



# Installation and Operation Instructions

## LED SURFACE MOUNT LIGHT HEADS

### Dual Stack Multi Colors

**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 manufacturers recommendations may result in property damage, serious injury, and/or death to 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.

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**Package Contains:**

1	Light Head
2	Screws
1	Installation Guide
1	Mounting Gasket
1	Bezel

**Operation Environment:**

**Ambient Temperature:** -40 to 65°C(-40 to 149°F)

**Specifications:**

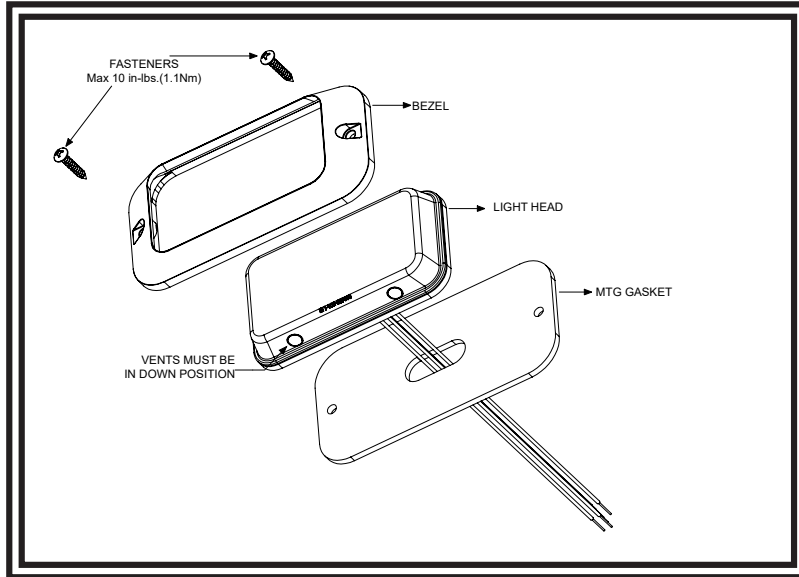
Light Head Model	ED3789 Multicolor
Input Voltage	12-24VDC
Work Current	1.2A Max @ 12 VDC Nominal
Physical H x W x L	0.62 in x 2.39 in x 4.72 in 1.58 cm x 6.07 cm x 11.98 cm
Weight	0.24 lb (0.11 Kg)
Available Dual Colors	Amb/Wht, Blue/Amb, Blue/Wht, Red/Amb, Red/Blue, Red/Wht

## Installation and Mounting:

To mount the light head, use the bezel as a template to mark the mounting holes. The supplied self-tapping #6 x 0.75" screws typically use 0.125" diameter holes but this may vary depending on the type of material and the thickness being tapped. Provide a minimum 0.50" diameter hole for the wires. Grommet the hole if possible and seal with RTV sealant.

### It is important to note:

The light head has 2 small round holes covered with vent membrane that must face downward when mounting the light head.



**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:

RED: Positive, (5A fuse required)

WHITE: Positive, (5A fuse required)

BLACK: Negative

BLUE: Pattern select to negative -- Dim control to positive

YELLOW: Synchronized Function (Up to 32 units can be Synchronized)

**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.

## Notes on Choosing Flash Patterns:

A variety of flash patterns may be chosen for the light head. The Dual Stack multi color light heads are split horizontally and vertically providing 4 separate lighted areas in each light head that may be chosen to operate alternately for patterns that flash using various color combinations. This allows patterns that flash up-down, right-left, diagonally, and to rotate. The areas are denoted as follows:

Primary color - upper level colors 1&3 and lower level colors 5&7 (color1 and color5 on the left side and color3 and color7 on the right, typically the same color on each level)

Secondary color - upper level colors 2&4 and lower level colors 6&8 (color2 and color6 on the left side and color4 and color8 on the right, typically the same color on each level).

A separate flash pattern may be assigned for the power wires red, white, or both connected together and the pattern operated depending which wire or wires are energized. Power the red or the white wires (or both together) then use the pattern select blue wire (touch to ground) to select the chosen flash pattern from the list below.

Note: The red and white wires powered together have patterns that always use both colors (except Pattern #1 - Default Steady Burn).

See the legend at the top of the pattern list for compliance with various standards.

## Pattern Select Operation:

The light head flash pattern may be changed by touching the Blue wire to ground for the following intervals (while the light head is flashing):

NOTE: The blue wire must be disconnected from any voltage when not activating DIM nor changing flash patterns.

