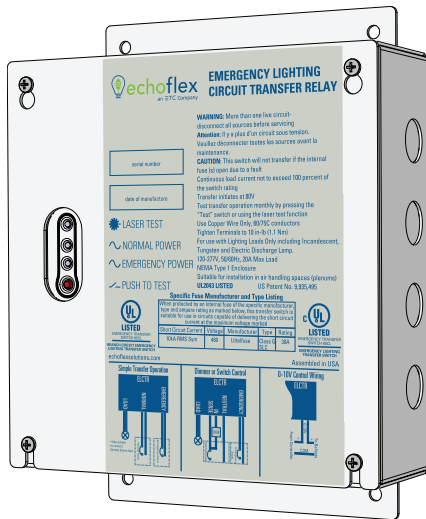


Echoflex Installation Guide

Emergency Lighting Circuit Transfer Relay

Overview

The Emergency Lighting Circuit Transfer Relay (ELCTR) transfers a single lighting circuit from its normal power source to an emergency power source in the event of the loss of normal power or an external trigger (e.g., fire alarm).



The ELCTR includes the following features and functions:

- a front panel accessible push-and-hold Test Switch
- a front panel accessible Laser Test, enabling remote testing with the use of a laser pointer (or similar)
- front panel status indicators for Normal Power (green) and Emergency Power (red)
- a fire alarm dry contact input, which can be set for normally open or normally closed operation
- an auxiliary relay for 0–10V or Digital Addressable Lighting Interface (DALI) control signals

Compliance

The ELCTR meets or exceeds the following regulatory standards:

- UL Listed to UL 1008 for Branch Circuit Emergency Transfer Switch Equipment
- cUL Listed to CSA C22.2 Emergency Transfer Switch Equipment
- UL Listed to UL 2043 for plenum rated products
- Complies with ANSI/NFPA 110, Standard for Emergency and Standby Power Systems
- Satisfies requirements of the National Electrical Code (NFPA 70):
 - Article 700 – Emergency Systems
 - Article 701 – Legally Required Standby Systems
 - Article 702 – Optional Standby Systems
 - Section 518.3(C) – Assembly Occupancies
 - Section 520.7 – Theatres and Similar Locations
 - Section 540.11(C) – Motion Picture Projection Rooms

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Installation Requirements

Install the ELCTR in a location that is accessible by qualified personnel for testing of the transfer function using either a laser pointer (or similar) or the onboard test switch.

The ELCTR installs to a flat surface, has four conduit entry locations, and includes a universal mounting plate with four mounting holes. Mounting and conduit hardware are provided by others.



Note: Suitable for use in other spaces used for environmental air (plenums) in accordance with Article 300 of the National Electrical Code (NFPA 70).

Ambient Environment

NEMA Type 1 Enclosure suitable for installation location that conforms to the following ambient environment:

- 0–40°C, 5%–95% non–condensing humidity

Electrical Specification



Note: Continuous load current not to exceed 100% of the switch rating.
Use copper wire only, minimum 75°C conductors.

Normal and Emergency Rated Operational Voltage Input

- 120–277 VAC +/- 10%, 50/60 Hz

Load Rating

- Supports a continuous load of up to 20A for tungsten and resistive load types, and supports electronic ballast loads of up to 16A (80% of the switch rating)
- Continuous load current not to exceed 100% of the switch rating

Transfer Initiation

- When normal power is lost, meaning the voltage drops below 85 VRMS, the unit transfers the output load to the emergency power source.
- When normal power is restored, meaning the voltage rises above 90 VRMS, the unit transfers the output load to the normal power source.

Short Circuit Current Rating

- Short circuit capacity of 10kA

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Fire Alarm Input

The Fire Alarm Input allows power transfer to the emergency power source (if emergency power is present) when triggered by an external system.



Note: This transfer is activated even when normal power is still present.

The contact input can be configured for normally open or normally closed operation using switch settings on the control board. Normally open and normally closed refer to the normal operational state of the external circuit, not to the de-energized state of the external relay.

