

# INSTALLATION & OPERATION MANUAL

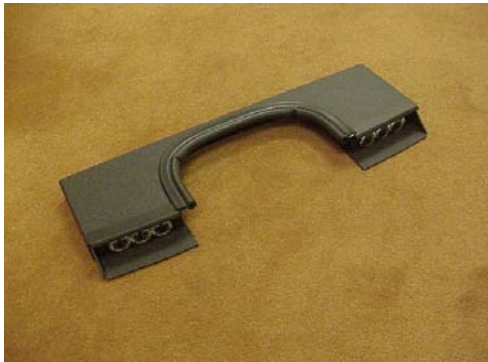
## WingMan™



LONG VERSION



DOUBLE STACK LONG VERSION



MINI VERSION



SHORT VERSION



## WingMan™

### Interior Lighting System Crown Victoria REAR DECK LIGHTBAR

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For future reference record your product's serial no. here \_\_\_\_\_

#### 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 WingMan™ is an interior LED lighting system that fits in the rear deck area behind the rear seat. It delivers a slim powerful warning signal to the rear of the vehicle without obstructing the driver's vision.

The WingMan is designed on a modular basis, which means that the lightbar can be customized to meet most requirements. The WingMan has room for up to eight LED lightheads. Each lighthead is individually wired for any flash pattern or combination of flash patterns required.



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 WingMan 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.

Standard lightbars are 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), and have not ordered a specially wired lightbar, contact the factory for instructions.

Test the unit before installation. To test, touch the black wire to the ground (earth) and the other wires to +12 volts D.C., in accordance with the instructions attached to the cable (an automotive battery is preferable for this test). Some units may be factory wired for control by a LED flasher or an ArrowStik Controller in which case the cable's wire tag should be consulted. A battery charger may be used, but please note that some electronic options (flashers, stingrays, etc.) may not operate normally when powered by a battery charger. If problems occur at this point, contact the factory.

## Installation & Mounting



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.

**Mounting Hardware** - All mounting hardware is packed in a small box inside the main carton. There are two brackets and two mounting plates used to mount the WingMan to the vehicle. These are discussed in detail later.

## Installation Instructions

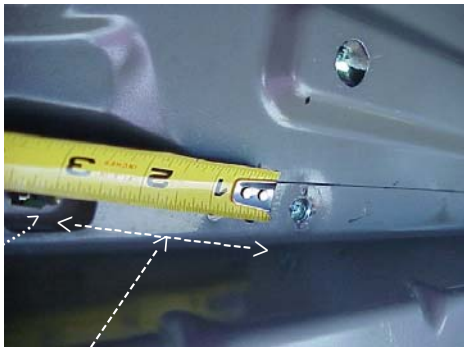
**Note:** The long version of the WingMan Rear Lightbar is illustrated in the following instructions but the steps are the same for both long and short versions!

**Step 1** Open the Crown Vic's trunk, move the spare tire from it's shelf to the bottom of the trunk, and place a piece of plywood or boards over the spare tire well so that there is a flat level platform to work from (see Figure 1). This will provide a more comfortable position for locating and drilling the mounting holes and the cable hole.



**FIGURE 1**

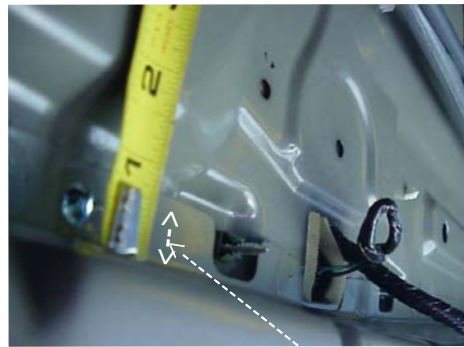
**Step 2** Measure over 3 inches from the center of the brake light mounting stud towards the outside of the Crown Victoria and mark the spot. This is the **side to side** location of the lightbar's mounting hole (shown in Figure 2). Measure **7/16"** from the inner bend of the sheet metal at the level closest to the spot welded seam in the Crown Vic's trunk and mark the spot. This is the **front to rear** location of the mounting hole (shown in Figure 3). Repeat the step for the mounting hole at the opposite side of the brake light. Note: The final distance between the two mounting holes will be approximately 12 1/8". When the marks are in the correct location they will look as shown in Figure 2A for the Passenger side and as shown in Figure 3A for the Driver's side.



