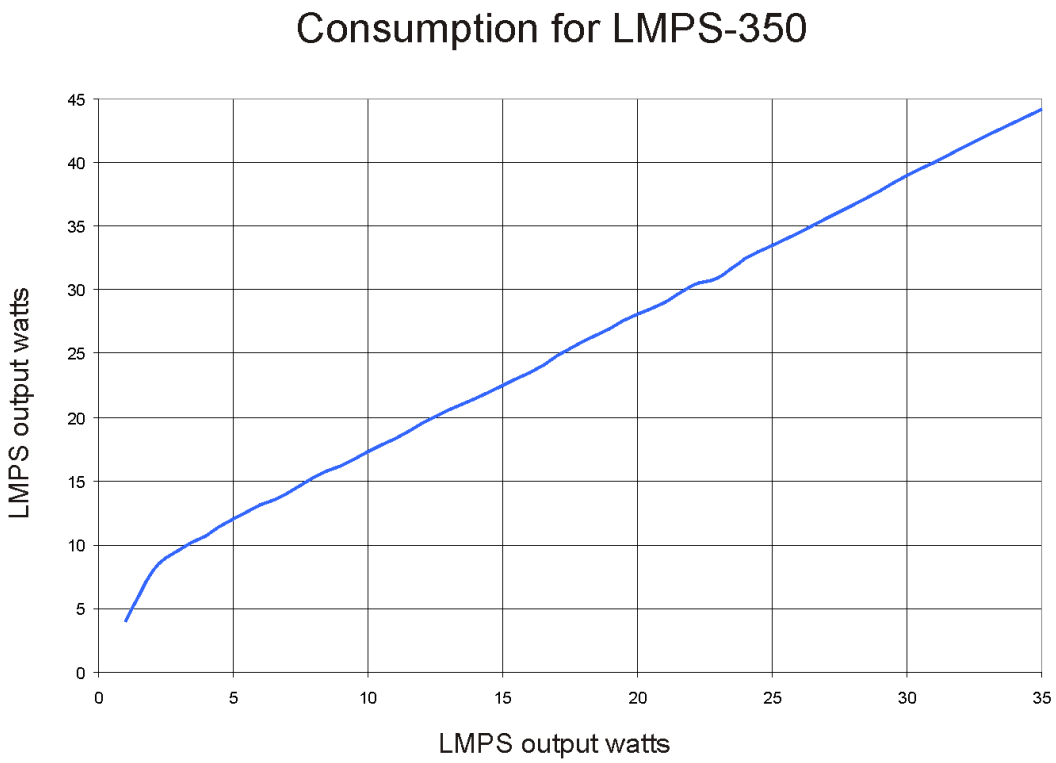
Table 2: Distance Factor for Twisted pair extension with single wire loop (figure 12)

Power supply	Length of twisted pair extension	Feet of single wire loop			
		15	25	50	75
LMPS-350	15	.95	.95	.49	N/A
	25	.91	.82	.41	N/A
	50	.66	.57	N/A	N/A
	75	.41	.33	N/A	N/A
LMPS-750	15	.77	.77	.65	.46
	25	.73	.73	.61	.34
	50	.73	.69	.50	N/A
	75	.65	.61	.34	N/A
	100	.61	.50	N/A	N/A
	125	.46	.34	N/A	N/A
	150	.34	.23	N/A	N/A

Table 3: Distance Factor for Twisted pair extension with single wire loop with return (figure 13)

Power supply	Length of twisted pair extension	Feet of single wire loop with return					
		15	25	50	75	100	125
LMPS-350	15	.95	.95	.74	.49	N/A	N/A
	25	.95	.91	.66	.33	N/A	N/A
	50	.82	.66	.41	N/A	N/A	N/A
	75	.49	.41	N/A	N/A	N/A	N/A
LMPS-750	15	.77	.77	.69	.65	.61	.42
	25	.77	.73	.69	.65	.57	.38
	50	.69	.65	.65	.54	.42	N/A
	75	.65	.61	.50	.42	N/A	N/A
	100	.61	.57	.42	N/A	N/A	N/A
	125	.50	.42	N/A	N/A	N/A	N/A
	150	.38	.27	N/A	N/A	N/A	N/A

- Factors such as wire construction and the layout and length of the electrical circuit can affect the loading of the power supply. As those factors are beyond the control of TFT Transfotec™ it is the responsibility of the installer to ensure that maximum loading will not be exceeded.
- In wire loop with return configurations the return wire needs to be routed as close as possible from one another and they need to be tied together at least each foot.
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application; see the requirements in technical bulletin #27 “Wiring for architectural applications”.
- Contact TFT Transfotec™ for other wire types and distances usage.



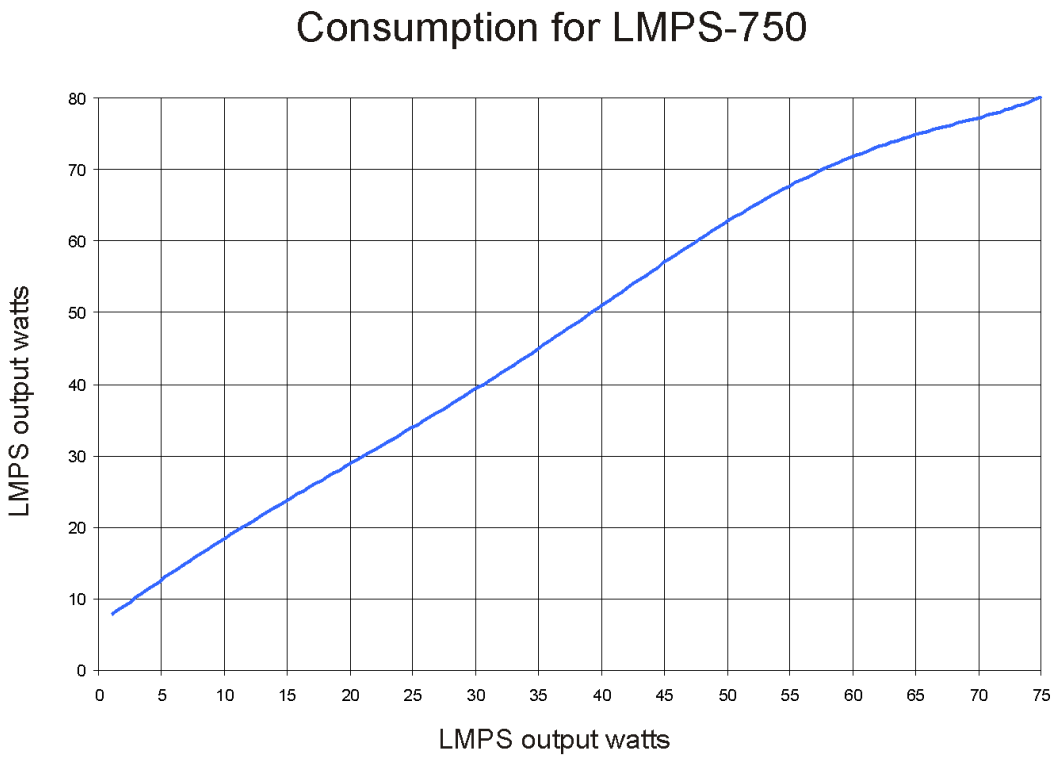
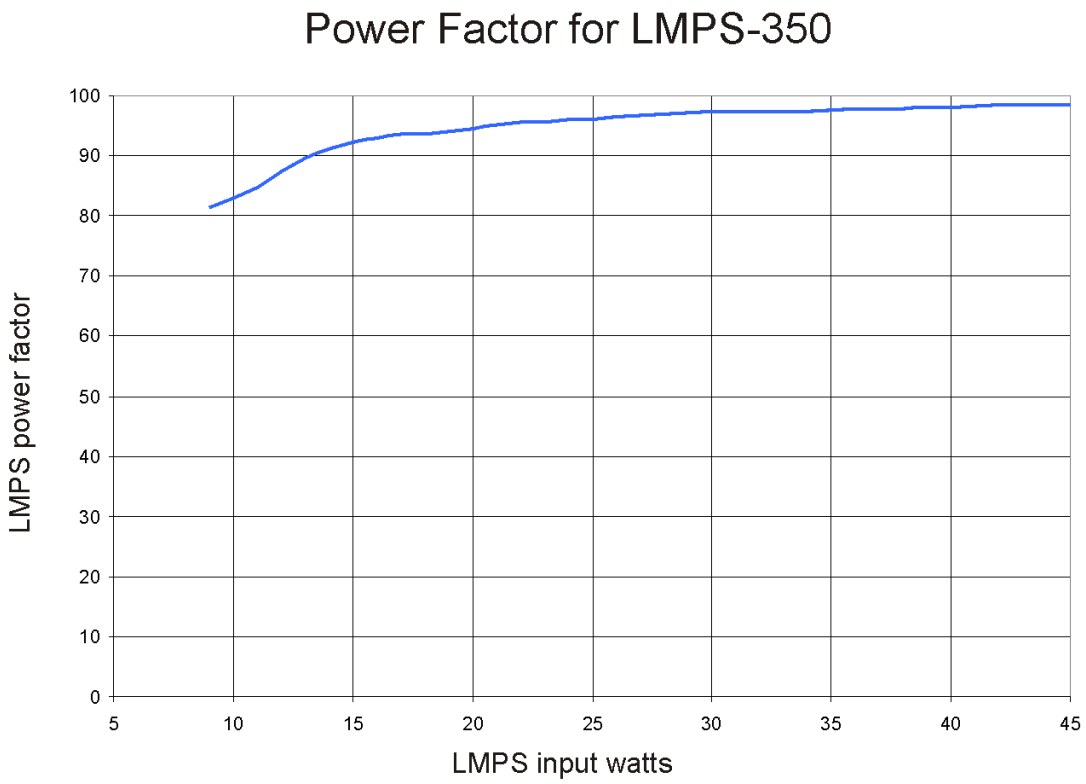


