

EcoSystem™ 5-Series LED Driver — 5 W to 75 W

EcoSystem™ 5-Series LED drivers provide a high-performance solution for any space, in any application, while providing smooth, continuous dimming down to 5% of full output current.

Features

- Continuous, flicker-free dimming from 100% to 5%¹.
- Guaranteed dimming performance when used with Lutron® controls.
- Guaranteed compatibility with Energi Savr Node™ units with EcoSystem™, GRAFIK Eye® QS with EcoSystem™, PowPak® dimming module with EcoSystem™, and Quantum® systems, allowing for integration into a planned or existing EcoSystem™ lighting control solution.
- QwikFig™ compatible models available, see **How to Build a Model Number** page for details. For more information, please refer to the **QwikFig™ User Guide** (Lutron® P/N 041473) or contact your Lutron sales representative.
- Protected from miswires of input power to EcoSystem™ control inputs up to 277 V_~.
- A rated lifetime of 50,000 hours at 75 °C (167 °F) calibration point (t_c).
- Type TL Rated².
- FCC Part 15 compliant for commercial applications at 120–277 V_~².
- 100% performance tested at factory.
- RoHS compliant.
- Non-volatile memory restores all settings after power failure.
- For more information please visit: www.lutron.com/EcoSystem5Series

EcoSystem™ Features

- Simpler to wire and more reliable than 0-10 V_~.
- Guarantees compatibility between Lutron® controls, drivers, and sensors.
- Accommodates zone changing without rewiring.
- Link to Lutron® Quantum® Total Light Management System to monitor lighting power consumption.

¹ Light output at 5% depends on the efficacy of the light engine used with the driver.

² Does not include J, K, L, M, and N output ranges (preliminary spec).



EcoSystem™ LED Driver, case type M

1.18 in (30 mm) W x 1.00 in (25 mm) H x 14.13 in (359 mm) L

Job Name:	Model Numbers:	
<input type="text"/>	<input type="text"/>	<input type="text"/>
Job Number:	<input type="text"/>	<input type="text"/>

Specifications

Regulatory Approvals

- 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 120–277 V \sim ⁴
- Meets UL® 8750, “Light Emitting Diode (LED) Equipment for use in Lighting Products”⁴
- Type TL rated⁴
- Class 2 output⁴
- Meets LED driver requirements for Energy Star version 1.2
- Class 2 output designed to withstand hot swap⁴
- Inrush current less than NEMA 410-2011 limit⁴
- Dimming method: constant-current reduction, refer to Lutron® Application Note #360 for details

Environmental

- Sound rated: Class A inaudible in 24 dBA ambient
- Relative Humidity: maximum 90% non-condensing
- Minimum Operating Ambient Temperature: $t_a = 0\text{ }^\circ\text{C}$ (32 $^\circ\text{F}$)³
- Indoor use only
- Rated for dry and damp locations

Driver Wiring and Mounting

- Driver is grounded by a mounting screw to the grounded fixture
- Terminal blocks on the driver accept one solid wire per terminal from 18 AWG to 16 AWG (0.75 mm² to 1.5 mm²)
- Fixture must be grounded in accordance with local and national electrical codes
- Maximum driver-to-LED light engine wire length for:

Wire Gauge	Maximum Lead Length		
	150 mA to 700 mA	710 mA to 1.50 A	1.51 A to 2.10 A
18 AWG (0.75 mm ²)	30 ft (9 m)	15 ft (4.5 m)	10 ft (3 m)
16 AWG (1.5 mm ²)	35 ft (10.5 m)	25 ft (7.5 m)	15 ft (4.5 m)
14 AWG (2.5 mm ²)	50 ft (15 m)	40 ft (12 m)	25 ft (7.5 m)
12 AWG (4.0 mm ²)	100 ft (30 m)	60 ft (18 m)	40 ft (12 m)

* To use wire gauges larger than the terminal blocks' rated gauge of 18 to 16 AWG (0.75 mm² to 1.5 mm²), refer to **Terminal Wiring Gauges** diagram. The 18 to 16 AWG (0.75 mm² to 1.5 mm²) wires connected to the driver should be less than 3 ft (0.9 m).