- When the contact input is triggered, the unit will transfer to the emergency power source.
 - When the contact input trigger is removed, the unit will transfer back to the normal power source, if present, or will remain on emergency power until normal power is restored.
-



Note: The fire alarm input functions with up to 1,000 ft (300 m) of 18 AWG wire connected between the input and the switch. Fire Alarm Inputs of up to 10 SC1008 units can be wired together using a single normally open or normally closed contact. See [Fire Alarm Input on page 7](#) for details.

0–10V Auxiliary Output

The 0–10V Auxiliary Output provides an additional single pole relay that opens when the unit is in the emergency state. This allows connection of 0–10V or DALI ballasts that need the removal of the control signal in order to illuminate at full in an emergency state.

Installation

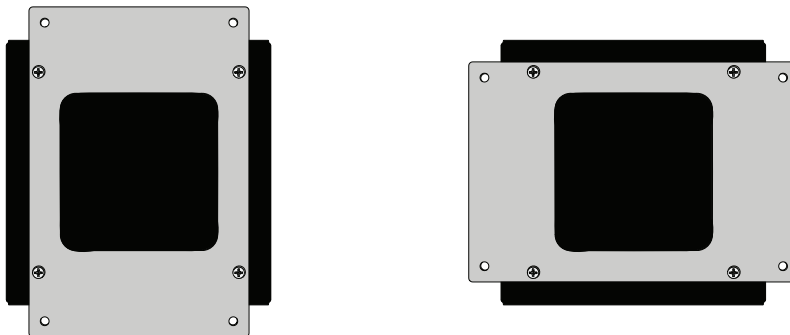
Mounting and Conduit

1. Using the attached mounting plate, secure the ELCTR enclosure to a flat surface using four 1/4-20 mounting bolts or screws (provided by others).
-



Note: The mounting plate on the ELCTR enclosure can be rotated 90°, to change the orientation as needed for the installation. Simply remove the screws securing the mounting plate to the ELCTR enclosure, rotate the plate 90°, reinstall the plate screws, and secure the ELCTR unit to the installation location.

ELCTR rear view showing different mounting orientations

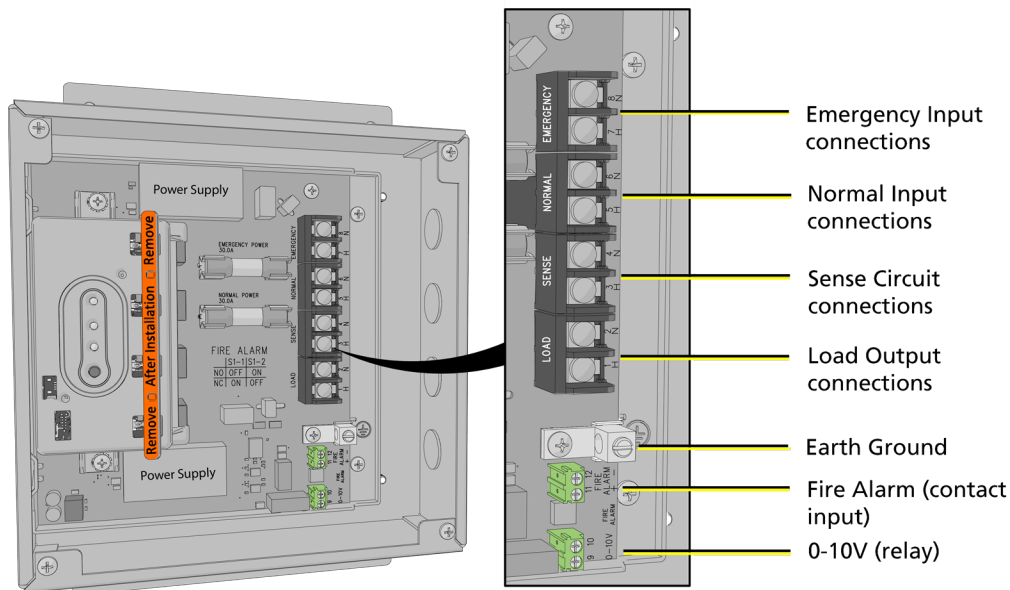


2. Temporarily remove the front cover to the unit.

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- Four knockouts are provided on the right side of the enclosure. Install conduit fittings (provided by others) to the knockout locations.



