Installation and Operation Instructions

Matrix Pursuit Lightbar

IMPORTANT! Read all instructions before installing and using. Installer: This manual must be delivered to the end user.

WARNING!
Failure to install or use this product according to manufacturer's recommendations may result in property damage, serious bodily/ personal injury, and/or death to you and those you are seeking to protect!

Do not install and/or operate this safety product unless you have read and understand the safety information contained in this manual.

1. Proper installation combined with operator training in the use, care and maintenance of emergency warning devices are essential to ensure the safety of emergency personnel and the public.
2. Emergency warning devices often require high electrical voltages and/or currents. Exercise caution when working with live electrical connections.
3. This product must be properly grounded. Inadequate grounding and/or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.
4. Proper placement and installation is vital to the performance of this warning device. Install this product so that output performance of the system is maximized and the controls are placed within convenient reach of the operator so that s/he can operate the system without losing eye contact with the roadway.
5. It is the responsibility of the vehicle operator to ensure daily that all features of this product work correctly. In use, the vehicle operator should ensure the projection of the warning signal is not blocked by vehicle components (i.e., open trunks or compartment doors), people, vehicles or other obstructions.
6. The use of this or any other warning device does not ensure 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, drive against traffic, respond at a high rate of speed, or walk on or around traffic lanes.
7. This equipment is intended for use by authorized personnel only. The user is responsible for understanding and obeying all laws regarding emergency warning devices. Therefore, the user should check all applicable city, state, and federal laws and regulations. The manufacturer assumes no liability for any loss resulting from the use of this warning device.
8. This product may contain high intensity LEDs staring directly into these lights could result in temporary and/or permanent vision impairment.

Specifications:

		Position:	Color:	Peak Current @12 VDC:	Peak Power:
Cross Section:	2.5" x 13.8"	Upper	RED	2.5 A	32 W
		Upper	BLUE	2.3 A	30 W
		Upper	WHITE	2.3 A	30 W
Max Input Voltage:	10-32 VDC	Upper	AMBER	1.9 A	24 W
		Upper	GREEN	1.9 A	25 W
Nominal Input Voltage:	12-24 VDC	Lower	RED	1.7 A	21 W
		Lower	BLUE	2.4 A	31 W
Fusing Requirement:	60A	Lower	WHITE	2.5 A	31 W
		Lower	AMBER	1.9 A	24 W
Matrix Connectivity:	CAT5				
Temp. Range:	-40ºC to 65ºC (-40ºF to 149ºF)				

Additional Matrix Resources
Product Information: www.code3esg.com/us/en/products/matrix
Training Videos: www.youtube.com/c/Code3Inc
Matrix Software: http://software.code3esg.global/updater/matrix/downloads/Matrix.exe

Installation & Mounting:

Unpacking and Pre-installation Inspection

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 light-heads, etc. Report any damage to the carrier and keep the shipping carton.

Standard light-bars are built to operate on 12 or 24VDC negative ground (earth) vehicles. If you have an electrical system other than 12 or 24VDC negative ground (earth), and have not ordered a specially wired light bar, contact the factory for instructions.

Mounting the lightbar

All mounting hardware is packed in a small box or bag inside the main carton. Four standard kits are available: (1) Hook-On Type, (1) Tow and Recovery and (2) Permenant Types. NOTE: Hook-On mounting for “gutterless” type vehicle will require a special hook for mounting. Several special application hooks are available. Contact the factory for details. Refer to the instructions included with the mounting kit for installation.

CAUTION!
When drilling into any vehicle surface, make sure that the area is free from any electrical wires, fuel lines, vehicle upholstery, etc. that could be damaged.

Wiring Instructions:

IMPORTANT! This unit is a safety device and it must be connected to its own separate, fused power point to assure its continued operation should any other electrical accessory fail. Do not wire in parallel with any other accessory.

Notes:

- 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., under-hood) will significantly reduce the current carrying capacity of wires, fuses, and circuit breakers. 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 termination should only be made to substantial chassis components, preferably directly to the vehicle battery.
- Circuit breakers are very sensitive to high temperatures and will “false trip” when mounted in hot environments or operated close to their capacity.

Caution:
Disconnect the battery before wiring up the lightbar, to prevent accidental shorting, arcing and/or electrical shock.