- When the light head signal becomes steady, disconnect the Blue wire and the flash pattern will increment by one pattern.

- When the light head signal becomes steady, then goes off, disconnect the Blue wire and the flash pattern will decrement by one pattern.

- When the light head signal becomes steady, then goes off, then becomes steady again, disconnect the Blue wire and the flash pattern will reset to the factory default pattern.

- When the light head signal becomes steady, then goes off, then becomes steady again, then goes off again, disconnect the Blue wire and the flash pattern will become set to the steady burn mode.

## Notes on Dim Control:

The light head intensity may be reduced if necessary. The Blue wire when connected to positive will reduce the intensity to 25% for SAE patterns.

NOTE: The blue wire must be disconnected from any voltage when not activating DIM nor changing flash patterns.

## Notes on Synchronizing and Phase (Sync Ph):

(Up to 32 light heads can be Synchronized by connecting their yellow wires).

When the yellow wires of the light heads are connected together, the group with Ph1 flash patterns will flash simultaneously. If the light heads in the second group are set to Ph2 flash patterns, they will flash alternately with the first group. To simplify the set-up of a synchronized installation, the following process is recommended:

1. Before connecting the yellow wires together, choose the desired flash pattern for each light head. **The patterns chosen must have the same flash rate for all light heads intended to be synchronized. (By definition a 75fpm light head will not sync with at 120fpm light head)** To avoid confusion set each light head individually to the chosen flash pattern using the blue pattern select wire. Ph1 light heads will alternate with Ph2 light heads and simultaneously with all other light heads set to Ph1. Ph2 light heads flash simultaneously with all other light heads set to Ph2. It is also strongly recommended that the same style of flash pattern be used on all heads to produce the most effective warning pattern.
2. Connect the yellow synchronization wires together and check that the light heads are flashing in a synchronized manner as expected. If a pattern for one light head appears to be wrong, keep the yellow wire connected and use the blue pattern select wire to cycle forward or backward for that individual light head until the correct pattern is selected. Once that is completed verify the light head is synchronized correctly.

# Flash Patterns ED3789:

For patterns that meet SAE J595 Class1 requirements for Red, Blue, Amber, and White, see **S** in chart below!

For patterns that meet California Title 13 Class B requirements for Red, Blue, and Amber, see **C** in chart below!

