

## Hi-lume® Premier 0.1% EcoSystem®/3-wire Constant Voltage 24 V $\overline{\text{=}}$ LED Driver with Soft-on, Fade-to-Black™

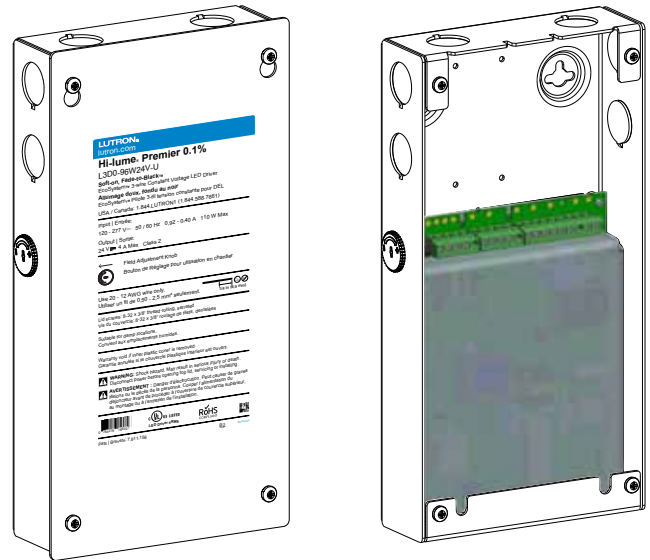
The Hi-lume® Premier 0.1% Constant Voltage Driver (L3D0) is a high-performance LED driver capable of controlling up to 96 W of 24 V $\overline{\text{=}}$  constant voltage loads. This driver provides smooth and continuous dimming down to 0.1% low-end. It is ideal for use with strip lighting in applications such as coves, under or over cabinet lighting and pathway lighting. The driver is UL® Listed with an integrated wiring compartment and can be mounted up to 150 ft (45 m) away from the load.

### Features

- Continuous, flicker-free dimming from 100% to 0.1%<sup>1</sup>.
- Soft-on, Fade-to-Black™ operation for EcoSystem® controls: fades smoothly between 0% and 0.1% when turned on and off for an incandescent like experience.<sup>2</sup>
- PWM dimming meets IEEE1789 over the entire dimming range.
- UL® Listed for United States and Canada (cULus®).
- NOM certified for Mexico.
- Field Adjustment Knob offers customer low-end light output tuning for better fixture-to-fixture matching.
- Guaranteed dimming performance when used with Lutron® controls:
  - HomeWorks® QS, Energi Savr Node™ units with EcoSystem® controls, GRAFIK Eye® QS with EcoSystem® controls, PowPak® with EcoSystem® dimming modules, PowPak® with EcoSystem® wireless fixture controls, and Quantum® systems, allowing for integration into a planned or existing EcoSystem® lighting control solution.
  - Lutron® 3-wire controls and interfaces.
- Protected from miswires of input power, up to 277 V $\sim$ , to EcoSystem® control inputs.
- Rated lifetime of 50,000 hours at 40 °C (104 °F) ambient temperature and maximum loading.
- FCC Part 15 compliant for commercial applications at 120–277 V $\sim$  and residential applications at 120 V $\sim$ .
- In rush limiting allows full loading of circuit breakers without nuisance tripping.

<sup>1</sup> Light output at 0.1% depends on installation and light engine efficacy.

<sup>2</sup> Soft-on, Fade-to-Black™ dimming technology is not available for 3-wire controls.



**Hi-lume® Premier 0.1% Constant Voltage Driver (L3D0)**  
5.5 in (140 mm) W x 2.0 in (51 mm) H x 10.5 in (267 mm) L

- 100% end-of-line performance tested at a Lutron® factory.
- RoHS compliant.
- Restores all settings after power failure.
- Barrier provided for Class 2 separation in the wiring compartment.
- Redundant connections on line and control terminals for easy daisy chain wiring.
- Redundant connections on output terminals allow for easy wiring of two LED load home runs.
- Class 2 output designed to withstand hot swap.
- For more information please visit: [www.lutron.com](http://www.lutron.com)

### LUTRON® SPECIFICATION SUBMITTAL

Page

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Specifications

### Regulatory Approvals and Compliance

- Lutron® Quality Systems registered to ISO 9001.2008
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV
- FCC Part 15 compliant for commercial applications at 120 V~ to 277 V~ and residential applications at 120 V~
- Meets UL® 8750/CSA C22.2 No. 250.13-14, "Light Emitting Diode (LED) Equipment For Use in Lighting Products"
- NOM certified
- Class 2 output; meets UL® 1310/CSA C22.2 No. 223-M91

### Performance

- Dimming Range: 100% to 0.1%<sup>1</sup>
- LED lighting turns on to any dimmed level without flashing to full brightness
- Operating Voltage: 120 V~ to 277 V~ at 50/60 Hz
- Rated lifetime of 50,000 hours at 40 °C (104 °F) ambient temperature and maximum loading
- For rated warranty, ambient temperature ( $t_a$ ) not to exceed 40 °C (104 °F) (maximum rated temperature)<sup>2,3</sup>
- Patented thermal fold back protection
- Non-volatile memory restores all driver settings after power failure
- Typical standby power consumption: 0.25 W at 120 V~ and 0.4 W at 277 V~
- Open-circuit protected output
- Short-circuit and overload-protected output
- Output: 24 V== constant voltage at high-end
- Output Load Range: 25 W to 96 W at high-end
- PWM dimming frequency: meets IEEE1789 at all dim levels
- Power Factor: > 0.95 at maximum power
- Total Harmonic Distortion (THD): < 20% at maximum power

