



Littelfuse EL3100 Ground Fault and Phase Voltage Indicator User Guide

[Home](#) » [Littelfuse](#) » Littelfuse EL3100 Ground Fault and Phase Voltage Indicator User Guide 

Contents

- 1 Littelfuse EL3100 Ground Fault and Phase Voltage Indicator
- 2 DESCRIPTION
- 3 FEATURES
- 4 REMOTE INDICATION
- 5 OUTPUT CONTACT
- 6 INSTALLATION
- 7 TECHNICAL SPECIFICATIONS
- 8 ORDERING INFORMATION
- 9 WARRANTY
- 10 MANUAL REVISION HISTORY
- 11 CONTACT
- 12 Documents / Resources
 - 12.1 References



Littelfuse EL3100 Ground Fault and Phase Voltage Indicator



DISCLAIMER

Specifications are subject to change without notice. Littelfuse Startco is not liable for contingent or consequential damages or expenses sustained as a result of a malfunction, incorrect application, or incorrect adjustment.

DESCRIPTION

- The EL3100 is a self-powered ground-fault and phasevoltage indication system for three-phase systems. The EL3100 meets the National Electrical Code requirements for ground detectors for ungrounded alternating-current systems as defined in NEC 250.21. It also meets the Canadian
- Electrical Code requirements for ungrounded alternating-current systems in accordance with CEC 10-106(2).
- Voltage connections are provided on the EL3100 for 208-, 240-, 480-, and 600-V systems. Three green LEDs on the EL3100 indicate the presence of phase-to-ground voltage and one red LED indicates a ground fault. The phase LED intensity is a function of line-to-ground voltage providing a visual indication of phase balance.
- There are cases when one of the three-phase indicators is off but no ground fault is indicated. This occurs on an ungrounded system when there is a phase loss. Groundfault indication is still enabled and will be activated when either of the energized phases develops a ground fault.
- The EL3100 can operate stand-alone or with up to five remote LED indicators. High-intensity 16-mm IP67 LED lamps are available in red and green colours. LED indicators and wiring operate in low-voltage mode.
- A solid-state relay output indicates a ground fault. The output relay is closed when the three-phase neutral voltage shifts as a result of ground leakage.

FEATURES

- Direct connection to EL3100 for voltages up to 600 Vac line-to-line
- Provides faulted-phase indication for resistance grounded and ungrounded systems
- Provides phase-voltage indication for resistance grounded and ungrounded systems
- The EL3100 can be used stand-alone or with low-voltage remote LEDs
- Solid-state (100 mA, 120 Vac/Vdc) output relay
- Three green phase-voltage LEDs
- One red ground-fault LED

- Up to five remote LEDs can be connected

REMOTE INDICATION

Terminals 10 through 15 are used for remote LED indication. High-intensity LEDs with no internal resistors are required. See Section 7 for ordering information. Fig. 2 illustrates a remote LED application where all LEDs are used.

There are five remote LED outputs for phase-voltage indication, no-ground-fault indication, and ground-fault indication. Connect optional remote LEDs to terminals DA, DB, and DC (12, 11, and 10) for phase-voltage indication. The intensity of these LEDs is proportional to phase-to-ground voltage. A ground fault or phase loss is indicated when one LED is off while the other two are on. A remote LED connected to terminal DG (13) provides no ground-fault indication. This LED is on when there is no ground fault and is off when the three-phase-neutral voltage shifts from ground potential as the result of a ground fault (or if the system is de-energized). A remote LED connected to terminal DR (14) is on when a ground fault is present and off when no ground fault is present (or the system is de-energized). Terminal DN (15) is the LED common terminal.

NOTE: Unused LED outputs must be left unconnected.

OUTPUT CONTACT

A solid-state normally open ground-fault-indication relay output is at terminals 16 and 17. The output relay is closed when the three-phase neutral shifts more than 20 Vac to ground for the “L” voltage inputs and 40 Vac for ground for the “H” voltage inputs.

NOTE: The relay output has a rating of 100 mA at 120 Vac/Vdc and has a 35-Ω closed resistance.

INSTALLATION

Outline and mounting details of the EL3100 are shown in Fig. 1. For 208- or 240-Vac systems use terminals AL (7), BL (8), and CL (9). For systems above 240 Vac and up to 600 Vac, use terminals AH (1), BH (3), and CH (5). Connect bonding terminal (G) to ground. See Fig. 2. Terminals 2, 4, and 6 are not used.

