



PLD10+

Emergency LED Battery Pack Installation,
Operation, and Service Instructions



ILL-93319838 CLASS 2 OUTPUT

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. This product is for use with an emergency LED lighting load and supplies 10.0 W of constant output power for 90 minutes and reduces output power thereafter for 120 minutes to LED lamps rated from 20-56 Vdc.
2. Make sure all connections are in accordance with the NEC and any local regulations.
3. To reduce the risk of electric shock, disconnect both normal and emergency power supplies and converter connector from the emergency driver before servicing.
4. This emergency driver is suitable for factory or field installation inside of a suitable lighting fixture.
5. Do not use outdoors. This product is suitable for use in damp locations where the ambient temperature is 0°C minimum, +55°C maximum. See operating temperature for details. Product is not suitable for heated air outlets and wet or hazardous locations.
6. An unswitched AC power source is required (120/277 VAC, 50/60 Hz).
7. Do not install near gas or electric heaters.
8. Do not attempt to service the battery. A sealed, no-maintenance battery is used that is not field replaceable. Contact Dual-Lite for information on service.
9. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
10. Do not use this product for other than intended use.
11. Servicing should be performed by a qualified service personnel.
12. Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.

SAVE THESE INSTRUCTIONS

WARNING - This product contains chemicals known to the State of California to cause cancer, birth defects, and/or other reproductive harm. Thoroughly wash hands after installing, cleaning, or otherwise touching this product.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INSTALLER:

SEE UNIT LABEL FOR ADDITIONAL MODEL SPECIFICATIONS
SAVE THESE INSTRUCTIONS FOR USE BY OWNER/OCCUPANT



**CAUTION: DISCONNECT POWER DURING INSTALLATION AND BEFORE SERVICING.
READ ALL INSTRUCTIONS COMPLETELY BEFORE STARTING INSTALLATION.**

INSTALLATION

This product is suitable for field installation with suitable LED loads including LED luminaires, DC voltage driven LED replacements for fluorescent lamps and others. There are 5 checks to determine if your luminaire is eligible for field installation.

1. Ensure the LED load's rated power is greater than or equal to the power output of this emergency LED driver (10W). This is to ensure that this emergency product will not produce more power than the LED load can handle, thus ensuring that the LED load will not be damaged when the system is in the emergency mode.
2. Verify that the forward voltage of the luminaire's LED array is within the limits of this emergency LED driver. The forward voltage of the LED array is commonly designated as Vf and should be found on the luminaire marking's, in the luminaire specifications, or imprinted directly on the LED arrays. If multiple LED arrays are to be driven, verify that the total forward voltage is within the limits of this product. Using a voltage meter, it may be possible to directly measure the voltage across the LED array when operating from the AC driver.
3. Ensure the output current of the LED driver does not exceed 1.2 Amps. This is the current into the blue wire.
4. Ensure the LED fixture's rated efficacy is equal to or greater than 65 lm / watt. This is to ensure that the LED fixture can be mounted at or below the maximum rated mounting height of 43.29ft (12.78m) for 90-minute runtime (0°C to 55°C) or 35.23ft (10.74m) for 120-minute runtime (5°C to 55°C).
5. Ensure there will be sufficient light output in the end application. Estimate the emergency egress lighting illumination levels by doing the following:
 - a. Find the efficacy of the LED lighting fixture. Luminaire efficacy information can be found at the Design Lights Consortium website (<http://www.designlights.org>), Energy Star - Certified Products - product finder website (<http://www.energystar.gov/productfinder/>) or given by the luminaire manufacturer on product catalog specification sheets. The LED fixture efficacy will be given in lumens per watt (lm/w).
 - b. Lumens can be calculated by multiplying the output power of the emergency LED driver (10W) by the efficacy of the LED load. In many cases the actual lumen output in emergency mode will be greater than this calculation gives, however it will provide a good estimate for beginning the lighting design of the system.

$$\text{Lumens In Emergency Mode} = \text{Lumens Per Watt of Fixture} * \text{Output Power of Chosen Product}$$
$$(\text{LUMENS}) = (\text{LM/W}) * \text{W}$$

- c. Using the results of this calculation and industry standard lighting design tools, calculate the anticipated illumination levels in the path of egress.

