
INSTALLATION AND INSTRUCTION MANUAL



Models

2364LED, 2464LED and 2564LED

M-Tech[®] Plus Lightbars



PROUDLY MADE IN THE USA
An ISO 9001:2008 Certified Company



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STAR
WARNING
SYSTEMS

STAR
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VEHICLE PRODUCTS

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When mounting your lightbar, please be sure to keep any radio frequency sensitive equipment at least 20" from the bar and power cable(s). This is especially critical in lightbars utilizing strobes. Our strobe power supplies have been designed to limit RFI emissions, but certain very sensitive equipment may still be affected. Symptoms may include, but are not limited to, sporadic operation and degraded performance. Star Headlight & Lantern Co., Inc. cannot assume any responsibility for any radio frequency induced malfunction or damage to any radios, sirens, lightbars, or any other equipment mounted within 20" of a strobe lightbar. Any antennae mounted in the proximity of the lightbar may cause your radio to suffer the aforementioned results.



PLEASE NOTE: THE DIRECT MOUNT IS THE STANDARD MOUNT INCLUDED WITH THE LIGHTBAR. THE HOOK MOUNTS MUST BE USED ON ALL POLICE AND/OR OTHER EMERGENCY VEHICLES!!! THE HOOK MOUNTS ARE SOLD SEPARATELY. THEY ARE NOT INCLUDED WITH EACH LIGHTBAR. THEY MUST BE ORDERED SEPARATELY. SEE THE ACCOMPANYING HOOK MOUNT MANUAL FOR A COMPLETE LIST OF AVAILABLE MOUNTS AND KNOWN VEHICLE APPLICATIONS.



It is the sole responsibility of the owner to ensure the lightbar is mounted securely. Check your light every time you enter the vehicle to ensure that it is mounted securely. The manufacturer assumes no responsibility for the secure mounting of this light.



This light utilizes high-intensity LED Lamps. DO NOT stare directly into the light while it is on, as momentary blindness and/or permanent eye damage may occur.

This light uses state-of-the-art Light Emitting Diode (LED) technology. This warning light is comprised of ultra-high intensity LEDs that are operated by a micro-controller to efficiently produce light output with lifetimes up to 100,000 hours.

Please Note: These instructions are provided as a general guideline only. Specific mounting, wiring, and/or weather-sealing may be necessary and are the sole responsibility of the installer. Star Headlight & Lantern Co., Inc. assumes no responsibility for the integrity of the installation for this or any of its products.

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NOTICE

Due to continuous product improvements, we must reserve the right to change any specifications and information, contained in this manual at any time without notice. Star Headlight & Lantern Co., Inc. makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Star Headlight & Lantern Co., Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

QUICK-INSTALL WIRING GUIDE



WIRE COLORS AND FUNCTIONS WILL VARY FROM HARNESS TO HARNESS. PLEASE BE SURE TO CORRECTLY IDENTIFY YOUR HARNESS AND USE THE CORRESPONDING TABLE. IN ADDITION, ALL LIGHTBARS ARE SHIPPED WITH A WORKSHEET THAT IDENTIFIES THE FUNCTION FOR EACH WIRE COLOR IN THAT SPECIFIC LIGHTBAR.

11-Wire Harness (271-PHANTOM)	
Green w/Yellow	Driver Side Scene Lights
White w/Brown	Passenger Side Scene Lights
Brown	Rear Enable (<i>Turns on Rear Facing M-Tech Plus™ Lights</i>)
Orange	Front Enable (<i>Turns on Front Facing M-Tech Plus™ Lights</i>)
White	Synchronization (<i>Used to synchronize two or more lights together</i>)
Green	Passenger Side Pattern Select (<i>Touch and release to +12-24 VDC to change patterns</i>)
Purple	High/Low Select (<i>Optional - Ground for low intensity</i>)
Red w/Green	Driver Side Pattern Select (<i>Touch and release to +12-24 VDC to change patterns</i>)
Red	Power (<i>Connect to constant +12-24 VDC †</i>)
Black	Ground (<i>Connect to the negative side of the battery</i>)
Bare	Ground (<i>Shield - Connect to a good chassis ground</i>)