NOTE: Bonding terminal (G) must be connected to the ground for correct fault indication and to ensure that fault potential is not transferred to the display. Outline and mounting details for the remote LEDs are shown in Fig. 3. Cable length should be limited to 10 m (33 ft). The recommended cable is 22 – 18 AWG (0.33 to 0.82 mm²) wire. Use shielded cable for cable lengths exceeding 2 m (6 ft). When the shielded cable is used, connect the cable shield to terminal SH (18) at the EL3100 only.

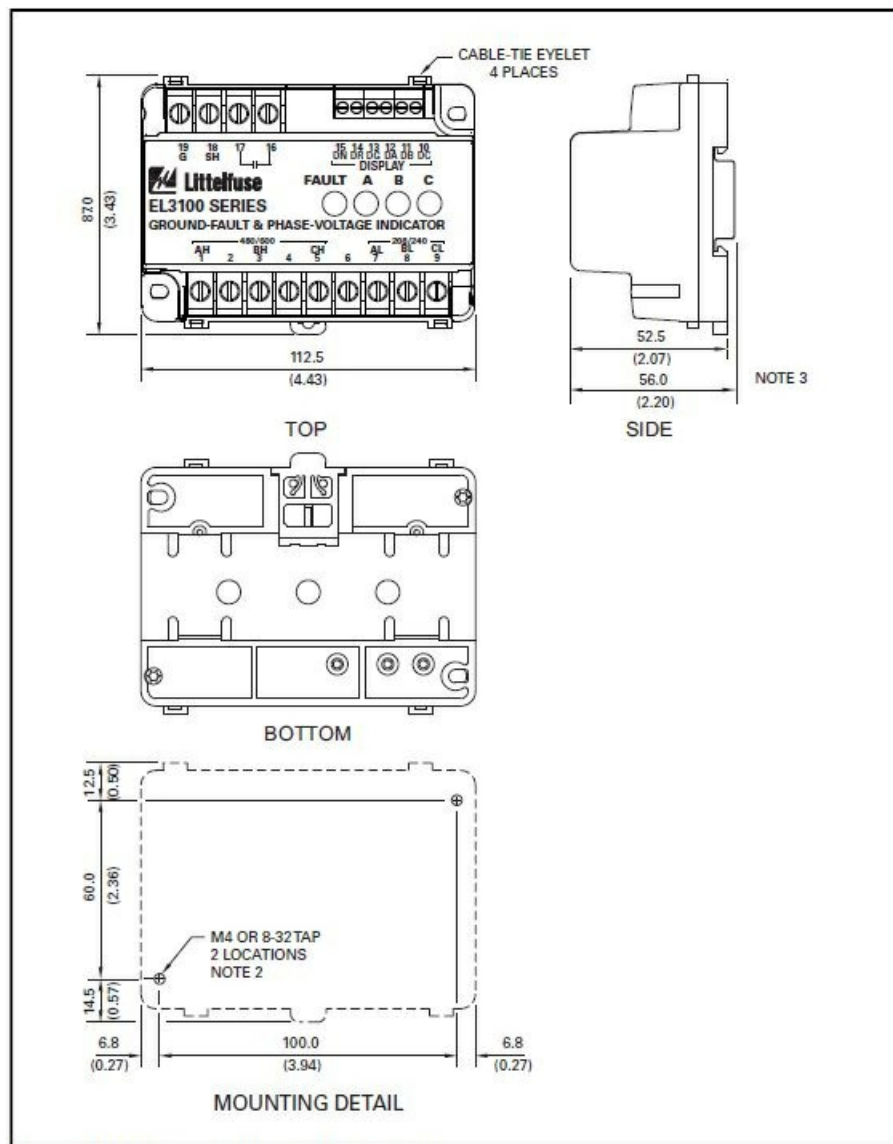


FIGURE 1. EL3100 Series Outline and Mounting Details.

NOTES

1. DIMENSIONS IN MILLIMETRES (INCHES).
2. MOUNTING SCREWS: M4 OR 8-32.
3. OVERALL HEIGHT WHEN MOUNTED ON DIN EN50022 35-mm x 7.5-mm TOP-HAT RAIL.