Connect the red (power) and black (ground) wires from the serial lightbar to a nominal 12 VDC supply, along with a customer supplied in-line, slow blow ATC style fuse. Check the box label or wire tag to determine if your lightbar requires a 30A or 60A fuse. This depends on the number and type of light modules installed inside. Nothing less than a 30A fuse is permitted. **Please note that the fuse holder selected by the customer must be rated by its manufacturer to meet or exceed the corresponding fuse ampacity and be wired directly to the vehicle battery.** See Figure 5 for details.

All Matrix compatible lightbars should also connect back to a central node, such as the Serial Interface Box or Z3 Serial Siren, to establish serial communication with the larger network. Depending on the lightbar model, this cable will involve either a CAT5 connection or bare wire, twisted pair termination labeled B Y at the central node. Connect the serial lightbar to your central node, according to the Matrix connectivity specified for the particular model at the beginning of this document. Please note, for CAT5 connections the PRI-1 port must always be

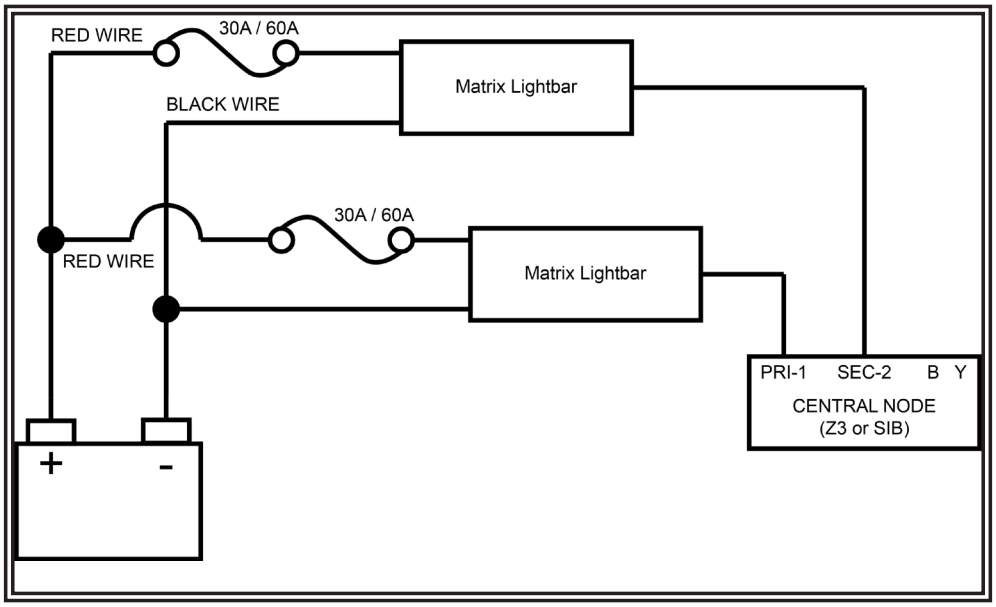

Figure 1

The Matrix network is designed to conveniently accommodate a large number of accessory devices. As more products utilizing CAT5 connectivity are integrated into the vehicle, routing of the cables can be accomplished in 'daisy chain' fashion, if desired. Serial lightbars utilizing CAT5 will always be the last device in either the PRI-1 or SEC-2 chain. Further instructions, features, and control options are detailed in the installation manual of the customer selected central node.

The following table indicates the default flash patterns of the serial lightbar. These patterns are activated by other Matrix compatible products, connected to the lightbar. These can easily be reconfigured as desired, in the Matrix Configurator. See Matrix Configuration Quick Start Manual for details.

Flash Patterns	
Default	Description
Arrowstik Right	Building Fast
Right Scene	Steady
Left Scene	Steady
Takedown/Alley Flash	Single Flash 150 - Alternating
Arrowstik Left	Building Fast
Dim	30%
Cruise	Dim, Full Bar
Level 3	Pursuit - Alternating
Level 2	Triple Flash 115
Level 1	Sweep
Takedown	Steady
Front Cut	
Arrowstik Flash	Quad Flash 115