20-Wire Harness Wiring (271RAZOR)	
Blue	Driver Side Alley Light (<i>Switched +12VDC Only</i>)
White w/Blue	ICL Power (<i>Intersection Clearing Lights</i>) or Scene Lights
White w/Yellow	Front Corner (<i>Controls any lights in the front corners other than ICL</i>)
Orange w/Yellow	Front Enable (<i>Turns on Front Facing M-Tech Plus™ Lights</i>)
Brown w/Yellow	<i>Not Used or Optional Component</i>
Red	Power (<i>Connect to constant +12-24 VDC †</i>)
Red w/Green	Passenger Side Pattern Select (<i>Touch and release to +12-24 VDC to change patterns</i>)
Purple	<i>Optional - High/Low (Ground for low intensity)</i>
Green w/Yellow	Front Center (<i>Controls any lights in the front centers</i>)
Red/Black	Driver Side Pattern Select (<i>Touch and release to +12-24 VDC to change patterns</i>)
White w/Brown	Alt. Front Center (<i>Controls any alternate lights in the front centers</i>)
Green w/Red	Rear Center (<i>Controls any lights in the rear centers</i>)
Brown w/Red	<i>Not Used or Optional Component</i>
Orange w/Red	Rear Enable (<i>Turns on Rear Facing M-Tech Plus™ Lights</i>)
White w/Red	Synchronization (<i>Used to synchronize two or more lights together</i>)
Yellow w/Black	Alt. LED 1 (<i>Controls any alternate LED lights</i>)
White w/Black	Alt. LED 2 (<i>Controls any additional alternate LED lights</i>)
Gray	Passenger Alley (<i>Switched +12VDC Only</i>)
Black	Ground (<i>Connect to the negative side of the battery</i>)
Bare	Ground (<i>Shield - Connect to a good chassis ground</i>)

† - The Red wire **MUST** be connected to +12VDC for the front and rear warning LEDs to operate. If you are NOT utilizing a separate Front and Rear enable function, you may connect the Red wire, along with the Front enable wire and Rear Enable wire to +12-24VDC through your On/Off switch. If you ARE using a separate Front and Rear Enable function, connect this wire to constant +12-24VDC. Please note: When the red POWER wire is connected to constant power the light will draw a small current (20 mA). If your vehicle will be sitting for extended periods of time (i.e. more than a few days), it is recommended all power wires be routed through an ignition switched power source.

QUICK-INSTALL WIRING GUIDE



WIRE COLORS AND FUNCTIONS WILL VARY FROM HARNESS TO HARNESS. PLEASE BE SURE TO CORRECTLY IDENTIFY YOUR HARNESS AND USE THE CORRESPONDING TABLE. IN ADDITION, ALL LIGHTBARS ARE SHIPPED WITH A WORKSHEET THAT IDENTIFIES THE FUNCTION FOR EACH WIRE COLOR IN THAT SPECIFIC LIGHTBAR.

14-Wire Harness Wiring (271-TOWBAR)	
Light Blue	Optional - High/Low (Ground for low intensity)
Orange	Rear Enable (Turns on Rear Facing M-Tech Plus™ Lights)
Yellow	Left Stop (+12VDC Only - Used only if you have STT lights in your bar)
Green	Right Stop (+12VDC Only - Used only if you have STT lights in your bar)
White w/Orange	Work Lights (+12VDC Only - Used only if you have worklights in your bar)
Brown	Tail (+12VDC Only - Used only if I.D. or STT lights are in your bar)
Red	Power (Connect to constant +12-24 VDC †)
Red w/White	Scene Lights
Red w/Green	Passenger Side Pattern Select (Touch and release to +12-24 VDC to change patterns)
Black w/Green	Driver Side Pattern Select (Touch and release to +12-24 VDC to change patterns)
White w/Green	Front Enable (Turns on Front Facing M-Tech Plus™ Lights)
Gray	Synchronization (Used to synchronize two or more lights together)
Black	Ground (Connect to the negative side of the battery)
Bare	Ground (Shield - Connect to a good chassis ground)

16-Wire Harness Wiring (271-STROBE)	
Light Blue	Driver Side Alley Light (Switched +12VDC Only)
White w/Brown	Pursuit (Used only if Pursuit lights are in your bar)
White w/Blue	ICL Power (Intersection Clearing Lights)
Green w/Yellow	Takedowns (Used only if Takedown lights are in your bar)
Red	Power (Connect to constant +12-24 VDC †)
Red w/Black	Driver Side Pattern Select (Touch and release to +12-24 VDC to change patterns)
Red w/White	Synchronization (Used to synchronize two or more lights together)
Red w/Green	Passenger Side Pattern Select (Touch and release to +12-24 VDC to change patterns)
Black w/Green	Rear Enable (Turns on Rear Facing M-Tech Plus™ Lights)
White w/Green	Front Enable (Turns on Front Facing M-Tech Plus™ Lights)
Orange	Not Used or Optional Component
White	Rear Flashers (Used only if Rear Flashers are in your bar)
Orange w/Red	Optional - High/Low (Ground for low intensity)
Gray	Passenger Alley (Switched +12VDC Only)
Black	Ground (Connect to the negative side of the battery)
Bare	Ground (Shield - Connect to a good chassis ground)

† - The Red wire **MUST** be connected to +12VDC for the front and rear warning LEDs to operate. If you are NOT utilizing a separate Front and Rear enable function, you may connect the Red wire, along with the Front enable wire and Rear Enable wire to +12-24VDC through your On/Off switch. If you ARE using a separate Front and Rear Enable function, connect the Red wire to constant +12-24VDC. Please note: When the red POWER wire is connected to constant power the light will draw a small current (20 mA). If your vehicle will be sitting for extended periods of time (i.e. more than a few days), it is recommended all power wires be routed through an ignition switched power source.