Performance

- Dimming Range: 100% to 5%¹
- Operating Voltage: 120–277 V \sim at 50/60 Hz
- Lifetime: 50,000 hours when calibration point (t_c) at 75 $^\circ\text{C}$ (167 $^\circ\text{F}$)²
- For rated warranty, t_c not to exceed 75 $^\circ\text{C}$ (167 $^\circ\text{F}$) (maximum rated temperature)²
- Patented thermal foldback protection
- LED lighting turns on to any dimmed level without flashing to full brightness
- Non-volatile memory restores all driver settings after power failure
- Typical standby power consumption: 0.2 W at 120 V \sim and 0.3 W at 277 V \sim
- Open-circuit protected output
- Short-circuit and overload-protected output
- Device turn-on time: < 100 ms from electronic off and < 500 ms from power off

¹ Light output at 5% depends on the efficacy of the light engine used with the driver.

² To maintain warranty, installer is responsible for ensuring that the driver calibration point does not exceed 75 $^\circ\text{C}$ (167 $^\circ\text{F}$).

³ Where t_a is the temperature of the air directly surrounding the driver.

⁴ Does not include J, K, L, M, and N output ranges (Preliminary Spec).

Job Name: <input type="text"/>	Model Numbers: <input type="text"/>	
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How to Select the Correct LED Driver for Your Load

1. Review the specifications of the LED load.
2. Identify the minimum and maximum operating voltage of the LED load at the desired operating current. This “current” will be the rated output current of the LED driver. Consult the LED load manufacturer for any questions.

Example: An LED load that is rated at 1 A and 33 V nominally, has an output voltage range of 28–38 V (at 1 A) due to unit-to-unit variation, temperature, etc.

3. Determine the proper operating range of the LED driver.
 - a. Identify the output range(s) of the driver family that includes the desired current.
 - i. Select Current

Example: Only “B”, “C”, “U”, and “V” models meet the current range of the selected load (1 A).

LED Load Output Range

L = 0.15 – 0.32 A, 20–40 V_{DC}, 5-10 W

M = 0.25 – 0.50 A, 20–40 V_{DC}, 6.5-14 W

N = 0.35 – 0.75 A, 20–40 V_{DC}, 10-20 W

B = 0.50 – 1.25 A, 20–40 V_{DC}, 15-35 W

C = 0.88 – 1.75 A, 20–40 V_{DC}, 25-50 W

D = 1.25 – 2.10 A, 20–40 V_{DC}, 35-75 W

J = 0.15 – 0.30 A, 30–50 V_{DC}, 6-12 W

K = 0.24 – 0.50 A, 30–50 V_{DC}, 9-20 W

T = 0.40 – 0.83 A, 30–50 V_{DC}, 15-35 W

U = 0.70 – 1.33 A, 30–50 V_{DC}, 25-50 W

V = 1.00 – 1.88 A, 30–50 V_{DC}, 40-75 W

- ii. Select Voltage

Example: Out of the 4 models indicated above, only “B” and “C” models meet the voltage requirement for the selected load (28–38 V).

LED Load Output Range

L = 0.15 – 0.32 A, 20–40 V_{DC}, 5-10 W

M = 0.25 – 0.50 A, 20–40 V_{DC}, 6.5-14 W

N = 0.35 – 0.75 A, 20–40 V_{DC}, 10-20 W

B = 0.50 – 1.25 A, 20–40 V_{DC}, 15-35 W

C = 0.88 – 1.75 A, 20–40 V_{DC}, 25-50 W

D = 1.25 – 2.10 A, 20–40 V_{DC}, 35-75 W

J = 0.15 – 0.30 A, 30–50 V_{DC}, 6-12 W

K = 0.24 – 0.50 A, 30–50 V_{DC}, 9-20 W

T = 0.40 – 0.83 A, 30–50 V_{DC}, 15-35 W

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Job Name: <input style="width: 90%; height: 20px;" type="text"/>	Model Numbers: <input style="width: 95%; height: 20px;" type="text"/>	
Job Number: <input style="width: 80%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 95%; height: 20px;" type="text"/>