Figure 5: LMPS system power consumption



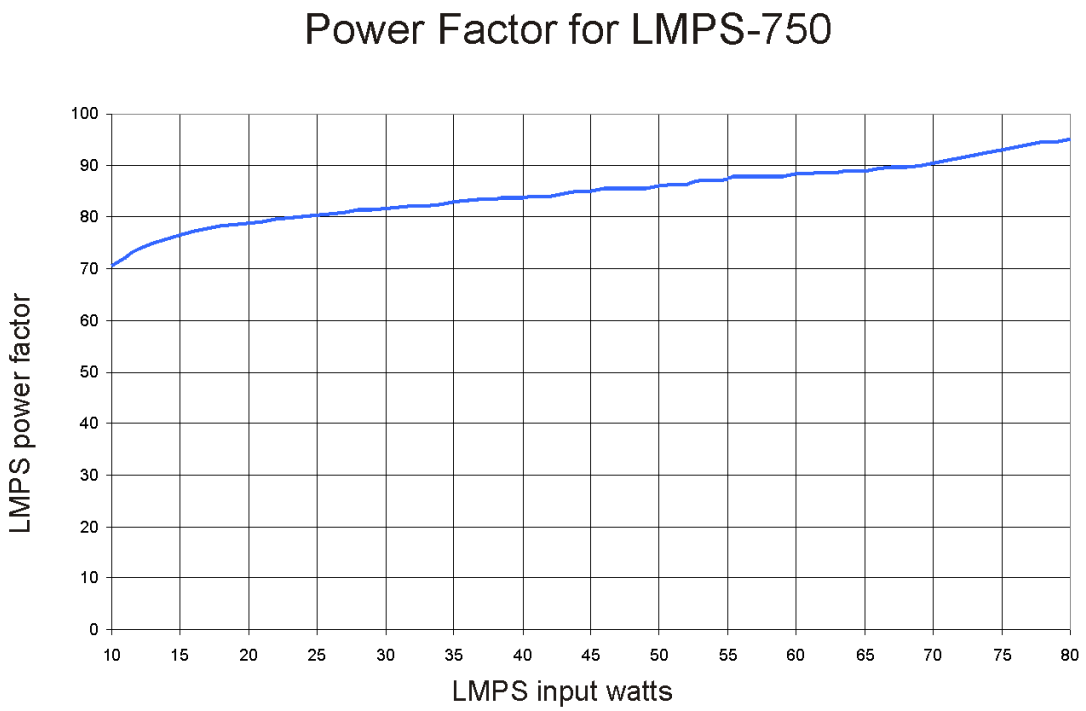


Figure 6: LMPS system efficiency

LMPS SECONDARY CIRCUIT CONFIGURATIONS

Twisted pair extention

clipNslide™ luminaires are at the end of a 14 AWG twisted pair extension.
This configuration offers the best performance for long distances.

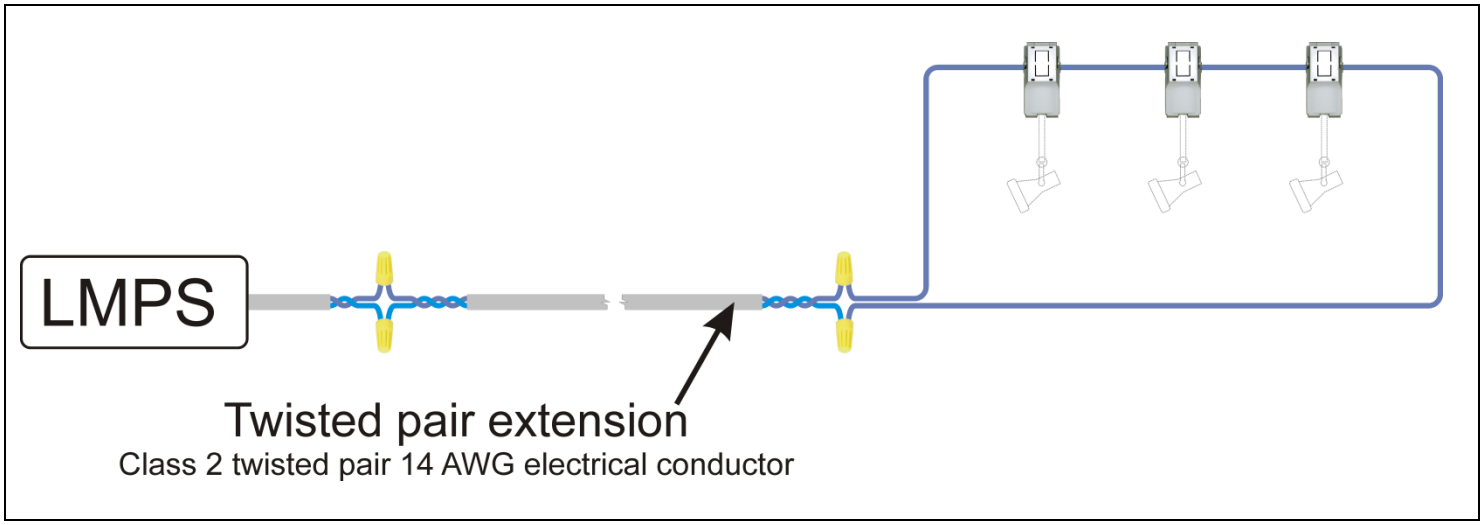


Figure 7: Twisted pair extension

BX cable extension

clipNslide™ luminaires are at the end of a 14 AWG BX cable.
BX cable is readily available and is a common cable used for electrical installations.
This configuration can also be used in cases of retrofits where BX cable is already installed.

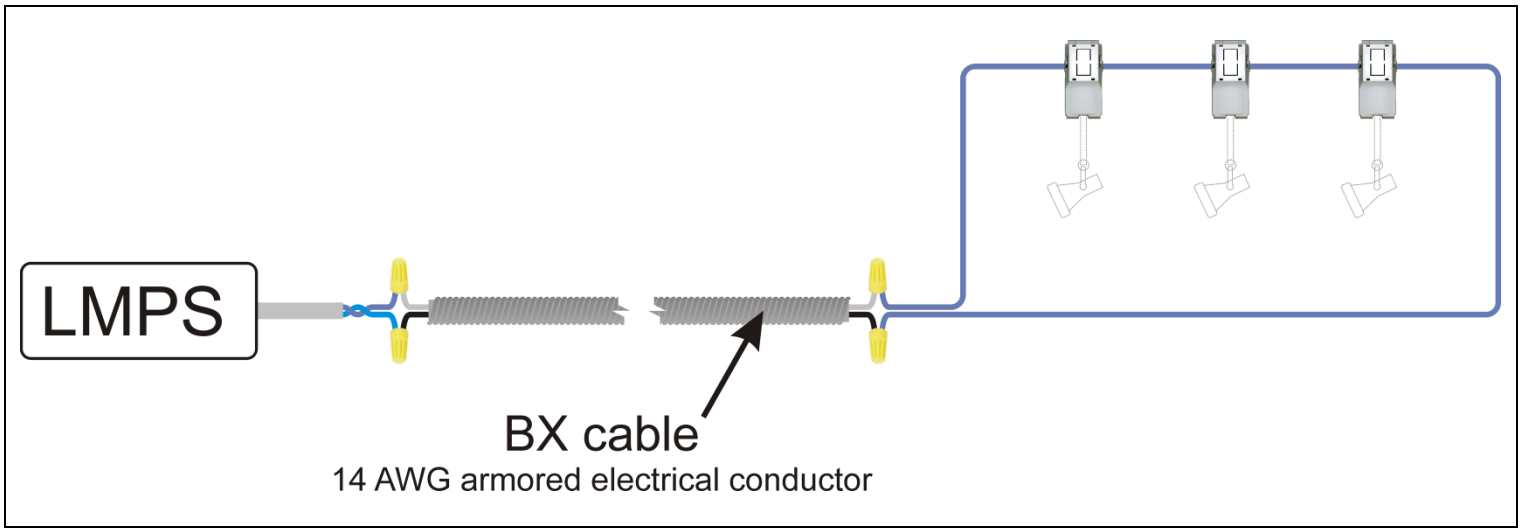


Figure 8: BX cable extension

Straight pair extension

clipNslide™ luminaires are at the end of a 14 AWG to 18 AWG straight pair cable.

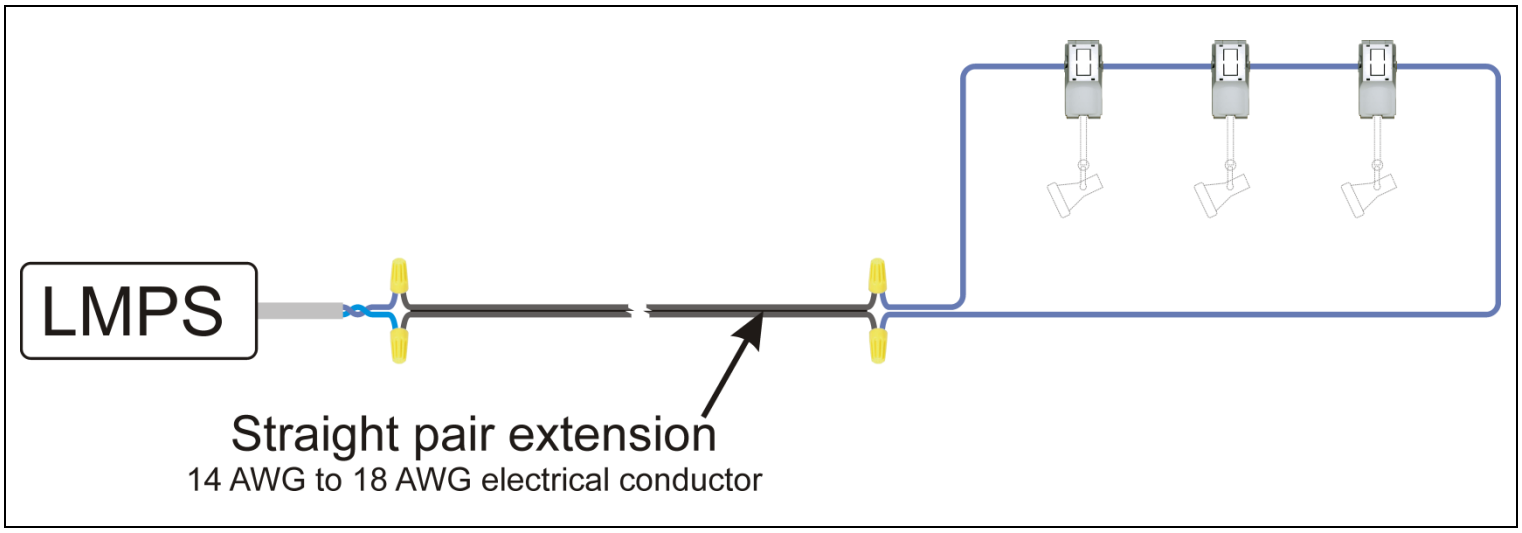


Figure 9: Straight pair extension

Single wire loop

clipNslide™ luminaires are distributed along one long 14 AWG to 18 AWG electrical conductor.