Wire Terminations

The ELCTR can accommodate installations that require a [Simple Transfer](#) of normal and emergency power or more complex installations that utilize a [Dimmed or Switched Load](#). See the related instruction for your installation type. Additionally, the unit can accommodate installations that utilize [0-10V Auxiliary Output](#) control and [Fire Alarm Input](#) for use with either normally open or normally closed operation.



WARNING: RISK OF DEATH BY ELECTRIC SHOCK! Failure to disconnect all power to the panel before working inside could result in serious injury or death.

AVERTISSEMENT: RISQUE D'ELECTROCUTION! Travailler à l'intérieur du panneau sans avoir déconnecté le courant peut entraîner des blessures graves, voire mortelles.

Before you begin pulling and terminating wire to the ELCTR enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for both normal and emergency power input is locked out and tagged out. Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout/tagout.

Wire and Terminal Specifications

Terminal	Wire Range	Strip Length	Torque Rating
Line / Load / Terminals 1-8	10-18 AWG (copper wire solid/stranded)	3/8" (10mm)	10 in-lbs
Control (signal) / Terminals 9-12	10-20 AWG (copper wire stranded only)	1/4" (6mm)	4 in-lbs
Earth Ground	6-14 AWG (copper wire solid/stranded)	3/8" (10mm)	35 in-lbs

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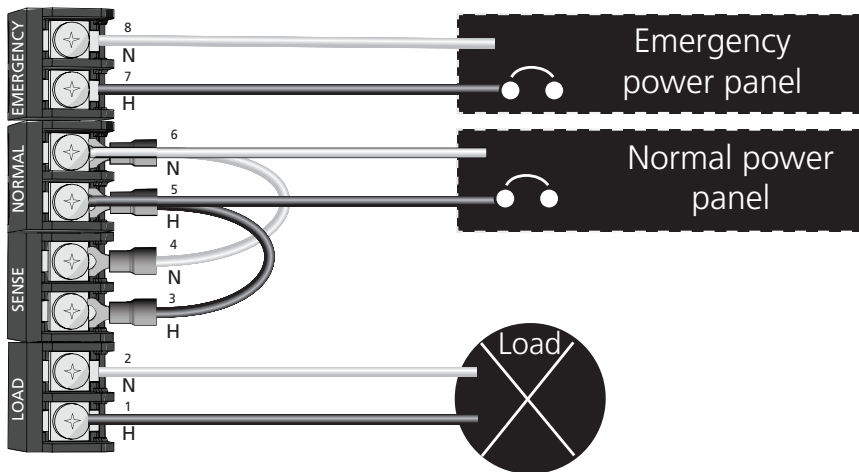
ELCTR

Earth Ground

See [Wire and Terminal Specifications on page 4](#) for specification of wire, strip length, and terminal torque ratings, then prepare and terminate your earth ground wire to the lug provided in the enclosure.

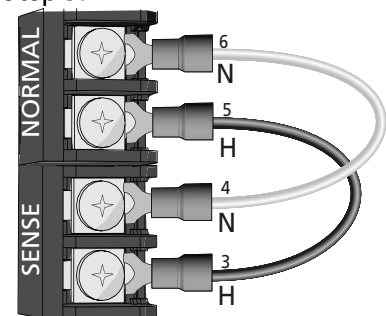
Simple Transfer

A simple transfer installation would be used for a load that is intended to be always on. In the event of loss of normal power, the load is transferred to the emergency power source but remains on. There is no control over the load.



1. See [Wire and Terminal Specifications](#) for wire size, strip length, and terminal torque.
2. Terminate load wires.
 - a. Run a neutral and a hot load wire through conduit to the load position for the load to be transferred from the ELCTR.
 - b. Terminate to the respective terminals LOAD 2N (neutral) and LOAD 1H (hot) in the ELCTR enclosure, securing each terminal screw onto the wire.
3. Install normal sense jumpers.
 - a. Install a jumper wire between terminals SENSE 3H (hot) and NORMAL 5H (hot).
 - b. Install a jumper wire between SENSE 4N (neutral) and Normal 6N (neutral).
4. Terminate normal power wires.
 - a. Run a neutral and a hot wire through conduit from the normal power source to the ELCTR.
 - b. Terminate the neutral wire to the NORMAL 6N (neutral) terminal and secure the terminal screw onto the wire and the jumper fork terminal.
 - c. Terminate the hot wire to the NORMAL 5H (hot) terminal and secure the terminal screw onto the wire and the jumper fork terminal.
5. Terminate emergency power wires.
 - a. Run a neutral and a hot wire through conduit from the emergency power source to the ELCTR.
 - b. Terminate to the respective terminals EMERGENCY 8N (neutral) and EMERGENCY 7H (hot) in the ELCTR enclosure, securing each terminal screw onto the wire.