PATTERN GROUP	PATTERN NO	FLASH PATTERN RED WIRE LED Primary Color UP 1&3, DN 5&7		Complies with	FLASH PATTERN WHITE WIRE LED Secondary Color UP 2&4, DN 6&8		Complies with	PATTERN GROUP	PATTERN NO	FLASH PATTERN RED & WHITE WIRE (together) LED Primary Color UP 1&3, DN 5&7 LED Secondary Color UP 2&4, DN 6&8		Complies with	
		SYNC			SYNC					SYNC			
0	1-Default	Cycle Flash Color 1&3&5&7 only		no	Cycle Flash Color 2&4&6&8 only		no	0	1-Default	Steady Burn Color 1&3&5&7 only		no	
1	2	Single 75FPM Ph1 Color 1&3&5&7 only		yes	SC	Single 75FPM Ph1 Color 2&4&6&8 only		yes	SC	2	Single 75FPM Rt-Lt 1&5 Alt 4&8	yes	S
	3	Single 75FPM Ph2 Color 1&3&5&7 only		yes	SC	Single 75FPM Ph2 Color 2&4&6&8 only		yes	SC	3	Single 75FPM Rt-Lt 3&7 Alt 2&6	yes	S
	4	Single 75FPM Alt 1&3&5&7 with 2&4&6&8		yes	SC	Single 75FPM Alt 2&4&6&8 with 1&3&5&7		yes	SC	4	Single 75FPM Diagonal 1&7 Alt 4&6	yes	S
	5	Single 75FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Single 75FPM Up-Dn 2&4 Alt 6&8 only		yes	S	5	Single 75FPM Diagonal 3&5 Alt 2&8	yes	S
	6	Single 75FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Single 75FPM Up-Dn 5&7 Alt 2&4 only		yes	S	6	Single 75FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	7	Single 75FPM Rt-Lt 1&5 Alt 3&7		yes	S	Single 75FPM Rt-Lt 2&6 Alt 4&8		yes	S	7	Single 75FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	8	Single 75FPM Diagonal 1&7 Alt 3&5		yes	S	Single 75FPM Diagonal 2&8 Alt 4&6		yes	S	8	Single 75FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	9	Single 75FPM CCW 1&3&5&7 only		no		Single 75FPM CCW 2&4&6&8 only		no		9	Single 75FPM CW 2&4&6&8 Alt 1&3&5&7	no	
	10	Single 75FPM CW 1&3&5&7 only		no		Single 75FPM CW 2&4&6&8 only		no					
	2	11	Single 375FPM Ph1 Color 1&3&5&7 only		yes	SC	Single 375FPM Ph1 Color 2&4&6&8 only		yes	SC	10	Single 375FPM Rt-Lt 1&5 Alt 4&8	yes
12		Single 375FPM Ph2 Color 1&3&5&7 only		yes	SC	Single 375FPM Ph2 Color 2&4&6&8 only		yes	SC	11	Single 375FPM Rt-Lt 3&7 Alt 2&6	yes	S
13		Single 375FPM Alt 1&3&5&7 with 2&4&6&8		yes	SC	Single 375FPM Alt 2&4&6&8 with 1&3&5&7		yes	SC	12	Single 375FPM Diagonal 1&7 Alt 4&6	yes	S
14		Single 375FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Single 375FPM Up-Dn 2&4 Alt 6&8 only		yes	S	13	Single 375FPM Diagonal 3&5 Alt 2&8	yes	S
15		Single 375FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Single 375FPM Up-Dn 5&7 Alt 2&4 only		yes	S	14	Single 375FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
16		Single 375FPM Rt-Lt 1&5 Alt 3&7		yes	S	Single 375FPM Rt-Lt 2&6 Alt 4&8		yes	S	15	Single 375FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
17		Single 375FPM Diagonal 1&7 Alt 3&5		yes	S	Single 375FPM Diagonal 2&8 Alt 4&6		yes	S	16	Single 375FPM CW 1&3&5&7 Alt 2&4&6&8	no	
18		Single 375FPM CCW 1&3&5&7 only		no		Single 375FPM CCW 2&4&6&8 only		no		17	Single 375FPM CW 2&4&6&8 Alt 1&3&5&7	no	
19		Single 375FPM CW 1&3&5&7 only		no		Single 375FPM CW 2&4&6&8 only		no					
3	20	Dbl 75FPM Ph1 Color 1&3&5&7 only		yes	SC	Dbl 75FPM Ph1 Color 2&4&6&8 only		yes	SC	18	Dbl 75FPM Rt-Lt 1&5 Alt 4&8	yes	S
	21	Dbl 75FPM Ph2 Color 1&3&5&7 only		yes	SC	Dbl 75FPM Ph2 Color 2&4&6&8 only		yes	SC	19	Dbl 75FPM Rt-Lt 3&7 Alt 2&6	yes	S
	22	Dbl 75FPM Alt 1&3&5&7 with 2&4&6&8		yes	SC	Dbl 75FPM Alt 2&4&6&8 with 1&3&5&7		yes	SC	20	Dbl 75FPM Diagonal 1&7 Alt 4&6	yes	S
