



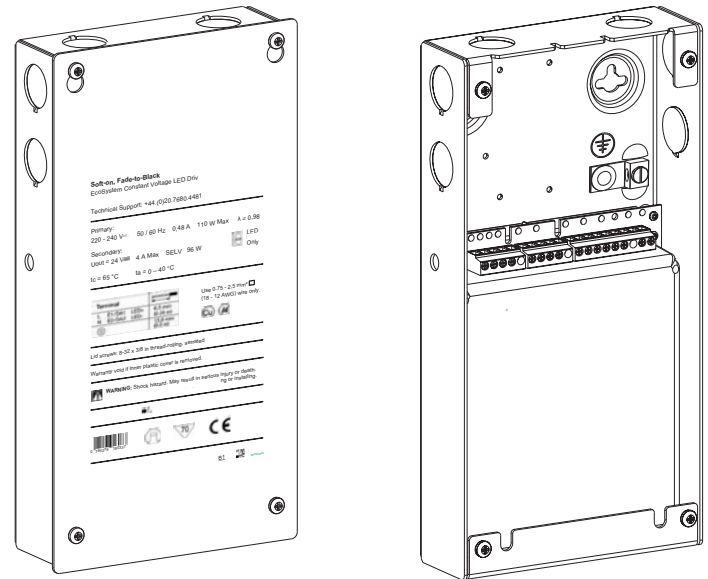
EOS-96-ECO-100-1-24V

1% Constant-Voltage 24 V $\overline{\sim}$ LED Driver with Soft-on, Fade-to-Black Dimming Technology

The CE-rated 1% Constant-Voltage Driver is a high-performance LED driver capable of controlling up to 96W of 24V- constant-voltage loads. This driver provides smooth and continuous dimming down to 1% low-end. It is ideal for use with strip lighting in applications such as coves, under / over cabinet and pathway lighting. The driver is designed with an integrated wiring compartment for ease of installation.

Features

- Continuous, flicker-free dimming from 100% to 1%
- Soft-on, Fade-to-Black dimming technology: Fades smoothly between 0% and 1% when turned on and off for an incandescent-like experience
- PWM dimming meets IEEE1789 throughout entire dimming range
- CE/ENEC rated
- SELV output
- Independent control gear
- Cord grips and grommets provided
- Remote mounting - up to 50 m (164 ft)
- Guaranteed dimming performance when used with Lutron controls:
 - HomeWorks QS, Energi Savr Node units with EcoSystem, PowPak dimming module with EcoSystem, and Quantum systems, allowing for integration into a planned or existing EcoSystem lighting control solution.
 - Energi Savr Node units with DALI, GRAFIK Eye QS with DALI, and Quantum systems, allowing for integration into a planned or existing DALI lighting control solution.
- Protected from miswires of input power, up to 240 V $\overline{\sim}$, to EcoSystem control inputs.
- Rated lifetime of 50 000 hours at 40 °C (104 °F) ambient temperature and maximum output power.
- CISPR 15 compliant at 220 V $\overline{\sim}$ to 240 V $\overline{\sim}$.



1% Constant Voltage Driver

140 mm (5.5 in) W x 51 mm (2.0 in) H x 267 mm (10.5 in) L

- 100% end-of-line performance tested at factory.
- RoHS compliant.
- Restores all settings after power failure (EcoSystem mode).
- Redundant connections on line and control terminals for easy daisy chain wiring.
- For more information please visit:
www.lutron.com/europe



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Specifications

Regulatory Approvals and Compliance

- Quality Systems registered to ISO 9001.2012
- 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
- CISPR 15 compliant at 220 V \sim to 240 V \sim
- IEC 61347-1 Lamp Control Gear Part 1 General + Safety Requirements
- IEC 61347-2-13 Lamp Control Gear Part 2-13 Particular Requirements for DC or AC supplied Electric Control Gear for LED modules
- IEC 62384 DC or AC Supplied Electronic Control Gear for LED Modules - Performance Requirements
- IP20 rated