Brake Light Mtg Stud

3" from Brake Light Mtg Stud

**FIGURE 2**



**FIGURE 3**

7/16" from bend in sheet metal



**FIGURE 2A(PASSENGER SIDE)**



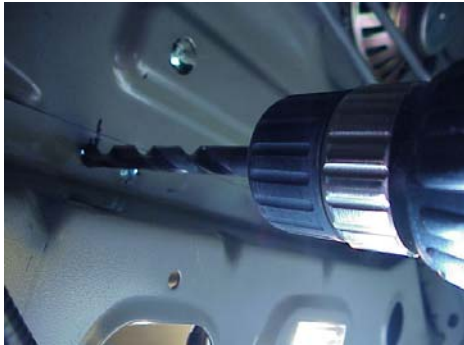
**FIGURE 3A(DRIVER'S SIDE)**

To Front of vehicle ----->

**Step 3** With a center punch and a hammer dimple the hole locations to keep the drill from walking off location.

**Step 4** Drill the two mounting holes with a 3/8" drill (see Figure 4).

**Step 5** Locate the existing hole in the trunk sheet metal on the driver's side of the Crown Vic and drill a 3/8" hole through the fiberboard for the cable (see Figure 5). **Note: If you are installing a Double Stack Version of the Long WingMan that is equipped with an ArrowStik, either drill the hole larger with a 3/4" diameter drill or drill an additional 3/8" hole next to the first hole for the ArrowStik Cable!**



**FIGURE 4**



**FIGURE 5**

**Step 6** Insert the 1/4-20 x 1.50 long carriage bolts through the square holes in the mounting brackets (as shown in Figure 6).

**Step 7** Install the mounting brackets (as shown in Figures 7 and 8) and thread two fender washers and a 1/4-20 locking nut onto each of the carriage bolts from inside the Crown Victoria's trunk (see Figure 9). Leave the nuts loose at this time.



**FIGURE 6**



**FIGURE 7**



**FIGURE 8**



**FIGURE 9**

**Step 8** Position the mounting brackets so that they are 12" across between the centers of the mounting holes and the passenger side bracket is firmly against the slight hump in the rear deck's fabric (see Figure 10).

**Step 9** Tighten the mounting bracket nuts from inside the trunk of the Crown Vic (as shown in Figure 11).

**Note:** Only tighten the brackets tight enough to draw them down into the fabric of the rear deck but not so tight that the brackets cannot be turned slightly as needed to center the WingMan Bar in the rear window and align the mounting bolts.



FIGURE 10



FIGURE 11

**Step 10** Remove the two outer child restraint seat belt covers (see Figure 12). **Note:** The seat belt covers may be kept in place if desired. The interfering portion of the covers must be trimmed to fit after the WingMan Rear Bar is installed.



FIGURE 12

**Step 11** Twist the wires of the WingMan's cable and feed the WingMan's cable through the cable hole and into the trunk (see Figures 13 and 14).



FIGURE 13



FIGURE 14

**Step 12** Install the rear WingMan Bar by positioning the bar in the center of the rear window centered on the brake light housing and position over the mounting brackets (see Figure 15). You will have to continue feeding the cable through the hole simultaneously while moving the bar into position.