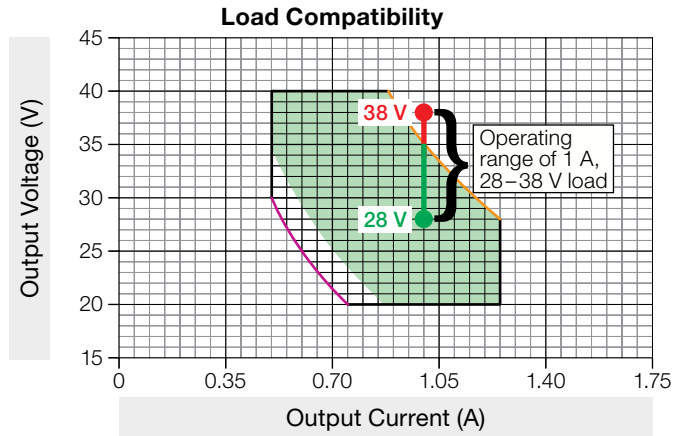
How to Select the Correct LED Driver for Your Load (continued)

b. Examine the **Load Compatibility** graphs below for each output range to ensure that the voltage range of the LED load is within the safe operating area.

Example: Lines marked below indicate load specifications (28–38 V at 1 A).

“B” Model (Not Compatible) ❌

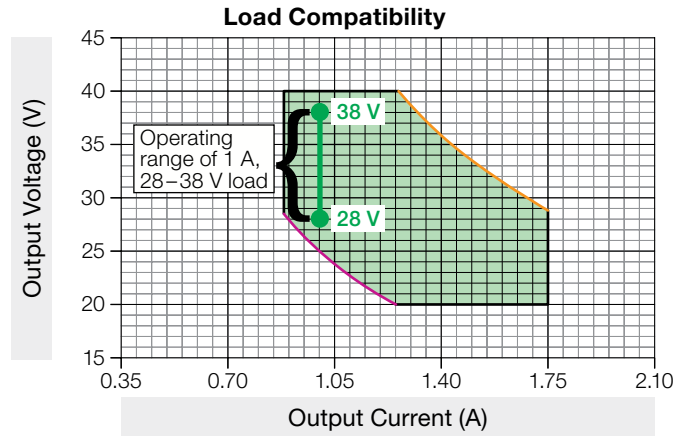
Since the maximum voltage of the load (38 V) exceeds the allowable voltage of “B” model (35 V at 1 A), this model is not compatible.



Key:
 Shaded area meets DLC Version 2.1 (areas outside of shaded areas may not meet THD or PF requirements).
 Constant 15 W output Constant 35 W output

“C” Model (Compatible) ✅

Operating voltage range for “C” model is 25–40 V at 1 A. Since the load specifications are within the operating range, “C” model is compatible for this load.



Key:
 Shaded area meets DLC Version 2.1 (areas outside of shaded areas may not meet THD or PF requirements).
 Constant 25 W output Constant 50 W output

4. See **How to Build A Model Number** to create the appropriate model number for the desired driver. If a QwikFig™ compatible driver is needed, identify the proper **LED Load Output Range** (voltage and current) and insert “BLK” in the **Current Level (for Constant Current)** section of the model number.

Job Name: <input style="width: 90%;" type="text"/>	Model Numbers: <input style="width: 60%;" type="text"/> <input style="width: 40%;" type="text"/>	
Job Number: <input style="width: 80%;" type="text"/>	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>

How to Build a Model Number (“BLK” models for use with Lutron® QwikFig™ technology): EcoSystem™ 5-Series (up to 75 W) LED Driver

LDE5 U1UMN- A

Example: LDE53U1UMN-BA070
 0.70 A, 15–28 W, 21.5–40 V^{***} LED driver
 For further assistance selecting your model number, contact our LED Center of Excellence at LEDs@lutron.com