Mounting Instructions

Please review the separate Mounting Bracket manual that is also enclosed with your bar for mounting instructions.

Wiring Harness Replacement

All standard lightbar models are designed for 12VDC negative ground vehicles only. Reverse polarity will cause serious damage to the lightbar and/or vehicle. Contact the automotive dealer if there are any doubts about the polarity of your vehicle.

PLEASE NOTE: If you are using the existing wire harness supplied with the lightbar,

Standard Razor lightbars come with a 15-foot wiring harness. If the harness supplied with the lightbar is not long enough for your application, Star recommends ordering the proper cable of the desired length from the factory. Completely remove the pre-installed wire harness and replace it with one that is the correct length.

- *Star recommends direct wiring to the terminal block on the inside of the lightbar, rather than making connections to the end of the wire that is supplied.*
 - *This lightbar is designed so that when replacing the wire harness, no wire connectors are needed and only a few common tools are necessary.*
 - *Direct wiring allows the wire connections to the lightbar to be made in a clean and dry environment, avoiding any problems that may arise due to weathering on external connections.*
 - *Wiring directly inside the lightbar reduces the number of connections. There is an increase in voltage loss with the addition of each connection.*
 - *Making connections to the wires already provided is an acceptable alternative, as long as these connections are good electrical connections and are resistant from weathering effects.*
1. Determine the number of wires that you will need to run. Your lightbar may not use all of the wires in the harness that was shipped with the lightbar. Please note which functions your bar has, then review the lists on pages 1-2 to determine which wires you will need to connect. The bare drain wire in our harness is optional (but recommended) and is only necessary if you are experiencing RFI problems.
 2. Locate the end of the lightbar into which the wire harness runs. The black terminal block(s), which you will be making your wire terminations to, should also be located at this same end.
 3. Remove the dome lens at this end of the lightbar:
 - Step A:** Loosen the four screws holding each dome on.
 - Step B:** Lift the dome off of the base exposing the interior components.
 - Step C:** When all work is completed, reverse the steps to reinstall the dome, taking care that the gasket is properly aligned.

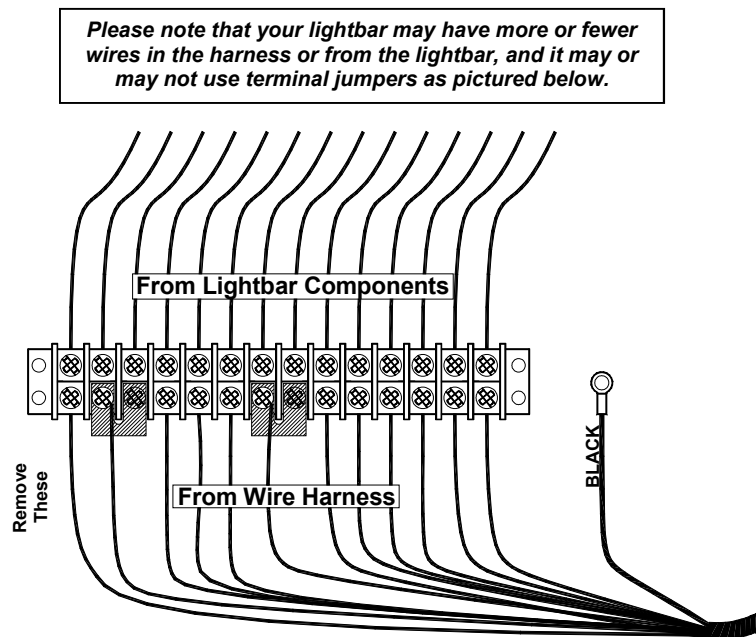


(Direct Wiring Guide CONT'D)

4. The wiring harness will connect to one or more terminal blocks inside the lightbar. All of the wires coming from the harness are terminated on one side of the terminal block and the wires leading to the internal components terminate on the opposite side of the terminal block. The Wiring Guide on pages 1-2 lists the wire colors from the harness in the same order as they are connected to the terminal block(s). Using the Wiring Guide, note which end of the terminal block(s) the wires in your harness start from.
5. Loosen the screws on the HARNESS SIDE of the terminal block and remove the harness. Remember that there may be "dead" wires from the harness connected to the terminal block inside your lightbar, but there will be no wires connected to the terminal across from them. These are extra wires in the harness that are not used. Replacing these wires in your new harness is not necessary.
6. Run the new external wires up through the wire bushing into the base and to the terminal block(s). Use the Wiring Guide to help determine where each of your new wires should be connected.
7. Strip each wire 1/4". Connect the external wires to the proper poles of the terminal block by inserting the stripped portion of the wire under the rising clamp screw and tightening down the screw. Note that no wire terminals are needed for connecting wires to this terminal block.