**Step 13** Align the mounting holes in the WingMan Bar with the mounting bracket and mounting plate holes and insert the supplied 1/4-20 x 1/2" bolts and internal tooth lock washers (see Figures 16 and 17). Make sure the spacing around the rear brake light housing is the same all around and the perimeter shape of the mounting plates line up with the shape of the mounting brackets (it may be necessary to slightly loosen the mounting bracket bolts in the trunk to center the lightbar around the brake light housing). After everything is centered and aligned, tighten the bolts with a phillips screwdriver (see Figure 18).



**FIGURE 15**



**FIGURE 16**

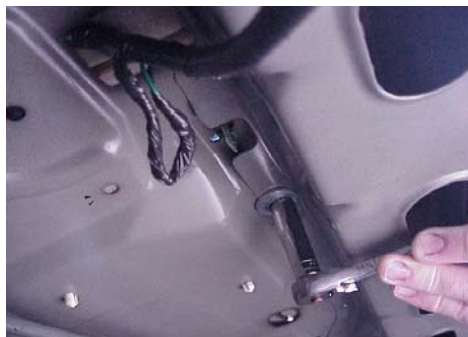


**FIGURE 17**



**FIGURE 18**

**Step 14** Finish tightening the mounting bolts in the trunk (see Figure 19).

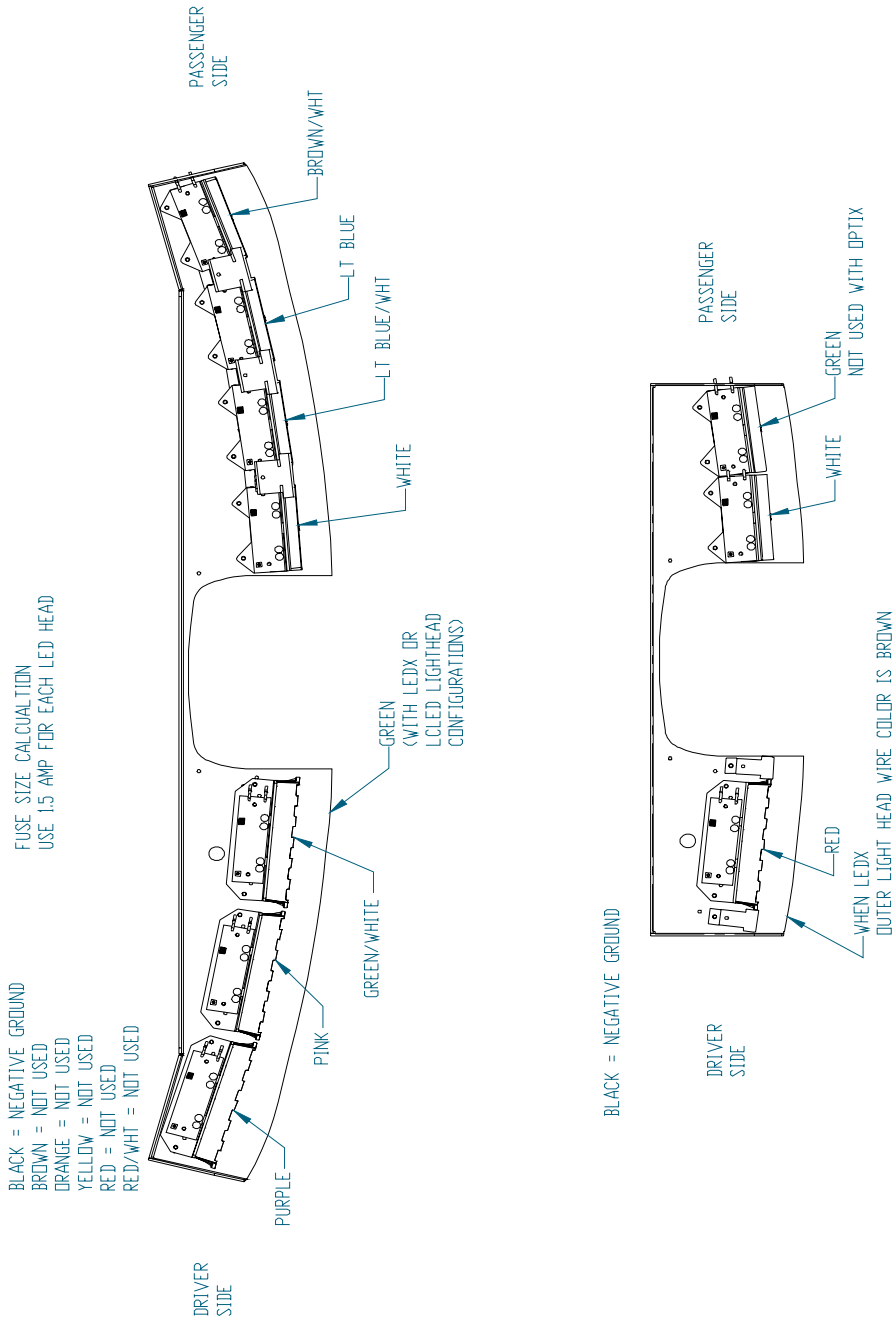


**FIGURE 19**

The bracket fasteners shown in Figures 16, 17, and 18 make excellent hard mounting points for radar guns and video cameras, etc.

**Caution:** Drilling into the housing of the lightbar could damage wiring or other internal components.

# Wiring Diagram



## Wiring Instructions

It is advisable to leave an extra loop of cable when installing the lightbar 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 remaining power wires to the +12V terminal of the battery, power switches, siren or RLS controller. Each lighthead is wired independently to allow complete flexibility of control.



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.

## LED MODULES

### Operating Specifications for directional module:

Operating Voltage: 10-16 VDC, Reverse Polarity Protection

Current Draw : Flashing Module

Red/Amber - .25A avg @ 12.8 Volts

Blue/White - .4A 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

