

WHELEN[®]

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Installation Guide:
Mirror-Beam™ ION™ Series™ and
ION™ V-Series™ Super-LED® Lighthouse

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.

⚠ WARNING: This product can expose you to chemicals including Methylene Chloride which is known to the State of California to cause cancer, and Bisphenol A, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

- **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.**
- **Any holes, either created or utilized by this product, should be made both air- and watertight using a sealant recommended by your vehicle manufacturer.**
- **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®, 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!**

Remove the Side Mirror Assembly:

Following factory instructions remove the mirror assembly from the vehicle.

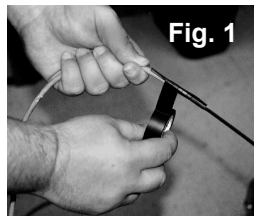
Preparing Mirror Assembly:

1. Following factory instructions carefully remove the mirror assembly cover from the front of the mirror assembly.
2. Determine the wire path and Mark off the wire hole location on the top of the cover. The wire hole must be located over the hole in the mirror assembly that the Mirror-Beam™ cable will exit. Drill the wire hole through the cover using a 3/4" drill.

Preparing the Mirror-Beam cable:

Because the Mirror-Beam cable must be routed through a specific, narrow and twisting path within the mirror assembly, it will be necessary to temporarily extend the length of the cable.

1. Locate the ty-wrap (included) and cut the fastener-end off.
2. Locate the end of the cable that has PIN-type terminals installed on the wires. Cut off the non-insulated wire (not used).
3. Strongly secure the ty-wrap to the cable with electrical or similar tape. It is important to have a sufficient length of the ty-wrap secured to the cable (2" minimum) (Fig. 1).

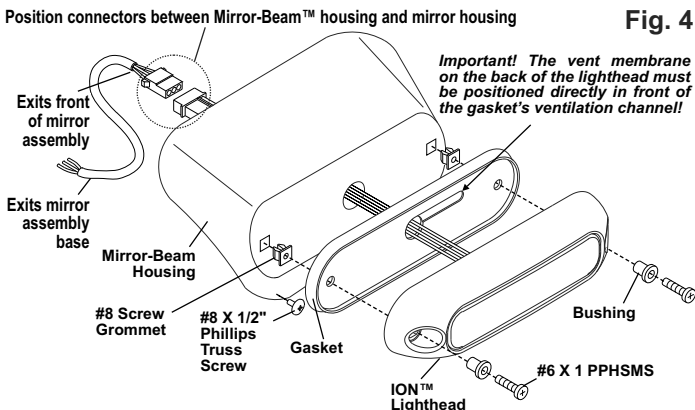


Routing Mirror-Beam Cable:

1. Insert the ty-wrap into the front of the mirror assembly. Continue to push the ty-wrap in until the end of the ty-wrap sticks out of the mirror neck. Pull the ty-wrap out until slack in the cable is gone. There should not be more than 4 - 5" of cable sticking out of the front of the mirror assembly.
2. Feed the ty-wrap back into the mirror assembly neck (along the mirror power cables path) and back out through the hole in the mirror assembly base that the mirror power cable connector occupies. You may have to cut out a small amount of the outside of the base gasket to accommodate the Mirror-Beam™ cable. You may also have to widen the connectors hole with a round file if the cable doesn't fit.
3. Insert the end of the cable into the 1/2" hole you drilled in the mirror assembly cover and snap the cover back onto the mirror assembly.
4. Remove the ty-wrap from the cable. Install the socket connector (supplied) onto the end of the cable coming out of the front of the mirror assembly. (see wiring diagram).

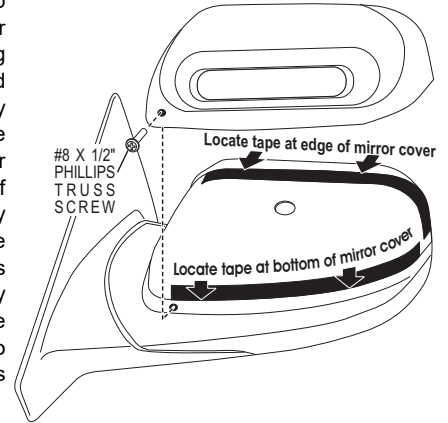


Affixing Mirror-Beam Housing to Mirror Assembly:



1. Reconnect the mirror power cable and remount the mirror assembly onto the vehicle using the original hardware. Route the Mirror-Beam cable through the door, along the same path as the vehicle's main power harness. Make sure that neither of the harness cables are crimped or pinched. Tighten all nuts firmly.
2. With the ION and its gasket properly oriented, secure the lighthouse to the Mirror-Beam housing. Plug the lighthouse into the cable connector and tuck this connection between the Mirror-Beam housing and the mirror assembly.
3. **NOTE: The following procedure requires that the mirror assembly be no colder than 60°F (18°C).** Thoroughly clean the plastic mirror assembly and the inside surface of the Mirror-Beam housing using a 50/50 mixture of isopropyl (not rubbing) alcohol and water. Dry completely.

4. Locate the two, 6" strips of double-sided adhesive tape (included). Peel the protective strip from one side of one piece of tape and mount it onto the top of the mirror assembly curving around the outboard side. When properly positioned, the tape will go along the rear (mirror side) edge of the mirror assembly cover. After the tape is mounted, it is important to apply pressure to the protective backing so that the tape adheres to the surface.