NOTE: This product has been designed to reliably interface with a wide selection of LED loads and is electrically compatible with every simple LED array that meets criteria 1 - 5 above. However, compatibility cannot be guaranteed with all current and future LED systems. Compatibility testing of the end-use system is suggested. Please contact the factory with any questions.

NOTE: After installation, it will be necessary to measure the egress lighting illumination levels to ensure it complies with national, state, and local code requirements.

Installation of this Emergency LED Driver will vary based on the luminaire type, however, generally follow these steps.

Step 1. Disconnect AC power to the LED lighting fixture. Remove lens and ballast channel cover from LED fixture if applicable. (see illustrations 2 & 4)

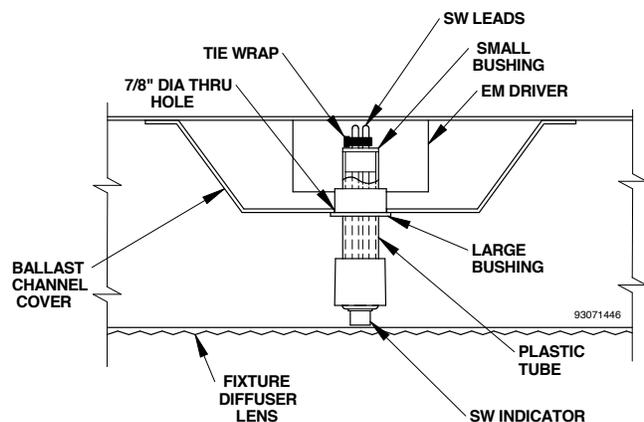
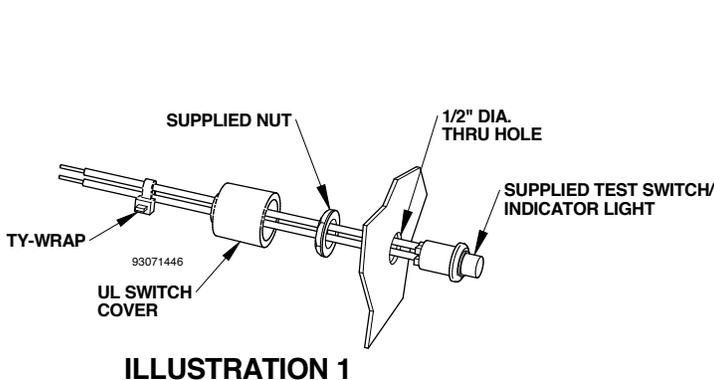
Step 2. Using the 2 supplied screws, mount the LED emergency driver inside of the LED lighting fixture.

The lighting fixture instructions might provide suggestions on the driver mounting location.

Note: due to the plastic construction, the EM driver must be located inside of fixture.

Step 3. Test switch/indicator light can be mounted directly to a fixture surface thru a 1/2 inch diameter hole. Once nut is tightened, slip UL switch cover over wires, pushing cover against fixture surface completely covering switch, then affix ty-wrap over wires against cover to secure. Switch should be visible once fixture is installed. (see illustration 1 & 4)

Step 4. Test switch/indicator light can also be installed onto a driver channel cover through a 7/8 inch diameter hole (see illustrations 2 & 3.) Trim plastic tube to desired length, affix switch with nut as shown and place into tube. Affix both the small bushing and the large bushing onto the plastic tube as shown. Connect tie wrap onto wires and tighten. Adjust nut for secure assembly and insert into channel. Switch should be visible once fixture is installed.