Lightbar Pattern Chart							
No.	Description	FPM	SAE J845 (180°)*		SAE J595		CA TITLE 13
			A, B, R	W	A, B, R	W	A, B, R
1	Sweep	-	-	-	-	-	-
2	Dual End Rotate	-	-	-	-	-	-
3	Pursuit	-	-	-	-	-	-
4	Pursuit (Steady Front Primary)	-	-	-	-	-	-
5	Cruise Low	-	-	-	-	-	-
6	Cruise Low Full Bar	-	-	-	-	-	-
7	Cruise High	-	-	-	-	-	-
8	Flicker Cruise Low	-	-	-	-	-	-
9	Flicker Cruise High	-	-	-	-	-	-
10	Takedown/Alley Flash	-	-	-	-	-	-
11	Single Flash	75	Class 1S	Class 1S	Class 1	Class 1	Class B
12	Triple Flash	115	Class 2S	Class 2S	Class 2	Class 2	-
13	Triple Flash (Steady Front Primary)	115	Class 2S	Class 2S	Class 2	Class 2	-
14	Quad Flash	115	Class 1S	Class 1S**	Class 1	Class 1***	-
15	Single Flash	150	Class 2S	Class 2S	Class 2	Class 2	-
16	Single Flash	250	-	-	-	-	-
17	Single Flash	375	-	-	-	-	-
18	Double Flash	75	Class 1S	Class 1S	Class 1	Class 1	Class B
19	Double Flash	115	Class 1S	Class 1S	Class 1	Class 1	Class B
20	Double Flash	150	Class 1S	Class 1S	Class 1	Class 1	-
21	Triple Flash	60	Class 1S	Class 1S	Class 1	Class 1	Class B
22	Triple Flash	150	Class 1S	Class 1S	Class 1	Class 1	-
23	Quad Flash NFPA	75	Class 1S	Class 1S	Class 1	Class 1	Class B
24	Quad Flash	150	Class 1S	Class 1S	Class 1	Class 1	-
25	Five Flash	75	Class 1S	Class 1S	Class 1	Class 1	Class B
26	Five Flash	150	Class 1S	Class 1S	Class 1	Class 1	-
27	Six Flash	60	Class 1S	Class 1S	Class 1	Class 1	Class B
28	Six Flash	80	Class 2S	Class 2S	Class 2	Class 2	-
29	All Bar Rotate	-	-	-	-	-	-
30	Intersection	-	-	-	-	-	-
31	Variable Flash	-	-	-	-	-	-
32	Cycle Flash	-	-	-	-	-	-
33	360 Combo	-	-	-	-	-	-
34	Hyper Flash	-	-	-	-	-	-

* Applies to lightbars with a minimum of the indicated colors in two corners

Replacement Parts and Assemblies:

There are many different types of light-heads producing various warning signals in the lightbar as explained below. All Pursuit lightbar retaining screws need to be torqued to 18 +/-1inlbs (4.52 +0/-5 Nm).

Warning Signal Modules

There are many different types of light-heads producing various warning signals in the lightbar as explained below. Note: LED modules are not user serviceable. All retaining screws to be torqued to 18 IN-LB (2.0 N-M).

Upper Deck Modules

Designed for an uncompromised warning signal, the upper level LED modules combine maximum emitting surface area with a very high output LED optical system to produce an effective output at all angles around the vehicle. These multi-voltage units operate from 10V to 30V using 100% solid-state electronics and LEDs rated to 100,000 hours of operation.

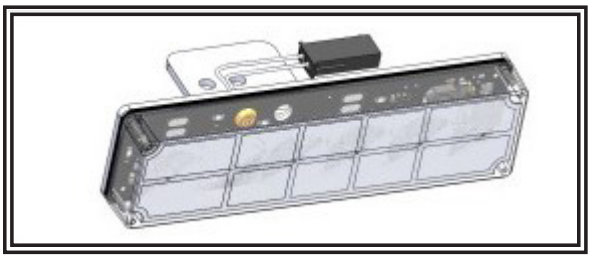

Figure 2

Lower Level LED Modules

Developed primarily to provide practical illumination over a broad area around the vehicle, the lower level cool-white LED modules pack high output into a very slimline optic. Options range from individual alley or takedown lights up to full 360° scene coverage, without impacting on upper level lightbar lens or LED color requirements. They can also be configured to flash in conjunction with the upper level warning patterns. In the amber version, the lower level can be configured as a traffic advisor, with a high resolution switching function for an improved visual effect.

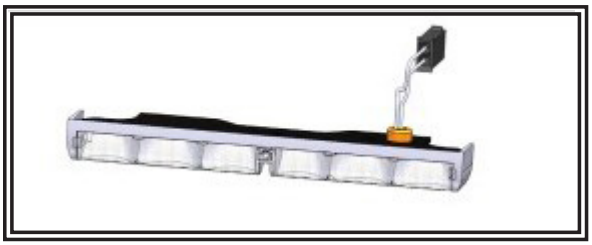

Figure 3

Sign Light Module

Mounted inside the lightbar and fully protected from weathering, the LED sign light is an enclosed module carefully specified to provide homogenous backlighting of the sign area while minimizing stray light. The overlaid text is available in plain white text with black, blue or amber background, or colored text with white background. Signs are also available in mirrored text.