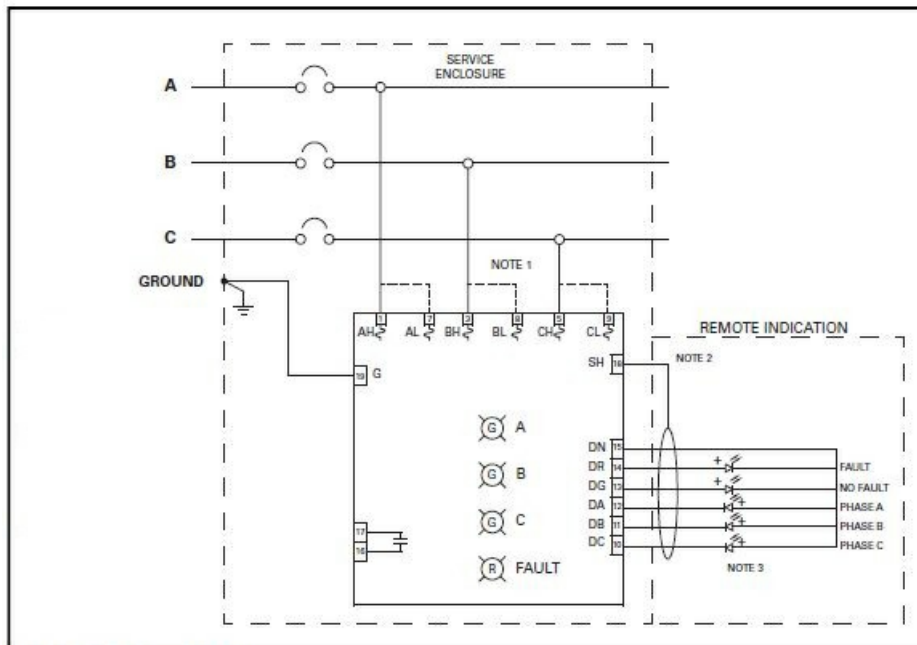


FIGURE 2. Connection Diagram.

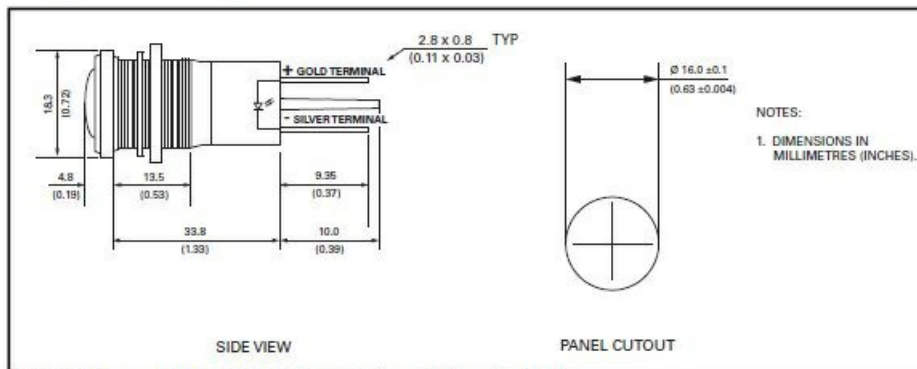


FIGURE 3. Remote 16-mm IP67 LED Lamp Outline and Mounting Details.

NOTES

1. USE L TERMINALS FOR SYSTEMS UP TO 240 VAC. USE H TERMINALS FOR SYSTEMS ABOVE 240 VAC UP TO 600 VAC.
2. USE SHIELDED 22 AWG TO 18 AWG (0.33 TO 0.82 mm²) CABLE FOR DISTANCES LONGER THAN 2 M (6 FT). USE BELDEN 3002A OR EQUIVALENT.
3. NOTE LED POLARITY. SEE FIG. 3.

