

Lumaris Tape Light Advanced Applications Guide

1.0 Overview

Purpose:

This app note is designed to help provide guidance for installers who are planning a Lumaris Tape Light project with a non-standard application that may not be covered by the product installation instructions.

Applicability

The instructions in this application note only apply to installations using the following Lutron tunable white LED tapes as included in the following part numbers: HWL-TLK-DL, RRL-TLK-DL, HWL-TLK-SW, RRL-TLK-SW, LU-T05-SW, LU-T05-DL, LU-T30-SW, LU-T30-DL

Wireless controllers as mentioned in this application note should be only those included in the following Lutron part numbers: HWL-TLK-DL, RRL-TLK-DL, HWL-TLK-SW, RRL-TLK-SW, HWL-TWC-WH, RRL-TWC-WH, HWL-TWCL-WH, RRL-TWCL-WH

Considerations:

The limitations of wire length must be carefully followed to ensure that LEDs are consistently illuminated from beginning of the run to the end of the run. This is particularly important with a tunable white solution where warm and cool LEDs are purposefully blended at different intensities to produce light at a specific Coordinated Color Temperature (CCT) and overall intensity.

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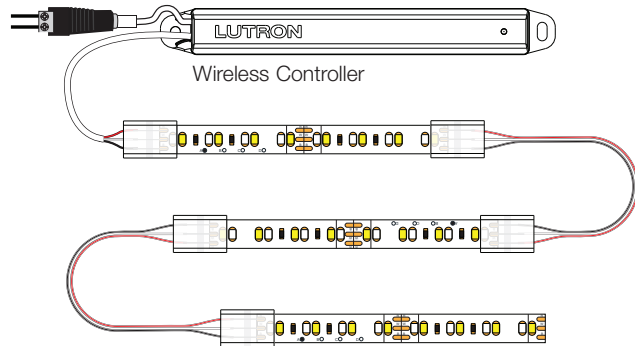
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2.0 Wiring Topology for Lumaris Tunable White Tape

Three basic options exist for wiring Lumaris tape light strips; series, parallel, and series-parallel. Each installation should be carefully considered to determine the most effective wiring option for that application. Examples are demonstrated below.

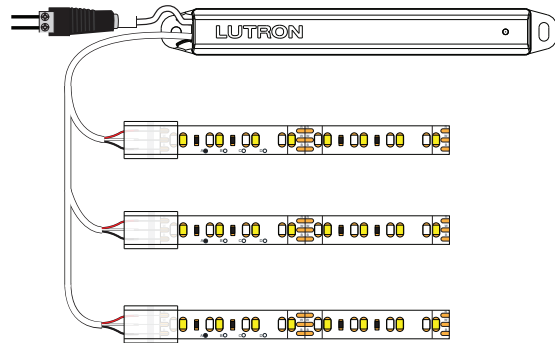
Series

Example: Segments of LED tape installed for under-cabinet lighting.



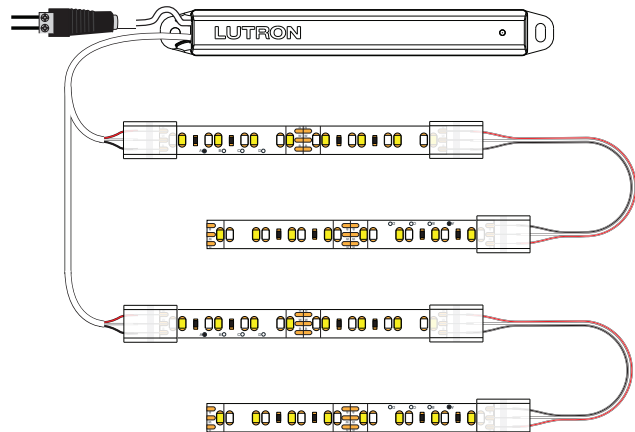
Parallel

Example: Segments of LED tape installed for bookshelf lighting.



Series-Parallel

Example: Any installation where series and parallel wiring is combined.



3.0 Advanced Installations Using the Lumaris Power Interface (LU-PH3-A)

When using the Lumaris Power Interface (LU-PH3-A) with the Lumaris tunable white tape light, there may be times when it would be advantageous to use greater than 10 ft (3 m) of wire on the output of a wireless controller. To maintain adequate voltages, the length of the 24 V_{DC} power wire must be considered when extending the wire length on the controller's output.

No individual series-wired LED tape run should have more than 10 ft (3 m) of 22 AWG (0.25 mm²) three-conductor wire (LU-WK1-TW) from the first LED tape segment to the last LED tape segment. If using more than six connectors on any individual series-wired LED tape run, each additional connector reduces the maximum length of the 22 AWG (0.25 mm²) three-conductor wire (LU-WK1-TW) allowed by 6 in (152.4 mm).

Additional wire in the middle of a tape run can increase resistance and cause noticeably inconsistent light levels between the beginning and end of the LED tape run.

The charts below detail some restrictions for these applications that will allow for maximum installation flexibility while maintaining optimum performance. These revised wire length rules **ONLY** apply when using the Lumaris Power Interface (LU-PH3-A) to power the Lumaris wireless controllers.