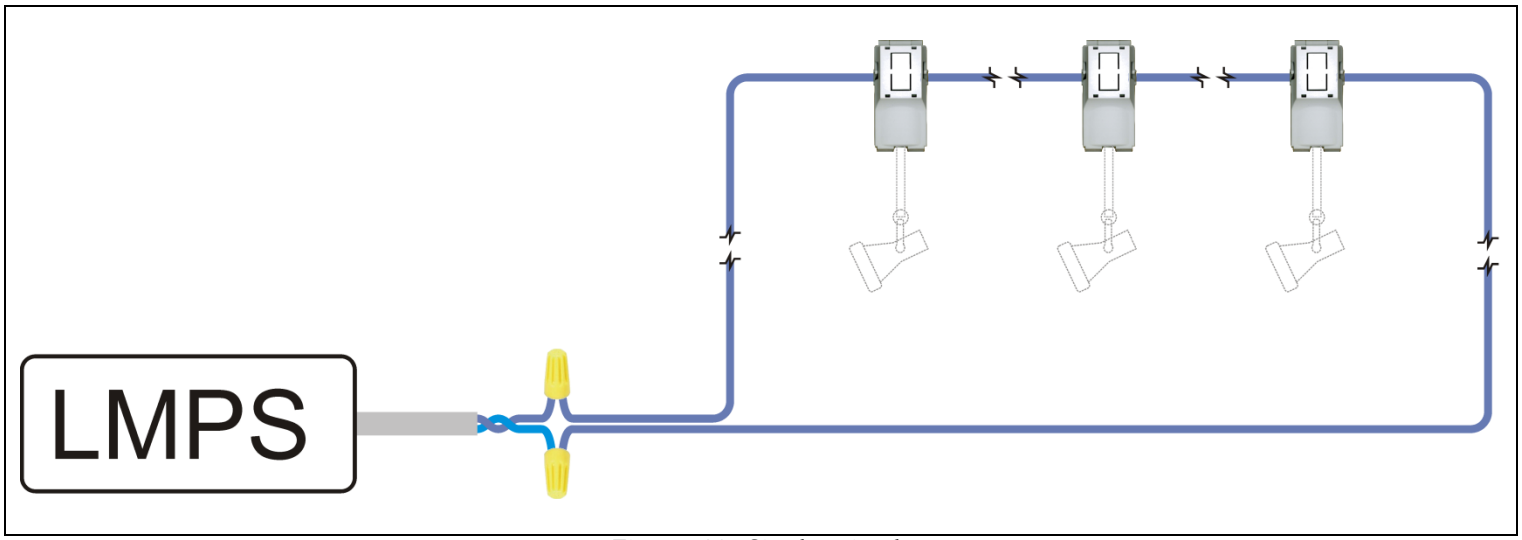


Figure 10: Single wire loop

- Single wire loop with return
  clipNslide™ luminaires are distributed on a long single wire and the wire comes back along the modules.

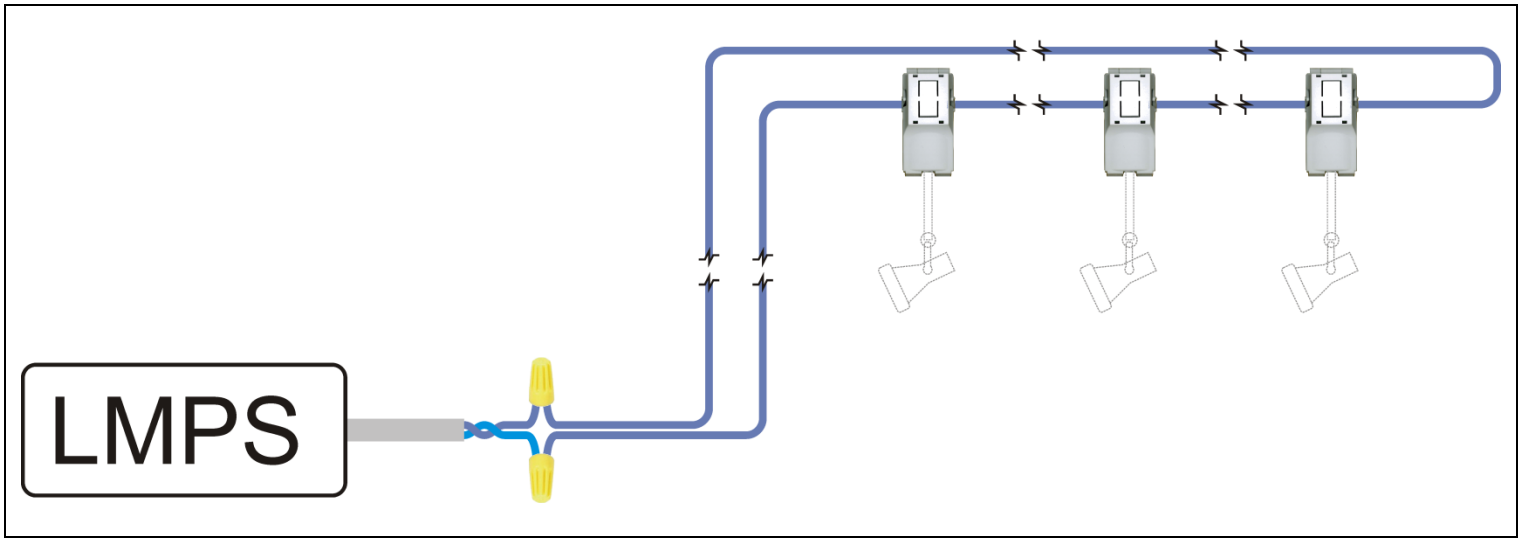


Figure 11: Single wire loop with return

- Twisted pair extension with single wire loop
  clipNslide™ luminaires are at the end of a twisted pair extension and distributed on a long single wire.

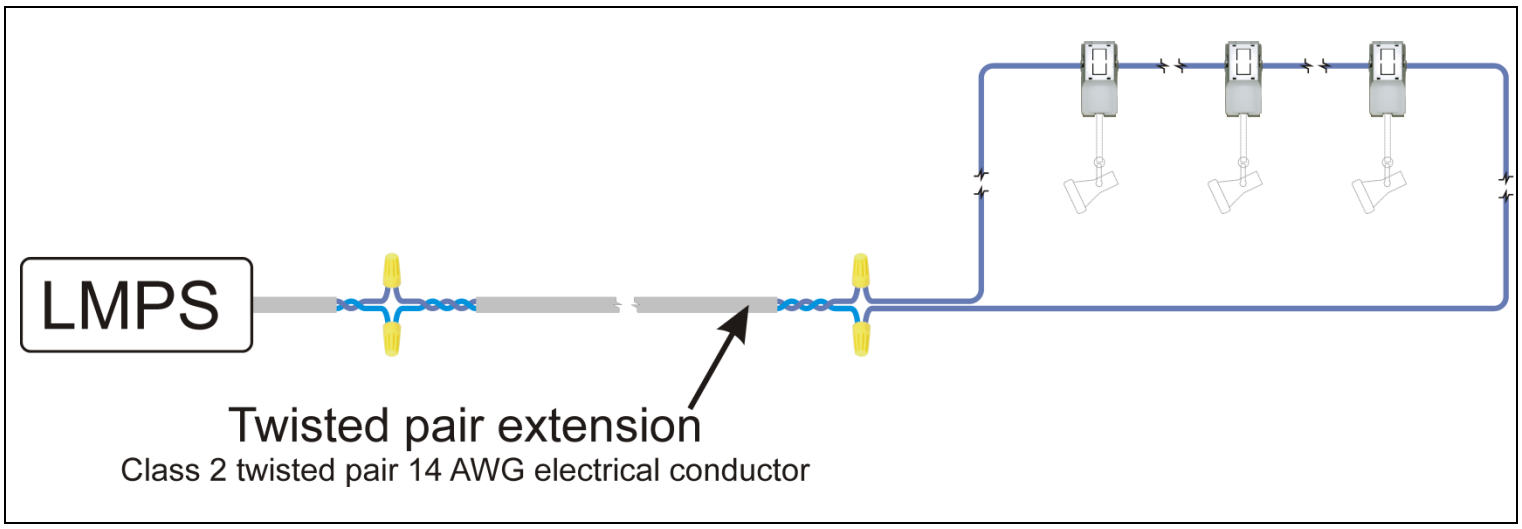


Figure 12: Twisted pair with single wire loop

- Twisted pair extension with single wire loop with return
  clipNslide™ luminaires are at the end of a twisted pair extension and distributed on a long single wire and the wire comes back along the modules.

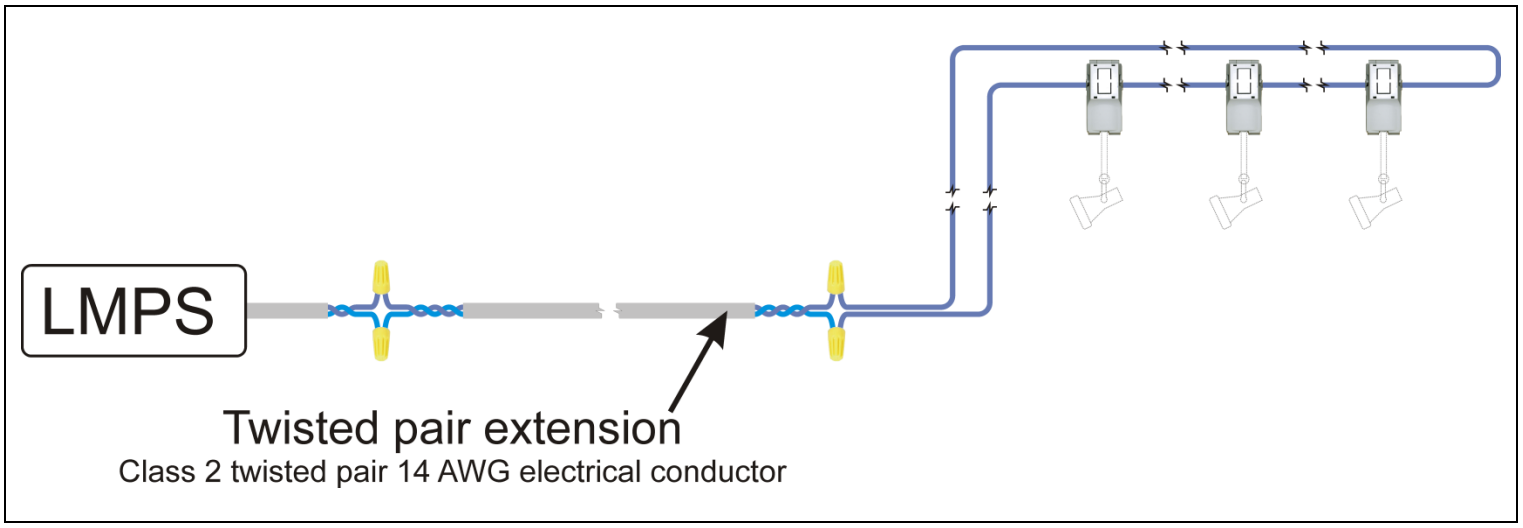


Figure 13: Twisted pair with single wire loop with return

PHYSICAL DIMENSIONS OF THE clipNslide™ HARDWARE

- The clipNSlide™ can be used with the factory enclosure or OEM's can design their own enclosure to fit their needs
- C.A.D. design files are available upon request for OEM projects.
- Ferrites contact surfaces must have equal pressure on both sides.