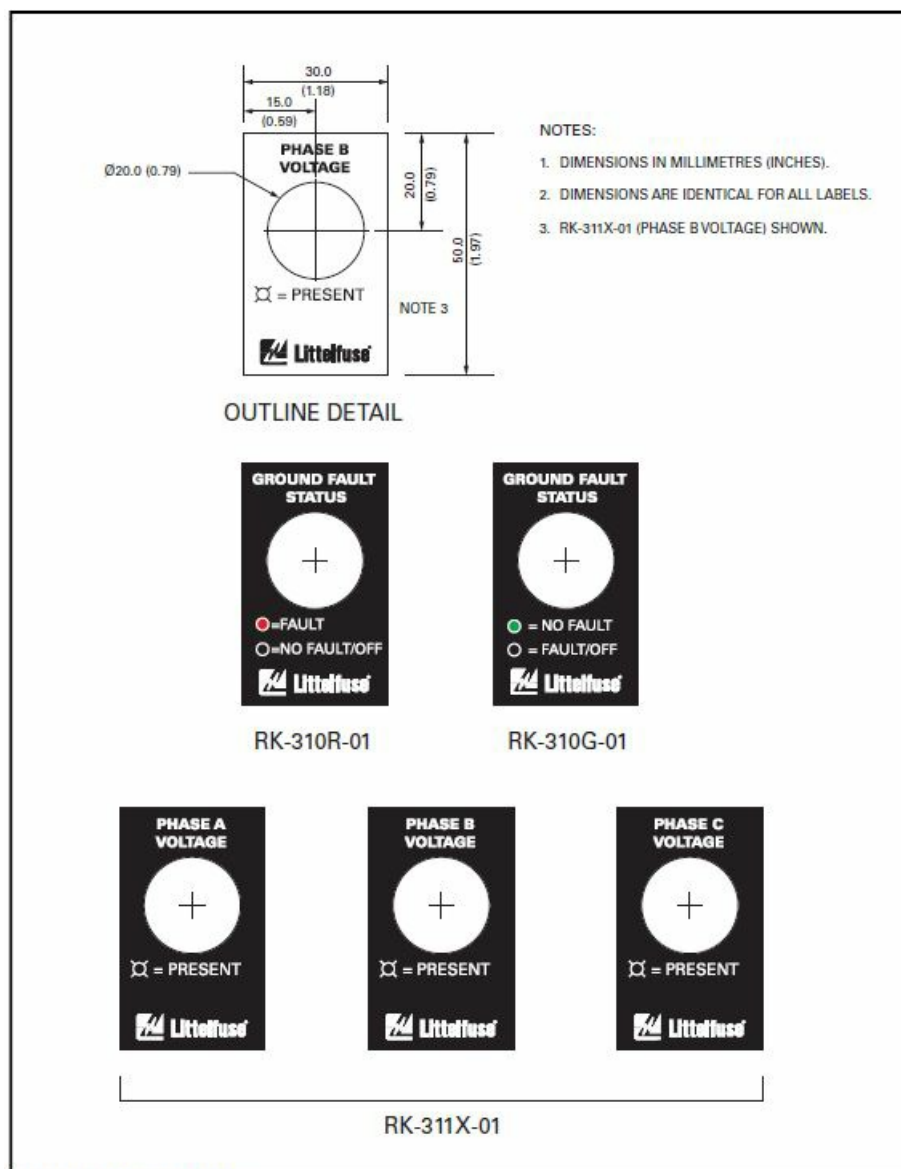


FIGURE 4. Remote LED Labels.

TECHNICAL SPECIFICATIONS

EL3100

Phase Voltage

- Input L 240 Vac line-to-line
- Input H 600 Vac line-to-line
- Input L, maximums 240 Vac to ground, 0.8 mA input current
- Input H, maximums 600 Vac to ground, 2.0 mA input current
- Internal Fuses (6) 500 mA, 600 Vac, not field serviceable
- Frequency Response (3 dB) 0 to 300 Hz

Trip Threshold

- Input L(1) 20 Vac
- Input H(1) 40 Vac
- Fault Current(2) 350 μ A

Solid-State Relay Output

- Configuration N.O. (Form A)
- Operating Mode Non-Fail-Safe
- Rating 100 mA, 120 V, 12 W (ac or dc)
- Protection 130 V MOV
- Closed Resistance 35 Ω maximum
- Dielectric Strength 1,500 Vac

Terminal Block Wire Sizes

- Voltage Inputs(3) 20 to 12 AWG (0.5 to 2.5 mm²)
- Bonding(3) 20 to 12 AWG (0.5 to 2.5 mm²)
- Relay(3) 20 to 12 AWG (0.5 to 2.5 mm²)
- Display LED's 24 to 12 AWG (0.2 to 2.5 mm²)