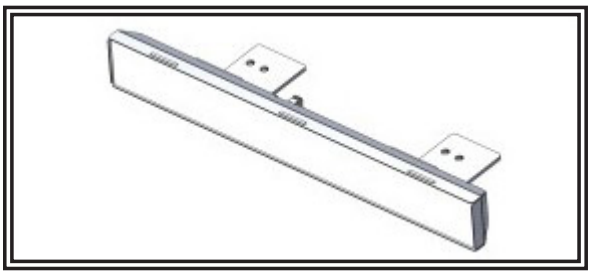

Figure 4

Lightbar Controller

The lightbar controller can control up to 40 seperate light heads, each of which can be configured to perform any supported lightbar function. Multiple controllers can work together in a lightbar to provide virtually unlimited lighting outputs. Lightbar chassis temperatures and ambient lighting levels are monitored by the Controller in order to maximize lighting output in a safe and controlled manner, over a wide range of environmental conditions throughout the life of the product.

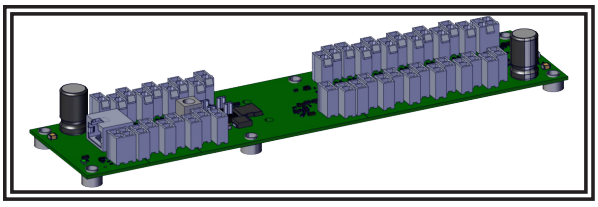

Figure 5

CAUTION!
Lightbar Controller outputs are only compatible with Pursuit LED Modules. The warrenty will be void if unsupported products are connected to the controller.

Replacement Parts and Assemblies:

(See previous page for exploded view of the lightbar)

CAUTION!
When replacing LED modules it is important to note the output from the controller for the module being replaced, because damage can occur from incorrect module configuration. Details regarding configuration of a specific lightbar can be obtained from the manufacturer.

Description	Part No.
Lenses Upper	
1. Upper Outboard Lens - Red	CR2501R
Upper Outboard Lens - Blue	CR2501B
Upper Outboard Lens - Clear	CR2501C
Upper Outboard Lens - Amber	CR2501A
2. Upper Center Lense Short - Red	CR2502R
Upper Center Lens Short - Blue	CR2502B
Upper Center Lens Short - Clear	CR2502C
Upper Center Lens Short - Amber	CR2502A
3. Upper Center Lens Long - Red	CR2503R
Upper Center Lens Long - Blue	CR2503B
Upper Center Lens Long - Clear	CR2503C
Upper Center Lens Long - Amber	CR2503A
Lenses Lower	
7. Lower Outboard Lens - (Clear Ony)	CR2504
8. Lower Center Short Lens - (Clear Only)	CR2505
9. Lower Center Long Lens - (Clear Only)	CR2506
LED Modules Upper	
10. Upper Level Light Head - Red	CZ2502R
Upper Level Light Head - Blue	CZ2502B
Upper Level Light Head - Amber	CZ2502A
LED Modules Lower	
11. Lower Level Light Head - White	CZ2503W
Lower Level Light Head - Red	CZ2503R
Lower Level Light Head - Blue	CZ2503B
Lower Level Light Head - Amber	CZ2503A

Maintenance:

Occasional cleaning of the lenses will ensure optimum light output. Take care when cleaning lenses. Although very impact resistant, polycarbonate scratches easily. Clean the lens and base with soap and water or a lens polish using a microfiber or other lint free soft cloth. Do not use solvents as they may damage the polycarbonate.

Lens Removal and Installation:

1. Identify the lens(es) to be removed - not all lenses need to be removed to access the internal components.
2. Unfasten the retaining screws from the lens(es) of the lightbar. Set these aside, as they will be used to reattach the lens(es).
3. Carefully lift the lens off the seal – choose a suitable location to temporarily store the lens so as to not scratch the surface.
4. When reinstalling, gently apply pressure around the upper lens taking care not to damage the seal around the lower lens set. Retorque the retaining screws to 12in lbs

Troubleshooting:

All lightbars 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 troubleshooting and repair information. If the problem cannot be rectified using the solutions given below, additional information may be obtained from the manufacturer – contact details are at the end of this document.