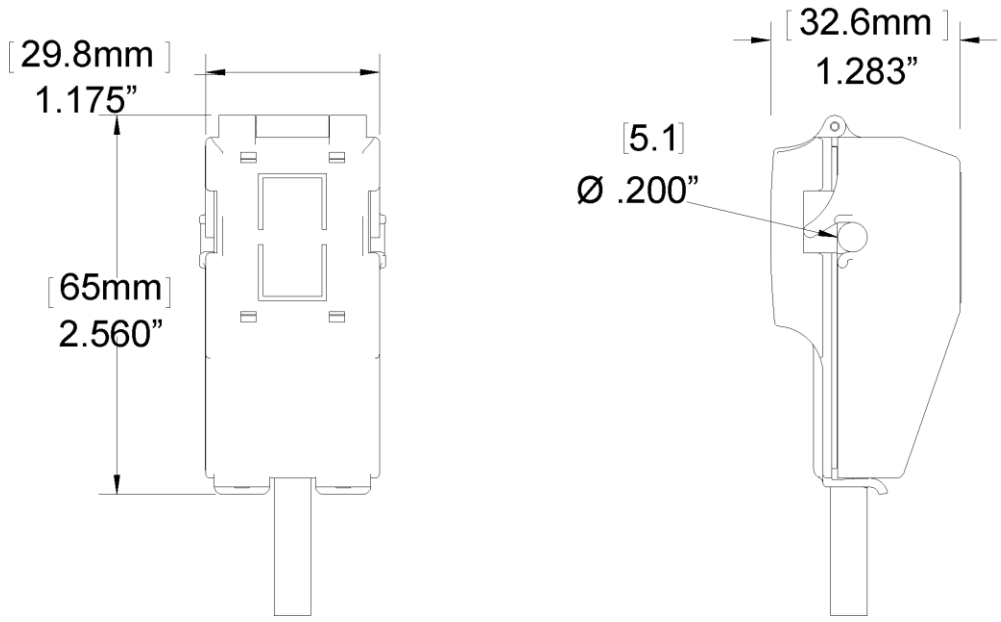


Figure 14: Dimensions of the clipNslide™

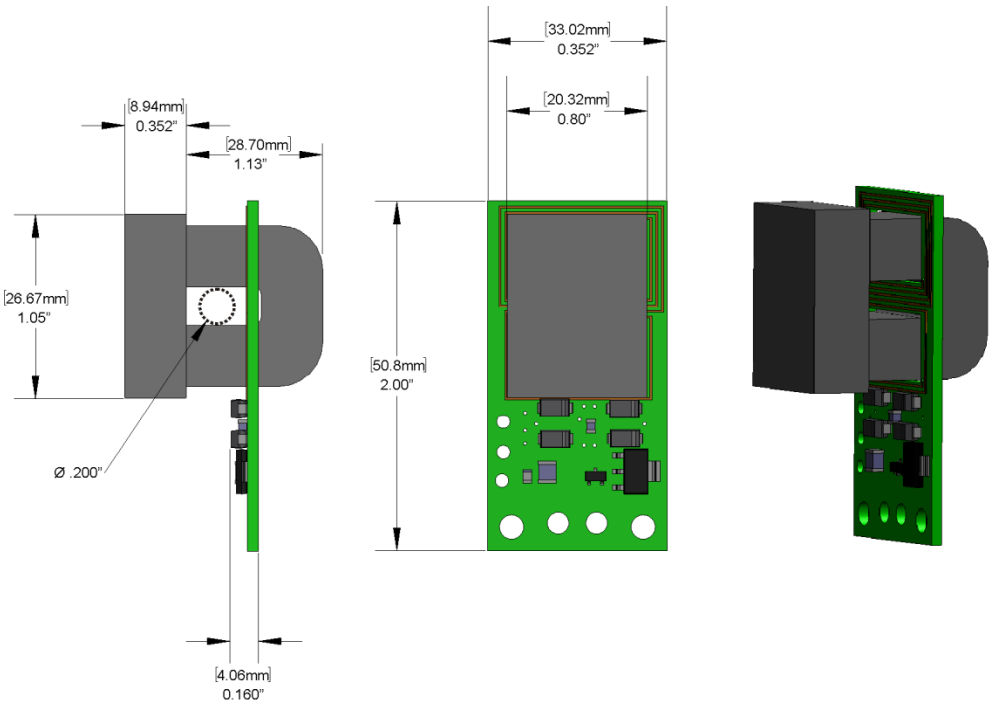


Figure 15: Dimensions of the clipNslide™ core components

clipNslide™ INSTALLATION INSTRUCTIONS

1. The clipNslide™ is hooked on an electrical conductor. Hang the clipNslide™ on the electrical conductor while supporting it and close the door (figure 16).
2. The two (2) snaps must be well engaged (figure 17). Failure to do so can lead mechanical failure of the system and serious personal injury.
3. The clipNslide™ can be attached on an **insulated** electrical conductor without any risks of electrical shock even when the power is on.
4. While powered the clipNslide™ can freely move on the electrical conductor.
5. The surface of both ferrites must be free of debris, dust and grease. If debris, dust and grease are present the clipNslide™ will not operate correctly. This will not damage the clipNslide™.
6. TFT Transfotec™ luminaires cannot be in contact with water, ice or snow in a manner that would not respect the limits of Ingress Protection IP67.

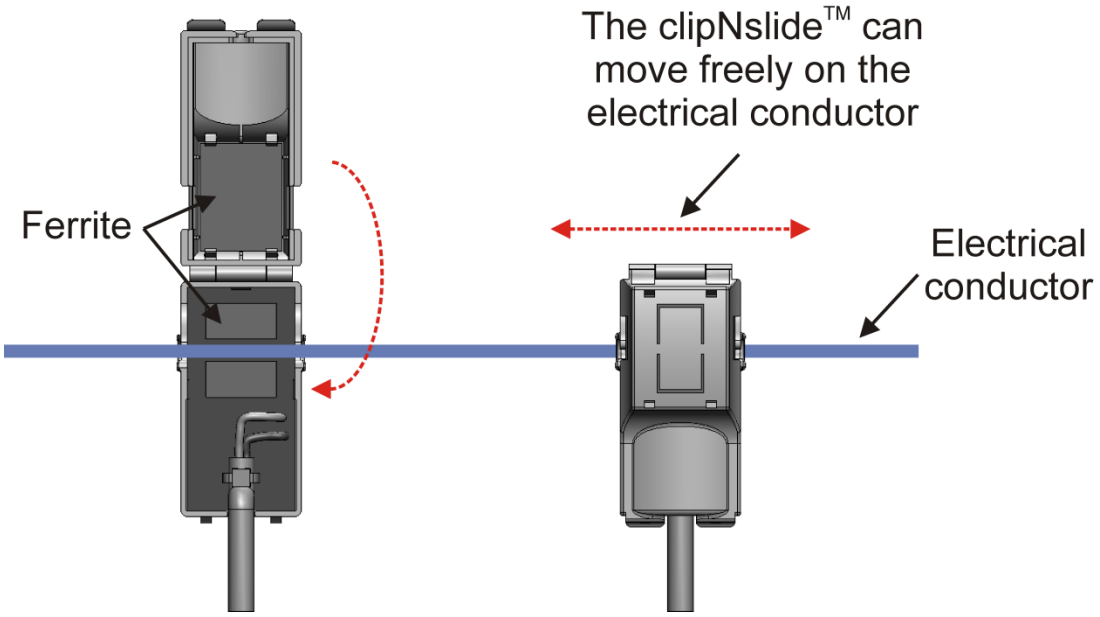


Figure 16: Installation of the clipNslide™

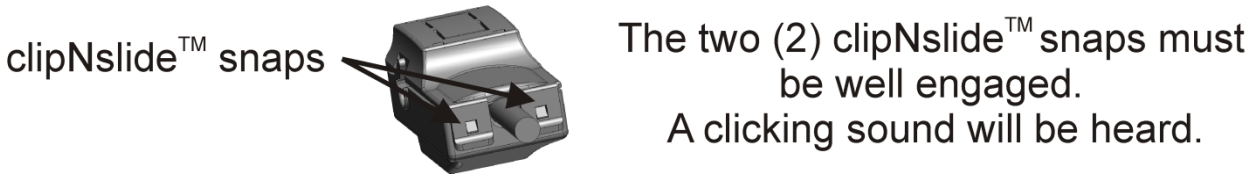


Figure 17: clipNslide™ snaps

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and of the suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- Both clipNslide™ snaps must be well engaged and secure. Failure to do so can lead serious personal injury.

LOCATIONS DEFINITIONS

DRY LOCATIONS

Dry locations are defined as a location not normally subject to dampness, but may include a location subject to temporary dampness as in the case of a building under construction, provided that ventilation is adequate to prevent the accumulation of moisture.

DAMP LOCATIONS

Damp locations are defined as an interior or exterior location that is normally or periodically subject to condensation or moisture in, on or adjacent to electrical equipment and includes partially protected locations under canopies, marquees, roofed open porches and similar locations. This also includes interior locations subject to moderate degrees of moisture, such as some basements, some barns and some cold-storage warehouses. Locations sheltered from the weather are considered damp locations.

WET LOCATIONS

Wet locations are defined as a location in which liquids may drip, splash, or flow on or against electrical equipment. This also includes outdoor locations, which are any location exposed to the weather. Locations that are sheltered from the weather are not considered outdoor locations. Conductors exposed to direct sunlight shall bear the mark “SUN RESISTANT”, “SR”, or similar or be listed as being sun resistant if they don’t bear such marking.

- The user is responsible that the installation methods and materials used are appropriate for the location.
- It is possible to have the power supply and the LED arrays installed in different location types, the user is responsible that the installation methods and materials used are appropriate for each location.
- The location definitions are taken from the American Electrical Code (NEC) article 100 and from the Canadian electrical code (NEC) section 0 and appendix B.