Be sure to check that no strands of wire are loose and shorting to the adjacent terminal or to the base of the lightbar.

All switches used should be rated for at least 125% of their rated load.



Electrical Connections

All standard lightbar models are designed for 12VDC negative ground vehicles only. Reverse polarity will cause serious damage to the lightbar and/or vehicle. Contact the automotive dealer if there are any doubts about the polarity of your vehicle.



RF INTERFERENCE

Please take the following steps to help eliminate any Radio Frequency Interference (RFI) with your two-way radio.

- **DO NOT** run the power wire for the lightbar along same path as any antenna wires.
- **DO NOT** run the power wire for the lightbar along same path as any radio power wires.
- **DO NOT** tap power for the lightbar off of the radio power wires.
- **DO NOT** mount the lightbar within 20" of any antennae. Sometimes mounting the lightbar or antenna over by just one foot can make a large difference in the interference.
- Ensure the black wire from the lightbar has a good connection to the **negative side of the battery**.

- For all standard Razor lightbars, 15 feet of cable (plus a drain wire and a foil shield) is supplied with the bar. All wires are color coded and sized at the correct gauge. If this length is not sufficient, it is recommended that the wire harness be completely replaced with the only connections to be made directly at the terminal block inside the lightbar. This will reduce the number of wire connections and help prevent any weathering problems on these connections. Refer to the *Direct Wiring Guide* on pages 3-4 for further instructions on this.
- **CAUTION: All wires and switches should be rated for at least 125% of their maximum current load.** In addition, all wires connected to the positive terminal of the battery should be fused at the battery for 125% of their rated load. The load can be calculated by adding all lamp wattages and dividing by 13. (Load <Amps> = Total Watts / 13 volts) **Do not use** 1/4" diameter glass fuses, as they are not suitable for continuous duty above 20 amps. If you are unsure of the current draw, please contact our Customer Service Department.
- **TESTING THE LIGHTBAR BEFORE IT IS PROPERLY FUSED & INSTALLED WILL VOID THE WARRANTY!!**
- The black ground wire should be connected to the negative terminal of your vehicle's battery. This wire should be as short as possible in order to minimize the voltage loss in this wire and reduce any chance of overheating.
- Your harness will contain all of the colored wires in its corresponding harness. Most applications though, will not use every wire. The "dead" wires in the harness will be connected to the terminal block inside your lightbar, but there will be no wires connected to the terminal across from them. These "dead" wires can be used for additional components that may be added at some point in the future, or they may be used to separately switch components that are currently wired together.
- Since many of the lightbars we build have custom components, and numerous different harnesses are used, wire colors WILL vary. You can use the Wire Guide on pages 1-2 or the worksheet shipped with each bar to identify the function of each wire. If you are still unsure of the function of a particular wire, you may test the function by grounding the black wire and applying +12VDC to the wire in question. Be sure to use a 20-amp fuse when testing.

Wire Functions



WIRE COLORS AND FUNCTIONS WILL VARY FROM HARNESS TO HARNESS. PLEASE BE SURE TO CORRECTLY IDENTIFY YOUR HARNESS AND USE THE CORRESPONDING TABLE IN THE WIRING GUIDE ON PAGES 1-2. IN ADDITION, ALL LIGHTBARS ARE SHIPPED WITH A WORKSHEET THAT IDENTIFIES THE FUNCTION FOR EACH WIRE COLOR IN THAT SPECIFIC LIGHTBAR.

Ground - Connect to the negative side of the battery.

Bare/Shield - Connect to the negative side of the battery.

Power (Red) - Connect to +12-24 VDC through your switch. *Be sure to use a 10 amp fuse when connecting the switch to the positive side of the power supply.*

The Red wire **MUST** be connected to +12VDC for the front and rear M-Tech Plus™ LEDs to operate.

Please note: When the red POWER wire is connected to constant power the light will draw a small current (20 mA). If your vehicle will be sitting for extended periods of time (i.e. more than a few days), it is recommended all power wires be routed through an ignition switched power source.

Front Enable - When the red POWER wire has power to it, applying +12VDC to the Front Enable wire will switch the front M-Tech Plus™ lights on independently from the rear M-Tech Plus™ lights.

Rear Enable - When the red POWER wire has power to it, applying +12VDC to the Rear Enable wire will switch the rear M-Tech Plus™ lights on independently from the front M-Tech Plus™ lights.