Dielectric Strength

- Input L(5) 1800 Vac, 1 s, 12 mA per phase
- Input H(5) 2650 Vac, 1 s, 9 mA per phase
- Shipping Weight 0.4 kg (0.9 lb)

EL3100 Dimensions

- Height 87 mm (3.4")
- Width 113 mm (4.4")
- Depth 56 mm (2.2")
- Mounting Configurations DIN Rail and Surface

Environment

- Operating Temperature -40 to 60°C (-40 to 140°F)
- Storage Temperature -55 to 80°C (-67 to 176°F)
- Humidity..... 85% Non-Condensing
- PWB Conformal Coating MIL-1-46058 qualified UL QMJU2 recognized
- Certification CSA, Canada and USA



- CAN/CSA C22.2 No. 144-M91 – Ground Fault Circuit Interrupters
- ANSI/UL Std 1053, 6TH Ed. – Standard for Ground Fault
- Sensing and Relaying Equipment
- CAN/CSA C22.2 No. 14-10 – Industrial Control Equipment
- UL Std 508, 17TH Ed. – Industrial Control Equipment Australia, Regulatory Compliance Mark (RCM)

REMOTE LED'S (RK-31XX-0X)

- Current 0.4 to 2.0 mA
- Terminals(4) 2.8 mm (0.11") x 0.8 mm (0.03")
- Configuration 16 mm (0.6"), panel mount, IP67
- Certification UL Recognized E317459