Step 3:



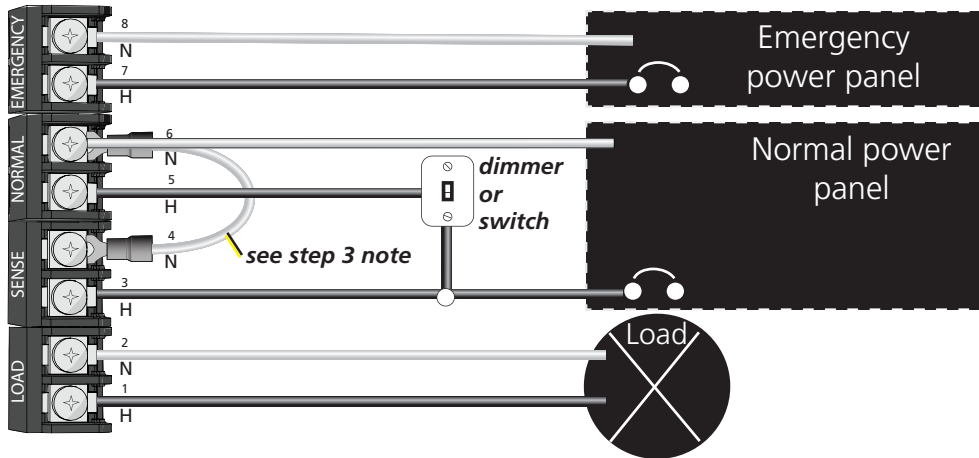
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Dimmed or Switched Load

The ELCTR has the ability to separate the sensing of normal power from the load itself; this allows you to have a light switch or dimmer controlling the load when normal power is available, but to have the load transfer to emergency power in the event of normal power loss.

The ELCTR can be used with switched or dimmed power control.



1. See [Wire and Terminal Specifications on page 4](#) for wire size, strip length, and terminal torque.
2. Terminate load wires.
 - a. Run a neutral and a hot load wire through conduit for the load to be transferred from the ELCTR to the load position.
 - b. Terminate to the respective terminals LOAD 2N (neutral) and LOAD 1H (hot) in the ELCTR enclosure, securing each terminal screw onto the wire.
3. Install a jumper wire between SENSE 4N (neutral) and Normal 6N (neutral).



Note: If using a separate neutral for the sense circuit, do not install the jumper. If using a three-wire feed as shown above, install the jumper as described in step 3.

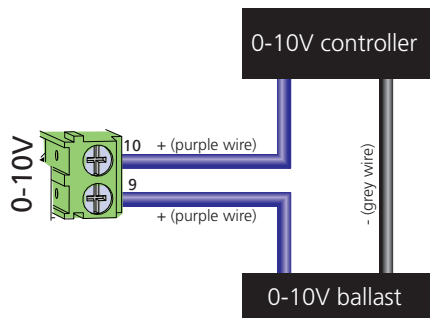
4. Terminate normal power wires.
 - a. Run a neutral and a hot wire through conduit from the normal power source (controlled dimmer or switch) to the ELCTR.
 - b. Terminate the neutral wire to the NORMAL 6N (neutral) terminal and secure the terminal screw onto the wire and the jumper fork terminal.
 - c. Terminate the hot wire to the NORMAL 5H (hot) terminal and secure the terminal screw onto the wire.
5. Terminate normal sense wire.
 - a. Run a hot sense wire from a non-controlled output of the normal power source through conduit to the ELCTR.
 - b. Terminate to SENSE 3H (hot) in the ELCTR enclosure, securing the terminal screw onto the wire.
6. Terminate emergency power wires.
 - a. Run a neutral and a hot wire through conduit from the emergency power source to the ELCTR.
 - b. Terminate to the respective terminals EMERGENCY 7N (neutral) and EMERGENCY 6H (hot) in the ELCTR enclosure, securing each terminal screw onto the wire.