If you do not need independent control of the front and rear M-Tech Plus™ lights, it is recommended that you connect all THREE wires (Power, Front Enable, and Rear Enable) together through your switch.

Driver Side Pattern Select - Touch and release to +12-24 VDC to change the flash pattern on the Driver side M-Tech Plus™ array (see page 7).

Passenger Side Pattern Select - Touch and release to +12-24 VDC to change the flash pattern on the Passenger side M-Tech Plus™ array (see page 7).

High/Low - Used for switching between High and Low power.

- Leave disconnected for High Power only (cover with wirenut or tape).
- Connect to Ground for Low Power only.
- Connect to Ground through a switch for High/Low switching.

Synchronization - Using this wire, two or more M-Tech Plus™ circuits or  lights can be synchronized with one another. If you will be synchronizing two or more units together, or synchronizing this light with other approved synchronizable lights, leave the White/Red wire disconnected for now. Connect the White/Red wires from all units together **ONLY AFTER PROGRAMMING** them for the **same** pattern (see Pattern Programming on page 7).

Additional components - If your bar contains any additional components including, but not limited to, those listed below, applying +12VDC to the appropriate wire will activate those components:

- | | | |
|--------------------------------|---------------------|------------------------------|
| • Driver Alley | • Rear Flashers | • Scene Lights |
| • Passenger Alley | • Work Lights | • I.D. Lights |
| • Intersection Clearing Lights | • Right Stop Lights | • Additional LED Lights |
| • Takedown Lights | • Left Stop Lights | • Additional Strobe Lights |
| • Pursuit Lights | • Tail Lights | • Additional Rotating Lights |

Pattern Programming

Before changing the pattern, please review these key points about programming the lightbar:

- The lightbar consists of two separate circuits. One circuit controls the driver's side and the other circuit controls the passenger's side.
 - The driver's side circuit and passenger's side circuit are programmed with different wires. The colors will vary depending upon your harness. Review the chart on pages 1-2 that corresponds to your harness to identify the color of each of the programming wires.
 - The two sides are usually programmed at the same time by connecting the two pattern programming wires together. The only exception typically will be when you wish to set the two sides for patterns that differ from one another.
 - The **default pattern** for this lightbar will produce a Quadflash with Post Pop pattern that alternates between the two halves of both the passenger side and driver side.
1. Connect both the Driver Side and Passenger Side Pattern Select wires together.
 2. Power up the light so that it is flashing.
 3. Touch and hold the **Pattern Select Wires** to +12-24VDC for 3 seconds. After 3 seconds, the light should blink once and you should release the Pattern Select wires. This will set both circuits to Pattern 1 (Alternating Flicker).
 4. Touch the Pattern Select wires to +12-24VDC for **one second** and release them to scroll through the patterns listed on the following page. The cycle will repeat itself after the last pattern.
 5. Once you find the pattern you wish to display, connect the Pattern Select wires to ground and deactivate the light. This will store the selected pattern.

Programming Shortcuts

For quicker programming, you can skip directly to specific patterns in the programming sequence. Touch and hold the Pattern Select wires to +12/24VDC for the length of time that corresponds to the pattern you would like to jump to. Then release the Pattern Select wires once the light blinks the appropriate number of times.

<u>Length of Hold</u>	<u>Unit Blinks</u>	<u>Jumps to</u>
3 seconds	1 time	† - Pattern 1
6 seconds	2 times	†† - Pattern 6
9 seconds	3 times	††† - Pattern 11 or 13
12 seconds	4 times	†††† - Pattern 16
15 seconds	5 times	††††† - Pattern 26

Restoring the Factory Default Pattern(s)

If you wish to set the lightbar back to the factory default pattern(s), proceed below:

1. Follow Steps 1-2 above.
2. Instead of holding both Pattern Select wires to +12-24VDC for three seconds, as indicated in Step 3 above, hold them to +12-24VDC for **6 seconds**.
3. After 6 seconds, the light will blink twice.
4. Release the Pattern Select wires and both circuits will be programmed for Pattern 6 (Alternating Quadflash).
5. Touch the Pattern Select wires to +12-24VDC for one second and release them. This will advance the circuits to Pattern 7 (Alternating Quadflash with Post Pop).
6. Connect the Pattern Select wires to ground and deactivate the light. This will store the selected pattern(s).

