

# INSTALLATION & OPERATION MANUAL



**CODE 3<sup>®</sup>**  
A PUBLIC SAFETY EQUIPMENT COMPANY

# LED Duo Beam <sup>TM</sup>

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**IMPORTANT:**

Read all instructions and warnings before installing and using.

**INSTALLER:**

This manual must be delivered to the end user of this equipment.

# Introduction

The LED-Duo Beam™ uses state of the art LEDs and optics to provide a superior optical output. The rugged design and long life capabilities make it virtually maintenance free. When properly configured, the Duo-Beam will provide 360 degree coverage and will exceed SAE Class 1 and California Title 13 requirements.



The use of this or any warning device does not ensure that all drivers can or will observe or react to an emergency warning signal. Never take the right-of-way for granted. It is your responsibility to be sure you can proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, or walking on or around traffic lanes. The effectiveness of this warning device is highly dependent upon correct mounting and wiring. Read and follow the manufacturer's instructions before installing or using this device. The vehicle operator should insure daily that all features of the device operate correctly. In use, the vehicle operator should insure the projection of the warning signal is not blocked by vehicle components (i.e.: open trunks or compartment doors), people, vehicles, or other obstructions.

This equipment is intended for use by authorized personnel only. It is the user's responsibility to understand and obey all laws regarding emergency warning devices. The user should check all applicable city, state and federal laws and regulations.

Code 3, Inc., assumes no liability for any loss resulting from the use of this warning device. Proper installation is vital to the performance of this warning device and the safe operation of the emergency vehicle. It is important to recognize that the operator of the emergency vehicle is under psychological and physiological stress caused by the emergency situation. The warning device should be installed in such a manner as to: A) Not reduce the output performance of the system, B) Place the controls within convenient reach of the operator so that he can operate the system without losing eye contact with the roadway.

Emergency warning devices often require high electrical voltages and/or currents. Properly protect and use caution around live electrical connections. Grounding or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.

**PROPER INSTALLATION COMBINED WITH OPERATOR TRAINING IN THE PROPER USE OF EMERGENCY WARNING DEVICES IS ESSENTIAL TO INSURE THE SAFETY OF EMERGENCY PERSONNEL AND THE PUBLIC.**

## Unpacking & Pre-installation

Carefully remove the light bar and place it on a flat surface, taking care not to scratch the lenses or damage the cable coming out of the bottom. Examine the unit for transit damage, broken lamps, etc. Report any damage to the carrier and keep the shipping carton.

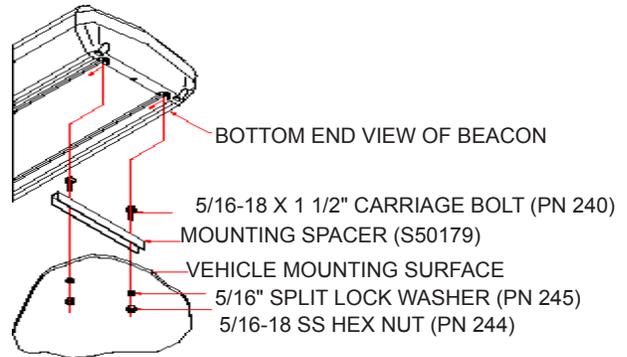
The LED Duo Beam™ is built to operate on 12 volt D.C. negative ground (earth) vehicles. If you have an electrical system other than 12 volt D.C. negative ground (earth) contact the factory.

# Installation & Mounting

In all cases, mount the lightbar so that the rubber edging that fits between the lens and the aluminum base faces to the front or the side of the vehicle.

## FLUSH MOUNT

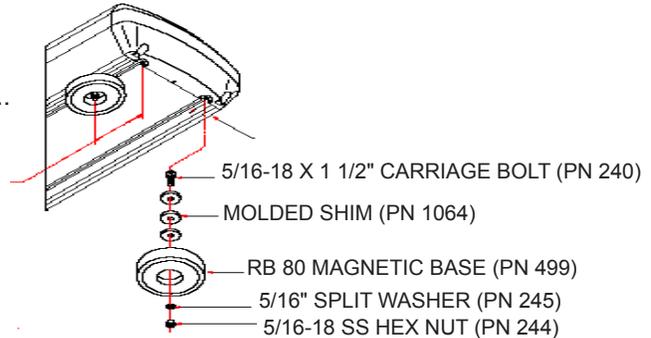
Slide bolts through track in bottom of beacon. Place spacer over bolts as shown in FIGURE 1. Align bolts with pre drilled holes in vehicle's surface. Place lock washer and nut on bolt then tighten until snug.