5. Peel the protective strip from the other piece of tape. Using the procedure outlined in the previous step, adhere it along the bottom of the mirror assembly cover.
6. Hold the Mirror-Beam housing in position on the mirror assembly and trim and remove any exposed tape. Remove the housing and fold the protective backing strips of the tape so that 1/2" to 3/4" of backing is extended over the edge of the mirror assembly.
7. Mount the Mirror-Beam housing onto the mirror assembly. **The housing must fully engage the mirror assembly.** Press the housing firmly onto the exposed tape on the mirror assembly.
8. The remaining protective backing strips must now be removed. The housing must not be in contact with the backing strips. Starting with the strip on top, and using a small, flat blade screwdriver gently pry the housing about 1/4" away from the mirror assembly. Carefully pull the protective strip "tab" created in step 6, and gently remove it completely from the tape strip. **Do not allow the strip to tear while being removed.**
9. Repeat for the other tape strip on the bottom.
10. Apply pressure to the Mirror-Beam assembly at the tape locations. Maintain pressure for a minimum of 20 minutes to allow the tape to properly setup. This can be accomplished by wrapping the Mirror-Beam™/mirror assembly tightly with adhesive tape.

WARNING: The tape adhesive used in this procedure is fully bonded after 72 hours @ 70°F (21°C). During this period, do not expose the Mirror-Beam to any unnecessary force, such as the high-pressure water from a car wash.

WARNING: The outer surfaces of this product may be cleaned with mild soap and water. Use of any other chemicals may void product warranty. Do not use a pressure washer.

11. Locate the factory-drilled hole in the Mirror-Beam housing. Using a 1/8" drill bit and the housing as a template, drill a hole into the mirror assembly. Using the #8 x 1/2" black oxide phillips truss screw, (included) secure the Mirror-Beam housing to the mirror assembly.

Connecting the Mirror-Beam to Power:

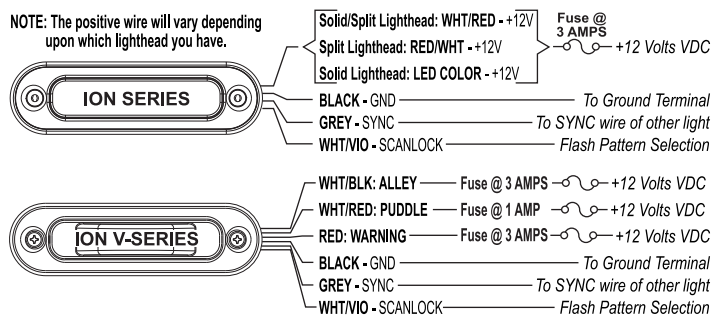
1. Re-connect the mirror assembly to its main power cable. Route the Mirror-Beam cable through the door, along the same path as the vehicle's main power cable and connect to power.
2. Cut the non-insulated wire off the Mirror-Beam cable. After the connections are complete, confirm proper operation.

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!

Scan-Lock™ (WHT/VIO) - With the light on: To advance to the next flash pattern, apply +VDC to the WHT/VIO wire for less than 1 second. To cycle backwards, apply +VDC to the WHT/VIO wire for more than 1 second. To reset to the factory default pattern, turn off power to the lighthouse. While applying +VDC to the WHT/VIO wire, turn the lighthouse back on. Continue to apply voltage for 5 seconds.

SYNC (GREY) - Lights configured to display the Phase 1 mode of a pattern will flash simultaneously. Lights configured to display the Phase 2 mode will alternate with any Phase 1 lights with the same pattern.

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



Flash Patterns:

- | | | | |
|-------------------------------|------------------------------|----------------------------|----------------------|
| 1. <i>SignalAlert™ 75PH 1</i> | 8. SingleFlash 75PH 2 | 15. SingleFlash 60 | 22. ActionFlash™ 150 |
| 2. <i>SignalAlert 75PH 2</i> | 9. <i>ComAlert™ 75PH 1</i> | 16. SingleFlash 90 | 23. ModuFlash™ |
| 3. <i>CometFlash@ 75PH 1</i> | 10. <i>ComAlert 75PH 2</i> | 17. SingleFlash 120 | 24. ActionScan™ |
| 4. <i>CometFlash 75PH 2</i> | 11. <i>LongBurst™ 75PH 1</i> | 18. SingleFlash 300 | 25. Steady |
| 5. DoubleFlash 75PH 1 | 12. <i>LongBurst 75PH 2</i> | 19. DoubleFlash 150 | |
| 6. DoubleFlash 75PH 2 | 13. PingPong™ 75PH 1 | 20. <i>ComAlert™ 150</i> | |
| 7. SingleFlash 75PH 1 | 14. PingPong 75PH 2 | 21. ActionFlash™ 50 | |

BOLD = California Title XIII Compliant Pattern

Italic = SYNC Pattern PH 1 = Phase 1 PH 2 = Phase 2

IMPORTANT: It is the responsibility of the installation technician to make sure that the installation and operation of this product will not interfere with or compromise the operation or efficiency of any vehicle equipment!

IMPORTANT WARNING!

CAUTION! DO NOT LOOK DIRECTLY AT THESE LED'S WHILE THEY ARE ON. MOMENTARY BLINDNESS AND/OR EYE DAMAGE COULD RESULT!