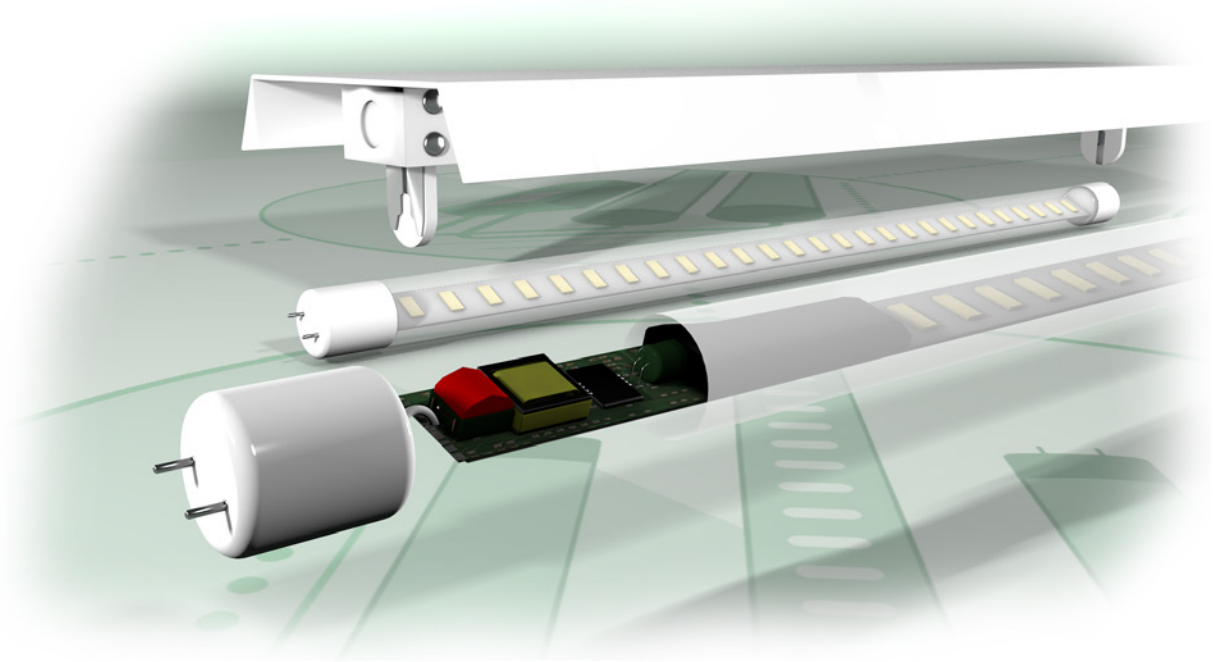
Emergency Solutions for LED Retrofit

Maintaining emergency egress lighting with new LED technology for fluorescent fixtures.



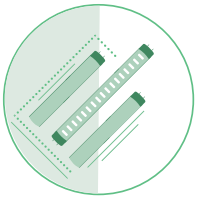
Covering:

- Emergency Solutions for common LED Retrofit Technology Applications, including:
  - LED Tube Lamps (T-LED)
  - LED Tube Lamps with Internal Drivers
  - LED Retrofit Kits
- An in-depth explanation of each LED retrofit option, paired with the optimal IOTA Emergency Lighting Solution.

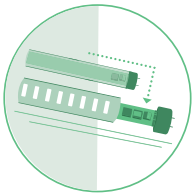
LED Retrofit Technology is a popular way to bring the benefits of LED energy savings to your existing fluorescent fixtures. When converting your lighting space to LED, however, you'll still need to comply with local and federal emergency egress lighting requirements. IOTA offers several emergency lighting solutions that can be employed for each retrofit application, enabling you to make a seamless transition to modern LED lighting while maintaining code-required emergency egress requirements.

Three Common LED Retrofit Options:

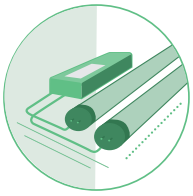
There are three common types of LED retrofit options: LED Tube Lamps, LED Tube Lamps with Internal Drivers, and LED Retrofit Kits. Each of these options have their unique advantages, and each require different emergency solutions to deliver their required egress requirements.



Type A: LED Tube Lamps (T-LED's) - Linear, compact or U-bent LED tubes.



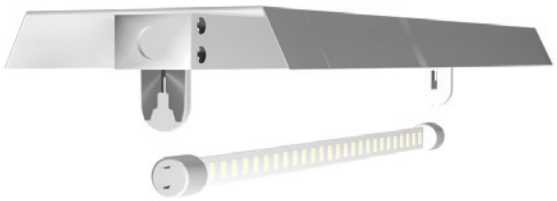
Type B: LED Tube Lamps with Internal Drivers - LED lamps with built-in drivers.



Type C: LED Retrofit Kits - LED Driver and LED tube pairs.