Flash Patterns

Flash Pattern #	Pattern Description	CPS**	Shortcut
1	Alternating Flicker	1.0	† 3Sec
2	Alternating Fast Double Flash	3.3	
3	Alternating Triple Flash	2.5	
4	Alternating PSU Flicker	0.7	
5	Alternating PSU Random	0.6	
6	Alternating Quad Flash	1.0	†† 6Sec
7	Alternating Quad Flash w/Post-Pop	1.0	
8	Alternating Single Flash	1.0	
9	Alternating Slow Double Flash	1.0	
10	Alternating Variable	0.3	
11	Alternating Post Pop (<i>Amber Value versions</i>) Alternating Quintflash (<i>All others</i>)	1.2	††† 9Sec (FOR NON-AMBER VERSIONS)
12	Alternating Random (<i>Amber Value versions</i>) Swing (<i>All others</i>)	1.3	
13	Alternating Quintflash (<i>Amber Value versions</i>) Alternating Fast Doubleflash, Alternating Flicker (<i>All others</i>)	N/A	††† 9Sec (FOR AMBER VERSIONS)
14	Alternating Fast Doubleflash, Alternating Flicker (<i>Amber Value versions</i>) Alt. Quad, Alt. Flicker, Alt. Double, Flicker (<i>All others</i>)	N/A	
15	Alt. Quad, Alt. Flicker, Alt. Double, Flicker (<i>Amber Value versions</i>) Counter Clockwise Rotation (<i>All others</i>)	2.5	
16	Simultaneous Quad w/Post Pop (Phase 1)	1.0	†††† 12Sec
17	Simultaneous Quad w/Post Pop (Phase 2)	1.0	
18	Alt. Triple, Alt. Non-Synch Double, Alt. Quint, Flicker	N/A	
19	Steady burn one side, Other side Single Flash	1.0	
20	Cycle All	N/A	
21 ☼	Quad w/Post Pop, Fast Double w/Post Pop ☼	N/A	
22 ☼	Alternating Non-Synch Double ☼	3.4	
23 ☼	Swing, Flicker ☼	N/A	
24 ☼	Slow Double, Fast Double ☼	N/A	
25 ☼	Alternating Fade ☼	0.8	
26 ☼	Simultaneous Flicker (Phase 1) ☼	1.0	††††† 15Sec
27 ☼	Simultaneous Flicker (Phase 2) ☼	1.0	
28 ☼	Simultaneous Tripleflash (Phase 1) ☼	2.5	
29 ☼	Simultaneous Tripleflash (Phase 2) ☼	2.5	
30 ☼	Simultaneous Doubleflash (Phase 1) ☼	1.0	
31 ☼	Simultaneous Doubleflash (Phase 2) ☼	1.0	
32 ☼	Simultaneous Quadflash (Phase 1) ☼	1.0	
33 ☼	Simultaneous Quadflash (Phase 2) ☼	1.0	
34 ☼	Sim. Quad (Phase 1), Alt. Triple, Sim. Flicker (Phase 1), Alt. Fast Double ☼	N/A	
35 ☼	Sim. Quad (Phase 2), Alt. Triple, Sim. Flicker (Phase 2), Alt. Fast Double ☼	N/A	

†, ††, †††, ††††, ††††† = Programming Shortcuts 1, 2, 3, 4, and 5 (see table on previous page)

• = Used for Synchronization


** = Cycles Per Second



The S8070-346-2**circuit, used in these lightbars, has low input voltage detection. With this feature the lightbar senses the input voltage and flashes a fast pattern (approximately 16 cycles per second) to indicate to the user that the battery voltage is getting low (less than 10V). Once the input voltage returns to normal (greater than 12V) the unit will return to the normal flashing.

☼ Patterns 21-35 are **NOT** included in the Amber Value versions

Synchronization

You can synchronize up to six total  approved lights.


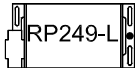

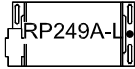



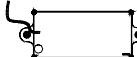


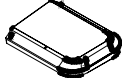
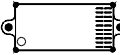

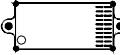

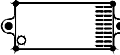

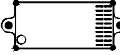









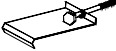

If you will be synchronizing your light with any of our  products, please note the following:

- All units that are to be synchronized MUST have the same **Pattern**.
- To check pattern compatibility with other  products, review the **Pattern List** for each product, noting the **Pattern**. Certain patterns are compatible with some lights, but not compatible with others.
- Programmable **Flash Patterns** can vary between our different lights, but Patterns 6-10 are fully compatible patterns with ALL of our other  products.
- Program the Pattern(s) for each light PRIOR TO connecting the synchronization wires together.
- All Synchronized Units must be switched ON/OFF by the same power switch.