LED Load Output Range
Class 2 Constant Current
 L = 0.15–0.32 A, 20–40 V^{***}, 5–10 W
 M = 0.25–0.50 A, 20–40 V^{***}, 6.5–14 W
 N = 0.35–0.75 A, 20–40 V^{***}, 10–20 W
 B = 0.50–1.25 A, 20–40 V^{***}, 15–35 W
 C = 0.88–1.75 A, 20–40 V^{***}, 25–50 W
 D = 1.25–2.10 A, 20–40 V^{***}, 35–75 W
 J = 0.15–0.30 A, 30–50 V^{***}, 6–12 W
 K = 0.24–0.50 A, 30–50 V^{***}, 9–20 W
 T = 0.40–0.83 A, 30–50 V^{***}, 15–35 W
 U = 0.70–1.33 A, 30–50 V^{***}, 25–50 W
 V = 1.00–1.88 A, 30–50 V^{***}, 40–75 W

Current Level (for Constant Current):
 015 = 0.15 A: . . . 210 = 2.10 A

Option 1: Order a driver configured by Lutron to a desired output current.
Example: LDE53U1UMN-BA070 has been pre-configured at Lutron to an output of 0.70 A. Refer to the example above.
Note: Lutron® pre-configured drivers are *not* QwikFig™ compatible and cannot be re-configured.

Option 2: Order a QwikFig™ compatible driver.
Example: LDE53U1UMN-BABLK (0.5–1.25 A)*
Note: Default set to minimum output current for the respective **LED Load Output Range**.

LED Load Power Range
 1 = Use when **LED Load Output Range** is “J,” “L,” or “M”
 2 = Use when **LED Load Output Range** is “K” or “N”
 3 = Use when **LED Load Output Range** is “B” or “T”
 5 = Use when **LED Load Output Range** is “C” or “U”
 7 = Use when **LED Load Output Range** is “D” or “V”


Attention: Model numbers may appear similar to Lutron® Hi-lume® A-Series drivers, but EcoSystem™ 5-Series drivers are not a direct model-for-model replacement for Hi-lume® A-Series drivers. Please note the driver’s output rating and the load ratings to select the correct product for your fixture.

Note: QwikFig™ bulk drivers are only available as UL® recognized. Does not include “J,” “K,” “L,” “M,” and “N” output ranges.

* Output voltage range changes with output current and according to power limits. Check driver specifications on following pages carefully to understand output voltage range of a particular SKU. Purchaser is responsible for electrical compatibility between LED driver and LED load.
 ** Minimum voltage of LDE53U1UMN-BA070 limited by 15 W minimum power.

Job Name: <input style="width: 90%;" type="text"/>	Model Numbers: <input style="width: 95%;" type="text"/>
Job Number: <input style="width: 80%;" type="text"/>	<input style="width: 95%;" type="text"/>

“C” Output Range

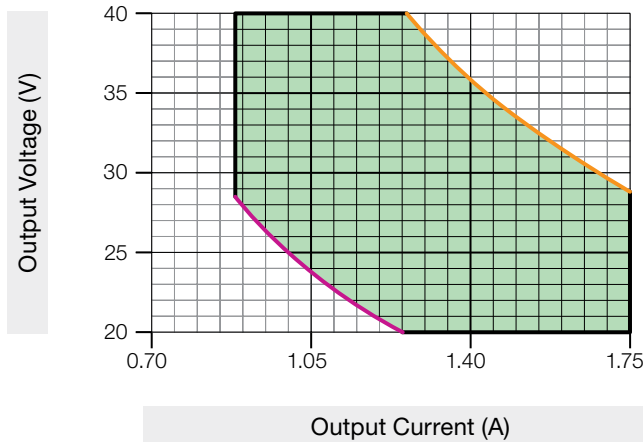
Driver Type	Output Dimming Method	Output Voltage	Output Current	Output Power	Standards Recognition	Maximum Rated Temp. @ t_c for Warranty
Constant Current Driver (Class 2)	Constant Current Reduction (CCR)	20–40 V \approx	0.88–1.75 A*	25–50 W	 Type TL 80 °C/76 °C	75 °C

* QwikFig™ compatible model number LDE55U1UMN-CABLK is configurable to any current within this range.