### Performance (continued)

- NEMA 410 – 2011 compliant
- Inrush Current Limiting Circuitry: decreases circuit breaker tripping, switch arcing and relay failure; allows full loading of switch leg
- Inrush Current: < 2 A
- Device turn-on time: < 100 ms from electronic off and, < 500 ms from power off
- Meets all "Solid State Electrical Performance Requirements" (Section 11) in Energy Star® for Luminaires Version 2.0
- L3D0-96W24V-U driver is programmed by Lutron® manufacturing and is NOT configurable by the Lutron® QwikFig™ configuration system

### Environmental

- Sound rated: Class A inaudible in 24 dBA ambient
- Relative Humidity: maximum 90% non-condensing
- Minimum Operating Ambient Temperature:  $t_a = 0$  °C (32 °F)<sup>3</sup>
- Indoor use only
- Rated for dry and damp locations
- Meets NEC® requirements for installation in "other space used for environmental air"<sup>4</sup>
- Meets the Canadian National Building Code Plenum Requirements for a concealed space used as a plenum within a floor or roof assembly
- Maximum heat output of module: 46 BTU/hour

<sup>1</sup> Light output at 0.1% depends on installation and light engine efficacy.

<sup>2</sup> To maintain warranty, installer is responsible for ensuring that the driver ambient temperature does not exceed 40 °C (104 °F).

<sup>3</sup> Where  $t_a$  is the temperature of the air directly surrounding the driver.

<sup>4</sup> Additional considerations may be required based on state and local codes and standards.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

## Specifications *(continued)*

### Driver Wiring and Mounting

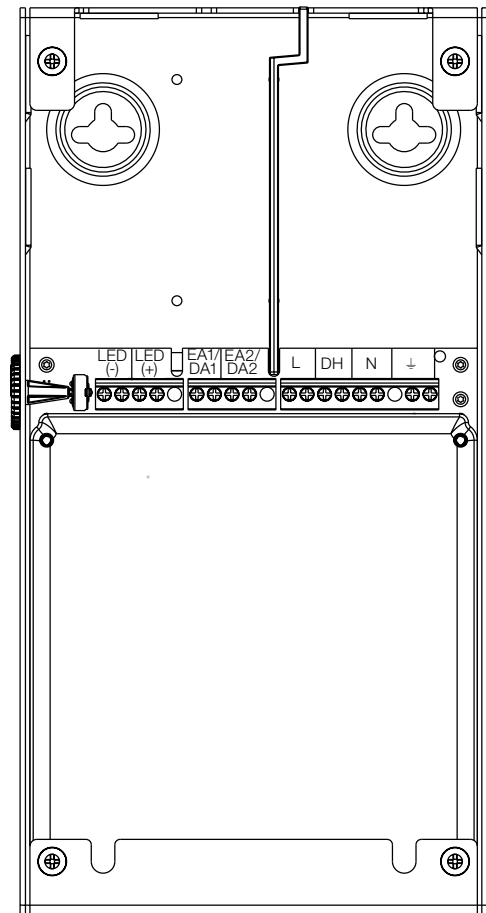
For best installation practices, please refer to Application Note #591 at [www.lutron.com](http://www.lutron.com).

- Mount the driver in a position where it can be easily located and accessed if service or troubleshooting is necessary.
- Driver is grounded by terminal connection
- Terminal blocks on the driver accept solid or stranded wire per terminal from 20 AWG to 12 AWG (0.50 mm<sup>2</sup> to 2.5 mm<sup>2</sup>).
- Maximum wire length between the LED driver and the start of the linear strip for different wire sizes is listed below. The table below can be used independently of line voltage powering the LED Driver.

Wire Gauge	Maximum Lead Length
24 AWG (0.20 mm <sup>2</sup> )	6 ft (1.8 m)
22 AWG (0.75 mm <sup>2</sup> )	10 ft (3.0 m)
20 AWG (0.50 mm <sup>2</sup> )	15 ft (4.5 m)
18 AWG (0.75 mm <sup>2</sup> )	25 ft (7.62 m)
16 AWG (1.0 mm <sup>2</sup> )	40 ft (12.2 m)
14 AWG (1.5 mm <sup>2</sup> )	60 ft (18.3 m)
12 AWG (2.5 mm <sup>2</sup> )	100 ft (30.5 m)
10 AWG (4.0 mm <sup>2</sup> )*	150 ft (45.7 m)

\* To use wire gauge larger or smaller than terminal blocks' rated gauge of 20 AWG to 12 AWG (0.50 mm<sup>2</sup> to 2.5 mm<sup>2</sup>), connect 1 ft (0.3 m) or less of rated wire from terminal and connect with larger or smaller wire.

Terminal Block Details



<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

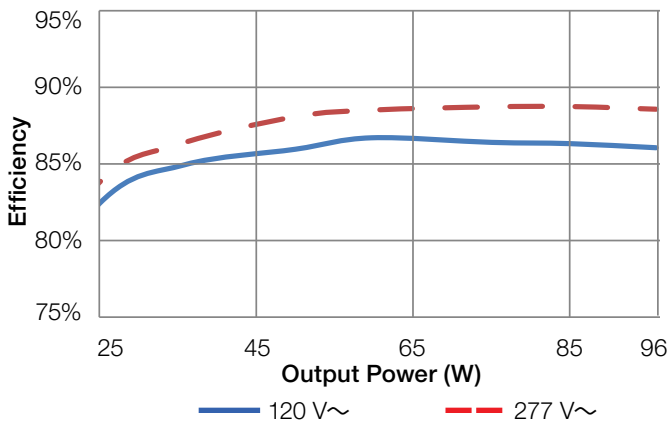
## Models Available

		Model	Input Voltage (V~)	Input Current <sup>1</sup> (A)	Typical Power Factor <sup>1</sup>	Typical THD <sup>1</sup> (%)	Output Power <sup>1</sup> (W)	Output Voltage <sup>1</sup> (V <sub>DC</sub> )
3-Wire or EcoSystem® Control <sup>2</sup>	For 24 V <sub>DC</sub> Constant Voltage LED Loads	L3D0-96W24V-U	120	0.92	0.99	7.5	25–96	24
			277	0.40	0.97	11	25–96	24

