

# RL-LED

## Warm White

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Item #2379

**OVERVIEW:** RL-LED LIGHTING uses track or other low voltage power to provide illumination in cars or a fixed source for stationary illumination. The RL-LED can produce as much as 18 lumens per LED which is quite blinding! Maximum illumination requires a low amount of voltage and remains constant for the balance of the speed / input voltage range. RL-LED LIGHTING gives a more intense, uniform illumination, and uses less current per lumen than other types. The RL-LED units also allow for different intensity settings, thereby making a coach or caboose more prototypical by allowing for different intensities to be set. The RL-LED is available in different versions: "Warm White" (item 2379, 2389), compares to an incandescent light bulb, which would be found in many applications. More modern trains would use the "Cool White" (item 2380, 2390) which looks more like fluorescent lighting. Older style lighting would use "Amber" (item 2381, 2391). The Amber series do not emit a super bright light as the others. The RL-LED is completely compatible with our DC sound systems, LocoMatic™ systems, all standard AC, DC, DCC, TMCC™, and DCS™ track power with NO extra items required. The maximum input voltage is 25 volts AC, 35 volts DC.

**INSTALLATION:** All RL-LED LIGHTING devices are to be mounted where space permits. Installation can be done by attaching wires to the existing 2 pin connector's leads for track power pickup and peeling the double sided tape to secure the unit in the position desired. DO NOT allow any other metal part to come in contact with any part on the board\*. **WARNING:** DO NOT power the board when the LED's Intensity Adjustment is turned higher than 12:00 o'clock unless the LED's are not pointing at your eyes. The LED's are capable of emitting extreme intensity that should not be directed to your eyes!

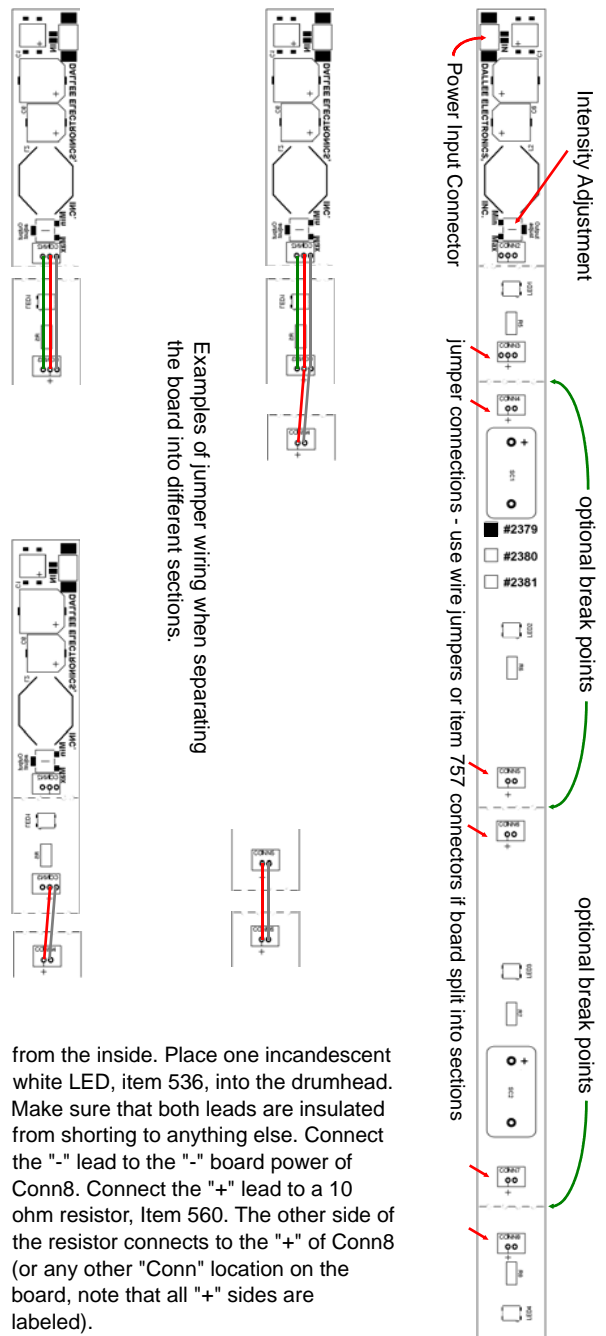
For alternative types of installation, the RL-LED board is also designed to be broken into sections with jumper wire locations provided. The breaking locations are shown by dashed lines with extra holes drilled through the board to provide an easier break. If breaking the power section from the first "LED1" you must jumper 3 wires. Item #758 provides connectors for this application. Failing to connect the section properly to the "LED1" section will damage the unit\*. If breaking the unit into sections, 2 wires are required between to continue power to the next section. Item #757 will match the predrilled holes. If a section is not required, keep it for another application or to extend another unit. When connecting sections that were broken from the main power unit, be sure to get the polarity correct. Reversing the connections may damage the LED's\*. As always with electronics, use only appropriate solder for electronics\*. Other solder fluxes will destroy wires and printed circuit boards. All soldering is to be done with an appropriate low wattage pencil tip iron. After the board placement has been selected, peel the double sided tape and adhere to a clean surface. Extra double sided tape, item #388, can be purchased if needed. Item 388 is a proper tape for use with electronic equipment. You can also illuminate the extra LED's by using item #378.

Things to look for when installing:

2 rail operators: should make sure the pickup wheels are on the same side of each truck. If not, a short will occur when the car is placed on the track. Make sure each truck picks up from an opposite rail. If not, the lights will not come on! Connect the Red wire to the right rail pickup and the gray wire to the left hand pickup.

3 rail operators: center rail roller pickup should be connected to the red wire and the gray wire to the outside rail pickups. The outside rail pickups are usually the chassis or trucks with appropriate wipers for the outside rail.

Illumination of a drumhead: Drill out the end of the car and backside of the drumhead to allow a T1 LED to pass through



from the inside. Place one incandescent white LED, item 536, into the drumhead. Make sure that both leads are insulated from shorting to anything else. Connect the "-" lead to the "-" board power of Conn8. Connect the "+" lead to a 10 ohm resistor, Item 560. The other side of the resistor connects to the "+" of Conn8 (or any other "Conn" location on the board, note that all "+" sides are labeled).

Drafting paper is an excellent choice for

a light diffuser inside a car along the windows. This helps diffuse the light within the car providing a more uniform appearance. You might also consider placing reflective metal duct tape along the inside roof to reflect the light downward within the car.

\*denotes items not covered under any warranty.

As an added bonus, add a super capacitor (item 559) to the RL-LED lighting board. By doing so, you will create "flicker free" lighting. LED's will show intermittent track power pickup compared to lamps and while there already is some energy storage on the boards, adding this capacitor will virtually eliminate any lighting fluctuations as well as keep the LED's illuminated for quite some time after track power is removed. While one of the "Super Cap's" will be sufficient, you can always add another. Locations are provided for the super capacitor. The positions are labeled SC1 and SC2. Either or both positions can be utilized. Note that the stripe on the capacitor indicates the "-" side of the capacitor. Therefore the other, longer lead, needs to be placed into the board where the "+" indication is on the board. Solder carefully with appropriate solder and a pencil iron and cut the leads near flush to the board.