Typical Performance Specifications:

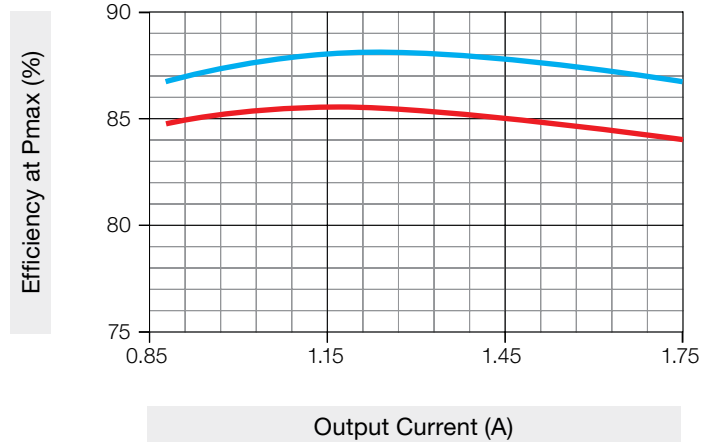
Parameter	Value	Test Conditions
Input Current	0.21 A	$V_i = 277\text{ V}\sim$, $t_a = 25\text{ °C}$, $I_o = 1.25\text{ A}$, $V_o = 40\text{ V}\approx$, Maximum Light Output LDE55U1UMN-CA125
Power Factor	0.97	
THD	13%	
Driver Efficiency	88%	

Load Compatibility



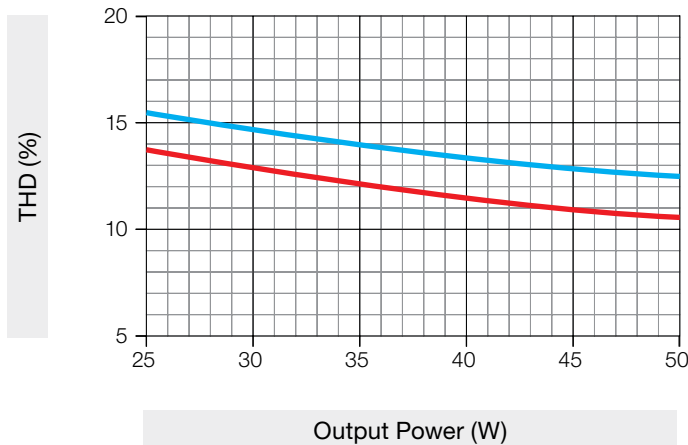
Key:
■ Shaded area meets DLC Version 2.1 (areas outside of shaded areas may not meet THD or PF requirements).
— Constant 25 W output — Constant 50 W output