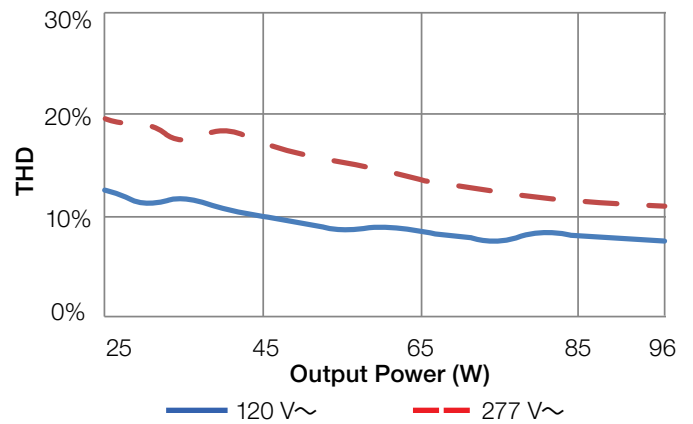
<sup>1</sup> At maximum output power.

<sup>2</sup> For wiring options, see **Wiring** section, pages 9-11.

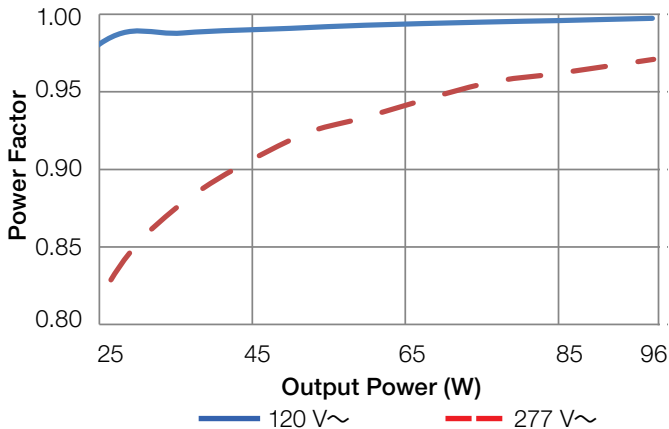
**Efficiency vs. Output Power**



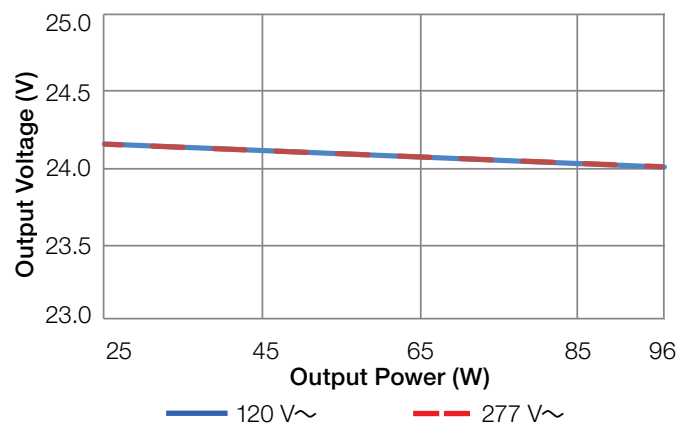
**THD vs. Output Power**



**Power Factor vs. Output Power**



**Output Voltage vs. Output Power**

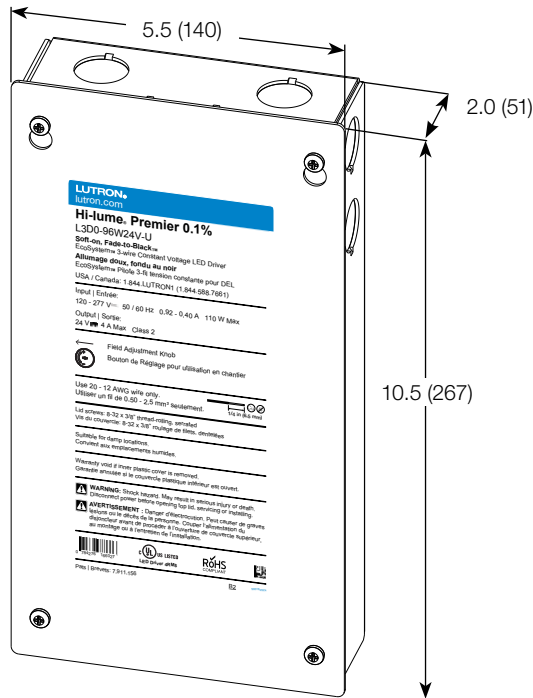


NOTE: Specifications are subject to change without notice.

Job Name:	Model Numbers:
Job Number:	

# Enclosure Dimensions

Measurements are shown as: in (mm)