Performance

- Dimming Range: 100% to 1%
- LED lighting turns on to any dimmed level without flashing to full brightness
- Operating Voltage: 220 V \sim to 240 V \sim at 50/60 Hz
- Rated lifetime of 50 000 hours at 40 °C (104 °F) ambient temperature
- For rated warranty, ambient temperature (t_a) not to exceed 40 °C (104 °F) (maximum rated temperature)^{1,2}
- Thermal foldback protection
- Non-volatile memory restores all driver settings after power failure (EcoSystem mode)
- Typical standby power consumption: 0.4 W at 230 V \sim
- Open-circuit protected output
- Short-circuit and overload-protected output
- SELV output designed to withstand hot swap
- Output: 24 V $\overline{=}$ constant voltage at high-end
- Output: 2 W to 96 W³
- PWM dimming frequency: meets IEEE1789 at all dim levels

- Power Factor: $\lambda > 0.95$ at maximum power
- Total Harmonic Distortion (THD): $< 20\%$ at maximum power
- Inrush Current Limiting Circuitry: decreases circuit breaker tripping, switch arcing and relay failure
- Inrush Current: < 2 A
- Device turn-on time: < 100 ms from electronic off and, < 500 ms from power off
- DALI compliant
 - IEC 62386-101 ed. 1.0
 - IEC 62386-102 ed. 1.0
 - IEC 62386-207 ed. 1.0
- Driver is programmed by Lutron manufacturing; NOT configurable by the Lutron QwikFig configuration system.

Environmental

- Sound rated: Class A inaudible in 24 dBA ambient
- Relative Humidity: maximum 90% non-condensing
- Operating Ambient Temperature: $t_a = 0$ °C–40 °C²
- Indoor use only
- Maximum heat output of module: 46 BTU/hour

¹ To maintain warranty, installer is responsible for ensuring that the driver ambient temperature does not exceed 40 °C (104 °F).

² Where t_a is the temperature of the air directly surrounding the driver.

³ At full light output. Product will function at less than 2 W but performance is not specified.



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Specifications *(continued)*

Driver Wiring and Mounting

- Driver must be grounded using the ground lug
- Terminal blocks on the driver accept solid or stranded wire per terminal from 0.75 mm² to 2.5 mm² (18 AWG to 12 AWG)
- Maximum wire length between LED driver and start of the linear strip for different wire sizes are listed below:

Wire Gauge	m (ft)
0.75 mm ² (18 AWG)	10 (32.8)
1.0 mm ² (16 AWG)	15 (49.2)
1.5 mm ² (14 AWG)	20 (65.6)
2.5 mm ² (12 AWG)	30 (98.4)
4.0 mm ² * (10 AWG)	50 (164.0)

* To use wire larger than terminal blocks' rated range of 0.75 mm² to 2.5 mm² (18 AWG to 12 AWG), connect 30 cm (12 in) or less of rated wire from terminal, through output strain relief, and connect with larger wire.

Maximum Number of Drivers on a Miniature Circuit Breaker

Class	Maximum Drivers
16 A Class B Breaker	30
16 A Class C Breaker	30



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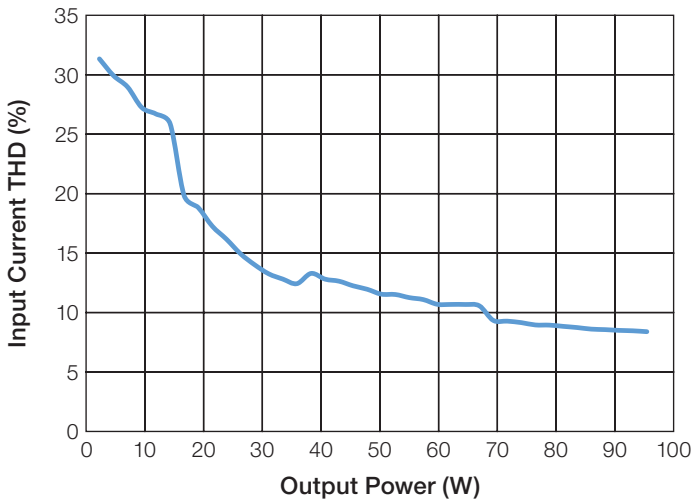
Model Available

	Model	Input Voltage (V \sim)	Input Current ¹ (A)	Typical Power Factor ¹	Typical THD ¹ (%)	Output Power (W)	Output Voltage (V $\overline{=}$)	Dimming (%)
For 24 V $\overline{=}$ Constant Voltage LED Loads ²	EOS-96-ECO-100-1-24V	220–240	0.47	0.97	8.5	2–96	24	1.0