## LED LightHead Flash Pattern

Place the unit on a clean work surface and remove the outer cover. With the chassis facing up, locate each lighthouse module circuit board. To change the flash patterns of the LED LightHeads, touch both posts of the J1 header simultaneously with an electrically conductive tool such as a screwdriver blade (see Figure 20). Repeating this procedure allows the operator to cycle through the numerous flash patterns offered until the desired pattern is achieved.

Directional Module Flash Pattern - Table 1

Flash Pattern	Description
Cycle Flash	Cycles through various patterns @ 70 fpm
Steady-Burn	Steady-Burn
Five Flash	Five Pulses per flash @ 70 fpm
Quad Flash	Four Pulses per flash @ 70 fpm
Triple Flash	Three Pulses per flash @ 70 fpm
Double Flash	Two Pulses per flash @ 70 fpm
Fast Double Flash	Two Pulses per flash @ 85 fpm
NFPA	Four Pulses, 70% Duty Cycle @ 75 fpm
Quad Pop Flash	Four Pulses per flash ( 3 equal, 1 extended) @ 70 fpm
Triple Pop Flash	Three Pulses per flash ( 2 equal, 1 extended) @ 70 fpm
Double Pop Flash	Two Pulses per flash ( 1 equal, 1 extended) @ 70 fpm

## LED Fusing Considerations

Although the average current draw per module is very low, due to the type of circuit used to power each module, the instantaneous peak current to a module can be significantly higher during low voltage conditions. To avoid prematurely blowing 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:

For LED 12 volt electrical current

1.5 x (number of modules being fused)

Example: 2 intersection modules and 6 directional modules.

Minimum fuse requirement for single fuse -  $1.5 (8) = 12 \text{ A}$

## Product Features

LED lighthouse options: Red, Blue, Amber; Directional or Spreading; Flashing or Steady-Burn Control

LED lighthouses: LED-X, Optix, LCLED

Size: 46.346" long x 2.00" tall x 7.406" deep (LONG VERSION)

Size: 25.300" long x 2.00" tall x 6.125" deep (SHORT VERSION)

Weight: 7.5lbs

## NarrowStik Version

The WingMan can be factory configured as a traffic director and operated using a NarrowStik® Control Head. Please refer to the NarrowStik Control Head Manual packaged with the control head for installation, wiring connections, and operation of the Control Head.