	23	Dbl 75FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Dbl 75FPM Up-Dn 2&4 Alt 6&8 only		yes	S	21	Dbl 75FPM Diagonal 3&5 Alt 2&8	yes	S
	24	Dbl 75FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Dbl 75FPM Up-Dn 5&7 Alt 2&4 only		yes	S	22	Dbl 75FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	25	Dbl 75FPM Rt-Lt 1&5 Alt 3&7		yes	S	Dbl 75FPM Rt-Lt 2&6 Alt 4&8		yes	S	23	Dbl 75FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	26	Dbl 75FPM Diagonal 1&7 Alt 3&5		yes	S	Dbl 75FPM Diagonal 2&8 Alt 4&6		yes	S	24	Dbl 75FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	27	Dbl 75FPM CCW 1&3&5&7 only		no		Dbl 75FPM CCW 2&4&6&8 only		no		25	Dbl 75FPM CW 2&4&6&8 Alt 1&3&5&7	no	
28	Dbl 75FPM CW 1&3&5&7 only		no		Dbl 75FPM CW 2&4&6&8 only		no						
4	29	Dbl 120FPM Ph1 Color 1&3&5&7 only		yes	S	Dbl 120FPM Ph1 Color 2&4&6&8 only		yes	S	26	Dbl 120FPM Rt-Lt 1&5 Alt 4&8	yes	S
	30	Dbl 120FPM Ph2 Color 1&3&5&7 only		yes	S	Dbl 120FPM Ph2 Color 2&4&6&8 only		yes	S	27	Dbl 120FPM Rt-Lt 3&7 Alt 2&6	yes	S
	31	Dbl 120FPM Alt 1&3&5&7 with 2&4&6&8		yes	S	Dbl 120FPM Alt 2&4&6&8 with 1&3&5&7		yes	S	28	Dbl 120FPM Diagonal 1&7 Alt 4&6	yes	S
	32	Dbl 120FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Dbl 120FPM Up-Dn 2&4 Alt 6&8 only		yes	S	29	Dbl 120FPM Diagonal 3&5 Alt 2&8	yes	S
	33	Dbl 120FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Dbl 120FPM Up-Dn 5&7 Alt 2&4 only		yes	S	30	Dbl 120FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	34	Dbl 120FPM Rt-Lt 1&5 Alt 3&7		yes	S	Dbl 120FPM Rt-Lt 2&6 Alt 4&8		yes	S	31	Dbl 120FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	35	Dbl 120FPM Diagonal 1&7 Alt 3&5		yes	S	Dbl 120FPM Diagonal 2&8 Alt 4&6		yes	S	32	Dbl 120FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	36	Dbl 120FPM CCW 1&3&5&7 only		no		Dbl 120FPM CCW 2&4&6&8 only		no		33	Dbl 120FPM CW 2&4&6&8 Alt 1&3&5&7	no	
	37	Dbl 120FPM CW 1&3&5&7 only		no		Dbl 120FPM CW 2&4&6&8 only		no					
5	38	Trpl 75FPM Ph1 Color 1&3&5&7 only		yes	SC	Trpl 75FPM Ph1 Color 2&4&6&8 only		yes	S	34	Trpl 75FPM Rt-Lt 1&5 Alt 4&8	yes	S
	39	Trpl 75FPM Ph2 Color 1&3&5&7 only		yes	SC	Trpl 75FPM Ph2 Color 2&4&6&8 only		yes	S	35	Trpl 75FPM Rt-Lt 3&7 Alt 2&6	yes	S
	40	Trpl 75FPM Alt 1&3&5&7 with 2&4&6&8		yes	SC	Trpl 75FPM Alt 2&4&6&8 with 1&3&5&7		yes	S	36	Trpl 75FPM Diagonal 1&7 Alt 4&6	yes	S
	41	Trpl 75FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Trpl 75FPM Up-Dn 2&4 Alt 6&8 only		yes	S	37	Trpl 75FPM Diagonal 3&5 Alt 2&8	yes	S
	42	Trpl 75FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Trpl 75FPM Up-Dn 5&7 Alt 2&4 only		yes	S	38	Trpl 75FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	43	Trpl 75FPM Rt-Lt 1&5 Alt 3&7		yes	S	Trpl 75FPM Rt-Lt 2&6 Alt 4&8		yes	S	39	Trpl 75FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	44	Trpl 75FPM Diagonal 1&7 Alt 3&5		yes	S	Trpl 75FPM Diagonal 2&8 Alt 4&6		yes	S	40	Trpl 75FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	45	Trpl 75FPM CCW 1&3&5&7 only		no		Trpl 75FPM CCW 2&4&6&8 only		no		41	Trpl 75FPM CW 2&4&6&8 Alt 1&3&5&7	no	
	46	Trpl 75FPM CW 1&3&5&7 only		no		Trpl 75FPM CW 2&4&6&8 only		no					
6	47	Quad 75FPM Ph1 Color 1&3&5&7 only		yes	SC	Quad 75FPM Ph1 Color 2&4&6&8 only		yes	SC	42	Quad 75FPM Rt-Lt 1&5 Alt 4&8	yes	S