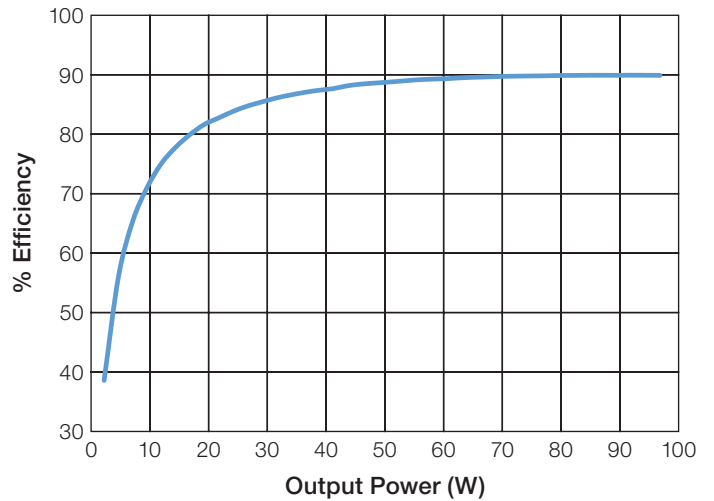
¹ At maximum output power.

² For wiring options, see **Wiring** section, page 8.

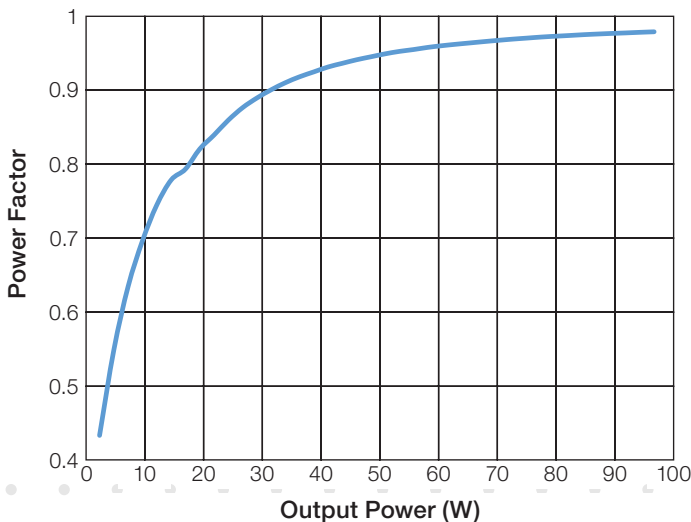
THD vs. Load at 230 V \sim



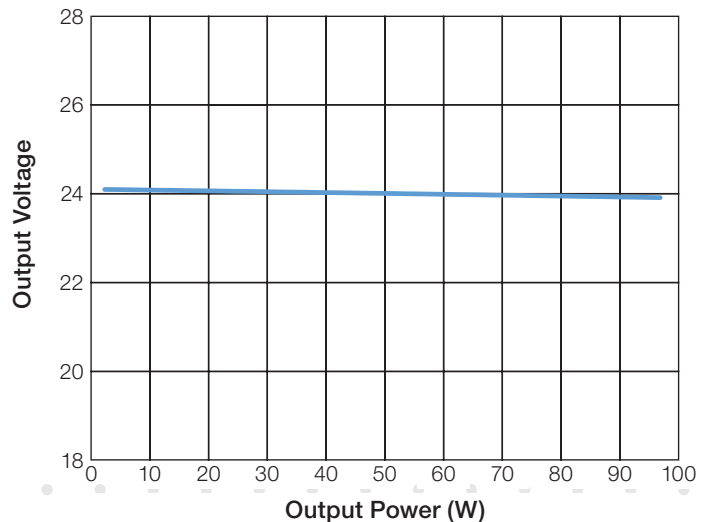
Efficiency vs. Load at 230 V \sim



Power Factor vs. Load at 230 V \sim



Output Voltage vs. Load at 230 V \sim



NOTE: Specifications are subject to change without notice.