Typical Efficiency vs. Output Current



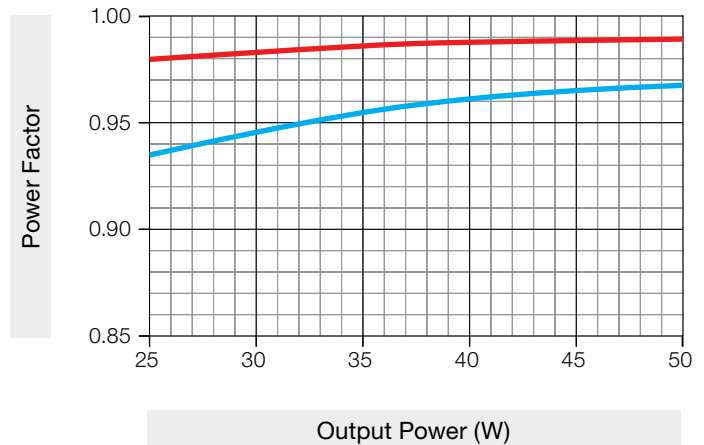
Key: — 120 V~ — 277 V~

Typical THD vs. Output Power



Key: — 120 V~ — 277 V~

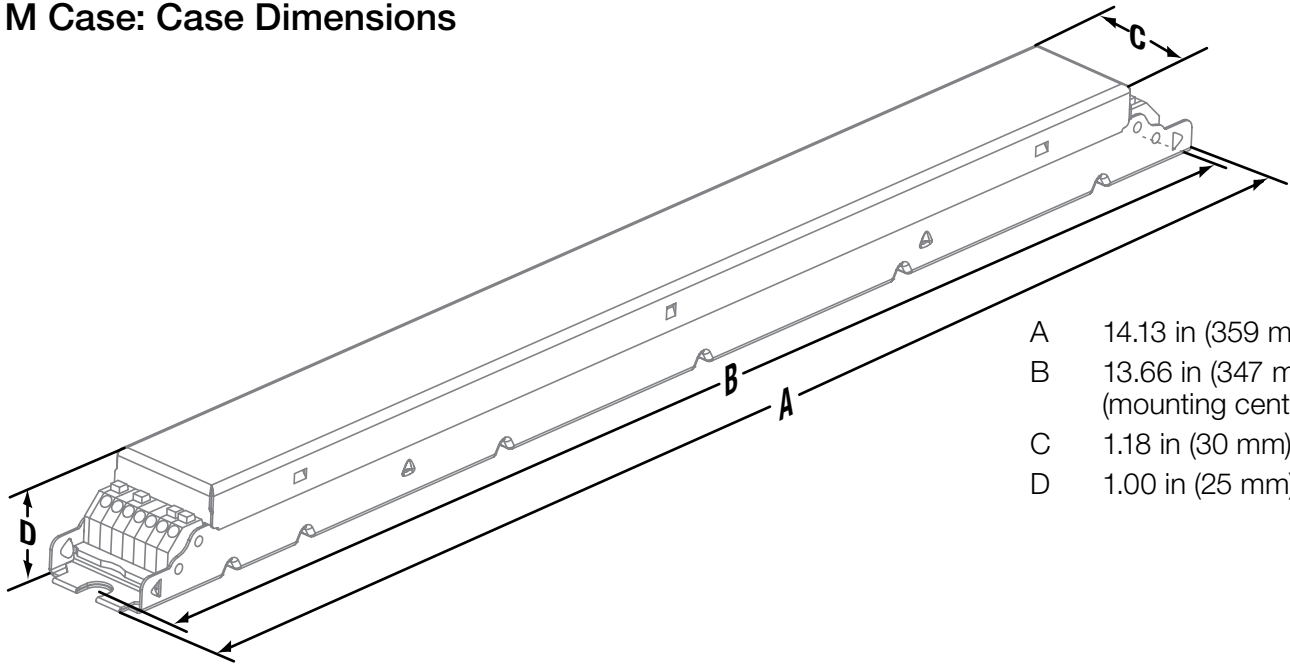
Typical Power Factor vs. Output Power



Key: — 120 V~ — 277 V~

Job Name: <input style="width: 90%;" type="text"/>	Model Numbers: <input style="width: 95%;" type="text"/>
Job Number: <input style="width: 80%;" type="text"/>	<input style="width: 95%;" type="text"/>