1) Type A - LED Tube Lamps (T-LEDs)

LED Tube Lamps are linear, compact, or U-bent LED lights, also known as T-LEDs, which directly replace the fluorescent tubes in your fixture. These T-LED lamps are designed to **convert the AC voltage coming from your fluorescent ballast to DC current.** This allows you to simply replace the fluorescent lamp with the LED tube without having to remove or re-wire the existing AC ballast.



Emergency Solution - IOTA Ballast with AC Output

LED Tube Lamp retrofit technology limits the use of existing fluorescent emergency ballasts due to the fact that some emergency ballasts provided DC current to the lamp load. Therefore, **it is important that your emergency battery pack be capable of providing true AC output to your TLEDs (see Figure 1).**

IOTA Engineering offers six different emergency ballasts that are capable of providing true AC output. All of these emergency ballasts have been tested and are **UL Listed** to work with select T-LEDs from major LED tube manufacturers. See **Chart 1A** for details on available Iota Emergency Ballast options.

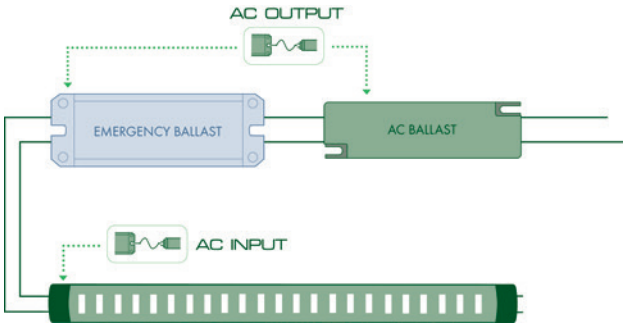


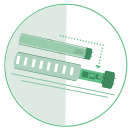
Figure 1 - AC and Emergency Ballast (AC Output) and LED Tube Lamp (AC Input).

Chart 1A - IOTA Emergency Ballasts for LED Retrofit Tubes:

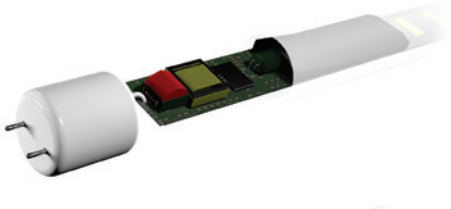
Ballast	Provides AC Output	Features
I-320	✓	Reduced Profile, Damp Location Rated, Suitable for Use in Enclosed and Gasketed Fixtures
I-160	✓	High Lumen Output, Damp Location Rated
I-162	✓	Parallel Operation, High Lumen Output, Damp Location Rated
ISL-54	✓	Slim Profile, Damp Location Rated, Suitable for Use in Enclosed and Gasketed Fixtures
ISL-540	✓	Slim Profile, Dam Location Rated, Suitable for Use in Enclosed and Gasketed Fixtures
ISD-80	✓	Self Diagnostic, Universal Input, Damp Location Rated, Suitable for Use in Enclosed and Gasketed Fixtures

Visit the IOTA Engineering **LED Retrofit Lamp to Ballast Selector** online at iotaengineering.com/ledretrofit.htm to find the correct emergency ballast for your retrofit installation.

2) Type B - LED Tube Lamps with Internal Drivers



LED Tube Lamps with Internal Drivers (may include downlight retrofit kits or linear LED lamps) feature a built-in driver that accepts AC **line voltage,** and allow you to replace your existing fluorescent lamps *and* fluorescent ballast to retrofit your fixture for LED.



Emergency Solution:

Since these LED Lamps are wired directly to the line voltage, and an emergency battery pack cannot be introduced between the driver and the lamp, the emergency lighting solution requires **delivering line voltage to the LED lamps from an auxiliary supply.** This can be done with either a generator set, or an **emergency inverter** (Figure2).

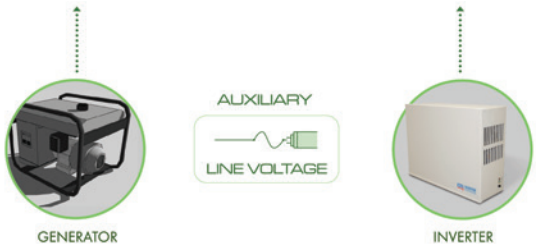


Figure 2 - Emergency Solutions that provide auxiliary line voltage include generators or inverters.

2) Type B - LED Tube Lamps with Internal Drivers (Cont.)

Emergency Solution - IIS Series Inverter

IOTA Engineering offers several different **emergency inverter options** to deliver auxiliary line voltage to your LED retrofit fixtures. The **benefits of an IOTA inverter over a generator** are **lower cost** and the ability to maintain the use of **lighting controls, such as switches or dimmers** on your lighting circuit. IOTA Inverters offer various wattage and mounting styles (see chart 2A).