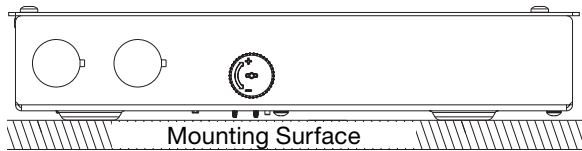
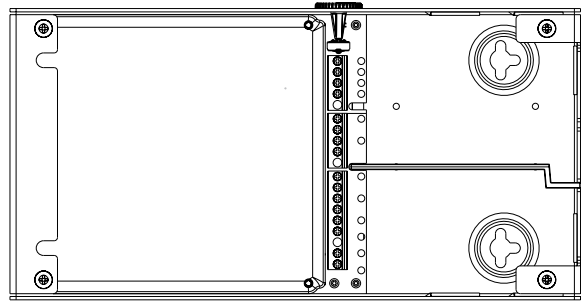
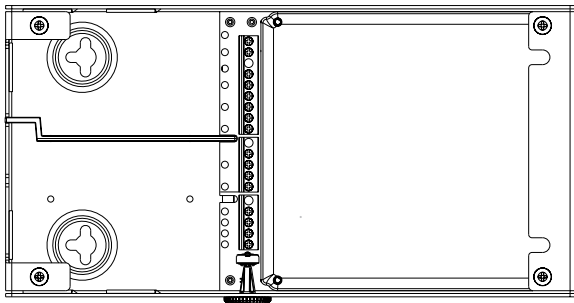
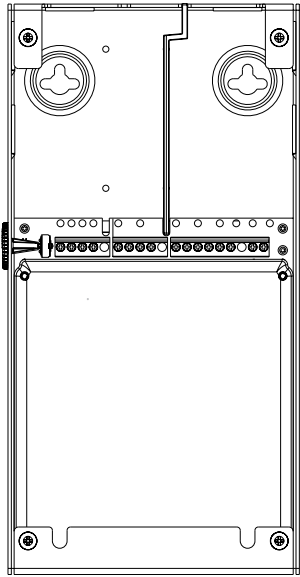


## Knockouts

- Sides
  - 4 locations: 1/2 in or 21 mm trade size
- Top
  - 2 locations: 1/2 in or 21 mm trade size

<p><b>Job Name:</b></p>	<p><b>Model Numbers:</b></p>
<p><b>Job Number:</b></p>	

### Mounting Options 1,2



- 1 Any other mounting configuration will require additional mechanical support. Improper installation may result in hazards to personnel or property.
- 2 Mount the driver in a position where it can be easily located and accessed if service or troubleshooting is necessary.

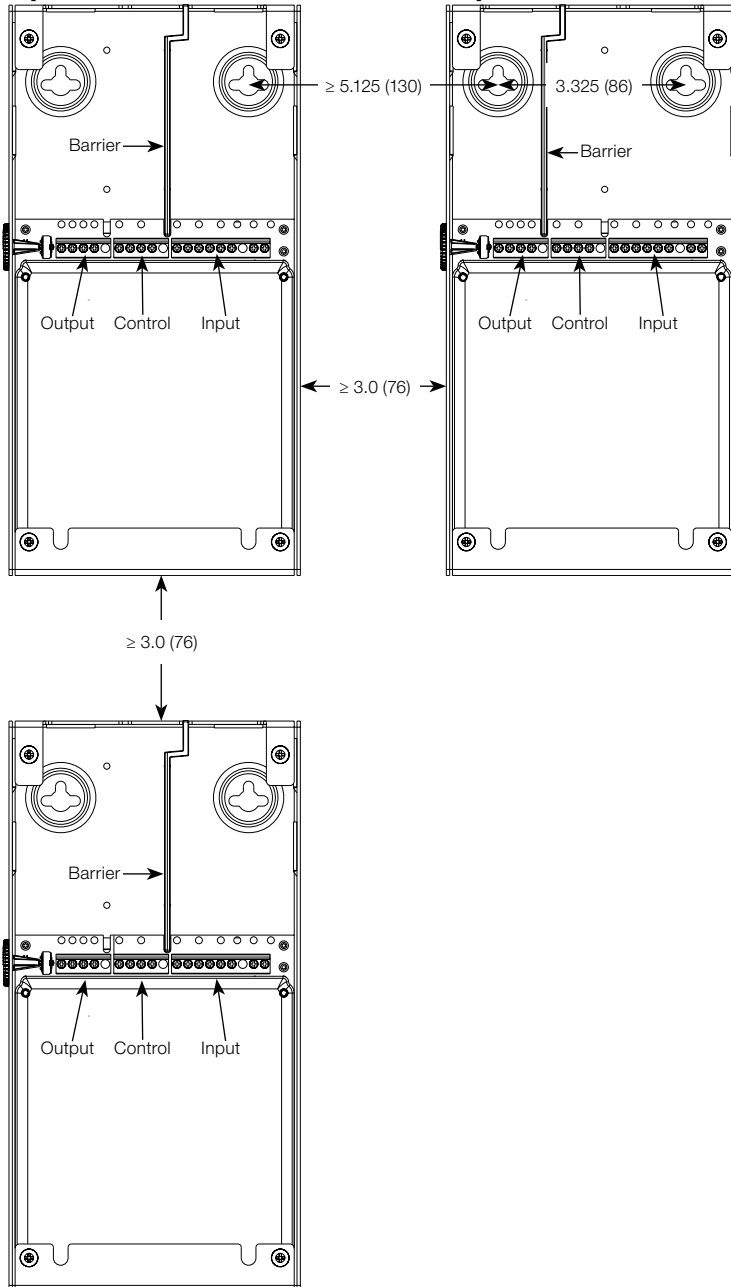
Job Name:	Model Numbers:
Job Number:	

## Barrier Installation and Driver Spacing Requirements

Measurements are shown as: in (mm)

### Option 1

### Option 2



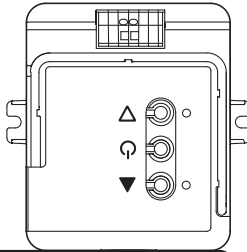
- Optional barrier can be placed either between the input and control terminals (**Option 1**) when the EcoSystem® links are wired as Class 2 or between the control and output terminals (**Option 2**) when EcoSystem® links are wired as Class 1.
- For 3-wire control, barrier could be placed in either location.
- See Lutron® Application Note #142 at [www.lutron.com](http://www.lutron.com) for more details regarding wiring EcoSystem® as Class 1 or Class 2.
- Maintain a minimum of 3.0 in (76 mm) between any two Hi-lume® Premier 0.1% drivers.