NOTE: Spacer must be used to prevent water from entering the bar.

## MAGNETIC MOUNT

Slide bolts through track in bottom of .. beacon approximately 2.25 inches from end. Place molded shims over bolts as shown. Attach magnetic base over bolts. Place lock washer and nut on bolt then tighten until snug.



## MIRROR MOUNT BRACKET

1. Assemble the brackets, tighten the 3/8 bolt but leave the 7/16 bolt finger tight at this time.
2. Position bracket assembly on top mirror supports, bracket A on rear support and bracket B on front support. Note: some mirror designs require reversing bracket A and B. Rotate bracket A as necessary to get the best fit. Some additional bending of brackets may be necessary in some cases to achieve a satisfactory fit.
3. Attach bracket assembly to mirror supports with U-bolts, position bracket assembly as desired and tighten U-bolts. The Duo Beam mounting bracket should be parallel to the ground.

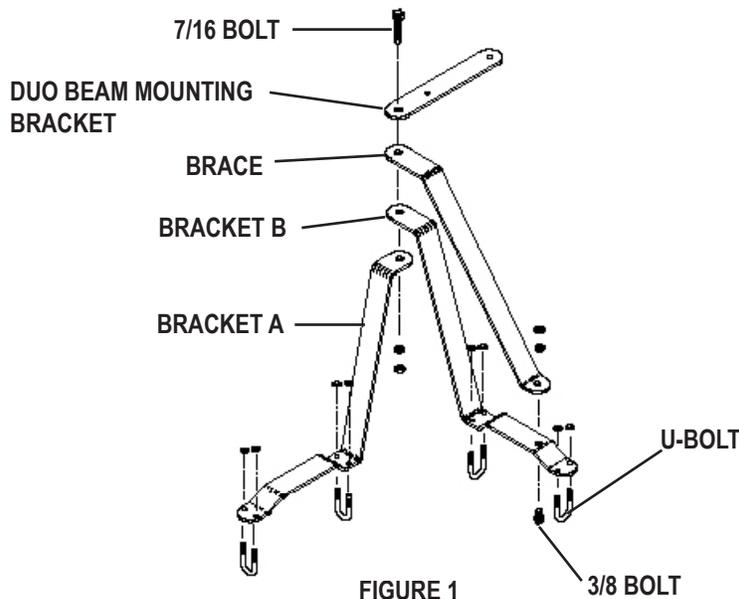


FIGURE 1



**WARNING!**

Utilizing non-factory supplied screws and/or mounting brackets and/or the improper number of screws may result in loss of warranty coverage on the equipment.

# Lightbar Wiring Instructions



## WARNING!

Larger wires and tight connections will provide longer service life for components. For high current wires it is highly recommended that terminal blocks or soldered connections be used with shrink tubing to protect the connections. Do not use insulation displacement connectors (e.g. 3M® Scotchlock type connectors). Route wiring using grommets and sealant when passing through compartment walls. Minimize the number of splices to reduce voltage drop. High ambient temperatures (e.g. underhood) will significantly reduce the current carrying capacity of wires, fuses, and circuit breakers. Use "SXL" type wire in engine compartment. All wiring should conform to the minimum wire size and other recommendations of the manufacturer and be protected from moving parts and hot surfaces. Looms, grommets, cable ties, and similar installation hardware should be used to anchor and protect all wiring. Fuses or circuit breakers should be located as close to the power takeoff points as possible and properly sized to protect the wiring and devices. Particular attention should be paid to the location and method of making electrical connections and splices to protect these points from corrosion and loss of conductivity. Ground terminations should only be made to substantial chassis components, preferably directly to the vehicle battery. The user should install a fuse sized to approximately 125% of the maximum Amp capacity in the supply line to protect against short circuits. For example, a 30 Amp fuse should carry a maximum of 24 Amps. **DO NOT USE 1/4" DIAMETER GLASS FUSES AS THEY ARE NOT SUITABLE FOR CONTINUOUS DUTY IN SIZES ABOVE 15 AMPS.** Circuit breakers are very sensitive to high temperatures and will "false trip" when mounted in hot environments or operated close to their capacity.