POWER SUPPLY ELECTRICAL CONNECTION IN DRY AND DAMP LOCATIONS

1. Installation shall be done in accordance with the National Electrical Code in the United States or the Canadian Electrical Code (CSA22.1) in Canada. Also follow local electrical code ordinances when applicable.
2. A listed electrical enclosure approved for the purpose shall be used for the LMPS primary connection.
3. Power supplies and electrical boxes shall be adequately supported, plumb and true and firmly secured in place with appropriate fasteners.
4. Adequate spacing and airflow shall be provided in between transformers and surrounding materials.
5. Power supplies shall be oriented or protected in a way that will not let condensing water accumulate in the enclosure.
6. All wire and splice connectors shall be suitable for the temperature conditions and locations where installed. Splices shall be kept to a minimum.
7. The Class 2 circuit shall be physically separated from other circuit types.
8. Use #8 fasteners to secure the power supply and the electrical box in place.
9. If more than one (1) LMPS is used, keep a spacing of at least one (1) inch (25.4 mm) between each LMPS.
10. If the Class 2 feeder circuit needs to be extended between the LMPS and the LED arrays, use twisted pair cable type CL2 14 AWG or better, listed for the applicable environment (figure 18). Substitutions according to **NEC table 725.154(G)** and **CEC article 16.210, 16-222, table 19** are permitted (also refer to **CEC Appendix B**).
    Permitted substitutions for **CL2** wires are: **CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3**.
11. For more details refer to the LMPS-350, LMPS-DC350, LMPS-750 product sheet (documents 11126.007, 11126.002 and 11978.003)

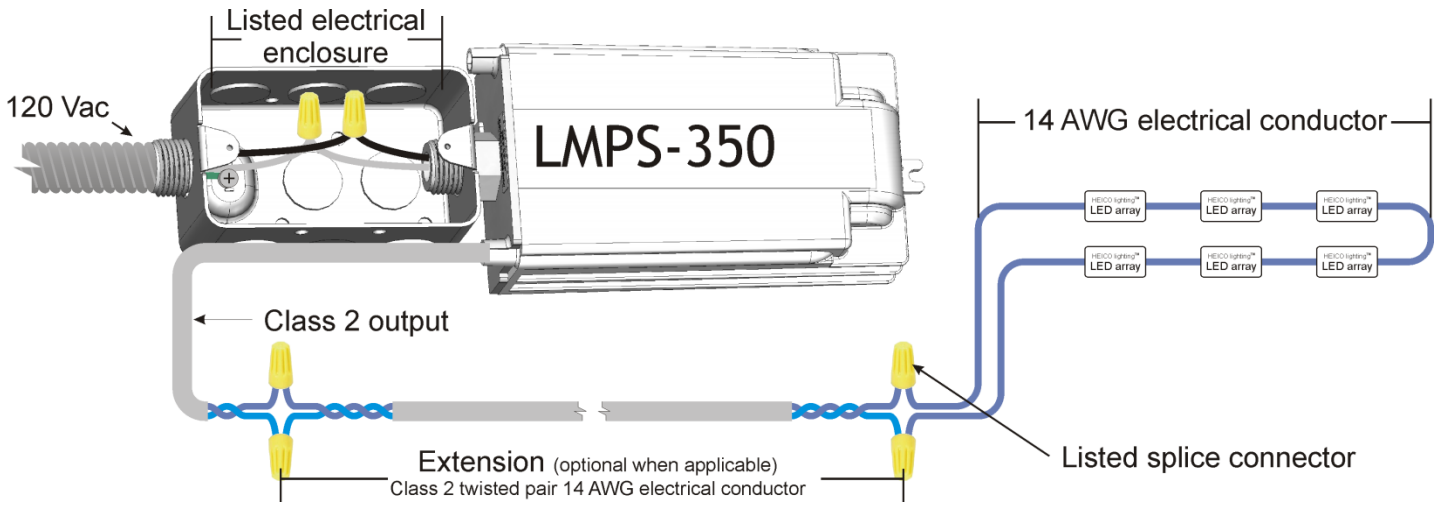


Figure 18: Electrical connections for installation in dry and damp locations (twisted pair extension and LMPS-350 shown, others are similar)

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the power supply and of the suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- All equipment shall be installed in a neat and workmanlike manner. See NECA 1-2010 standard "Good Workmanship in Electrical Construction".
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application; see the requirements in technical bulletin #27 "Wiring for architectural applications".
- The Class 2 circuit shall be physically separated from other circuit types.

POWER SUPPLY ELECTRICAL CONNECTION IN WET LOCATIONS

1. Installation shall be done in accordance with the National Electrical Code in the United States or the Canadian Electrical Code (CSA22.1) in Canada. Also follow local electrical code ordinances when applicable.
2. A listed electrical enclosure approved for the purpose shall be used for the LMPS primary connection.
3. Power supplies and electrical boxes shall be adequately supported, plumb and true and firmly secured in place with appropriate fasteners.
4. Adequate spacing and airflow shall be provided in between transformers and surrounding materials.
5. Power supplies shall be oriented or protected in a way that will not let condensing water accumulate in the enclosure.
6. All wire and splice connectors shall be suitable for the temperature conditions and locations where installed. Splices shall be kept to a minimum.
7. In wet locations the power supply shall be installed in an appropriate location and in a listed electrical enclosure approved for the purpose (examples: NEMA 3, 3R, 3S, 3X, 3RX, 3SX or 4).
8. The Class 2 circuit shall be physically separated from other circuit types.
9. Use #8 fasteners to secure the power supply and the electrical box in place.
10. If more than one (1) LMPS is used, keep a spacing of at least one (1) inch (25.4 mm) between each LMPS.
11. If the Class 2 feeder circuit needs to be extended between the LMPS and the LED arrays, use twisted pair cable type CL2 14 AWG or better, listed for the applicable environment (figure 19). Substitutions according to **NEC table 725.154(G)** and **CEC article 16.210, 16-222, table 19** are permitted (also refer to **CEC Appendix B**).
    Permitted substitutions for **CL2** wires are: **CMP, CL3P, CL2P, CMR, CL3R, CL2R, CMG, CM, PLTC, CL3**.
12. For more details refer to the LMPS-350, LMPS-DC350, LMPS-750 product sheet (documents 11126.007, 11126.002 and 11978.003)

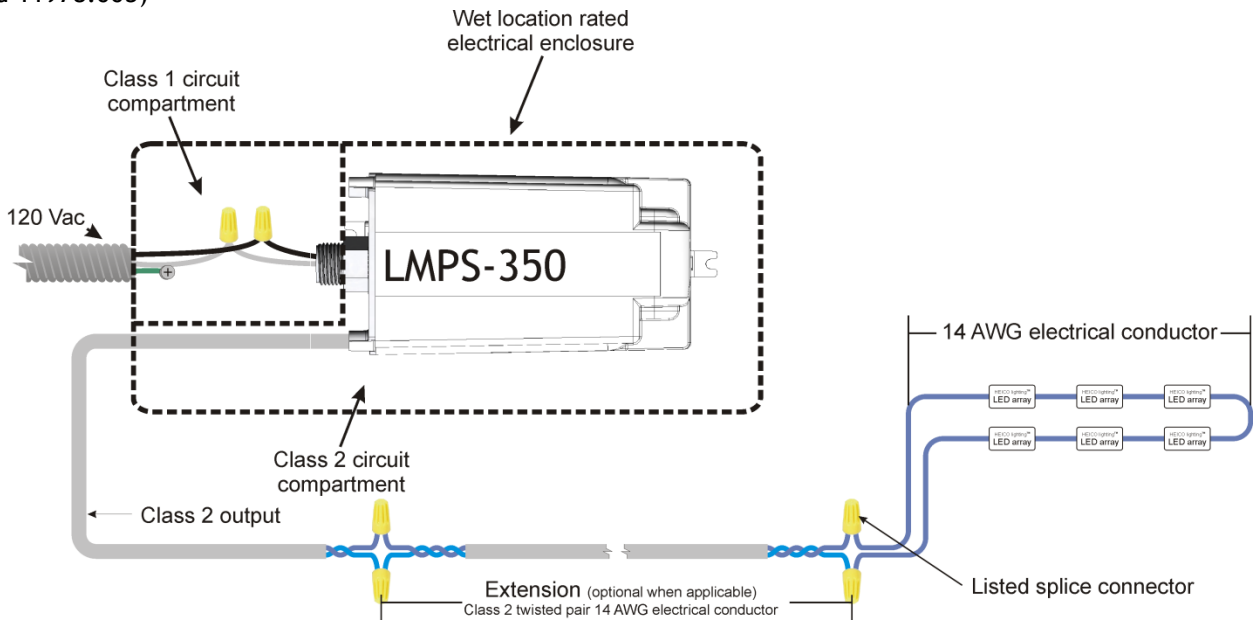


Figure 19: Electrical connections for installation in wet locations (twisted pair extension and LMPS-350 shown, others are similar)

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the power supply and of the suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- All equipment shall be installed in a neat and workmanlike manner. See NECA 1-2010 standard "Good Workmanship in Electrical Construction".
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application; see the requirements in technical bulletin #27 "Wiring for architectural applications".
- The Class 2 circuit shall be physically separated from other circuit types.

SUSPENDED LUMINAIRE ON AN ELECTRICAL CONDUCTOR

- Luminaires are attached on a taut electrical conductor. Suitable for indoors and outdoors installations.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.
- In outdoor environment and where exposed to sunlight the electrical conductor should be marked "SUN-RESISTANT", "SR" or a similar marking.
- Maximum wire diameter is 0.190" (4.8 mm)