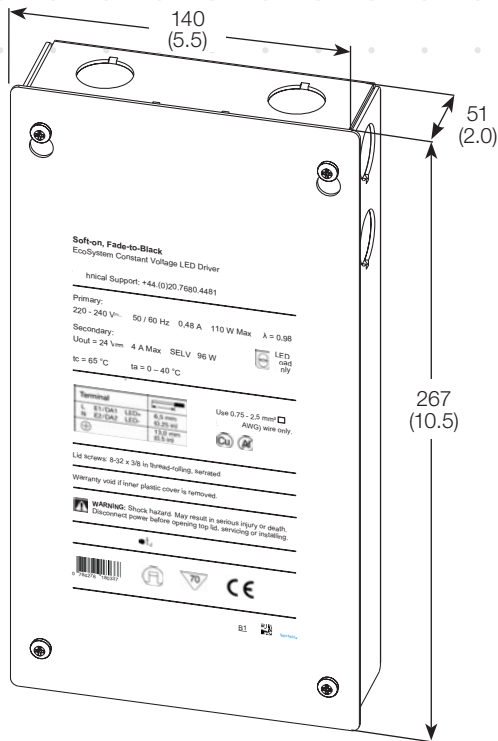


EOS-96-ECO-100-1-24V

1% Constant-Voltage 24 V_{DC} LED Driver
with Soft-on, Fade-to-Black Dimming
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Enclosure Dimensions

Measurements are shown as: mm (in)

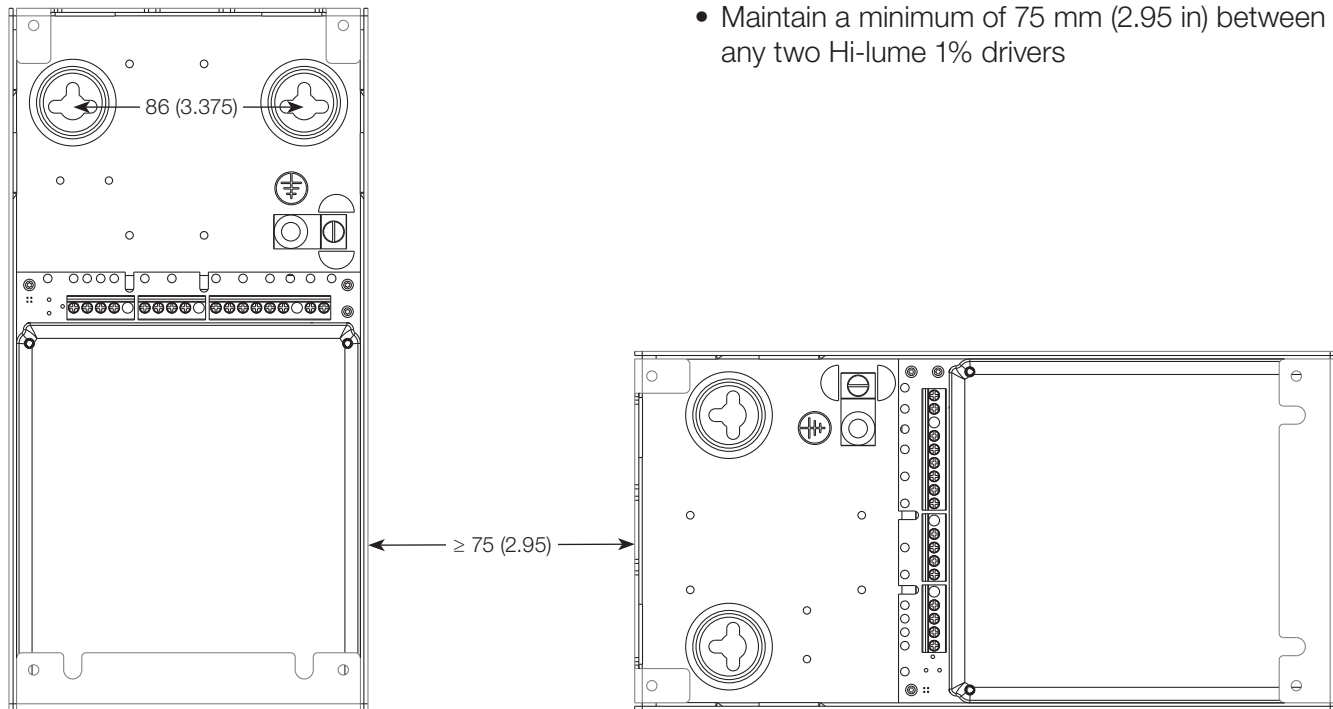


Knockouts

- Sides
 - 4 locations: 13 mm (0.5 in)
- Top
 - 2 locations: 13 mm (0.5 in)

