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**Safety First**

This document provides necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of this 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.
- 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 any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.
- 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.
- If this product uses a remote device to activate or control this product, make sure that this control is located in an area that allows both the vehicle and the control 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.
- **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!**
- **FAILURE TO FOLLOW THESE PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

**Mounting (Standard Bracket)**

1. Place the bracket against the mounting surface and mark the two mounting hole locations.
2. Drill two mounting holes sized for a #8 sheet metal screw. A wire passage hole may also be needed. De-burr this hole and install a grommet to protect the wires.

**NOTE:** If VHB tape (provided) is used, remove the protective backing from this tape and press it firmly onto the bottom of the bracket as shown. Clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly before mounting the bracket onto the mounting surface.

3. Route the wires through the hole in the bracket and through the wire passage hole. Secure the ION™ to the bracket using the hardware provided. Wire as outlined below.

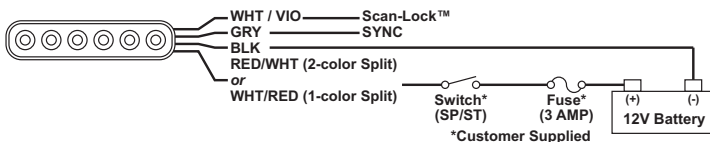
**Mounting (Gripper Bracket)**

1. Apply the protective pads to the bracket in the location shown (side view). Secure the ION™ to the bracket in the same fashion as outlined for the standard bracket.
2. Position the bracket onto the proposed mounting surface as shown. Apply a drop of Loctite 222 to the threads of the #6 x 1/2" PPHMS provided.
3. Thread these screws into the underside of the bracket as shown and secure the bracket to the mounting surface.

**Mounting (Ball Bracket)**

1. Secure the ball bracket to the desired surface using the hardware provided. Mount the ION onto the shield bracket and install this assembly onto the ball bracket as shown.

**Wiring**



**Operation**

**Scan-Lock™ (WHT/VIO) - To advance to the next pattern, apply +VDC to the WHT/VIO wire for less than 1 second. To cycle backwards, apply +VDC 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, turn the lighthouse back on. Continue to apply voltage for 5 seconds.**

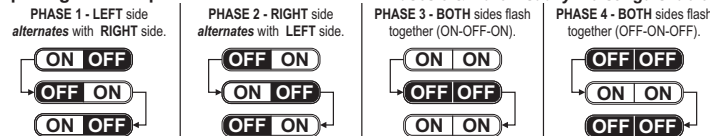
Lighthoods configured to display the Phase 1 mode of a pattern will flash simultaneously. Any lighthoods configured to display the Phase 2 mode will alternate with any Phase 1 lighthoods with the same pattern.

**Sync (GREY) - 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 same concept applies to Phases 3 & 4.**

To understand how to use the sync feature with more than two lighthoods, the principles will be applied to a sample system consisting of 4 lighthoods with 2 mounted on the rear, driver-side and 2 mounted on the rear, passenger-side. With all the wiring complete, turn on all 4 lighthoods. As shipped from factory, the lighthoods will all display SignalAlert™ 75 - Phase 1. To configure one side to alternate with the other side, change the pattern for either the passenger or driver side to Phase 2 mode for that pattern.

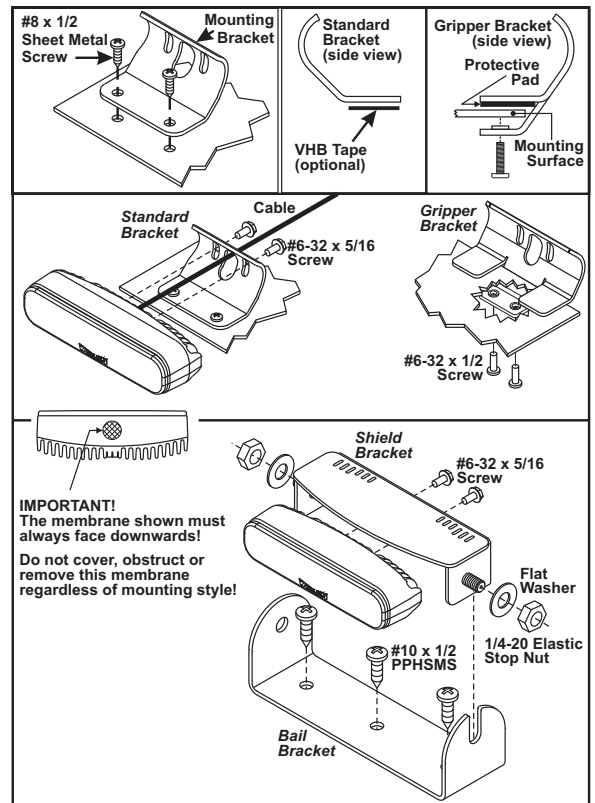
**IMPORTANT!** SYNC-capable LED lighthoods can be SYNCed to a SYNC-capable strobe power supply (such as the CS240S or UPS64LXA) by wiring their GREY wires together. When connected, LED lighthoods in Phase 1 of a pattern will flash **simultaneously** with strobe lighthoods connected to the GREEN wire outputs. LED lighthoods set to Phase 2 of a pattern will **alternate** with strobe lighthoods connected to the WHITE wire outputs. GREEN wire outputs always alternate with WHITE wire outputs.