## Wiring

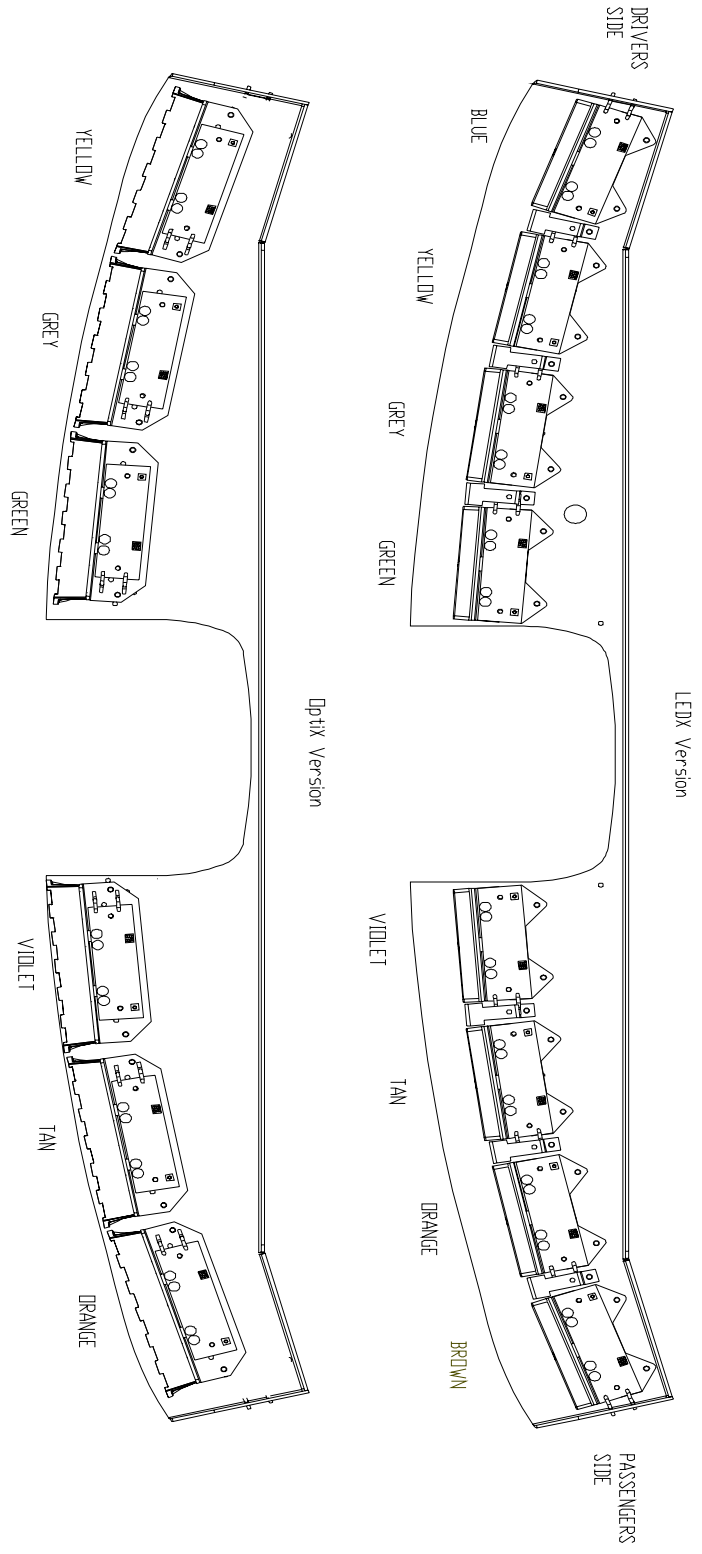
Refer to the NarrowStik wiring on page 10 for wire designations. For models with independently flashing red/blue heads located on each end, the Blue and Brown wires will be used to control these heads. The Blue wire is connected to +12V and the Brown to Ground. Refer to the Control Head manual for operation with the Control Head.