Job Name:	Model Numbers:
Job Number:	

### Control Mounting Options *(continued)*

A PowPak® Wireless Fixture Control can be mounted on the driver using the driver's available knockouts. Additional considerations may be required based on state and local codes and standards.

PowPak® Dimming Module  
 Model RMJ-ECO32-DV-B  
 OR  
 PowPak® Fixture Control<sup>1</sup>  
 Model FCJ-ECO, FCJS-ECO



**LUTRON.**  
lutron.com

**Hi-lume® Premier 0.1%**  
 L3D0-96W24V-U  
**Soft-on, Fade-to-Black™**  
 EcoSystem™ / 3-wire Constant Voltage LED Driver

**Allumage doux, fondu au noir**  
 EcoSystem™ - pilote 3-fil tension constante pour DEL  
 USA / Canada: 1.844.LUTRON1 (1.844.588.7661)

---

Input | Entrée:  
 120 - 277 V~ 50 / 60 Hz 0.92 - 0.40 A 110 W Max

Output | Sortie:  
 24 V<sub>DC</sub> 4 A Max Class 2

---

← Field Adjustment Knob  
 Bouton de Réglage pour utilisation en chantier

---

Use 20 - 12 AWG wire only.  
 Utiliser un fil 0,50 - 2,5 mm<sup>2</sup> seulement. 1/4 in (6,5 mm)

---

Lid screws: 8-32 x 3/8" thread-rolling, serrated  
 Vis du couvercle : 8-32 x 3/8" roulage de filets, dentelées

---

Suitable for damp locations.  
 Convient aux emplacements humides.

---

Warranty void if inner plastic cover is removed.  
 Garantie annulée si le couvercle plastique intérieur est ouvert.

---

**⚠ WARNING:** Shock hazard. May result in serious injury or death.  
 Disconnect power before opening top lid, servicing or installing.

**⚠ AVERTISSEMENT :** Danger d'électrocution. Peut causer de graves lésions ou le décès de la personne. Couper l'alimentation du disjoncteur avant de procéder à l'ouverture de couvercle supérieur, au montage ou à l'entretien de l'installation.

---

**UL LISTED**  
LED Driver 48MS

**ROHS**  
COMPLIANT

Pats. | Brevets: 7,911,156

Hi-lume® Premier 0.1% Constant Voltage Driver  
 Model L3D0-96W24V-U

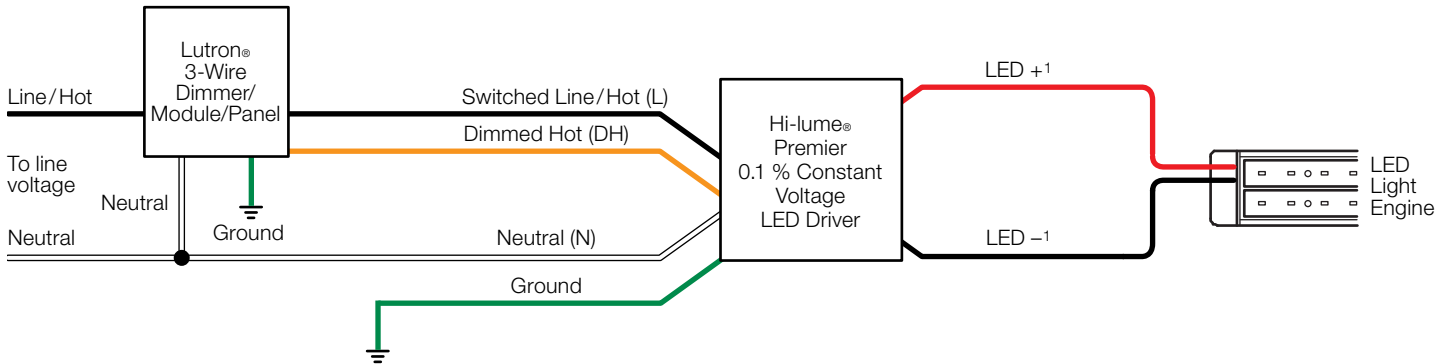
<sup>1</sup> The wireless fixture control will need to have its low-end level reprogrammed to dim to 0.1% output. For more detail on adjusting the low-end light level, refer to Application Note #556 at [www.lutron.com](http://www.lutron.com), call 1.877.346.5338 (U.S.A. and Canada only), or email [LEDs@lutron.com](mailto:LEDs@lutron.com)

<b>LUTRON® SPECIFICATION SUBMITTAL</b>		Page
<b>Job Name:</b>	<b>Model Numbers:</b>	
<b>Job Number:</b>		



## Wiring

### L3D Models: 3-Wire Controls (third wire required for control signal) Wiring Diagram



<sup>1</sup> For the maximum wire length between the LED driver and the start of the linear strip, see charts in the **Driver Wiring and Mounting** section.

### Compatible Controls without Soft-on, Fade-to-Black™ dimming technology: Lutron® 3-Wire Controls<sup>4</sup>

Guaranteed performance specifications with the controls listed in the chart below.