Route the wiring cables into the engine or passenger compartment, taking care to use grommets and to apply sealant around openings to keep water out. It is advisable to leave an extra loop of cable when installing the light bar to allow for future changes or reinstallations. Connect the black lead to a solid frame ground (earth), preferably, the (-) or ground (earth) side of the battery, and the red power wire to the +12V terminal of the battery through an appropriately rated fuse ( see the fusing considerations section for fuse selection ) or breaker. If there is a white wire in the cable, it is not used.



## WARNING!

This Product contains high intensity LED devices. To prevent eye damage, DO NOT stare into light beam at close range.

## LED Fusing Considerations

Although the average current draw per LED module is very low, the instantaneous peak current to a module can be higher during low voltage conditions. To avoid prematurely blowing of ATO style fuses or tripping breakers it is recommended the following rule-of-thumb be used to size fuses or breakers. This is especially important in light bars with many LED modules running off a single fused source.

### Minimum fuse size calculation:

1.5 x (number of modules being fused)

Example:

LED Duo Beam™ Light bar with 4 LED modules .

Minimum fuse requirement for single fuse -  $1.5 (4) = 6A$  minimum

## Maintenance

### Lens Cleaning

Use plain water and a soft cloth, or Code 3 lens polish and a very soft paper towel or facial tissue. Because plastic scratches easily, cleaning is recommended only when necessary (about every six months). Do not subject the lenses to car washes that use brushes, as these will scratch the lenses.

## Dim Operation

Lightbar LED modules are equipped with a low power "Dimming" mode. Dimming will be controlled by applying +12V by way of the appropriate wire(color) in the wire harness/wire list. When DIM is engaged the LED's will operate in a reduced power mode. For safety purposes, the corner modules in lightbars are not connected to the dimming circuit. This ensures that when corner modules are turned on, full 360 degree coverage and compliance with SAE warning light standards is provided. The DIM control wires(two white wires) located on each of the modules are connected from one module to the next. To disable the dimming function on a particular module, disconnect the white wires. Then reconnect the white wire to the white wire on another module that has dimming enabled.



The Dim setting reduces the light output of emergency warning lights reducing the effectiveness of them especially in brightly lit areas. Failure to use adequate light for the circumstances can cause motorists to fail to see the emergency vehicle and lead to serious personal injury or death. Never use the DIM setting in a brightly lit area. Use of the DIM setting may cause emergency lights to not comply with applicable emergency warning light standards. Use caution when using the DIM setting to assure that motorists can clearly see the emergency vehicle.

## Code 3® PriZm II™ LED Reflector 360° Corner Modules

The RX 2700 Lightbar is equipped with new Code 3® PriZm II™ LED Reflector 360° corner LED modules that provide a full 360° of warning. The lighthouse has been designed to exceed all applicable requirements for 360° warning devices in Red, Blue, Amber and White.

### **Operating Specifications for 360° module:**

Operating Voltage: 10-16 VDC, Reverse Polarity Protection  
Current Draw : Red/Amber - .5A avg @ 12.8 Volts  
Blue/White - .8A avg @ 12.8 Volts  
Available Colors - Red, Blue, Amber and White

### **Master/Slave Operation (See Directional Modules section below if so equipped)**

Some 360 degree corner modules consist of a "master" and a "slave" driver circuit board and LED light engines with a single integrated heatsink bracket. The "master" circuit board (rear position) must always be powered for the "slave"(front position) to flash. The "master" is always located in the rear position of the module. The lightbar is wired to allow running only the rear facing LED on each module by removing power to the front facing "slave" module. This gives a "front-cutoff" function. The flash pattern for each corner pair can be selected by shorting together the 2-pin header J1, on the "master" momentarily and releasing. The module is set-up for "Cycle Flash" as a standard. Holding down the 2-pin header for 5 seconds, or longer, and releasing will return the pattern to Cycle Flash. The following chart describes the available patterns and order (**Both heads will be in the mode selected. Both heads will flash together unless in Front Cut-off mode**):

### **360 Degree Module Flash Pattern - Table 1 (If so equipped)**

See Figure 1, for 2-pin header location.