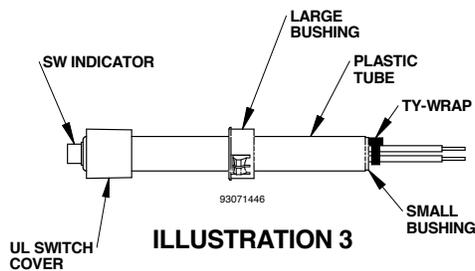


ILLUSTRATION 3

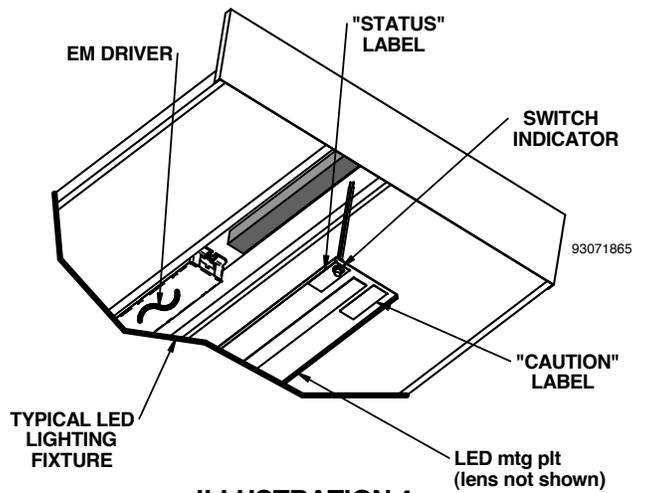


ILLUSTRATION 4

Mounting Height: This product meets or exceeds the NFPA minimum light requirements with all loads, down to the smallest rated lamp load, at heights up to 43.29ft (12.78m) for 90-minute runtime (0°C to 55°C) or 35.23ft (10.74m) for 120-minute runtime (5°C to 55°C). Many factors influence emergency illumination levels, such as the lamp load selected, luminaire design, and environmental factors, therefore end use verification is necessary. For field installations, when the attached luminaire is mounted at heights greater than 43.29ft (12.78m) for 90-minute runtime (0°C to 55°C) or 35.23ft (10.74m) for 120-minute runtime (5°C to 55°C), the level of illumination must be measured in the end application to ensure the requirements of NFPA 101 and local codes are satisfied.

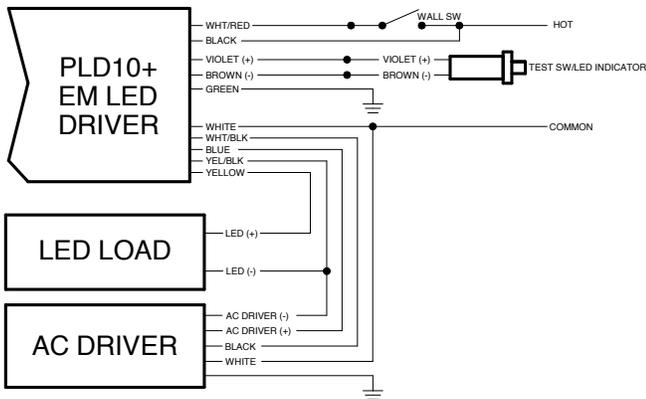
- Step 5. Select correct wiring diagram to connect the emergency driver to the LED load, AC LED driver and Switch. Make sure all connections are in accordance with the National Electrical Code and any local regulations.
- Step 6. Install in a visible location the labels "CAUTION" & "STATUS" (see illustration 4).
- Step 7. After installation is complete, supply AC power to the emergency ballast.
- Step 8. At this point, power should be connected to both the AC driver and the emergency driver, and the charging indicator light should illuminate indicating the battery is charging.
- Step 9. A short-term discharge test may be conducted after the emergency ballast has been charging for one hour.
- Step 10. Charge for 24 hours before conducting a long-term discharge test. Refer to "Operation" section below