Mounting Dimensions

Measurements are shown as: mm (in)

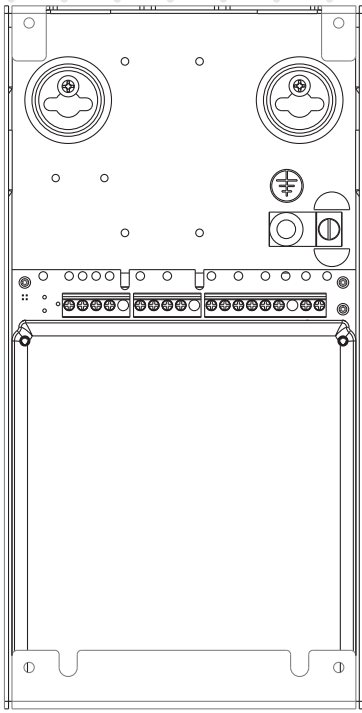




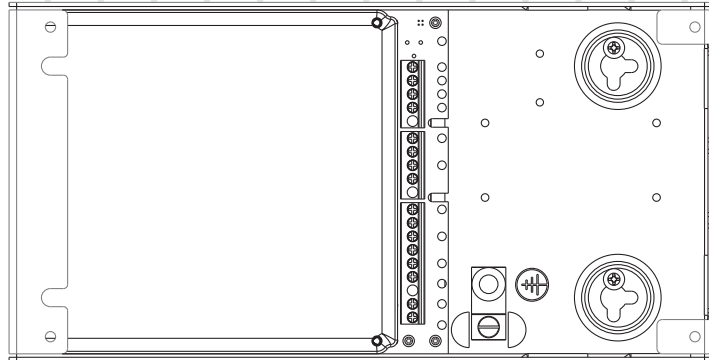
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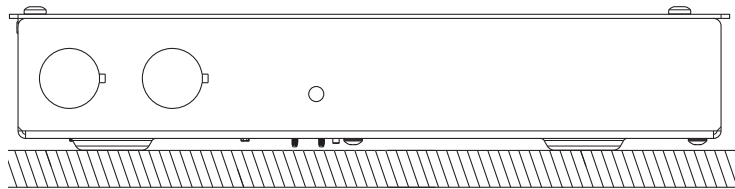
Mounting Options



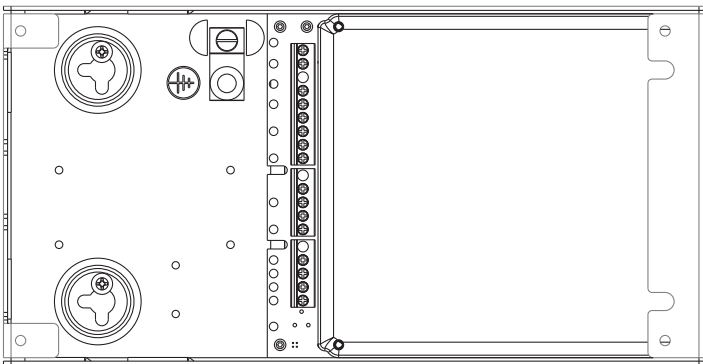
Correct



Correct



Correct



Correct



NOTE: Any other mounting configuration will require additional mechanical support. Improper installation may result in hazards to personnel or property.
NOTE: Driver should be mounted in an accessible location.