Troubleshooting

Symptom	Possible solutions
Flash Pattern is not changing	Pattern select wire must be pulled to +12VDC to change pattern.
Unit stuck in high power	High/Low wire must be grounded to activate low power mode.
Bar is not synchronizing with other product	<ul style="list-style-type: none"> -Check to ensure all desired lights to be synchronized have the capability of being synchronized. -Check to ensure synchronization wire is connected to all units that are desired to be synchronized. -Check to ensure all lights to be synchronized are set to same <i>Pattern</i>. -Ensure that the entire system that is desired to be synchronized is powered up at the same time via the same switch. -Ensure that the total amount of synchronizable products in the system does not exceed 6 lights.
One single LED is out.	The entire flasher board will need to be replaced.
One complete half of the bar is out.	<ul style="list-style-type: none"> -Check wiring to the flasher board that is experiencing the problem. -The entire LED board on that side may need to be replaced.
If the bar is experiencing erratic flashing or side to side synchronizing within the bar is not working.	<ul style="list-style-type: none"> -Ensure both sides are set to the same <i>Pattern Type</i>. -Ensure synchronization wire is connected between both flasher boards internally. -Ensure both flasher circuits in the bar are powered from the same power switch.

Parts

	LST129-4 4.5" LINEAR STROBE TUBE		RP249-L 4-HEAD REMOTE STROBE PAK
	LST129-7 7" LINEAR STROBE TUBE		RP249A-L 2-HEAD REMOTE STROBE PAK
	2073-H27 27-WATT HALOGEN BULB (TAKE-DOWN/PURSUIT, FLASHER, ICL, WORKLIGHT)		TD77-2 TRAFFIC DIRECTOR CONTROL BOX
	2073-1157 STT BULB		LDC-TD LED CONVERTER CIRCUIT FOR TD
	2073-FTEFG BULB FOR 220-50 ALLEY LIGHT		FM3662 2.9 FPS HALOGEN FLASHER
	520-21-* UPPER END DOME		LDF398 8-OUTPUT LED FLASHER (20 OUTPUT TERMINALS)
	520-22-* UPPER CENTER DOME		LDF375-1 8-OUTPUT LED FLASHER w/CRUISE FOR VERSASTAR HEADS (20 OUTPUT TERMINALS)
	220-21L-* LOWER RAZOR END DOME		LDF375-2 8-OUTPUT LED FLASHER FOR ALLEYS & TDP VERSASTAR HEADS (20 OUTPUT TERMINALS)
	220-22L-* LOWER RAZOR CENTER DOME		LDF375-3 8-OUTPUT DUAL COLOR LED FLASHE FOR ALLEYS & TDP LINEUM HEADS (20 OUTPUT TERMINALS)
	820-100LL Filter for Halogen/Incandescent Light		LDF288-ICL 2-OUTPUT LED FLASHER FOR ALLEYS & TDP VERSASTAR HEADS (8 OUTPUT TERMINALS)
	LSF4.5-5-* 4.5" LINEAR STROBE FILTER		LDF369 2-OUTPUT LED FLASHER FOR ALL LED HEADS EXCEPT M-TECH & VERSASTAR (8 OUTPUT TERMINALS)
	LSF7-5-* 7" LINEAR STROBE FILTER		LSF-EC-* LINEAR STROBE ENDCAP
	30047-61 DOME GASKETING (1 FOOT)		920-29-2R V-MIRROR
	30053-33 TOP DOME SCREWS		HOOK MOUNTS THESE ARE PICTURED IN THE HOOK MOUNT MANUAL AND WORK IN CONJUNCTION WITH THE 820-39-PB
	820-39-PB BLACK NYLON DIRECT MOUNT KIT		

* = COLOR (White, Black, Clear, or Gray)

Please note that these items are not drawn to scale. Many have been enlarged to show more detail.

(Parts CONT'D)



S520-DLX6TDK6A
DLX6 TRAFFIC DIRECTOR KIT



S520-BWTDK6A
BATWING TRAFFIC DIRECTOR KIT



220-DLXTC
DLXT LED HEAD



220-DLX6-1*
DLX6 INNER LED WITH BRACKET



S520-DLX6-1*
DLX6 INNER LED



220-DLX6-3*
DLX6 END OR CORNER LED
WITH BRACKET



S520-DLX6-3*
DLX6 END OR CORNER LED



220-DLX6-4*
DLX6 OUTER LED WITH BRACKET



S520-DLX6-4*
DLX6 OUTER LED



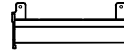
520-308-4*
BATWING LED



220-308-4*
BATWING LED WITH BRACKET



SH3924 (SH3924-1 when angled)
4.5" LINEAR STROBE HEAD



SH3927
7" LINEAR STROBE HEAD



220-14LDH
DIRECTIONAL HALOGEN
(TAKEDOWN/PURSUIT, FLASHER, ICL,
WORKLIGHT) (Less Bulb)



220-14STT
STOP/TURN/TAILO LIGHT



220-50
ALLEY LIGHT



220-50-1
ALLEY LIGHT TO FIT
WITH M-TECH 220-D2



S520-DLX6-HK
DLX6 LED ALLEY LIGHT



S520-DLX6-2A
DLX6 T.D. LED



S520-308-6*
BATWING T.D. LED



520-9-1*
LINEUM LED HEAD



520-8-1*
WINGED LINEUM LED HEAD



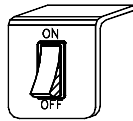
220-51LED-*
STARBLAST DIRECTIONAL
LED FLOOD/TAKEDOWN

*=COLOR

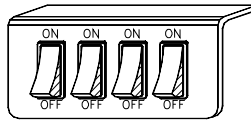
Please note that these items are not drawn to scale.