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0–10V Auxiliary Output

The ELCTR features a single pole auxiliary relay that provides switching for installations utilizing 0–10V or Digital Addressable Lighting Interface (DALI) controls. In the event of an emergency, the relay opens the control circuit, sending any connected loads to their full intensity output.



Note: All low-voltage Class 2 wiring must be separated from all Class 1 wiring. Follow local codes and installation restrictions.

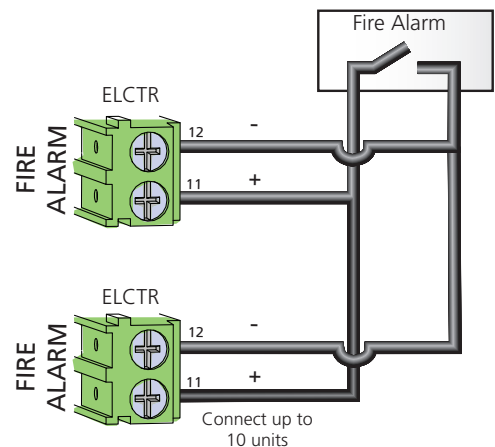
Echoflex recommends limiting the distance run for the 0–10V control wiring from the controller to the last ballast (driver) to 300ft, based on 18 AWG wire.

1. Run a +10V wire, typically purple, between the 0–10V controller and the 0–10V terminal 10 in the ELCTR and secure the terminal onto the wire.
2. Run a +10V wire, typically purple, between 0–10V ballast and the 0–10V terminal 9 in the ELCTR and secure the terminal onto the wire.
3. Run a common wire, typically grey, between the 0–10V controller and the 0–10V ballast.

Fire Alarm Input

The ELCTR features a single dry-contact input that can be used to force the transfer from normal to emergency state, even if both normal and emergency power are present. The contact may be configured for either normally closed (NC) or normally open (NO) operation by setting switch 1 and 2 on the ELCTR control board.

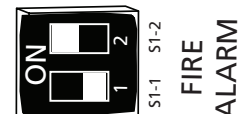
1. Run a positive control wire between the fire alarm device and the FIRE ALARM 11 "+" terminal in the ELCTR and secure the terminal onto the wire.
2. Run a negative (common) control wire between the fire alarm device and the FIRE ALARM terminal 12 "-" and secure the terminal onto the wire.



Note: The system supports connection of up to 10 ELCTR units connected in parallel to the fire alarm device.

3. Set the fire alarm contact input configuration switches for either normally open or normally closed operation.

FIRE ALARM		
	S1-1	S1-2
NO	OFF	ON
NC	ON	OFF

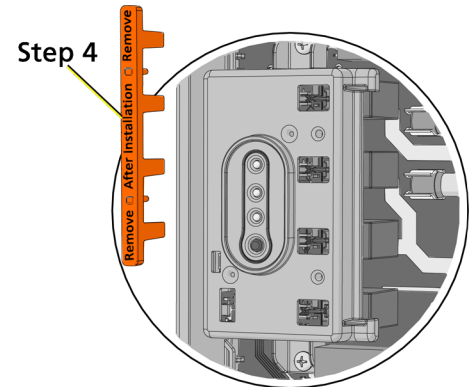


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Final Installation and Power Up

1. Check that each termination point is secure.
2. Check that the fire alarm contact input switches are set for correct switch operation, either normally open or normally closed.
3. Clear all debris from the inside of the enclosure.
4. Remove and discard the orange plastic strip that is securing the relays in place.
5. Attach and secure the front cover to the enclosure.
6. Apply both normal and emergency power to the unit.
7. Test the operation of the ELCTR as described in [Operation and Test](#) below.



Operation and Test

It is important to test the ELCTR regularly because it is a life safety device. **NFPA 101 Life Safety code requires testing of life safety devices every 30 days.**

Test the ELCTR unit using either the test button or laser test as described in the following sections.