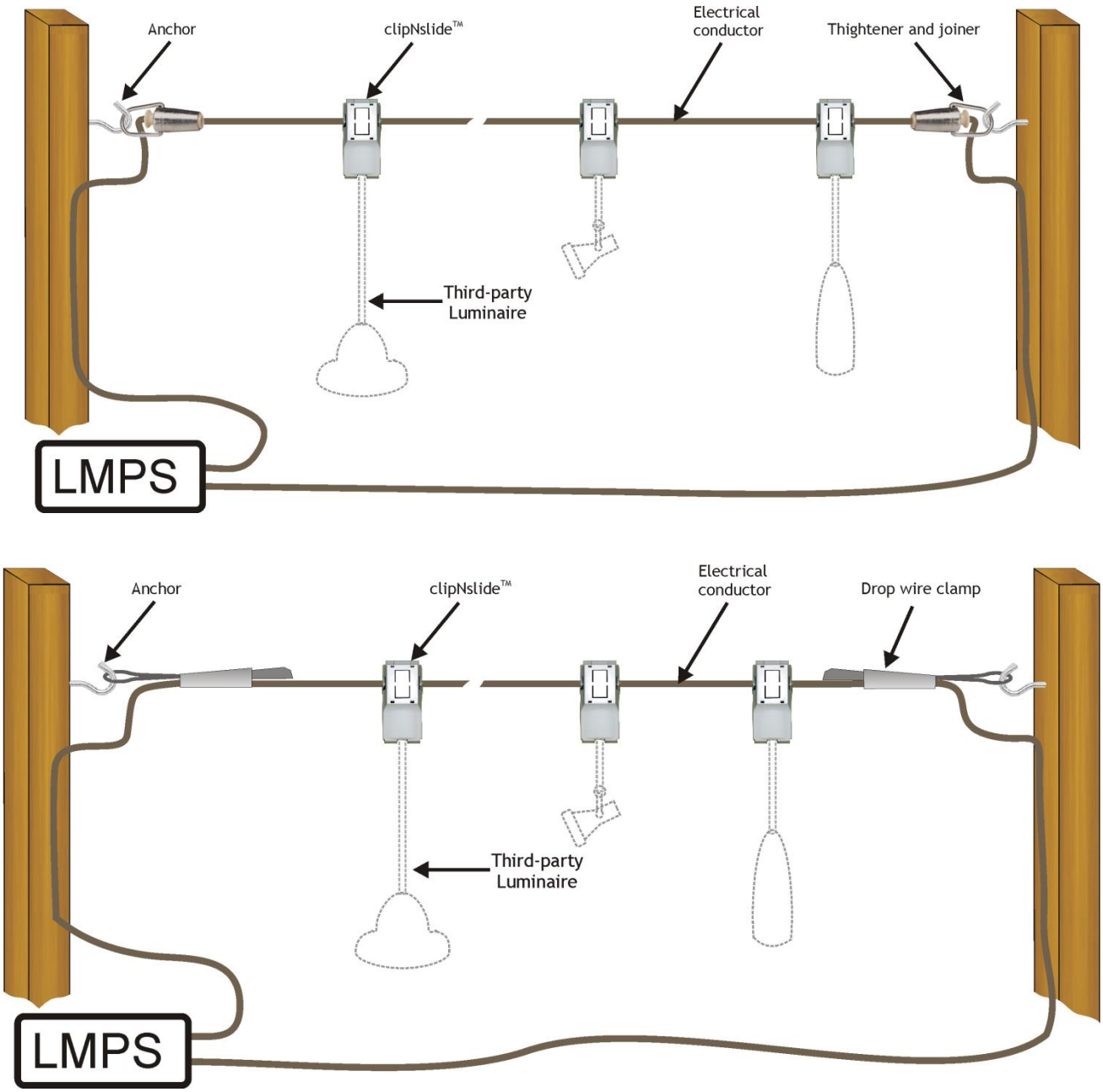
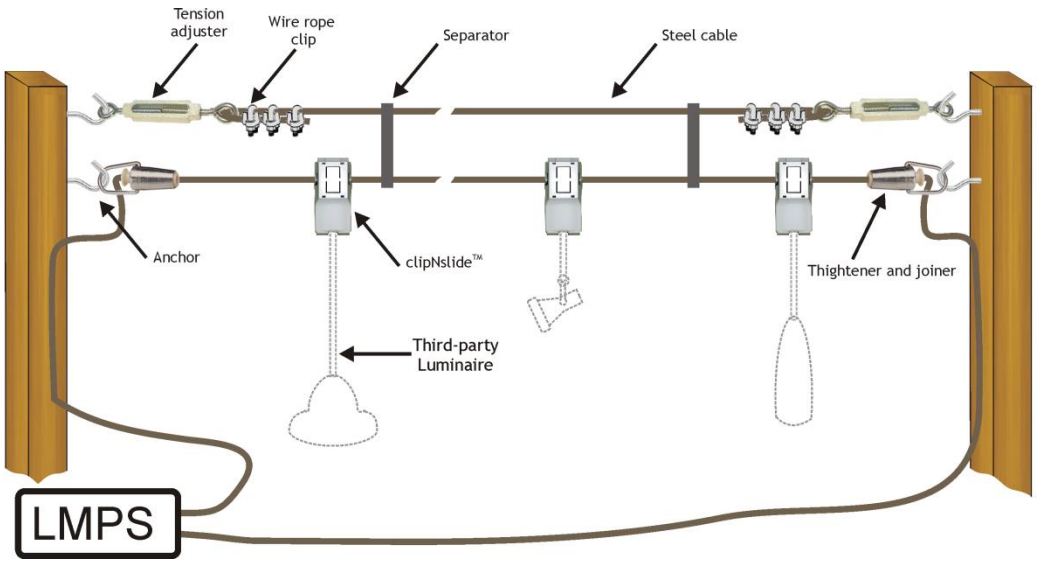


Figure 20: Suspended luminaires on an electrical conductor

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper selection of the electrical conductor and associated hardware. The load bearing capacity and tensile strength of the electrical conductor must not be exceeded.

SUSPENDED LUMINAIRES WITH MESSENGER CABLE

- Luminaires are attached on an electrical conductor that is supported by a messenger cable.
- Some installations are required by the electrical code or local ordinances to have a messenger cable supporting the electrical conductor. The user is responsible for proper selection of the messenger cable and associated hardware. The load bearing capacity and tensile strength of the messenger cable must not be exceeded.
- Suitable for indoors and outdoors installations.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.
- In outdoor environment and where exposed to sunlight the electrical conductor should be marked "SUN-RESISTANT", "SR" or a similar marking.
- Maximum wire diameter is 0.190" (4.8 mm)



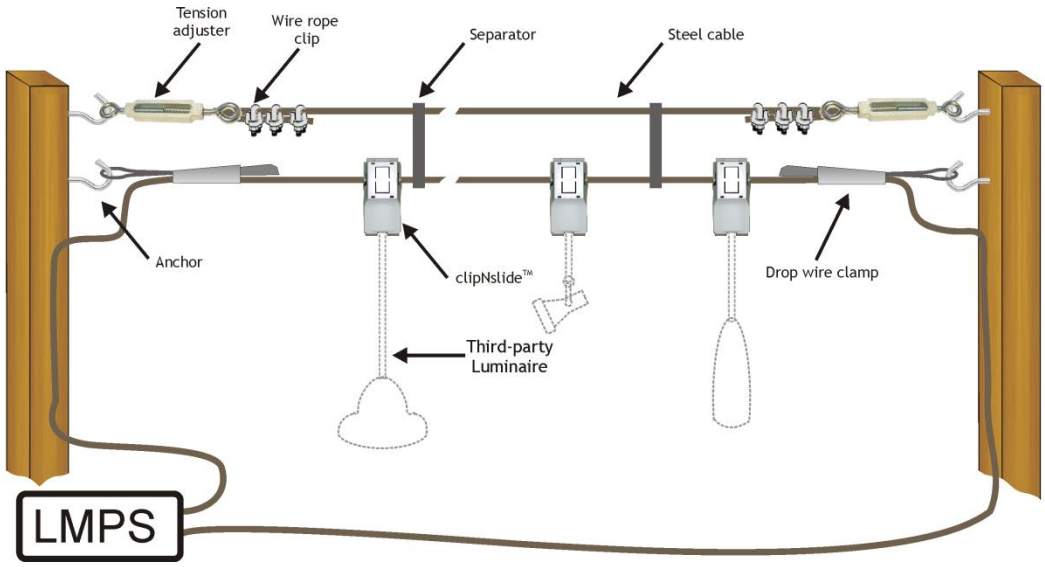


Figure 21: Suspended luminaires with messenger cable

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper selection of the messenger cable and associated hardware. The load bearing capacity and tensile strength of the messenger cable must not be exceeded.

SUSPENDED LUMINAIRES ON AN INSULATED STEEL CABLE

- Luminaires are attached on an insulated steel cable. The user is responsible for proper selection of the insulated steel cable and associated hardware.
- The load bearing capacity and tensile strength of the insulated steel cable must not be exceeded.
- Suitable for indoors and outdoors installations.
- This configuration shall be approved as a system by a legal certification authority (UL or ETL).
- Maximum wire diameter is 0.190” (4.8 mm)

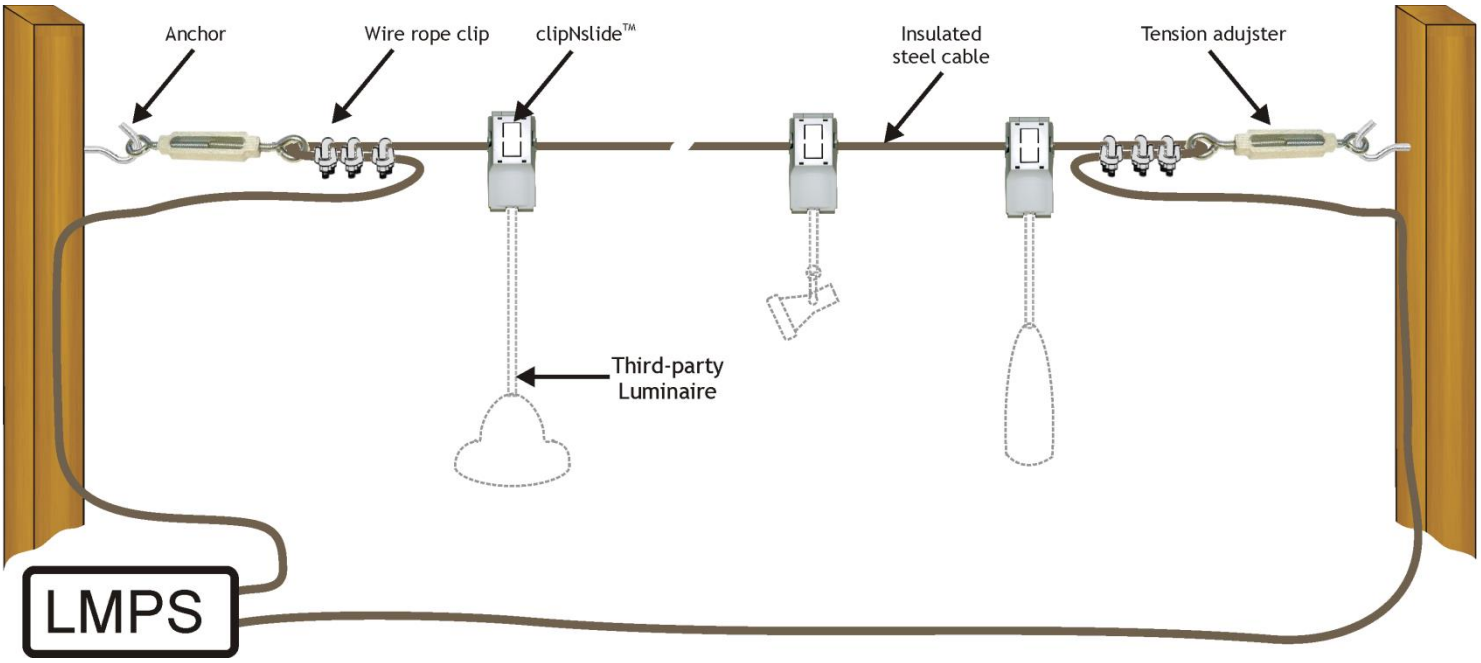


Figure 22: Suspended luminaires on an insulated steel cable

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper selection of the insulated steel cable and associated hardware. The load bearing capacity and tensile strength of the insulated steel cable must not be exceeded.
- This configuration shall be approved as a system by a legal certification authority (UL or ETL).