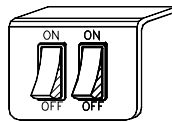
Optional Switch Boxes



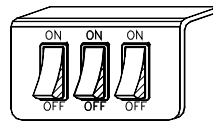
SP3860-1



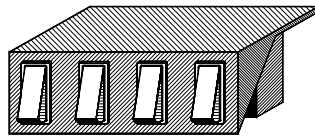
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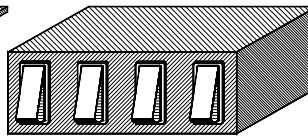
SP3860-2



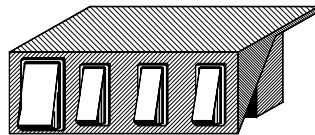
SP3860-3



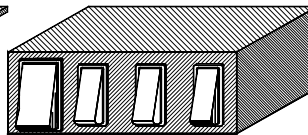
SP1515



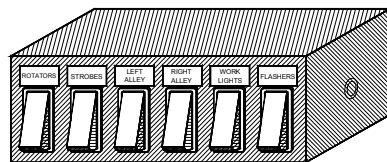
SB1515



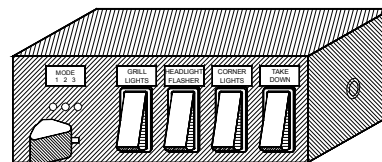
SP3015



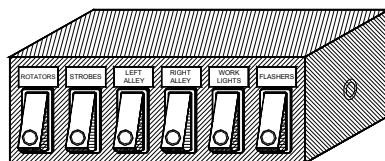
SB3015



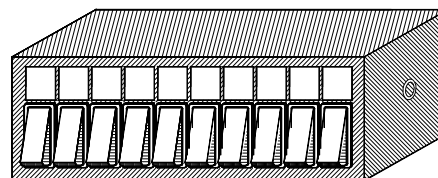
SB4020



SB4040



SB4020T



SB4425

Warranty

ONE YEAR LIMITED WARRANTY LED FIVE YEAR LIMITED WARRANTY

The manufacturer warrants each new product, under normal use, against factory defects in material and workmanship for **one year** after the date of purchase. The manufacturer warrants the **LED components** in this light against factory defects in material and workmanship for **five years** after the date of purchase. The owner will be responsible for returning to the Service Center any defective item(s) with the transportation costs prepaid. The manufacturer will, without charge, **repair or replace at its option**, products, or part(s), which its inspection determines to be defective. Repaired or replacement item(s) will be returned to the purchaser with transportation costs prepaid from the service point. A copy of the purchaser's receipt must be returned with the defective item(s) in order to qualify for the warranty coverage. If a copy of the receipt is not provided, the warranty period shall cover five years from the date of manufacture.

Exclusions from this warranty include, but are not limited to, bulbs, strobe tubes, domes, and/or the finish. This warranty shall not apply to any light, which has been altered, such that in the manufacturer's judgment, the performance or reliability has been affected, or if any damage has resulted from abnormal use or service. This warranty does not apply to defect or damage occurring as a result of disaster, accident, abuse, misuse, lightning, power surges, or failure to follow instructions in any enclosed manuals. Any damage or defects occurring as a result of any unauthorized service or repairs by unauthorized persons shall be excluded from this warranty.

There are no warranties expressed or implied (including any warranty of merchantability or fitness), which extend these warranty period. **The loss of use of the product, loss of time, inconvenience, commercial loss or consequential damages, including costs of any labor, are not covered.** The manufacturer reserves the right to change the design of the product without assuming any obligation to modify any product previously manufactured.

This warranty gives you specific legal rights. You might also have additional rights that may vary from state to state. Some states do not allow limitations on how long an implied warranty lasts. Some states do not allow the exclusion or limitation of incidental or consequential damages. Therefore, the above limitation(s) or exclusion(s) may not apply to you.

If you have any questions concerning this or any other product, please contact our **Customer Service Department** at (585) 226-9787.

If a product must be returned for any reason, please contact our Customer Service Department to obtain a Returned Materials Authorization Number (RMA #) before you ship the product back.
Please write the RMA # clearly on the package near the mailing label.



PROUDLY MADE IN THE USA
An ISO 9001:2008 Certified Company



Star Headlight & Lantern Co., Inc.

455 Rochester Street Avon, NY 14414 Phone: 585-226-9787 FAX: 888-478-2797

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