For assistance selecting controls, contact our LED Center of Excellence at **1.877.346.5338** (U.S.A. and Canada only) or **LEDs@lutron.com**

Product	Model Number		Drivers per Control <sup>1</sup>		Load Type	Low-end Trim Setting
	120 V~	277 V~	120 V~	277 V~		
Nova T★ dimmer	NTF-10-	NTF-10-277-	1-16	1-19	—	—
	NTF-103P-	NTF-103P-277-	1-8	1-14	—	—
Nova dimmer	NF-10-	NF-10-277-	1-16	1-19	—	—
	NF-103P-	NF-103P-277-	1-8	1-14	—	—
Skylark dimmer	SF-10P-	SF-12P-277-	1-8	1-14	—	—
	SF-103P-	SF-12P-277-3-	1-8	1-14	—	—
Diva dimmer	DVF-103P-	DVF-103P-277-	1-8	1-14	—	—
	DVSCF-103P-	DVSCF-103P-277-	1-8	1-14	—	—
Ariadni dimmer	AYF-103P-	AYF-103P-277-	1-8	1-14	—	—
Maestro dimmer	MAF-6AM-	MAF-6AM-277-	1-6	1-14	—	—
	MSCF-6AM-	MSCF-6AM-277-	1-6	1-14	—	—
Maestro Wireless dimmer	MRF2-F6AN-DV-		1-6	1-14	—	—
RadioRA 2 dimmer	RRD-F6AN-DV-		1-6	1-14	Dual voltage 3-wire dimmer	21% <sup>3</sup>
HomeWorks QS dimmer	HQRD-F6AN-DV-		1-6	1-14	Fluorescent 3-wire LED 3-wire	21% <sup>3</sup>
Interfaces <sup>2</sup>	PHPM-3F-120-	—	1-16	—	—	—
	PHPM-3F-DV-		1-16	1-38	—	—
	BCI-0-10		1-16	1-38	—	—
GP dimming panels	Various		1-16	1-38	2-1	—

<sup>1</sup> No derating required in multi-gang applications provided that the fixture-count does not exceed the quantity listed.

<sup>2</sup> Please refer to interface specification sheet for compatible system list.

<sup>3</sup> Trim level allows the ability to get to 0.1% but might result in dead travel for 1%–4% on user interface for some installations. In this instance, 22% trim level could be used to avoid dead travel but might result in >0.1% dim level.

<sup>4</sup> Soft-on, Fade-to-Black™ dimming technology is not available for 3-wire controls.

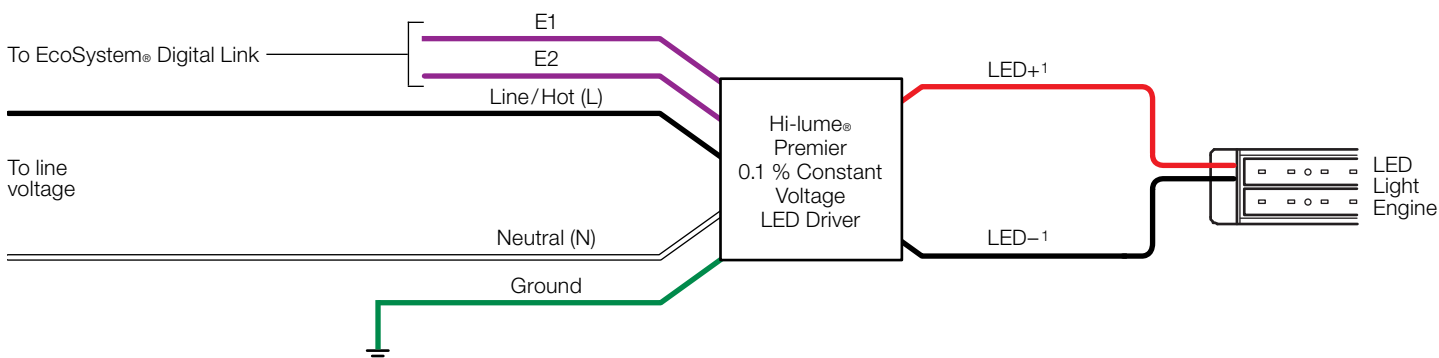
**Note:** For information about legacy products use in existing control application with this driver, contact LEDs@lutron.com

## LUTRON® SPECIFICATION SUBMITTAL

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

Wiring (continued)

L3D Models: EcoSystem® Digital Controls



<sup>1</sup> For the maximum wire length between the LED driver and the start of the linear strip, see charts in the *Driver Wiring and Mounting* section.

Compatible Controls with Soft-on, Fade-to-Black™ dimming technology: Lutron® EcoSystem® Digital Controls  
 Guaranteed performance specifications with the controls listed in the chart below.

For assistance selecting controls, contact our LED Center of Excellence at **1.877.346.5338** (U.S.A. and Canada only) or **LEDs@lutron.com**

Product	Model Number		Recommended System Version <sup>2</sup>	Drivers per Control
	120 V~	277 V~		
PowPak® Dimming Module with EcoSystem®	RMJ-ECO32-DV-B URMJ-ECO32-DVB		5.9 or higher	32 per EcoSystem® link
PowPak® Wireless Fixture Control with EcoSystem® <sup>1</sup>	FCJ-ECO FCJS-ECO		0796554 or higher	3 per EcoSystem® link
Energi Savr Node™ unit with EcoSystem®	QSN-1ECO-S, QSN-2ECO-S QSN-2ECO-PS120 UQSN-1ECO-S, UQSN-2ECO-S		9.027 or higher	64 per EcoSystem® link
GRAFIK Eye® QS unit with EcoSystem®	QSGRJ-_E QSGR-_E	—	9.009 or higher	64 per EcoSystem® link
Quantum® Light Management Hub	QP2-_P_C	—	3.2 or higher <sup>3</sup>	64 per EcoSystem® link
HomeWorks® QS with EcoSystem®	LQSE-2ECO-D QSGRJ-_E QSGR-_E	—	10 or higher <sup>4</sup>	64 per EcoSystem® link

<sup>1</sup> All devices connected to one PowPak® Wireless Fixture Control will be controlled together. Devices will dim to the same level as the result of a control command. The wireless fixture control will need to have its low-end level reprogrammed to dim to 0.1% output. For more detail on adjusting low-end light level, refer to Application Note #556 at [www.lutron.com](http://www.lutron.com).

<sup>2</sup> For lower system versions, please visit [www.lutron.com/LEDsystemcheck](http://www.lutron.com/LEDsystemcheck) to check if your system requires changes.