IN-CEILLING LUMINAIRES

- Luminaires are installed in the ceiling with the clipNslide™ attached to the electrical conductor.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire.
- Suitable for indoors and outdoors installations.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.

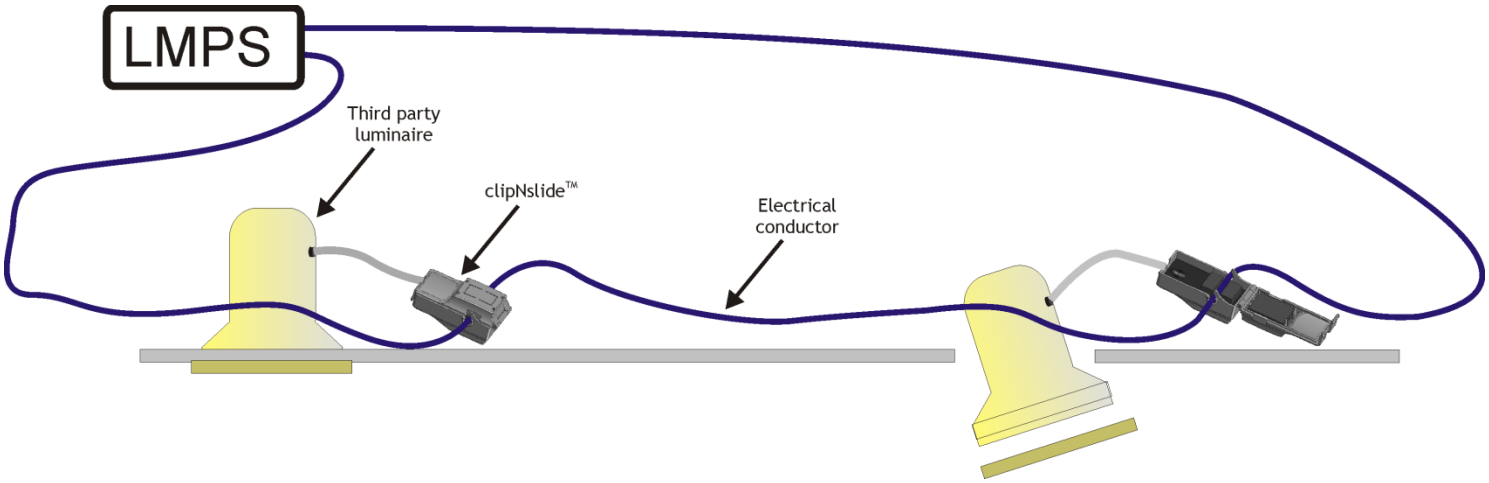


Figure 23: In-ceiling luminaires

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire .

IN-WALL LUMINAIRES

- Luminaires are installed in the walls with the clipNslide™ attached to the electrical conductor.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire.
- Suitable for indoors and outdoors installations.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.

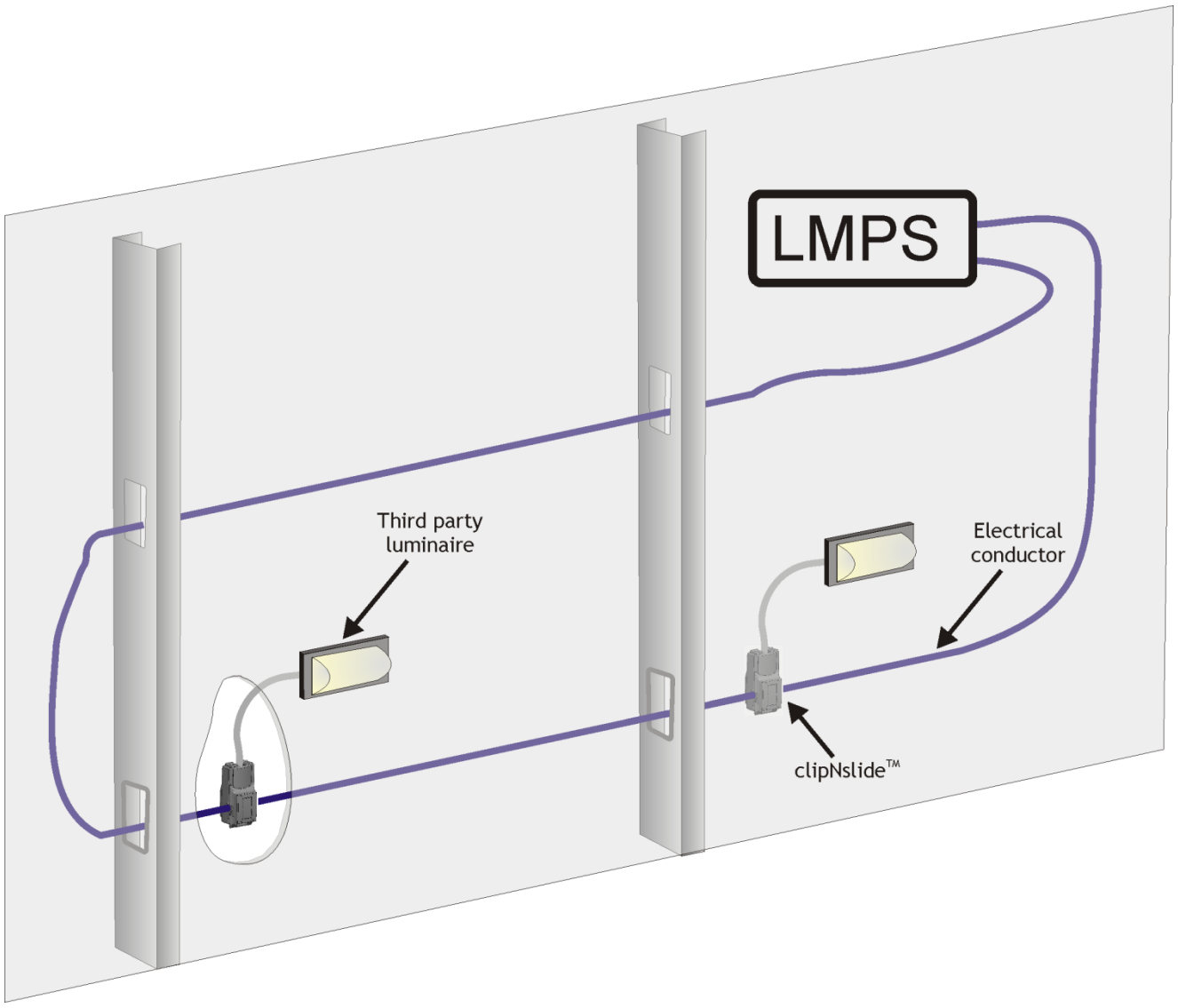


Figure 24: In-wall luminaires

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire .

EXTERIOR DECK LUMINAIRES

- Luminaires are installed in or on an exterior deck with the clipNslide™ attached to the electrical conductor under the deck.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.
- In outdoor environments and where exposed to sunlight the electrical conductor should be marked "SUN-RESISTANT", "SR" or a similar marking.

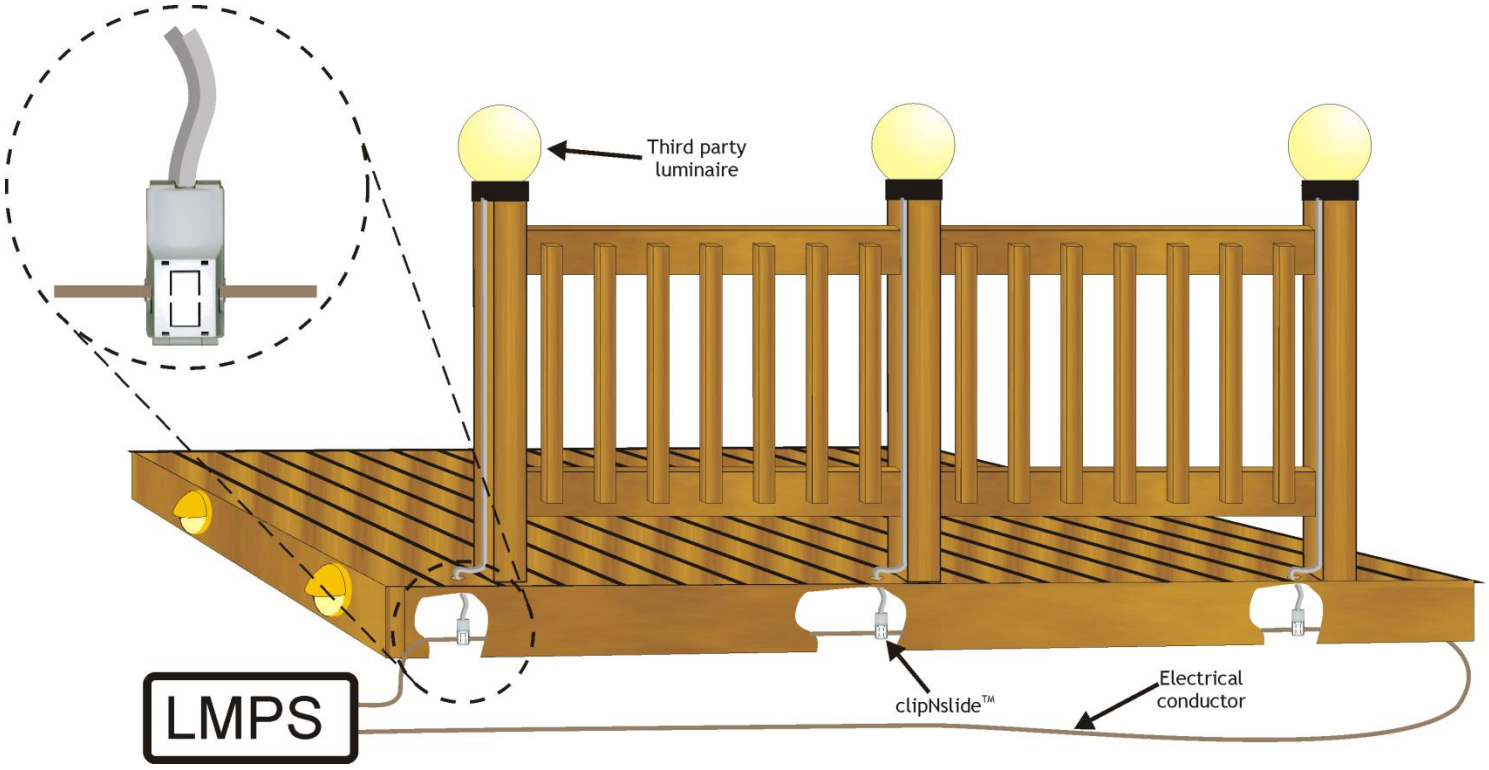


Figure 25: Exterior deck luminaires

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper ventilation and minimum space requirement of the luminaire .