*Due to the nature of the insulation displacement connectors used for wire-to-tape connections, **ONLY** 22 AWG (0.25 mm²) 3-conductor stranded wire may be used on the outlet of the wireless controller. Solid wire and other sizes are not supported.*

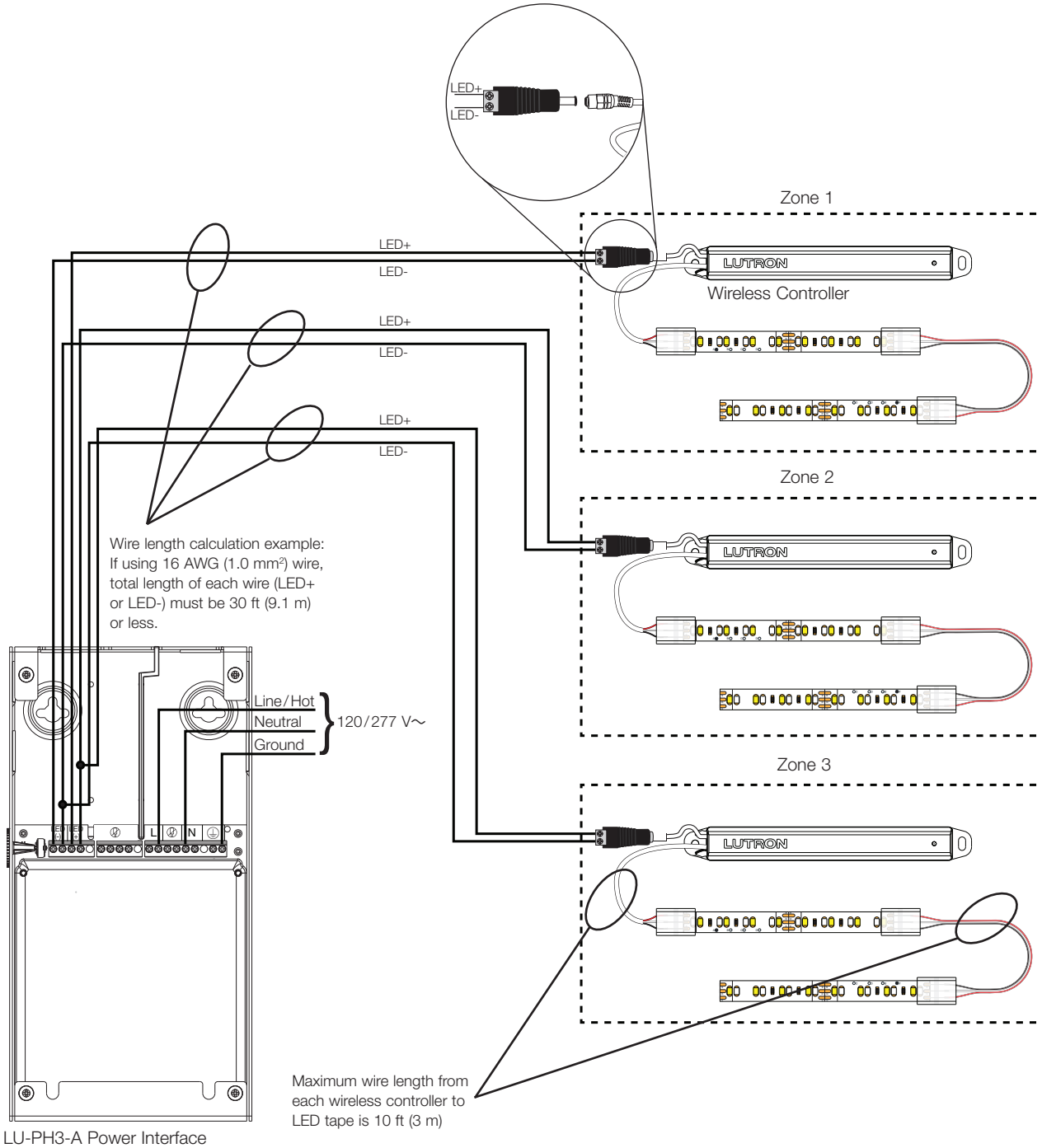
When Lumaris wireless controllers are fully loaded with 16.4 ft (5 m) of LED tape, the following limits apply:					
Max length of 3-conductor wire in ft (m):	Max wire length from power interface to wireless controller in ft (m):				
22 AWG (0.25 mm ²)	12 AWG (4.0 mm ²)	14 AWG (2.5 mm ²)	16 AWG (1.0 mm ²)	18 AWG (0.75 mm ²)	20 AWG (0.50 mm ²)
10 (3.0)	75 (22.9)	50 (15.2)	30 (9.1)	20 (6.1)	10 (3.0)
20 (6.1)	40 (12.2)	25 (7.6)	16 (4.9)	10 (3.0)	6 (1.8)
30 (9.1)	8.5 (2.6)	5.5 (1.7)	3.5 (1.1)	2 (0.6)	1.5 (0.4)

When Lumaris wireless controllers are loaded with no more than 8.2 ft (2.5 m) of LED tape, the following limits apply:					
Max length of 3-conductor wire in ft (m):	Max wire length from power interface to wireless controller in ft (m):				
22 AWG (0.25 mm ²)	12 AWG (4.0 mm ²)	14 AWG (2.5 mm ²)	16 AWG (1.0 mm ²)	18 AWG (0.75 mm ²)	20 AWG (0.50 mm ²)
10 (3.0)	150 (45.7)	96 (29.3)	60 (18.3)	38 (11.6)	23 (7.0)
20 (6.1)	85 (25.9)	53 (16.1)	33 (10.0)	21 (6.4)	13 (4.0)
30 (9.1)	17 (5.2)	11 (3.3)	7 (2.1)	4 (1.2)	2.5 (0.8)

4.0 Multi-Zone Wiring Instructions

When wiring Lumaris wireless controllers to a Lumaris power interface (LU-PH3-A), a single home run may only be used for 24 V_{DC} power when all three wireless controllers are programmed as the same lighting zone. When wireless controllers are independent zones, they each must have their own dedicated 24 V_{DC} power wire run.

If a multi-zone application is used with three wireless controllers, the LED(+) and LED(-) wires for two of the controllers will need to be spliced together inside the power interface enclosure. Example schematic shown below.



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