#### **Flash Pattern**

Cycle Flash (default)  
Quad Flash70  
Mode Flash  
NFPA Quad Flash75  
Five Flash70  
Triple Flash70  
Quad Pop Flash70

## LED DIRECTIONAL MODULES

In addition to the 360 warning modules the lightbar may be equipped with a number of single head front-rear warning LED modules. These modules are available in either the, PriZm II LED REFLECTOR Module, 3-LED REFLECTOR, 3-LED OLP OPTIX (dual stack 3-LED lighthouses) in steady-burn and flashing versions. The steady-burn versions can be flashed by connecting the module(s) to any flasher that does not require ground through the load (example: Code 3® 900 series flasher). The flashing modules will have "Cycle Flash" as the standard pattern. The flash pattern can be changed by shorting the 2-pin header, J1 as shown in Figure 1, momentarily then releasing. Table 1 shows the available patterns and the order when stepping through patterns. The module can be reset to "Cycle Flash" by shorting the header for greater than 5 seconds and releasing.

**See next page for operating specifications and available colors for front-rear modules.**

## LED DIRECTIONAL MODULES (CONT)

### Operating Specifications for front-rear module:

**Operating Voltage:** 10-16 VDC, Reverse Polarity Protection

**Current Draw:** Flashing Module:

Red/Amber - .25A avg @ 12.8 Volts

Blue/White - .40A avg @ 12.8 Volts

Steady Burn Module:

Red/Amber - .5A avg @ 12.8 Volts

Blue/White - .8A avg @ 12.8 Volts

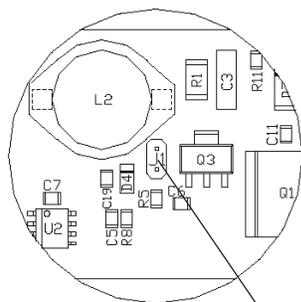
**Available Colors:** Red , Blue, Amber, and White

## Flash Pattern Selection

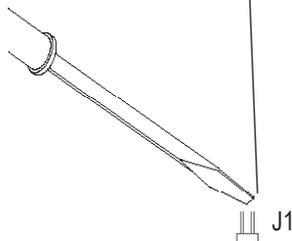
**Directional module Flash Pattern - Table 1**

Flash Pattern	Description
1. Cycle Flash (DEFAULT)	Cycles through various patterns @ 70 fpm
2. NFPA Quad Flash 80 FPM	Four Pulses per flash @ 80 fpm
3. Steadyburn	Steady-Burn
4. Five Flash 150 FPM	Five Pulses per flash @ 150 fpm
5. Quad Flash 150 FPM	Four Pulses per flash @ 150 fpm
6. Triple Flash 150 FPM	Three Pulses per flash @ 150 fpm
7. Double Flash 150 FPM	Two Pulses per flash @ 150 fpm
8. Single Flash 150 FPM	One Pulse per flash @ 150 fpm
9. Single Flash 250 FPM	One Pulse per flash @ 250 fpm
10. Single Flash 375 FPM	One Pulse per flash @ 375 fpm
11. Triple Pop Flash 75 FPM	Three Pulses per flash ( 2 equal, 1 extended) @ 75 fpm
12. Quad Pop Flash 75 FPM	Four Pulses per flash ( 3 equal, 1 extended) @ 75 fpm
13. Single Flash 75 FPM	One Pulse per flash @ 75 fpm
14. Double Flash 75 FPM	Two Pulses per flash @ 75 fpm
15. Triple Flash 70 FPM	Three Pulses per flash @ 70 fpm
16. Quad Flash 70 FPM	Four Pulses per flash @ 70 fpm
17. Five Flash 70 FPM	Five Pulses per flash @ 70 fpm
18. Mod Flash	
19. Action Flash	