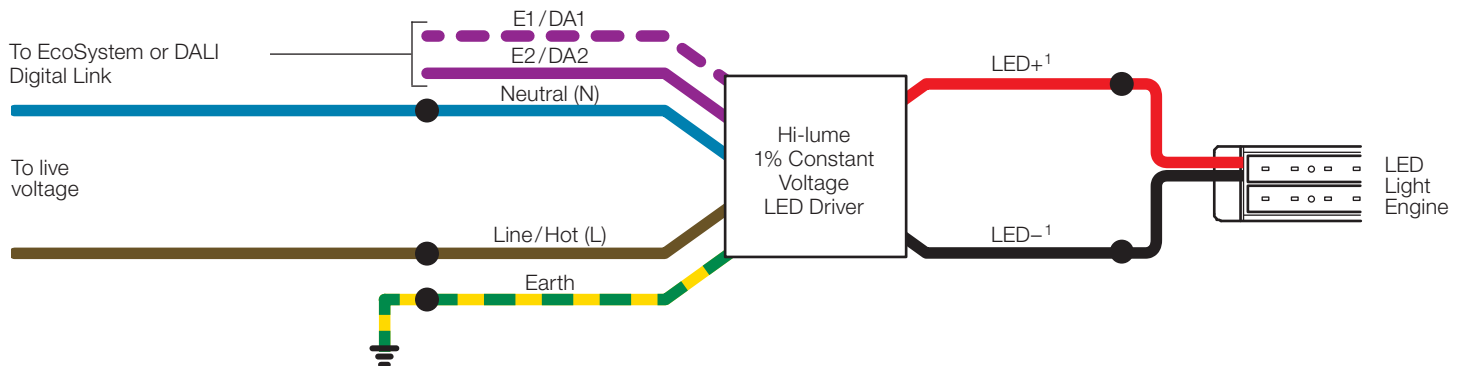


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Wiring

LDE Models: EcoSystem and DALI Digital Controls



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

Compatible Controls: Lutron EcoSystem and DALI Digital Controls

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

For assistance selecting controls, contact our LED Center of Excellence at LEDs@lutron.com

EcoSystem Controls			
Description	Part Number	Maximum Drivers per Control	Measured Light Output Range
PowPak Dimming Module with EcoSystem	RMK-ECO32-DV-B RMM-ECO32-DV-B	32	100% – 1%
Energi Savr Node with EcoSystem	QSNE-2ECO-D	64 (2 links)	100% – 1%
HomeWorks QS with EcoSystem	LQSE-2ECO-D	64 (2 links)	100% – 1%

DALI Controls			
Description	Part Number	Maximum Drivers per Control	Measured Light Output Range
Energi Savr Node with DALI	QSNE-2DAL-D	64 (2 links)	100% – 1%
GRAFIK Eye QS Wireless with DALI	QSGRK-_D QSGRM-_D	64	100% – 1%
GRAFIK Eye QS with DALI (non RF)	QSGR-_D	64	100% – 1%
HomeWorks QS/myRoom Plus Power Module	LQSE-2DAL-D LQRK-WPM-_D	64 (2 links) 64	100% – 1%



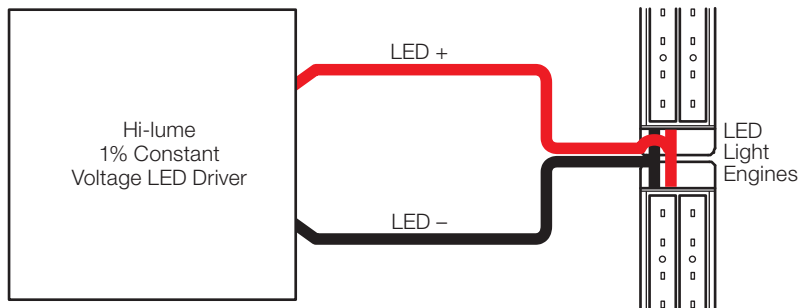
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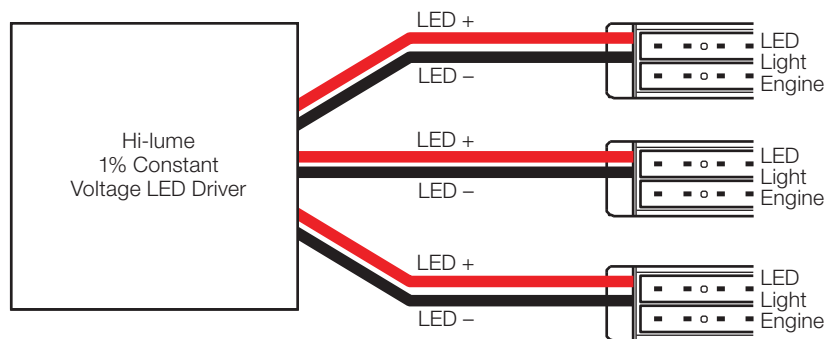
Wiring (continued)

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.