<sup>3</sup> Version 3.1 (or later) is required to dim lower than 1%.

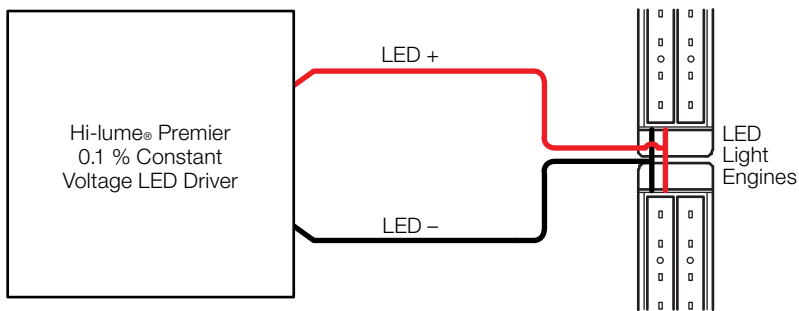
<sup>4</sup> Version 7.0 (or higher) is required to dim lower than 1%.

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

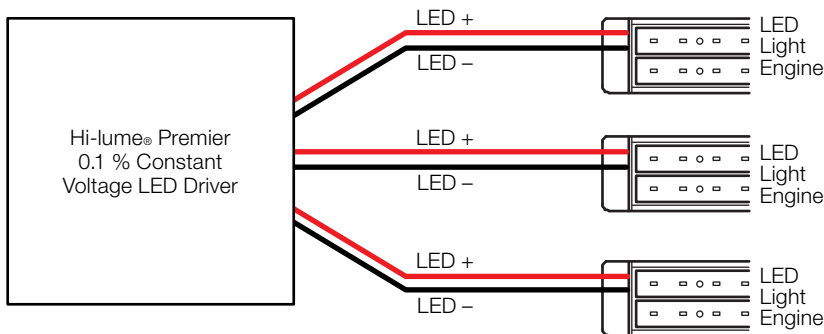
### Wiring (continued)

#### Continuous LED Light Run

In a continuous LED light run, it is best to connect the load wires in the middle of the LED light run. Please consult load manufacturer best practices for any additional consideration in load installation.



When connecting several LED light homeruns, ensure that the wire lengths and wattages match as closely as possible for best performance.



Job Name:	Model Numbers:
Job Number:	

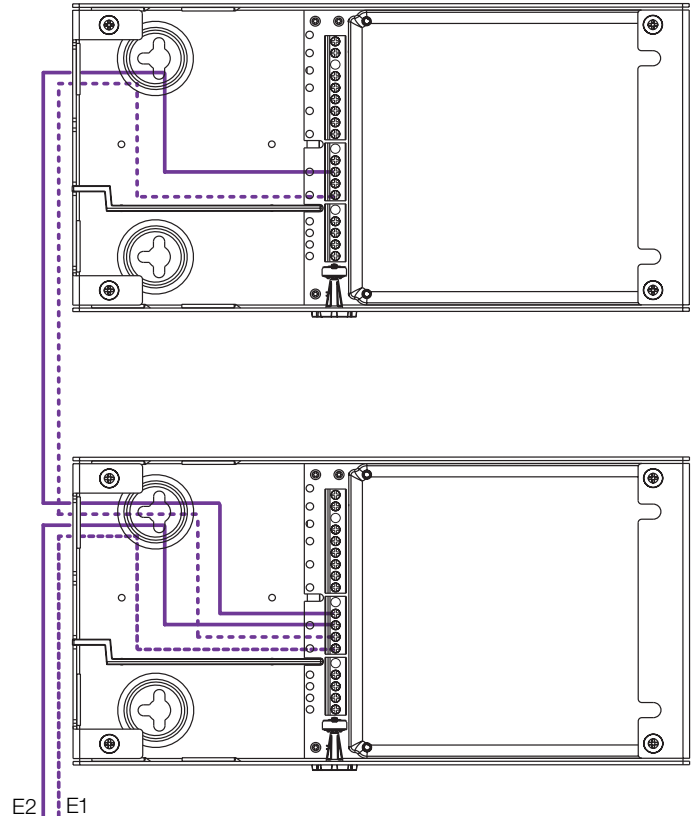
## EcoSystem® Wiring

### EcoSystem® Digital Link Overview

- The EcoSystem® Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Sensors do not connect directly to drivers. Sensors are integrated through the EcoSystem® controller.
- E1 and E2 (EcoSystem® Digital Link wires) are polarity-insensitive and can be wired in any topology.
- Power is supplied to the EcoSystem® Digital Link from the control system.
- Protected from miswires of input power, up to 277 V~, to EcoSystem® control inputs.

### EcoSystem® Digital Link Wiring

- EcoSystem® Digital Link terminals accept 20 AWG to 12 AWG (0.50 mm<sup>2</sup> to 2.5 mm<sup>2</sup>) solid or stranded copper wire per terminal.
- Make sure that the supply breaker to the drivers and EcoSystem® Digital Link Supply is OFF when wiring.
- E1 and E2 terminals of the drivers can be daisy chained as shown to the right.
- Using two different colors for E1 and E2 will reduce confusion when wiring several drivers together.
- The EcoSystem® Link may be wired Class 1 or Class 2 (See Lutron® Application Note #142 at [www.lutron.com](http://www.lutron.com) for more details). Consult applicable electrical codes for proper wiring practices. Ensure that the barrier placement is consistent with this wiring choice.
- For emergency wiring, please refer to Lutron® Application Note #106.