**Split Lighthouse Operation:**



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

Before returning the vehicle to active service, visually confirm the proper operation of this product, as well as all vehicle components and/or equipment.



**Flash Patterns:**

NOTE: **BOLD** = CA. Title XIII Compliant Pattern / *Italic* = SYNC Pattern / PH 1 = Phase 1, PH 2 = Phase 2

- |                            |                             |                              |
|----------------------------|-----------------------------|------------------------------|
| 1. SignalAlert™ 75 (PH 1)  | 24. LongBurst 75 (PH 4)     | 47. ModuFlash™ (Alt.)        |
| 2. SignalAlert™ 75 (PH 2)  | 25. PingPong™ 75 (PH 1)     | 48. ModuFlash™ (Sim.)        |
| 3. SignalAlert™ 75 (PH 3)  | 26. PingPong™ 75 (PH 2)     | 49. DoubleFlash 120 (Alt.)   |
| 4. SignalAlert™ 75 (PH 4)  | 27. PingPong™ 75 (PH 3)     | 50. DoubleFlash 120 (Sim.)   |
| 5. CometFlash® 75 (PH 1)   | 28. PingPong™ 75 (PH 4)     | 51. PingPong™ 120 (Alt.)     |
| 6. CometFlash™ 75 (PH 2)   | 29. SSNF 75 (PH 1)          | 52. PingPong™ 120 (Sim.)     |
| 7. CometFlash™ 75 (PH 3)   | 30. SSNF 75 (PH 2)          | 53. TripleFlash™ 75 (Alt.)   |
| 8. CometFlash™ 75 (PH 4)   | 31. SingleFlash 60 (Alt.)   | 54. TripleFlash™ 75 (Sim.)   |
| 9. DoubleFlash™ 75 (PH 1)  | 32. SingleFlash 60 (Sim.)   | 55. TripleFlash 120 (Alt.)   |
| 10. DoubleFlash™ 75 (PH 2) | 33. SingleFlash 90 (Alt.)   | 56. TripleFlash 120 (Sim.)   |
| 11. DoubleFlash™ 75 (PH 3) | 34. SingleFlash 90 (Sim.)   | 57. SigAlert Cal.™ (Alt.)    |
| 12. DoubleFlash™ 75 (PH 4) | 35. SingleFlash 120 (Alt.)  | 58. SigAlert Cal. (Sim.)     |
| 13. SingleFlash™ 75 (PH 1) | 36. SingleFlash 120 (Sim.)  | 59. Action SF 60/120 (Alt.)  |
| 14. SingleFlash™ 75 (PH 2) | 37. SingleFlash 300 (Alt.)  | 60. Action SF 60/120 (Sim.)  |
| 15. SingleFlash™ 75 (PH 3) | 38. SingleFlash 300 (Sim.)  | 61. Action SF60/TF120 (Alt.) |
| 16. SingleFlash™ 75 (PH 4) | 39. DoubleFlash 150 (Alt.)  | 62. Action SF60/TF120 (Sim.) |
| 17. ComAlert™ 75 (PH 1)    | 40. DoubleFlash 150 (Sim.)  | 63. CalScan™ (Alt./Sim.)     |
| 18. ComAlert™ 75 (PH 2)    | 41. ComAlert™ 150 (Alt.)    | 64. ActionScan™ (Alt./Sim.)  |
| 19. ComAlert™ 75 (PH 3)    | 42. ComAlert™ 150 (Sim.)    | 65. SteadyFlash 60           |
| 20. ComAlert™ 75 (PH 4)    | 43. ActionFlash™ 50 (Alt.)  | 66. SteadyFlash 75           |
| 21. LongBurst™ 75 (PH 1)   | 44. ActionFlash™ 50 (Sim.)  | 67. SteadyFlash 90           |
| 22. LongBurst™ 75 (PH 2)   | 45. ActionFlash™ 150 (Alt.) | 68. SteadyFlash 120          |
| 23. LongBurst™ 75 (PH 3)   | 46. ActionFlash™ 150 (Sim.) | 69. Steady & Steady          |

## **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 he can operate the system without taking his 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.