	48	Quad 75FPM Ph2 Color 1&3&5&7 only		yes	SC	Quad 75FPM Ph2 Color 2&4&6&8 only		yes	SC	43	Quad 75FPM Rt-Lt 3&7 Alt 2&6	yes	S
	49	Quad 75FPM Alt 1&3&5&7 with 2&4&6&8		yes	SC	Quad 75FPM Alt 2&4&6&8 with 1&3&5&7		yes	SC	44	Quad 75FPM Diagonal 1&7 Alt 4&6	yes	S
	50	Quad 75FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Quad 75FPM Up-Dn 2&4 Alt 6&8 only		yes	S	45	Quad 75FPM Diagonal 3&5 Alt 2&8	yes	S
	51	Quad 75FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Quad 75FPM Up-Dn 5&7 Alt 2&4 only		yes	S	46	Quad 75FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	52	Quad 75FPM Rt-Lt 1&5 Alt 3&7		yes	S	Quad 75FPM Rt-Lt 2&6 Alt 4&8		yes	S	47	Quad 75FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	53	Quad 75FPM Diagonal 1&7 Alt 3&5		yes	S	Quad 75FPM Diagonal 2&8 Alt 4&6		yes	S	48	Quad 75FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	54	Quad 75FPM CCW 1&3&5&7 only		no		Quad 75FPM CCW 2&4&6&8 only		no		49	Quad 75FPM CW 2&4&6&8 Alt 1&3&5&7	no	
	55	Quad 75FPM CW 1&3&5&7 only		no		Quad 75FPM CW 2&4&6&8 only		no					
7	56	Quad 150FPM Ph1 Color 1&3&5&7 only		yes	S	Quad 150FPM Ph1 Color 2&4&6&8 only		yes	S	50	Quad 150FPM Rt-Lt 1&5 Alt 4&8	yes	S
	57	Quad 150FPM Ph2 Color 1&3&5&7 only		yes	S	Quad 150FPM Ph2 Color 2&4&6&8 only		yes	S	51	Quad 150FPM Rt-Lt 3&7 Alt 2&6	yes	S
	58	Quad 150FPM Alt 1&3&5&7 with 2&4&6&8		yes	S	Quad 150FPM Alt 2&4&6&8 with 1&3&5&7		yes	S	52	Quad 150FPM Diagonal 1&7 Alt 4&6	yes	S
	59	Quad 150FPM Up-Dn 1&3 Alt 5&7 only		yes	S	Quad 150FPM Up-Dn 2&4 Alt 6&8 only		yes	S	53	Quad 150FPM Diagonal 3&5 Alt 2&8	yes	S
	60	Quad 150FPM Up-Dn 1&3 Alt 6&8 only		yes	S	Quad 150FPM Up-Dn 5&7 Alt 2&4 only		yes	S	54	Quad 150FPM CCW 1&3&5&7 Alt 2&4&6&8	no	
	61	Quad 150FPM Rt-Lt 1&5 Alt 3&7		yes	S	Quad 150FPM Rt-Lt 2&6 Alt 4&8		yes	S	55	Quad 150FPM CCW 2&4&6&8 Alt 1&3&5&7	no	
	62	Quad 150FPM Diagonal 1&7 Alt 3&5		yes	S	Quad 150FPM Diagonal 2&8 Alt 4&6		yes	S	56	Quad 150FPM CW 1&3&5&7 Alt 2&4&6&8	no	
	63	Quad 150FPM CCW 1&3&5&7 only		no		Quad 150FPM CCW 2&4&6&8 only		no		57	Quad 150FPM CW 2&4&6&8 Alt 1&3&5&7	no	
	64	Quad 150FPM CW 1&3&5&7 only		no		Quad 150FPM CW 2&4&6&8 only		no					
8	65	Modulation Flash Color 1&3&5&7 only		no		Modulation Flash Color 2&4&6&8 only		no					
9	66	Modulation Flash Up-Dn 1&3 Alt 5&7 only		no		Modulation Flash Up-Dn 2&4 Alt 6&8 only		no					
10	67	Modulation Flash Rt-Lt 1&5 Alt 3&7		no		Modulation Flash Rt-Lt 2&6 Alt 4&8		no					
11	68	Modulation Flash CCW 1&3&5&7 only		no		Modulation Flash CCW 2&4&6&8 only		no					
12	69	Modulation Flash CW 1&3&5&7 only		no		Modulation Flash CW 2&4&6&8 only		no					
13	70	Steady Burn 1&3&5&7 only		no		Steady Burn 2&4&6&8 only		no					

## **Troubleshooting:**

The LED Surface Mount light head has been thoroughly factory tested. If any of the the device functions fail, please check the following:

1. Be sure the power source is activated, then check all connections both positive and ground at the light head (to assure no open or shorted circuits).
2. Permanently connecting the Blue programming wire to ground will disable the light head, no matter what the programmed flash pattern.
3. If the Dim function does not operate, verify the Blue wire is connected to positive.
4. If the sync function is not being used and the light head is functioning erratically, verify the Yellow wire is not connected to positive or ground.