### Notes

- The EcoSystem® Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem® Digital Link length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Digital Link Length (max)
12 AWG	2200 ft
14 AWG	1400 ft
16 AWG	900 ft
18 AWG	550 ft
20 AWG	352 ft

Wire Size	Digital Link Length (max)
2.5 mm <sup>2</sup>	828 m
1.5 mm <sup>2</sup>	517 m
1.0 mm <sup>2</sup>	310 m
0.75 mm <sup>2</sup>	207 m
0.50 mm <sup>2</sup>	155 m

<b>Job Name:</b>	<b>Model Numbers:</b>
<b>Job Number:</b>	

### Field Adjustment Knob

The Field Adjustment Knob is located on the side of the Hi-lume® Premier 0.1% Constant Voltage Driver (L3D0) enclosure. This feature enables the customer to tune the lowest light output achieved during normal operation. An example of this scenario is shown in the image below. Adjusting the Field Adjustment Knob of the lower light output driver minimizes the light output difference and sets the low-end light level at 0.1%. This feature **only needs** to be used in cases of mismatched loads that are separately controlled by 2 or more units.

Figure 1: Cove Lighting with Mismatched Light Output at Low-End Due to Installation Variability

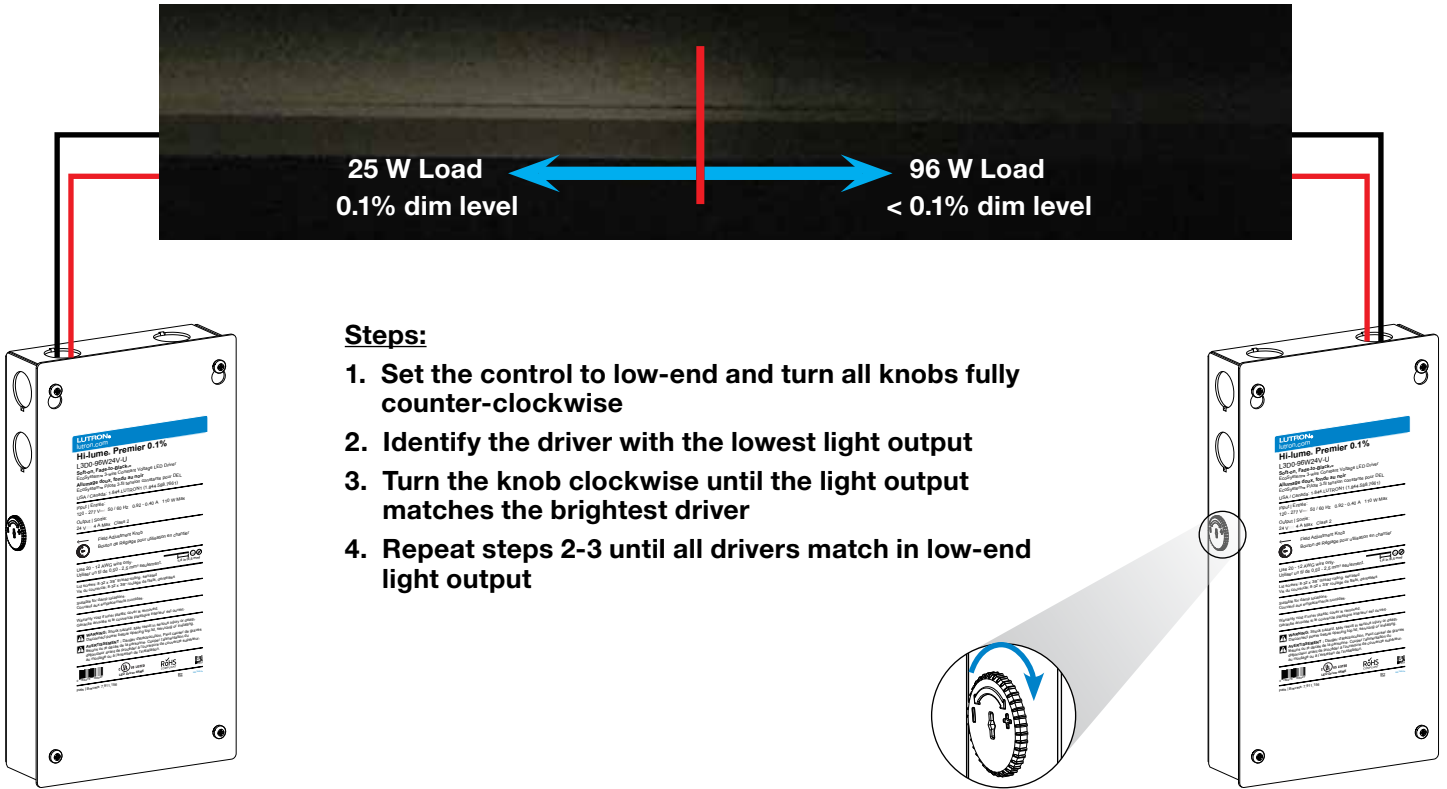


Figure 2: Cove Lighting After the Use of the Field Adjustment Knob Eliminates Mismatch without Costly Re-wiring



The Field Adjustment Knob cannot fix light level mismatch among loads on the same driver. For example, two homeruns of different wattage. For increasing the minimum light output of all the drivers in a space, please use the control's low-end trim feature. Using the Field Adjustment Knob for this purpose will degrade On/Off transition performance.

Job Name:	Model Numbers:
Job Number:	

## Facilities Manager

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:  
 (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Service

### Driver Warranty

For warranty information, please visit [www.lutron.com/driverwarranty](http://www.lutron.com/driverwarranty)

### Replacement Parts

When ordering Lutron® replacement parts, please provide the full model number. Consult Lutron if you have any questions.

### Further Information

For further information, please visit us at [www.lutron.com](http://www.lutron.com) or contact our LED Control Center of Excellence at **1.877.346.5338** (U.S.A. and Canada only) or [LEDs@lutron.com](mailto:LEDs@lutron.com)

## LUTRON® SPECIFICATION SUBMITTAL

Page

Job Name:	Model Numbers:
Job Number:	