**WARNING!**



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

RED = POWER, +12VDC  
 RED/WHI = POWER, +12VDC  
 WHITE WIRE = DIM MODE

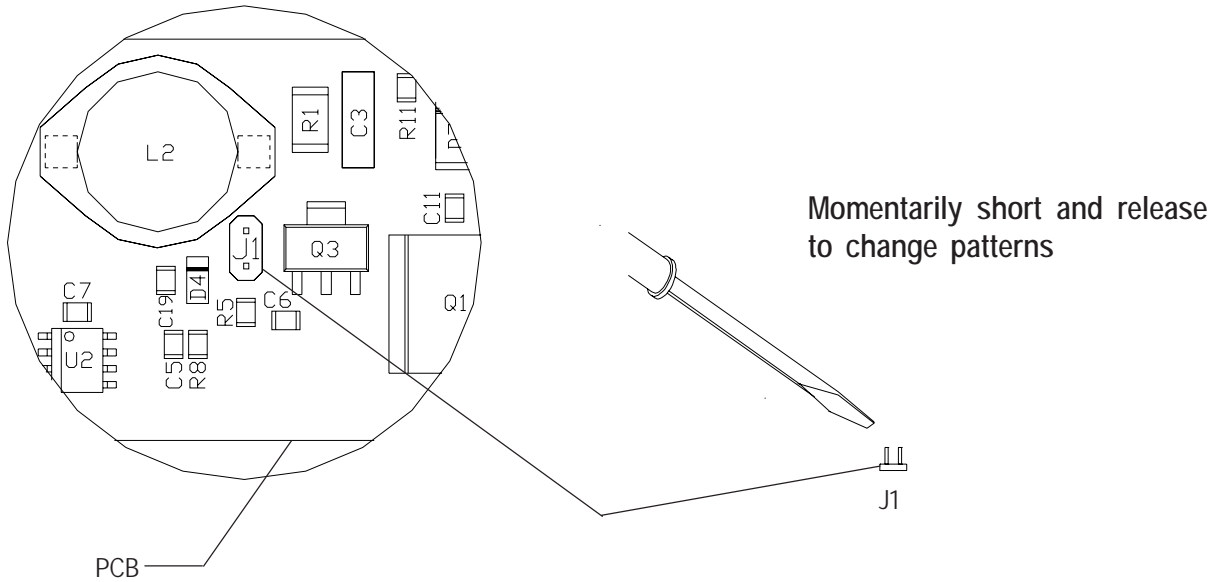


Narrows-tik Wiring Designations

## Directional module Flash Pattern - Table 2

CycleFlash (DEFAULT)  
 NFPA QuadFlash75  
 Steadyburn  
 ModelFlash  
 ActiveFlash  
 FiveFlash70  
 QuadFlash70  
 TripleFlash70  
 DoubleFlash70  
 SingleFlash75

Quad Pop Flash75  
 Triple Pop Flash75  
 SingleFlash375  
 SingleFlash250  
 SingleFlash150  
 FiveFlash150  
 QuadFlash150  
 DoubleFlash150  
 TripleFlash150



