

# WHELEN<sup>®</sup>

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### Installation Guide: L31HBF Series Super-LED<sup>®</sup> Beacon

#### Warnings to Installers

Whelen's emergency vehicle warning devices must be properly mounted and wired in order to be effective and safe. Read and follow all of Whelen's written instructions when installing or using this device. Emergency vehicles are often operated under high speed stressful conditions which must be accounted for when installing all emergency warning devices. Controls should be placed within convenient reach of the operator so that they can operate the system without taking their eyes off the roadway. Emergency warning devices can 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 vehicle damage, including fire. Many electronic devices used in emergency vehicles can create or be affected by electromagnetic interference. Therefore, after installation of any electronic device it is necessary to test all electronic equipment simultaneously to insure that they operate free of interference from other components within the vehicle. Never power emergency warning equipment from the same circuit or share the same grounding circuit with radio communication equipment. All devices should be mounted in accordance with the manufacturer's instructions and securely fastened to vehicle elements of sufficient strength to withstand the forces applied to the device. Driver and/or passenger air bags (SRS) will affect the way equipment should be mounted. This device should be mounted by permanent installation and within the zones specified by the vehicle manufacturer, if any. Any device mounted in the deployment area of an air bag will damage or reduce the effectiveness of the air bag and may damage or dislodge the device. Installer must be sure that this device, its mounting hardware and electrical supply wiring does not interfere with the air bag or the SRS wiring or sensors. Mounting the unit inside the vehicle by a method other than permanent installation is not recommended as unit may become dislodged during swerving; sudden braking or collision. Failure to follow instructions can result in personal injury. Whelen assumes no liability for any loss resulting from the use of this warning device. **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.**

#### Warnings to Users

Whelen's emergency vehicle warning devices are intended to alert other operators and pedestrians to the presence and operation of emergency vehicles and personnel. However, the use of this or any other Whelen emergency warning device does not guarantee that you will have the right-of-way or that other drivers and pedestrians will properly heed an emergency warning signal. Never assume you have the right-of-way. It is your responsibility to proceed safely before entering an intersection, driving against traffic, responding at a high rate of speed, or walking on or around traffic lanes. Emergency vehicle warning devices should be tested on a daily basis to ensure that they operate properly. When in actual use, the operator must ensure that both visual and audible warnings are not blocked by vehicle components (i.e.: open trunks or compartment doors), people, vehicles, or other obstructions. It is the user's responsibility to understand and obey all laws regarding emergency warning devices. The user should be familiar with all applicable laws and regulations prior to the use of any emergency vehicle warning device. Whelen's audible warning devices are designed to project sound in a forward direction away from the vehicle occupants. However, because sustained periodic exposure to loud sounds can cause hearing loss, all audible warning devices should be installed and operated in accordance with the standards established by the National Fire Protection Association.

#### Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- **Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.**
- **Whelen Engineering requires the use of waterproof butt splices and/or connectors if that connector could be exposed to moisture.**
- **Failure to use specified installation parts and/or hardware will void the product warranty.**
- **If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr the holes and remove any metal shards or remnants. Install grommets into all wire passage holes.**
- **If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro<sup>®</sup>, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.**
- **Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owner's manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.**
- **For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post (this does not include products that use cigar power cords).**
- **If this product uses a remote device for activation or control, make sure that this device is located in an area that allows both the vehicle and the device to be operated safely in any driving condition.**
- **Do not attempt to activate or control this device in a hazardous driving situation.**
- **This product contains either strobe light(s), halogen light(s), high-intensity LEDs or a combination of these lights. Do not stare directly into these lights. Momentary blindness and/or eye damage could result.**
- **Use only soap and water to clean the outer lens. Use of other chemicals could result in premature lens cracking (crazing) and discoloration. Lenses in this condition have significantly reduced effectiveness and should be replaced immediately. Inspect and operate this product regularly to confirm its proper operation and mounting condition. Do not use a pressure washer to clean this product.**
- **It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.**
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

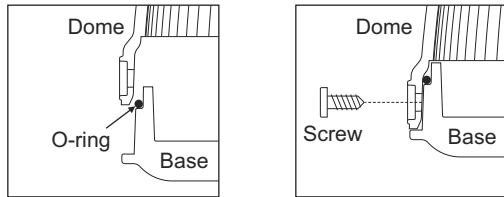
**Mounting:**

This beacon uses a base that may be mounted one of three ways. It is designed to be mounted in a normal dome-up position.