WIRING

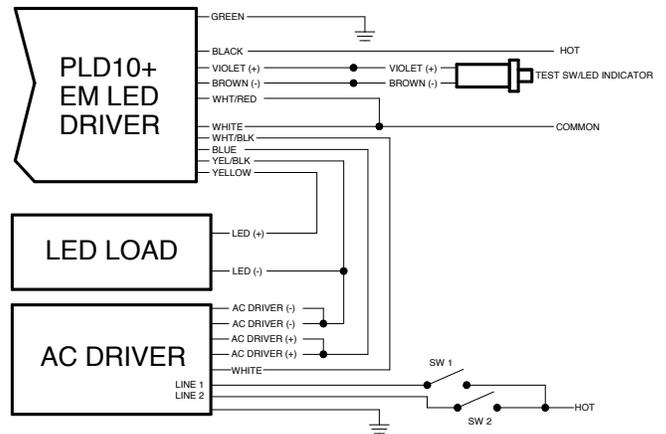
Note: Make sure the necessary branch circuit wiring is available. An unswitched source of power is required. The emergency ballast must be fed from the same branch circuit as the AC ballast.

EMERGENCY DRIVER AND AC DRIVER MUST BE FED FROM THE SAME BRANCH CIRCUIT TYPICAL SCHEMATICS ONLY. CONSULT THE FACTORY FOR OTHER WIRING DIAGRAMS

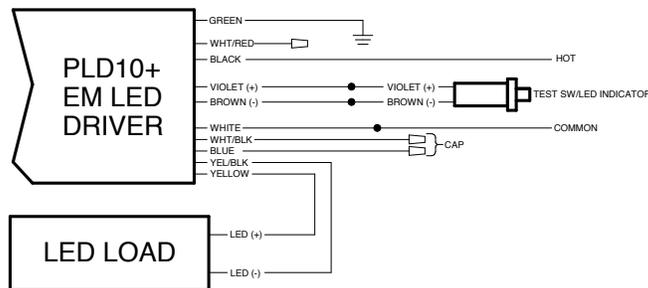
EMERGENCY BACK-UP & AC DRIVER



EMERGENCY BACK-UP, AC DRIVER AND STEP DIMMING



EMERGENCY BACK-UP ONLY



NOTE: For short term testing of the emergency function, the battery must be charged for at least one hour. The emergency driver must be charged for at least 24 hours before conducting a long term test.

OPERATION

During normal operation AC power is applied, the charging indicator light is illuminated. (red for non-Spectron® and green for Spectron® models), indicating that the battery is being charged. When power fails, the charging indicator turns off, and the emergency LED driver automatically switches to emergency power (internal battery), operating the LED load for a minimum of 90 minutes or 120 minutes (see operating temperature for details). When AC power is restored, the emergency driver returns to the charging mode.

NOTE: All models are supplied with an AC lock-out circuit, which prevents the battery from discharging when it is not in service. This includes shipping and after the battery is disconnected.

NOTE: All models are supplied with a Low Voltage Disconnect circuit which prevents damage to the battery from deep discharge during prolonged emergency operation.

NOTE: Batteries are often shipped in a discharged state - this is normal. The battery will require charging. Allow 24 hours of charging before testing the unit.

Non-Spectron® models:

Once installed with its LED load, manual testing can be performed by following the below procedure:

Condition		Result	
AC input	Test switch	LED load	Red LED Status Indicator
ON	Released	ON (driver output) or OFF (EMBB only)	ON
ON	Press & hold	ON (switches to PLD+ output)	OFF
ON	Released	ON (switches to driver output) or OFF (EMBB only)	ON
OFF	Released	ON (switches to PLD+ output)	OFF

The unit also has a visual indication of unit malfunction when there is a “Charger Fault” with the red LED blinking three times with a 3 second pause between the 3 blink group.

SERVICE ALERT CODES

FROM "STATUS" LED INDICATOR:

- RED BLINKING = BATTERY DISCONNECTED
- = CHARGER FAULT
- = AC ON

Models with Spectron® Self-Testing/Self-Diagnostic Circuitry Provide:

- Visual indication of AC power status • Visual indication of self-diagnostic test status and results

Visual Indication of any unit malfunction include

- Battery Disconnected • Battery Fault • Charger Fault • LED Driver Fault • Lamp Fault • Load Learn Failure

Spectron® equipped models also include:

Brownout protection: unit will automatically transfer to emergency operation upon detection of low AC power (approximately 80% of nominal line).