**Flash Pattern Header for OPTIX/LEDX**

## Troubleshooting

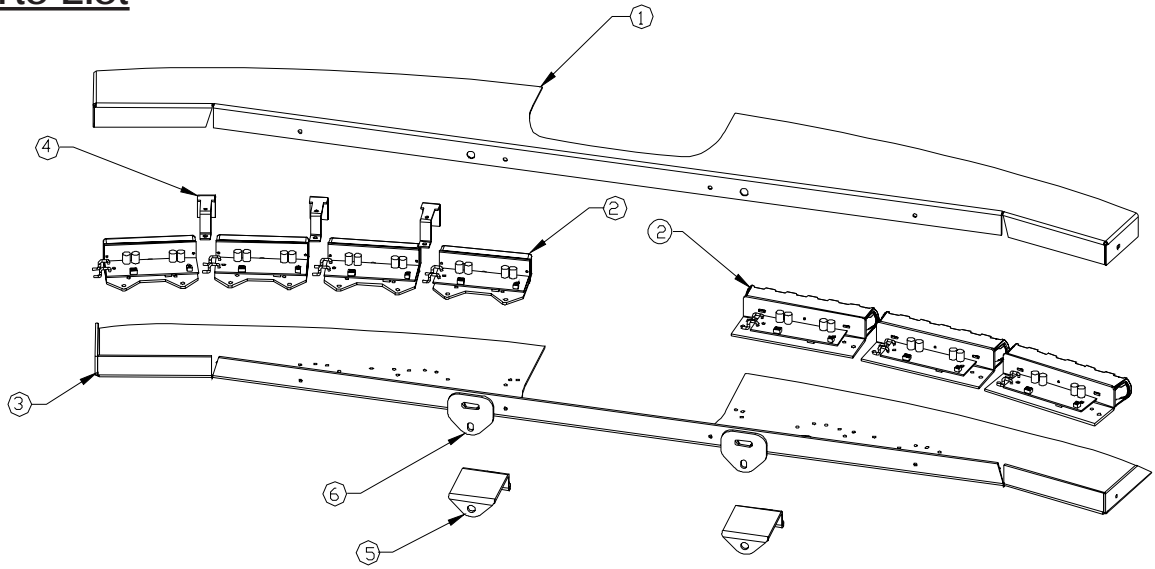
All WingMan Bars are thoroughly tested prior to shipment. However, should you encounter a problem during installation or during the life of the product, follow the guide below for information on repair and troubleshooting. Additional information may be obtained from the factory technical help line at 314-996-2800.

### TROUBLESHOOTING GUIDE

**Note:** LED modules must be replaced as a module. There are no user serviceable parts.

PROBLEM	QUESTIONS	POSSIBLE CAUSE	SOLUTION
LED module not operating when powered.	N/A	a. Bad power/ground connection. b. Defective module.	a. Fix connection. b. Replace module

# Parts List



<u>Reference Number</u>	<u>Part Description</u>	<u>Part Number</u>
1	Outer Panel LEDX-OPTIX version	T13940
1	Outer Panel Short LEDX-OPTIX version	T13941
1	Outer Panel LCLED version	T14681
1	Outer Panel Mini LEDX-OPTIX version	T14682
1	Outer Panel FLP Double Stack version	T14688
2	*LEDX Module 4"	*Contact Code 3, Inc for P/N
2	*LCLED Module 4"	*Contact Code 3, Inc for P/N
2	*OPTIX Module 6"	*Contact Code 3, Inc for P/N
2	FLP Double Stack Module 6"	*Contact Code 3, Inc for P/N
3	Chassis	T09654
3	Chassis FLP Double Stack Version	T14689
4	Outer Panel Support Brkt LEDX	T09657
4	Outer Panel Support Brkt LCLED	T09661
5	Mounting Brkt. Crown Vic	T09656
6	Mounting plate Crown Vic	T09652
x	CHIMSL Gasket---not shown	T09835

Notes:

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Notes:

# WARRANTY

Code 3<sup>®</sup>, 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<sup>®</sup>, 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<sup>®</sup>, 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<sup>®</sup>, 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<sup>®</sup>, 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<sup>®</sup>, Inc. reserves the right to repair or replace at its discretion. Code 3<sup>®</sup>, 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 returned to sender after the service has been rendered.

**NEED HELP? Call our technical help hotline. 314-996-2800.**



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