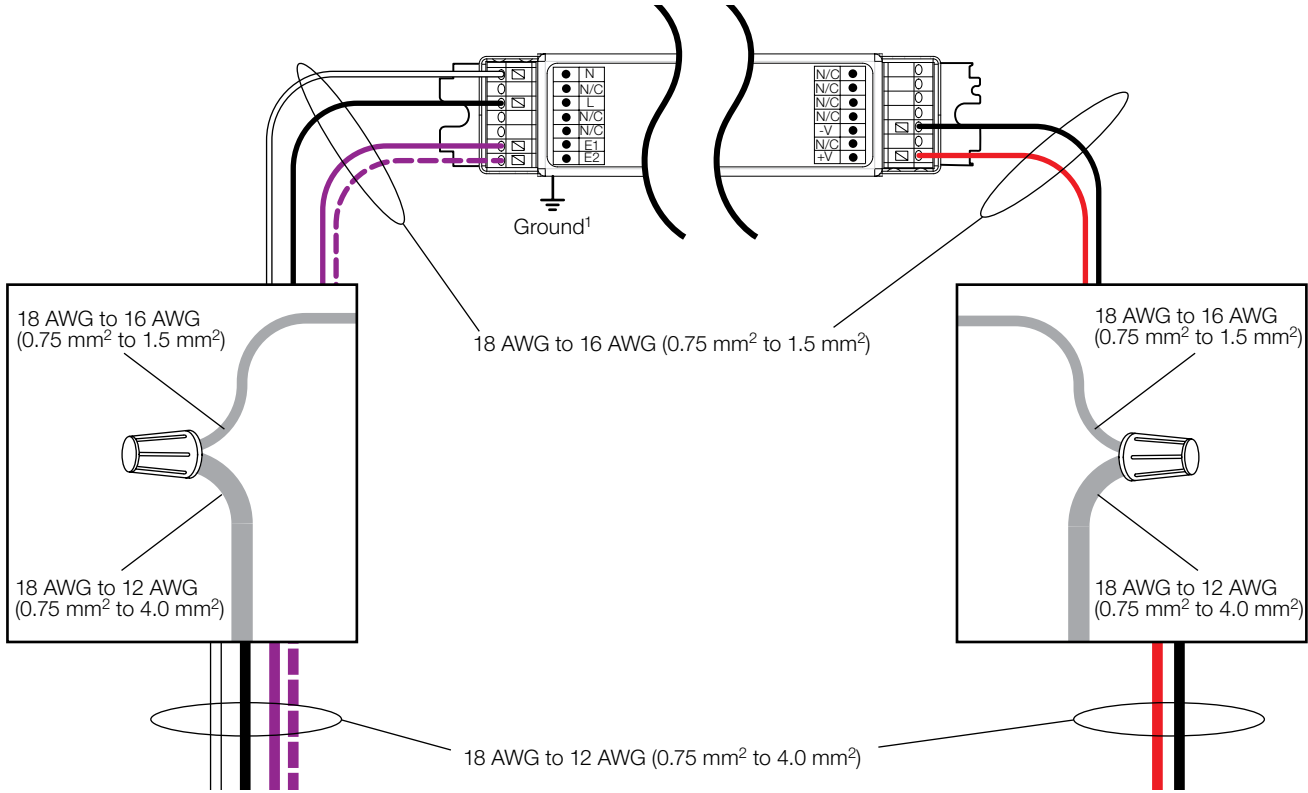
M Case: Case Dimensions



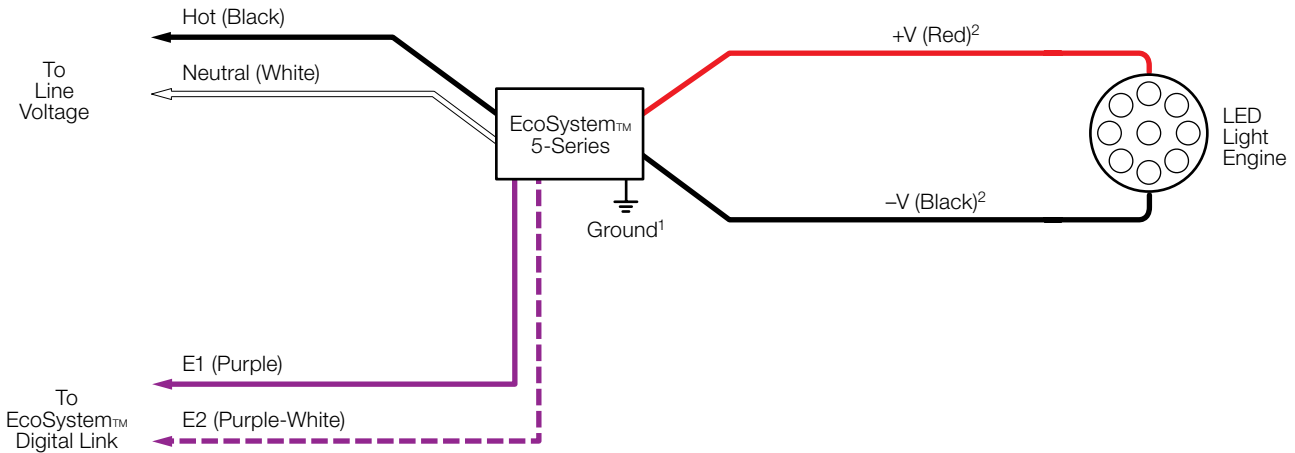
- A 14.13 in (359 mm)
- B 13.66 in (347 mm)
(mounting center)
- C 1.18 in (30 mm)
- D 1.00 in (25 mm)

Job Name: <input type="text"/>	Model Numbers: <input type="text"/>	<input type="text"/>
Job Number: <input type="text"/>	<input type="text"/>	<input type="text"/>

Terminal Wiring Gauges



Wiring Diagram for EcoSystem™ Digital Control



Note: Colors shown correspond to terminal blocks on driver.