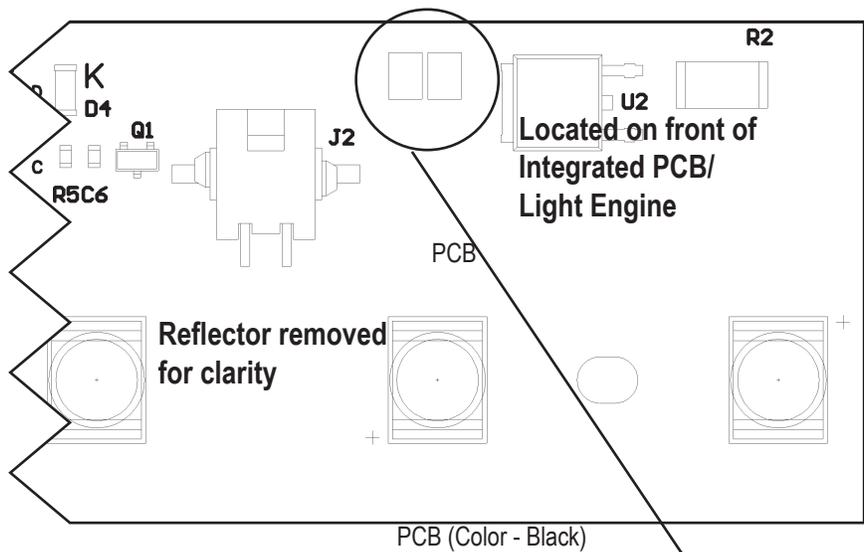
Located on rear of PCB



PCB (Color - Green)



FOR APPLICATIONS USING SEPARATE PCB & LIGHT ENGINES



Located on front of Integrated PCB/ Light Engine

Reflector removed for clarity

PCB (Color - Black)

FOR APPLICATIONS USING INTEGRATED PCB/LIGHT ENGINE (ONE-PIECE)

Momentarily short and release to change patterns

# Notes

# WARRANTY

Code 3, ®Inc.'s emergency devices are tested and found to be operational at the time of manufacture. Provided they are installed and operated in accordance with manufacturer's recommendations, Code 3, Inc. guarantees all parts and components except the lamps to a period of 1 year, LED Lighthouse modules to a period of 5 years (unless otherwise expressed) from the date of purchase or delivery, whichever is later. Units demonstrated to be defective within the warranty period will be repaired or replaced at the factory service center at no cost.

Use of lamp or other electrical load of a wattage higher than installed or recommended by the factory, or use of inappropriate or inadequate wiring or circuit protection causes this warranty to become void. Failure or destruction of the product resulting from abuse or unusual use and/or accidents is not covered by this warranty. Code 3, Inc. shall in no way be liable for other damages including consequential, indirect or special damages whether loss is due to negligence or breach of warranty.

**CODE 3, INC. MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY INCLUDING, WITHOUT LIMITATION, WARRANTIES OF FITNESS OR MERCHANTABILITY, WITH RESPECT TO THIS PRODUCT.**

# PRODUCT RETURNS

If a product must be returned for repair or replacement\*, please contact our factory to obtain a Return Goods Authorization Number (RGA number) before you ship the product to Code 3, Inc. Write the RGA number clearly on the package near the mailing label. Be sure you use sufficient packing materials to avoid damage to the product being returned while in transit.

\*Code 3, Inc. reserves the right to repair or replace at its discretion. Code 3, Inc. assumes no responsibility or liability for expenses incurred for the removal and /or reinstallation of products requiring service and/or repair.; nor for the packaging, handling, and shipping; nor for the handling of products return to sender after the service has been rendered.

PROBLEMS OR QUESTIONS? CALL OUR TECHNICAL ASSISTANCE HOTLINE (314) 996-2800

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Part No. T07594 Rev. 2 8/2009  
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