

Emergency Lighting and UL924

What is a Directly Controlled Luminaire?

DMF Lighting has been asked several times about additions to the 2014 and 2017 National Electrical Code® referring to “Directly Controlled Luminaires,” with respect to use in emergency lighting circuits. In the 2014 edition the following was added:

700.24 Directly Controlled Luminaires. Where emergency illumination is provided by one or more directly controlled luminaires that respond to an external control input to bypass normal control upon loss of normal power, such luminaires and external bypass controls shall be individually listed for use in emergency systems.

In the 2017 edition under ARTICLE 700.2 Definitions the following definition was added:

Luminaire, Directly Controlled. An emergency luminaire that has a control input for an integral dimming or switching function that drives the luminaire to full illumination upon loss of normal power.

There are published magazine articles, if not read carefully, that suggest any lighting fixture that has a 0-10Vdc or digital control input and is used in an emergency lighting circuit, must be qualified to UL924, Underwriters Laboratories, Standard For Safety - Emergency Lighting and Power Equipment.

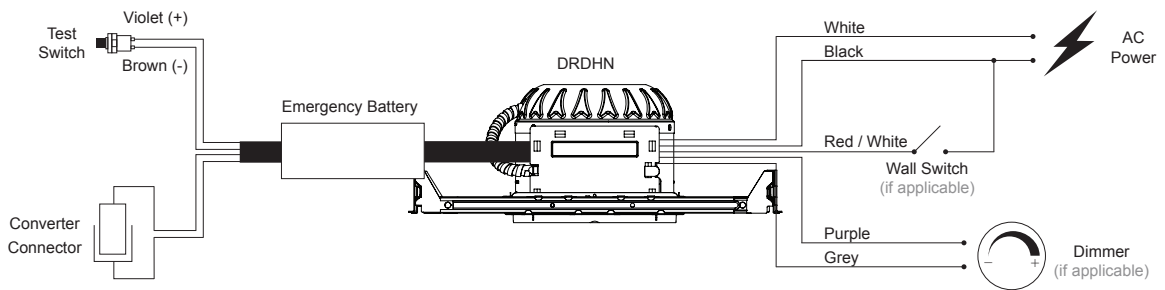
The key to understanding the NEC additions is the phrase *direct control*. Authorities want to ensure that a light fixture used in an emergency circuit will perform appropriately under emergency conditions. If normal power is lost, for any reason, and the emergency circuit kicks in, how does the light fixture respond to the external signal controlling the light level? One example of an unacceptable response is when a control signal from a dimmer is set to zero during normal power operation (i.e. the light is off), and in emergency power mode the light fixture responds with no light output. The updates above are designed to make sure that this sort of emergency response does not happen. In short, a light fixture that detects switching from normal power to emergency power must be capable of providing sufficient light to enable people to safely respond to the situation.

Are DMF EM lighting systems directly controlled?

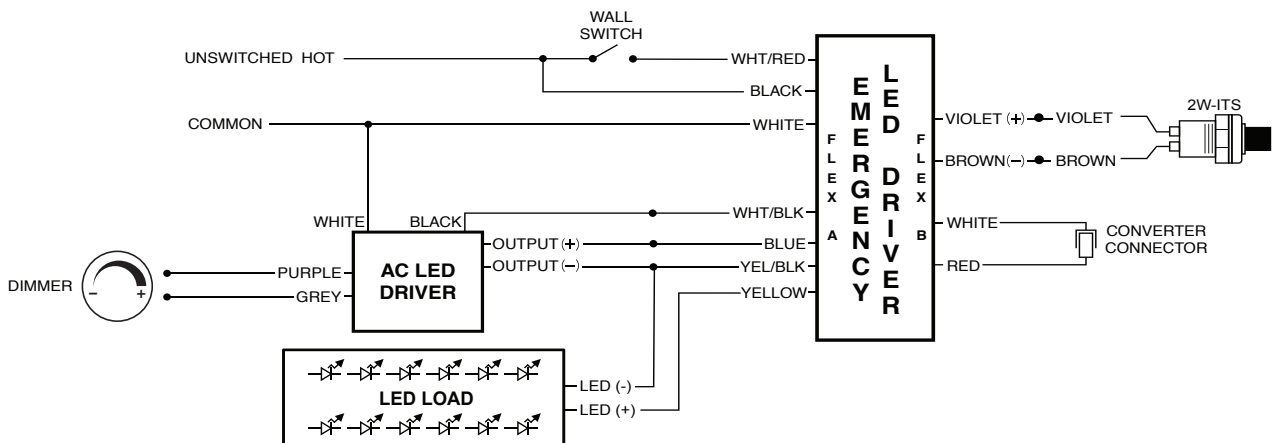
DMF Lighting provides EM - Emergency lighting options with most of its light fixture housing types. These emergency light fixtures can be dimmed with triac/ELV, 0-10Vdc or more sophisticated digital signals. However, during emergency conditions the dimmer is not used to control the light output, hence the light fixture is not directly controlled. DMF uses UL924 qualified emergency LED drivers with battery backup¹, which detect the loss of normal power and switch control to battery power in emergency conditions.

How does the DMF EM battery backup system work?

The diagram below illustrates the typical EM battery backup system.



The detailed wiring diagram below illustrates that the emergency LED driver powers the LED LOAD using the AC LED driver input, in normal power mode, and with battery power in emergency mode.



¹ For example, Philips Bodine BSL17C-C2