¹ Fixture and driver case must be grounded in accordance with local and national electrical codes; ground connection to driver must be accomplished through grounding the case.

² For maximum driver-to-LED light engine wire length, see charts in the **Driver Wiring and Mounting** section.

Job Name:	Model Numbers:	
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Job Number:	<input type="text"/>	<input type="text"/>

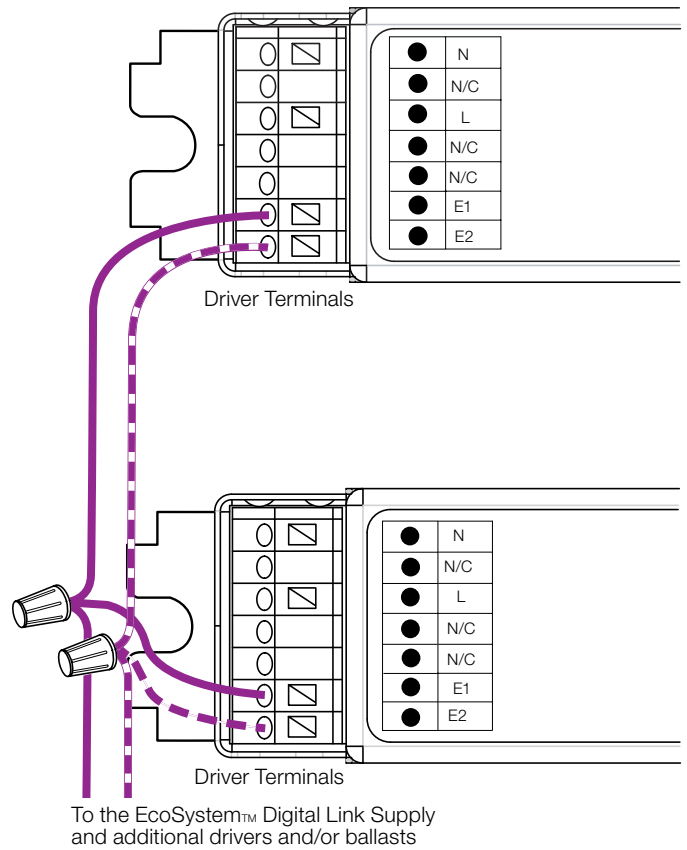
EcoSystem™ Wiring Diagrams

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 EcoSystem™ 5-Series LED 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.

EcoSystem™ Digital Link Wiring

- EcoSystem™ Digital Link terminals accept only one 18 AWG to 16 AWG (0.75 mm² to 1.5 mm²) solid copper wire per terminal.
- Make sure that the supply breaker to the drivers and EcoSystem™ Digital Link Supply is OFF when wiring.
- Connect the two conductors to the two driver terminals E1 and E2 as shown.
- Using two different colors for E1 and E2 will reduce confusion when wiring several drivers together.
- The EcoSystem™ Digital Link may be wired Class 1 or Class 2. Consult applicable electrical codes for proper wiring practices.
- 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

Wire Size	Digital Link Length (max)
4.0 mm ² *	828 m
2.5 mm ² *	517 m
1.5 mm ²	310 m
1.0 mm ²	207 m
0.75 mm ²	155 m

* To use wire gauges larger than the terminal blocks' rated gauge of 18 AWG to 16 AWG (0.75 mm² to 1.5 mm²), refer to **Terminal Wiring Gauges** diagram. The 18 AWG to 16 AWG (0.75 mm² to 1.5 mm²) wires connected to the driver should be less than 3 ft (0.9 m).

Job Name:	Model Numbers:	
<input type="text"/>	<input type="text"/>	<input type="text"/>
Job Number:	<input type="text"/>	<input type="text"/>