INTERIOR LIGHTING CABLE SYSTEMS

- Luminaires are installed on a third party indoor wiring system.
- The user is responsible for following the installation and safety instructions of the third party interior lighting cable system.
- Maximum wire diameter is 0.190” (4.8 mm)

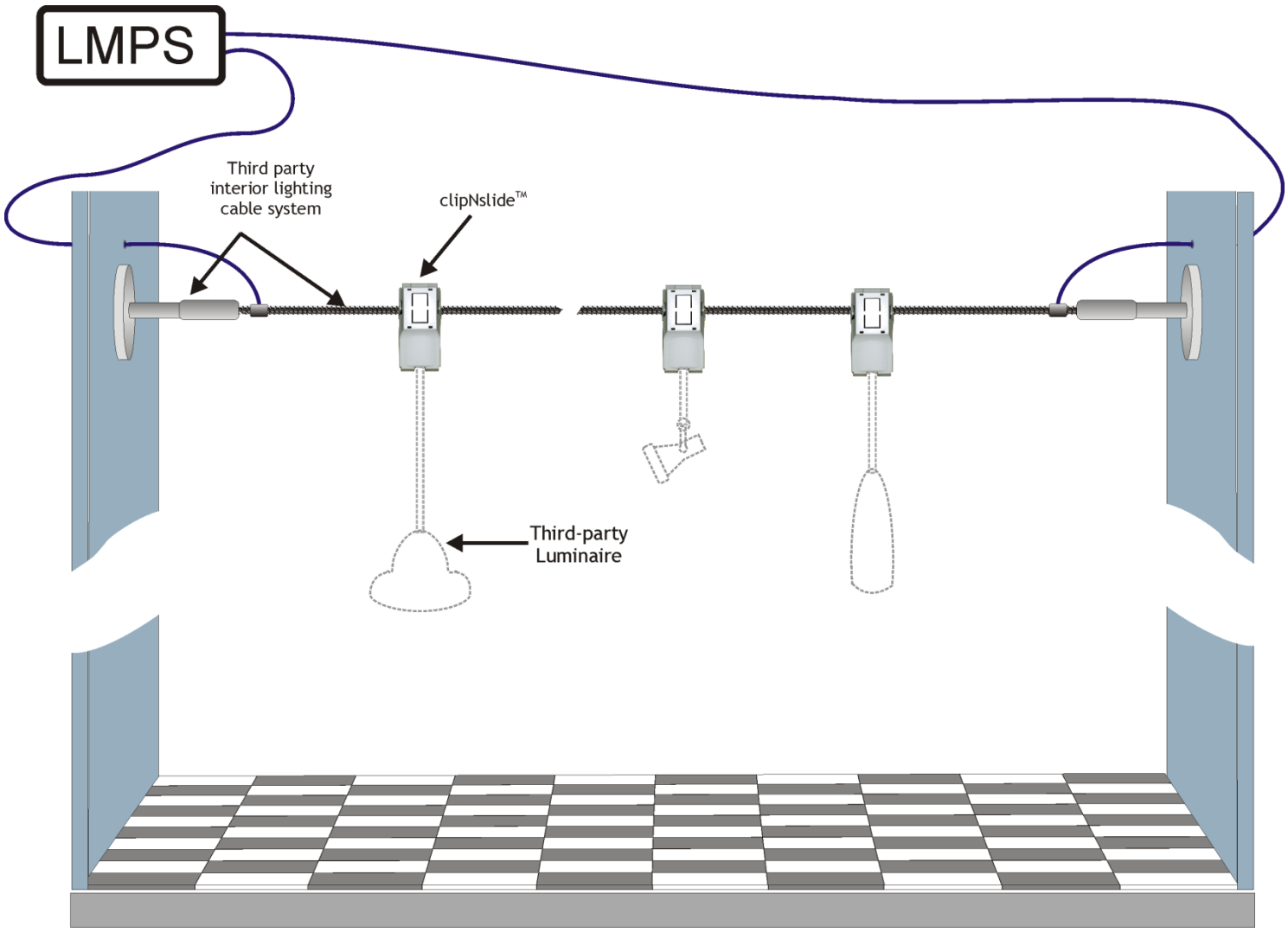


Figure 26: Interior lighting cable system

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for following the installation and safety instructions of the third party interior lighting cable system.
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.
- The user is responsible for proper selection of the electrical conductor and associated hardware.

SPLIT STRAIGHT PAIR

- Luminaires are installed on a dual conductor wire with small sections separated for one another.
- Separate only what is needed to insert the clipNslide™.
- Suitable wire types: RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, TW, UF, USE, USE-2, XHH, XHHW, XHHW-2, Z, ZW, ZW-2.
- In outdoor environments and where exposed to sunlight the electrical conductor should be marked "SUN-RESISTANT", "SR" or a similar marking.

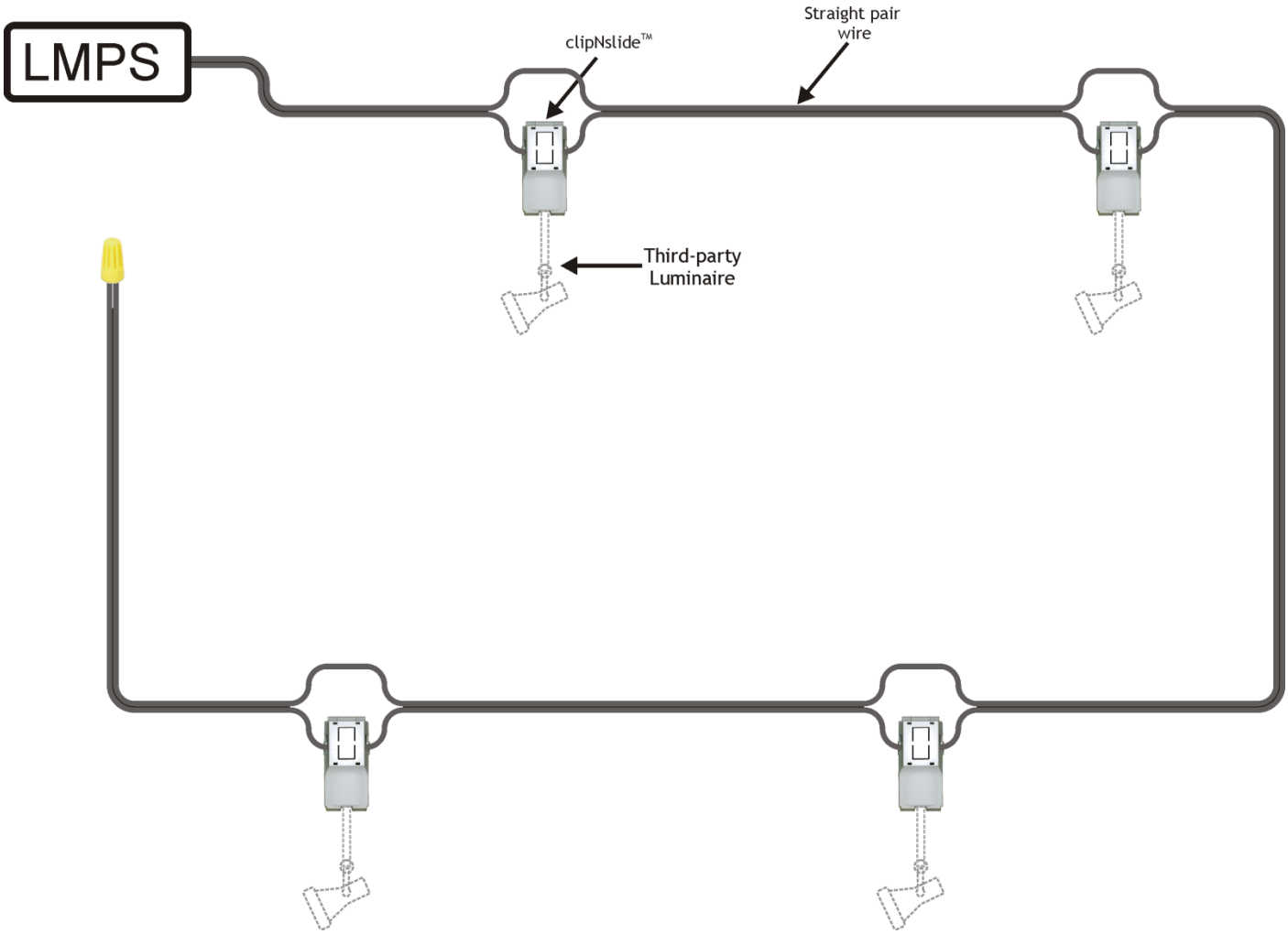


Figure 27: Split straight pair

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application.

WARNINGS AND DISCLAIMERS

- **IMPORTANT: The user is responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.**
- All technical data in this technical bulletin is based on test results and is believed to be correct. However since the end use of TFT Transfotec™ products, usage application and installation, is beyond our control, TFT Transfotec™ makes no warranty expressed or implied as to the fitness of use. Their use shall be solely by the judgment and at the risk of the user notwithstanding any statement in this technical bulletin.
- All equipment shall be installed in a neat and workmanlike manner. See NECA 1-2010 standard "Good Workmanship in Electrical Construction".
- The user is responsible for proper selection of the electrical conductor type that will be used for the specific application; see the requirements in technical bulletin #27 "Wiring for architectural applications".
- For other configurations and general information about circuit design please contact TFT Transfotec™.
- The user shall be the sole party responsible for the certification, by a legal certification authority (UL/ETL) of the system in which the clipNslide™ is used.
- The user shall be the sole party responsible for the safe electrical and mechanical installation of the clipNslide™ and suitability of the wiring system, mounting surfaces and any mounting hardware used. Failure to do so can lead to electrical and mechanical failure of the system and serious personal injury.
- The user shall be the sole party responsible for the published technical, safety information and installation instructions pertaining to the luminaire and lighting system.
- Refer to the product sheet for more information about the LMPS-350, LMPS-DC350, LMPS-750 power supplies.

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