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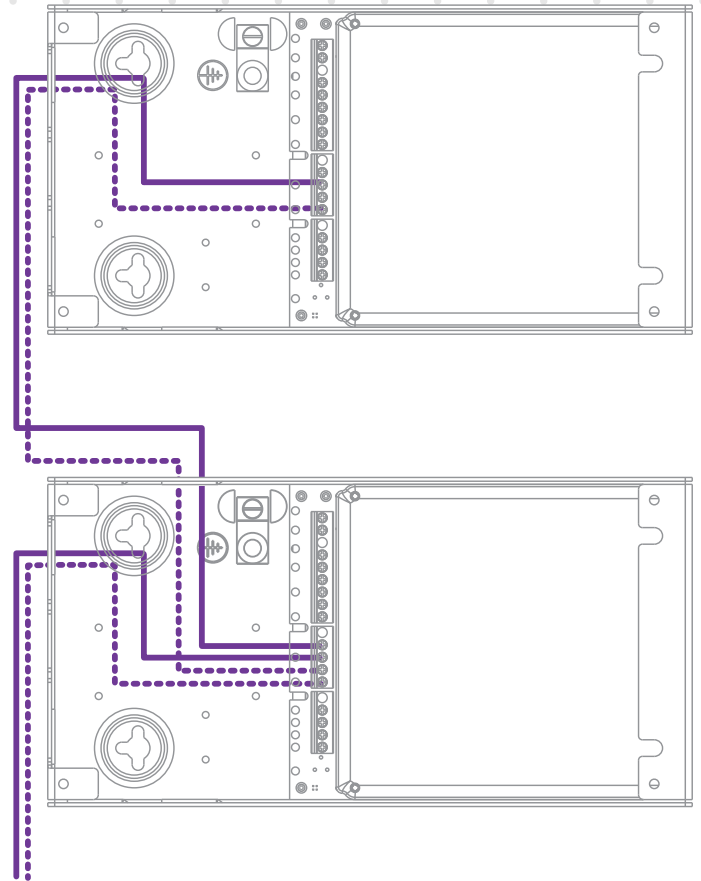
EcoSystem/DALI Wiring Diagrams

EcoSystem/DALI Digital Link Overview

- The EcoSystem/DALI Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Sensors are integrated through the Lutron EcoSystem/DALI controller.
- E1/DA1 and E2/DA2 (EcoSystem/DALI digital link wires) are polarity-insensitive and can be wired in any topology.
- Power is supplied to the EcoSystem/DALI Digital Link from the control system.

EcoSystem/DALI Digital Link Wiring

- EcoSystem/DALI Digital Link terminals accept 0.75 mm² to 2.5 mm² (18 AWG to 12 AWG) solid or stranded copper wire per terminal.
- Make sure that the supply breaker to the drivers and EcoSystem/DALI Digital Link Supply is OFF when wiring.
- E1/DA1 and E2/DA2 terminals of the drivers can be daisy chained as shown to the right.
- Using two different colors for E1/DA1 and E2/DA2 will reduce confusion when wiring several drivers together.
- Consult applicable electrical codes for proper wiring practices.



Notes

- The EcoSystem/DALI Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem/DALI length is limited by the wire gauge used for E1/DA1 and E2/DA2 as follows:

Wire Size	DALI Link Length ¹ (max)
2.5 mm ² (12 AWG)	300 m (984 ft)
1.5 mm ² (14 AWG)	300 m (984 ft)
1.0 mm ² (16 AWG)	200 m (656 ft)
0.75 mm ² (18 AWG)	150 m (492 ft)

Wire Size	EcoSystem Link Length (max)
2.5 mm ² (12 AWG)	830 m (2 723 ft)
1.5 mm ² (14 AWG)	520 m (1 706 ft)
1.0 mm ² (16 AWG)	310 m (1 017 ft)
0.75 mm ² (18 AWG)	210 m (689 ft)

¹ DALI does not recommend wire lengths longer than 300 m (984 ft).



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Service

Ballast/Driver Warranty

For warranty information, please visit
www.lutron.com/driverwarranty

Replacement Parts

When ordering replacement parts, please provide
the full model number.

Contact Information

For further information, please visit us at
www.lutron.com/europe