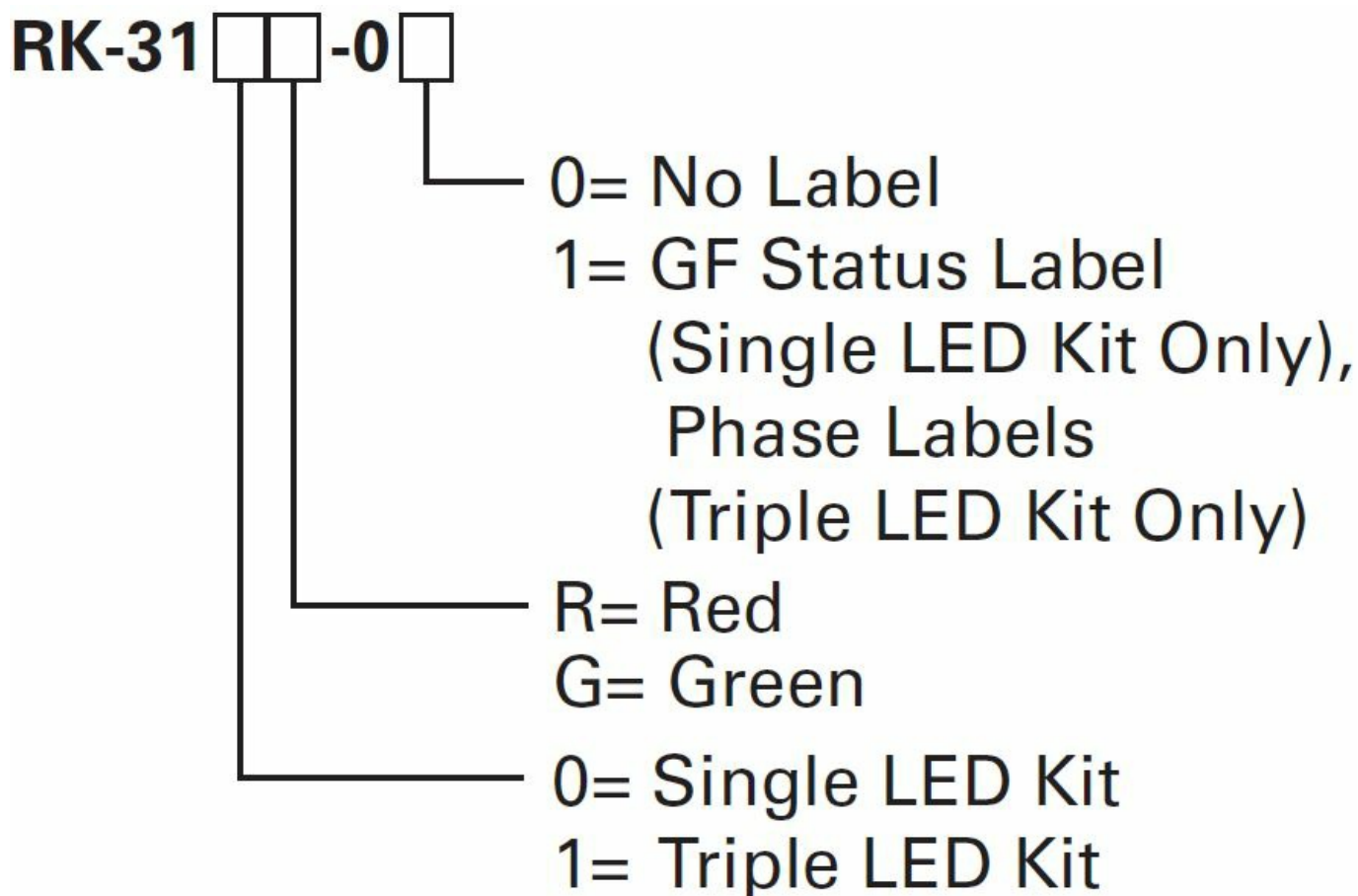
NOTES

1. Three-phase neutral-to-ground shift between terminal G (19) and source supply.
2. Current flowing in terminal G (19) (ground connection).
3. Accepts No. 8 (M4) ring terminals.
4. Supplied with Faston terminals for 22 – 18 AWG (0.33 to 0.82 mm²) wire.
5. With terminal G (19) connected to the ground. Do not remove the ground connection to terminal G (19) during dielectric testing to avoid test potential transfer to the remote display.

ORDERING INFORMATION

EL3100-00

- Remote LED Part Numbers (see Fig. 4 for label details):



WARRANTY

- The EL3100 Ground-Fault & Phase-Voltage Indicator is warranted to be free from defects in material and workmanship for five years from the date of purchase.
- Littelfuse Startco will (at Littelfuse Startco's option) repair, replace, or refund the original purchase price of an EL3100 that is determined by Littelfuse Startco to be defective if it is returned to the factory, freight prepaid, within the warranty period.
- This warranty does not apply to repairs required as a result of misuse, negligence, an accident, improper installation, tampering, or insufficient care.
- Littelfuse Startco does not warrant products repaired or modified by non-Littelfuse Startco personnel.

APPENDIX A

EL3100 REVISION HISTORY

MANUAL RELEASE DATE	MANUAL REVISION	PRODUCT REVISION
		<u>(REVISION NUMBER ON PRODUCT LABEL)</u>
February 22, 2016	2-B-022216	02
January 27, 2014	2-A-012714	
November 27, 2012	1	01
October 29, 2012	0	00

MANUAL REVISION HISTORY

REVISION 2-B-022216

- SECTION 6
- RCM certification added.
- Frequency response specification added.
- REVISION 2-A-012714
- SECTION 5
- Remote LED labels (Fig. 4) added.
- SECTION 6
- Dielectric strength specification added.
- SECTION 7
- Ordering information updated.
- APPENDIX A
- Revision history added.
- REVISION 1
- SECTION 6
- Updated solid-state relay protection information.
- REVISION 0
- Initial release.


PRODUCT REVISION HISTORY

- PRODUCT REVISION HISTORY
- PRODUCT REVISION 02
- Added filter capacitor.
- PRODUCT REVISION 01
- Solid-state relay protection changed to 130 V.
- PRODUCT REVISION 00
- Initial release.

CONTACT

- 3714 Kinnear Place
 - Saskatoon, SK Canada S7P 0A6
 - Ph: (306) 373-5505
 - Fx: (306) 374-2245
 - www.littelfuse.com/relayscontrols.
 - Arrow.com.
-

Documents / Resources

	<p>Littelfuse EL3100 Ground Fault and Phase Voltage Indicator [pdf] User Guide</p> <p>EL3100 Ground Fault and Phase Voltage Indicator, EL3100, Ground Fault and Phase Voltage Indicator, Fault and Phase Voltage Indicator, Phase Voltage Indicator, Voltage Indicator, Indicator</p>
---	---

References

- [Protection Relays and Controls - Littelfuse](#)
- [User Manual](#)