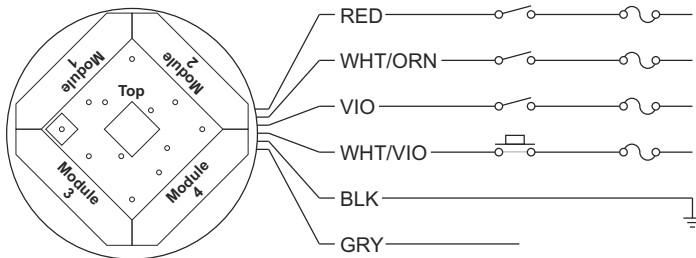
**Permanent surface mount:**

**CAUTION: Permanent mounting of this product will require drilling. It is absolutely necessary to make sure that no other vehicle components could be damaged by this process. Check both sides of the mounting surface before starting. If damage is likely, select a different mounting location.**

1. Remove the screws securing the dome to the base and remove the dome. Position the beacon in its proposed mounting location (refer to safety warnings on page 1).
2. Locate the 3, round mounting holes on the inside bottom of the base. Using the base as a template, mark the location of these holes onto the mounting surface. Remove the beacon and make a mark in the center of the beacon's mounted position for a wire passage hole.
3. Using an appropriately sized drill bit (based on the mounting hardware used and the thickness of the mounting surface), drill the three mounting holes marked in step 2. The wire access hole should be drilled using a 3/8" drill bit. Deburr all holes and install a rubber grommet (customer supplied) to protect the wires.
4. Turn the beacon upside-down so that the bottom of the base is facing up. Remove protective backing from the base gasket and apply to the beacon base. **It is critical that the gasket be centered on the base with its slot aligned with the base notch!** Make sure the gasket is flat against the base.
5. Feed the wires through the wire access hole in the mounting surface.
6. Align the base with the mounting holes and secure with 3 sheet metal screws. Position the O-ring onto the base as shown and carefully return the dome to its mounted position. After visually confirming that the gasket is properly seated, secure the dome to the base using the hardware removed in step 1.



The beacon wires function as outlined below:



Color	Function	Connect to:	Switch Type	Fuse @
RED	Power (Modules 1&2)	+12VDC	SP/ST	3 Amp
WHT/ORN	Power (Modules 3&4)	+12VDC	SP/ST	3 Amp
VIO	Low Power	+12VDC	SP/ST	1 Amp
WHT/VIO	Scan-Lock™	+12VDC	MOM (N.Open)	1 Amp
BLK	Ground	Ground	n/a	N/A
GRY	SYNC	See text	n/a	N/A

**WARNING! All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and FUSED at the battery to carry that load. DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!**

Refer to the "Operation" section for wire function information.

**Temporary Mount (Magnetic, Suction Cup, etc.)**

**WARNING: The use of any magnetically mounted warning device on the outside of a vehicle in motion is not recommended and is at the sole risk and responsibility of the user.**

**Magnetic/suction:** Thoroughly clean the proposed mounting surface prior to mounting. For suction cup mounting, wipe the suction cup clean, place the beacon onto its mounting surface and apply gentle pressure to ensure a good seal has been achieved. The Magnetic/Suction Cups mount the same way as standard suction cups but are best suited to a flat, steel surface. **Magnetic:** Simply place the beacon onto the mounting surface and plug it into the vehicle cigar lighter.

**NOTE: The magnetic mount model does not offer Scan-Lock™, Cruise Light, Low Power or SYNC.**

**1" N.P.T. Pipe Mount (optional):**

1. Turn the beacon upside-down so the bottom of the base is facing up. Remove the base gasket from the base and discard. Install the grommets (included with the kit) into the three, square mounting holes in the bottom of the base.
2. Feed the beacon wires through the pipe mount base plate. Secure the base plate onto the beacon base using the provided hardware.
3. Feed the beacon wires through the pipe and connect the beacon wires as outlined in the Permanent Mount section.
4. Install the plugs (included with kit) into the unused permanent mounting holes.
5. Screw the strobe beacon onto the pipe, being careful not to pinch or strain the wires. *Hand tighten* the unit onto pipe.