LED States

Red LED	Green LED	State	Notes
On	On	Normal and emergency power are both present. The ELCTR is supplying Normal power to the load.	
Blinking	Off	The ELCTR is supplying emergency power to the load.	This may be due to the loss of normal power, the making of the fire alarm contact, or the activation of the test mode.
Off	On	Normal power is present; emergency power is not.	The ELCTR is supplying normal power to the load and will not transfer.
Off	Off	Neither normal nor emergency power are being supplied to the unit.	If the LEDs are not lit as expected when power is present, it is possible that one or both of the internal fuses have blown. See Fuse Replacement on page 9 to check and replace the fuses.
Blinking	Blinking	Relays are detected in an invalid state	If both LEDs are blinking, the ELCTR relays need to be manually reset to a known state. See Troubleshooting on page 10 for detailed instructions.

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Test Button

Press and hold the “PUSH TO TEST” button to place the ELCTR into emergency mode and transfer the load from normal power to emergency power. The ELCTR remains in emergency mode until you release the “PUSH TO TEST” button. If emergency power is not present for the test, the ELCTR will remain in normal mode.

Laser Test

Directing a laser pointing device at the “LASER TEST” sensor located on the front of the ELCTR enclosure places the ELCTR into emergency mode and transfers the load from normal power to emergency power. The ELCTR remains in emergency mode for 10 seconds and then returns to normal mode. If emergency power is not present for the test, the ELCTR will remain in normal mode.



Note: *If the laser test functionality is not desired, or the unit is to be installed in a high ambient light environment such as outside in direct sunlight, a light blocking sticker is included in the product packaging. Remove the adhesive backing and apply the sticker over the laser test sensor to disable its use.*

Fuse Replacement



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Before you begin pulling and terminating wire to the ELCTR enclosure, make sure the main circuit breaker cabinet or other readily accessible input power disconnect device for both normal and emergency power input is locked out and tagged out. Enclosures installed without an accessible input power disconnect device cannot be serviced or operated safely. Follow all local codes and restrictions. When the disconnect device is not located near the installed enclosure, the disconnect must allow for proper lockout/tagout.

In-line fuses are present for the normal power input and the emergency power input. Replace fuses only with Class G SLC 30A fuses.

1. Disconnect both power supply sources and lock/tag out appropriately.
2. Loosen the four screws and remove the cover.
3. Use a voltmeter to test if the fuses are functional, and replace the ones that have failed.
4. Replace the cover to the enclosure.
5. Reapply power from both sources and test the unit. See [Operation and Test on page 8](#) for instructions on testing the unit.

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Troubleshooting

When both of the ELCTR LEDs are blinking, the relays need to be manually reset to a known state.

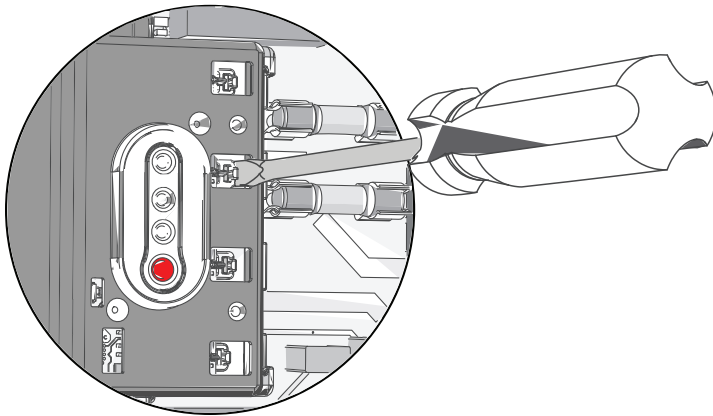


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1. Disconnect both power supply sources and lock/tag out appropriately.
2. Loosen the four screws and remove the cover.



3. Locate the four relay switches near the status LEDs.
4. Using a flat blade screwdriver, carefully slide the relay switch to the left.
5. Repeat for all four relays in the ELCTR enclosure.
6. Replace the cover to the enclosure.
7. Reapply power from both sources and retest the unit. See [Operation and Test on page 8](#) for instructions on testing the unit.