Problem	Possible Cause(s)	Comments / Response
No Power	Faulty wiring	Ensure power and ground connections to the lightbar are secured. Remove and reconnect the red power wire to the vehicle battery.
	Input Voltage	The lightbar is equipped with an over voltage lockout circuit. During a sustained overvoltage event, the Lightbar Controller inside will maintain communication with the rest of the Matrix network, but disable power out to the light modules. Look for the solid red V_FAULT LED. Ensure that input voltage does not exceed the specified range for your particular model. When overvoltage occurs, the input must temporarily drop ~1V below the maximum limit in order to resume normal operation.
	Blown fuse	The lightbar may have blown an upstream fuse. Check and replace fuse if necessary.
No Communication	Ignition input	An ignition wire input is first required to bring the central node out of a sleep state. From that point, the central node controls the status of all other Matrix compatible devices, including the lightbar. If the lightbar is active, you should see a flashing green STATUS LED on the Lightbar Controller inside. See the installation manual of the customer selected central node for further troubleshooting of the ignition input.
	Connectivity	Ensure that the lightbar communications cable is securely connected back to a central node. Ensure that any other cables connecting Matrix compatible accessory devices in a CAT5 daisy chain are fully seated with positive lock. Remember that the PRI-1 jack at the central node must first be used, before the SEC-2 jack can be used.
Bad Light Module	Short Circuit	If a light module is shorted out, and the user attempts to activate a flash pattern, the pattern will not operate. Instead, the Lightbar Controller inside the lightbar will display a solid red I_FAULT LED.

Warranty:

Manufacturer Limited Warranty Policy:

Manufacturer warrants that on the date of purchase this product will conform to Manufacturer's specifications for this product (which are available from the Manufacturer upon request). This Limited Warranty extends for Sixty (60) months from the date of purchase.

DAMAGE TO PARTS OR PRODUCTS RESULTING FROM TAMPERING, ACCIDENT, ABUSE, MISUSE, NEGLIGENCE, UNAPPROVED MODIFICATIONS, FIRE OR OTHER HAZARD; IMPROPER INSTALLATION OR OPERATION; OR NOT BEING MAINTAINED IN ACCORDANCE WITH THE MAINTENANCE PROCEDURES SET FORTH IN MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS VOIDS THIS LIMITED WARRANTY.

Exclusion of Other Warranties:

MANUFACTURER MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE IMPLIED WARRANTIES FOR MERCHANTABILITY, QUALITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICE ARE HEREBY EXCLUDED AND SHALL NOT APPLY TO THE PRODUCT AND ARE HEREBY DISCLAIMED, EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW. ORAL STATEMENTS OR REPRESENTATIONS ABOUT THE PRODUCT DO NOT CONSTITUTE WARRANTIES.

Remedies and Limitation of Liability:

MANUFACTURER'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDY IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR UNDER ANY OTHER THEORY AGAINST MANUFACTURER REGARDING THE PRODUCT AND ITS USE SHALL BE, AT MANUFACTURER'S DISCRETION, THE REPLACEMENT OR REPAIR OF THE PRODUCT, OR THE REFUND OF THE PURCHASE PRICE PAID BY BUYER FOR NON-CONFORMING PRODUCT. IN NO EVENT SHALL MANUFACTURER'S LIABILITY ARISING OUT OF THIS LIMITED WARRANTY OR ANY OTHER CLAIM RELATED TO THE MANUFACTURER'S PRODUCTS EXCEED THE AMOUNT PAID FOR THE PRODUCT BY BUYER AT THE TIME OF THE ORIGINAL PURCHASE. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR LOST PROFITS, THE COST OF SUBSTITUTE EQUIPMENT OR LABOR, PROPERTY DAMAGE, OR OTHER SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES BASED UPON ANY CLAIM FOR BREACH OF CONTRACT, IMPROPER INSTALLATION, NEGLIGENCE, OR OTHER CLAIM, EVEN IF MANUFACTURER OR A MANUFACTURER'S REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. MANUFACTURER SHALL HAVE NO FURTHER OBLIGATION OR LIABILITY WITH RESPECT TO THE PRODUCT OR ITS SALE, OPERATION AND USE, AND MANUFACTURER NEITHER ASSUMES NOR AUTHORIZES THE ASSUMPTION OF ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH SUCH PRODUCT.

This Limited Warranty defines specific legal rights. You may have other legal rights which vary from jurisdiction to jurisdiction. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages.

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 returned to sender after the service has been rendered.

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