**Operation:**

This beacon features low power operation, Scan-Lock pattern control and SYNCHRONIZATION capabilities. These functions operate as outlined below.

**Low Power** - Activate the VIO wire to put the beacon into low power operation. Disable this wire to restore normal, high power operation.

**Scan-Lock™** - Activate the RED wire to turn on the beacon. Activate the WHT/VIO wire for less than 1 second and release to cycle forward through patterns. Activating the WHT/VIO wire for more than 1 second will cause the lighthouse to cycle backward through patterns. When the desired pattern is displayed, allow it to run for more than 5 seconds. The lighthouse will now display this pattern when active. To reset to the factory default pattern, turn off power, activate the WHT/VIO wire, then turn power back on.

**See below for pattern information:**

All lighthoods configured to display the Phase 1 mode of a given pattern will flash simultaneously. Any lighthoods configured to display the Phase 2 mode of a pattern, will alternate with any Phase 1 lighthoods with the same pattern.

**Sync** - To sync two lighthoods, configure both lighthoods to display the same Phase 1 pattern. With the power off, connect the GREY wires from each lighthouse together. When the lighthoods are activated, their patterns will be synchronized. To configure the two lighthoods to alternate their patterns, advance the pattern of either lighthouse to the Phase 2 mode of the current pattern.

The following example will demonstrate how to use the SYNC feature with more than 2 lighthoods. In this sample system, there are 4 lighthoods. 2 are mounted on the rear, driver side of the vehicle and 2 mounted on the rear, passenger side of the vehicle.

With all the wiring complete, turn on the 4 lighthoods. As shipped from the factory, all the lighthoods will simultaneously display the same pattern (SignalAlert 75 Phase 1).

To configure, for example, the passenger side lighthoods to alternate with the driver side lighthoods to Phase 2 mode of the same pattern. **Do not SYNC more than 8 (eight) beacons!**

PATTERN LIST	DETAILS	INPUT WIRES		
		RED	WHT/ORG	RED + WHT/ORG
1 SignalAlert™ Freedom PH 1 2 SignalAlert Freedom PH 2 3 Comet Flash® PH 1 4 Comet Flash PH 2 5 DoubleFlash 150 PH 1 6 DoubleFlash 150 PH 2 7 DoubleFlash 75 PH 1 8 DoubleFlash 75 PH 2 9 SingleFlash 375 PH 1 10 SingleFlash 375 PH 2 11 SingleFlash 150 PH 1 12 SingleFlash 150 PH 2 13 SingleFlash 75 PH 1 14 SingleFlash 75 PH 2	<b>Patterns 1-14:</b> 7 Patterns, each having a Phase 1 and Phase 2.  <b>SYNC Note:</b> Set both Beacons to Phase 1 for simultaneous display or set one to Phase 1 and the other to Phase 2 for alternating display.	Module 1+2 Top=Off	Module 3+4 Top=Off	Module 1+2+3+4 Top=On
15 SignalAlert Freedom 16 Comet Flash 17 DoubleFlash 150 18 DoubleFlash 75 19 SingleFlash 375 20 SingleFlash 150 21 SingleFlash 75	<b>Patterns 15-21:</b> 7 Patterns (SYNC).	Module 1 then 2 Top=Off	Module 3 then 4 Top=Off	Module 1+3 then 2+4 Top=Off
22 ActionFlash™ ALT 23 ActionFlash SIM 24 ModuFlash™ ALT 25 ModuFlash SIM	<b>Patterns 22-25:</b> 2 Patterns (Non-SYNC).  Note: Each pattern has an Alternating (ALT) and Simultaneous (SIM) display.	ALT: Module 1 then 2 Top=Off  SIM: Module 1+2 Top=Off	ALT: Module 3 then 4 Top=Off  SIM: Module 3+4 Top=Off	ALT: Module 1+3 then 2+4 Top=Off  SIM: Module 1+2+3+4 Top=On
26 50 RPM 27 75 RPM 28 118 RPM 29 250 RPM	<b>Patterns 26-29:</b> 4 Patterns (Non-SYNC)  Note: These patterns are only available when both input wires are active.		Module 1+2+3+4 Top=Off	
30 ActionScan™	<b>Pattern 30:</b> 1 Pattern (Non-SYNC)	Module 1+2 Top=Off	Module 3+4 Top=Off	Module 1+2+3+4 Top=On