Time Delay Retransfer: upon return of normal AC power, unit will remain in emergency mode for an additional 15 minutes to allow AC Power to stabilize.

LED Status Indicator

A bicolor LED (Green/Red) is provided in the test switch of all models equipped with the Spectron® option.

Green Operating Status LED

Serves as both an AC power and self-test indicator. During normal operation, the Green Operating Status LED will be illuminated indicating the presence of AC power. During all automatic or manual self-test cycles, the Green Operating Status LED will blink.

Automatic Tests

The unit will automatically initiate a self-test/ self-diagnostic cycle based on the following table:

Automatic Tests		
Testing Period	Duration of Test	Green LED Status Indicator
Once a month	1 minute	2 blinks per second
Once every 6 months	90 minutes	1 blink per second

Pressing test switch at any time after a 90 minute test cycle has begun cancels the remainder of the 90 minute test and returns the unit to normal operation.

Red Service Alert LED

Under normal operating conditions, the Red Service Alert LED indicator will remain off. If the Spectron® controller detects a malfunction, the Red Service Alert LED will blink in the pattern listed in the following image:

SERVICE ALERT CODES

FROM "STATUS" LED INDICATOR:

- RED BLINKING = BATTERY DISCONNECTED
- = BATTERY FAULT
- = CHARGER FAULT
- = LED DRIVER FAULT
- = LAMP FAULT *
- = LOAD LEARN FAILURE
- ALTERNATING = LOAD LEARN IN PROGRESS
- = AC ON
- GRN BLINKING = TEST MODE ENABLED

Manual Tests

By using the unit's test switch, one can initiate different duration test cycles based on the following table:

Manual Tests		
Initiating Action	Duration of Test	Green LED Status Indicator
Press test switch once	1 minute	2 blinks per second
Press test switch twice	90 minutes	1 blink per second

Once a Spectron® model is installed with its LED load, press and hold the test button for 7 seconds to initiate the “LOAD LEARN” process.
* On models with Spectron®, a Lamp Fault code will trigger if the load deviates more than 25%.

MAINTENANCE

Although no routine maintenance is required to keep the emergency driver functional, it should be checked periodically to ensure that it is working. If a unit is to be deliberately taken out of service for an extended period, the battery should be disconnected in order to preserve its life.

For non-Spectron models:

- a. Turn on AC power supply
- b. Firmly press and release test switch 10 times in a period less than 15 seconds. On each press, the red indicator light will switch off.
- c. Once completed, red indicator light will blink once every second showing “battery disconnected” per the service alert codes figure in the Operation section. Battery is electrically disconnected from the circuit at this point.
- d. Turn off AC power supply.

For Spectron® models:

- a. Turn on AC power supply
- b. Firmly press and hold test switch for 10 seconds, then release.
- c. Once completed, red indicator light will blink once every second showing “battery disconnected” per the service alert codes figure in the Operation section. Battery is electrically disconnected from the circuit at this point.
- d. Turn off AC power supply.

The following schedule is recommended:

1. Visually inspect the charging indicator light monthly. It should be illuminated. See OPERATION section for indicator illumination.
2. Test the emergency operation of the fixture at 30-day intervals for a minimum of 30 seconds. For non-Spectron® models, simply depress and hold the illuminated test switch button. The LED load should operate at reduced illumination. Spectron® equipped models will automatically conduct a 1-minute test every month.
3. Conduct a 90-minute discharge test once a year, by turning off the AC circuit breaker at the service panel. The LED load should operate at reduced illumination for at least 90 minutes. Spectron® equipped models will automatically conduct a 90-minute test every 6 months. Always remember to turn AC circuit breaker back on when maintenance is finished.

REFER ANY SERVICING INDICATED BY THESE CHECKS TO QUALIFIED PERSONNEL