Chart 2A - IIS Inverter Models

Inverter	Wattage	Mounting Styles
IIS-25-I	25 Watt	Multiple Options Available
IIS-35-I	35 Watt	Multiple Options Available
IIS-50-I	50 Watt	Multiple Options Available
IIS-125	125 Watt	Ceiling Grid, Surface Mounting
IIS-375	375 Watt	Surface Mounting
IIS-375 LED	375 Watt for LED	Surface Mounting
IIS-550	550 Watt	Surface Mounting

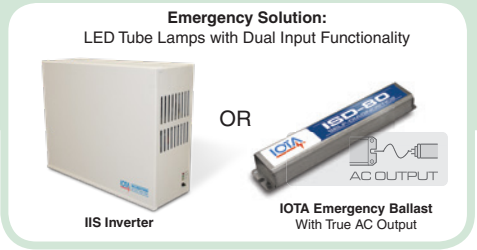
Zone Coverage
IIS Inverters allow for multiple "zones" of lamps to receive emergency illumination.

Simplified Testing
A momentary contact test switch and LED indicators allow for easy testing of an IIS Inverter.

Full Lumen Output
Operates your lamps at full lumen output during an emergency situation with no degradation of light output.

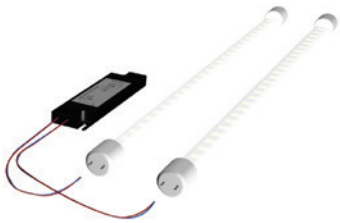
LED Tube Lamps with Dual Input Functionality

Some LED Tube Lamps with internal drivers are able to be **wired directly into the line voltage or used in conjunction with a fluorescent ballast.** Because these lamps can be powered by line voltage or a fluorescent ballast, your **emergency solution** can be either an **IOTA Inverter or an IOTA Emergency Ballast** capable of providing true AC output. (see the previous section for a list of compatible IOTA Ballasts).



3) Type C - LED Retrofit Kits

LED Retrofit Kits include LED tubes or arrays paired to an LED Driver. The LED lamps and driver replace your fluorescent lights and your dedicated fluorescent driver to retrofit your existing fluorescent fixture for LED.



Emergency Solution - ILB-CP LED Emergency Driver

Since you are completely replacing the fluorescent technology with LED technology in these retrofit fixtures, the emergency lighting solution of choice is an **emergency LED driver suitable for field installation.** The emergency LED driver wires between the driver included in your retrofit kit and your LED tubes, to power your LED lamps during an emergency situation.

Most LED emergency drivers on the market today, are UL Recognized Components for factory installation only and are not readily available for retrofit installation. **IOTA ILB-CP LED Emergency Drivers** are **UL Classified for field installation,** are fully compatible with retrofit installations, and offer a full line of wattage and mounting styles.

ILB-CP Series LED Emergency Drivers

UL LISTED

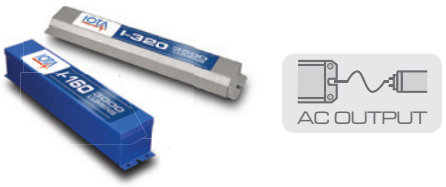
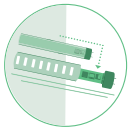
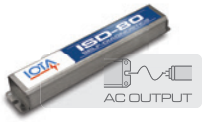
Featuring

- Field Installation
- Constant Power Output
- 5-12 Watt Models
- Various Mounting Styles
- 10-60V Class 2 Output
- 120/277 Vac Universal Input

Summary

LED Tube Lamps (TLEDs), LED Tube Lamps with Internal Drivers, and LED Retrofit Kits are all excellent ways of updating your fluorescent fixtures with LED technology, but all require different solutions for providing required emergency lighting. Regardless of your LED retrofit approach, IOTA Engineering has a suitable emergency lighting solution to bring code required emergency illumination to your applications. **See the table below for a summary of IOTA Emergency Solutions for each LED Retrofit option.**

Emergency Solution Matched to LED Retrofit Option

LED Retrofit Option	Description	Emergency Solution
Type A - LED Tube Lamps 	Linear, compact, or u-bent LED tubes that convert AC voltage from fluorescent ballasts into DC current to power the LED array.	IOTA Emergency Ballast with True AC Output 
Type B - "Direct Wire" LED Tube Lamps with Internal Drivers 	LED Tubes or downlight retrofit kits that feature Internal Drivers that accept line voltage. The fluorescent ballast is removed in this retrofit situation.	IIS Series Emergency Inverter 
LED Tube Lamps with Dual Input Functionality	LED Tubes with Internal Drivers that can receive power from AC line voltage or directly through a fluorescent ballast.	IIS Series Emergency Inverter  or IOTA Emergency Ballast with True AC Output 
Type C - LED Retrofit Kits 	LED tubes or arrays paired to an LED Driver. The LED lamps and driver replace your fluorescent lamps and your dedicated fluorescent ballast in this option.	ILB-CP Series Emergency LED Driver 

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