

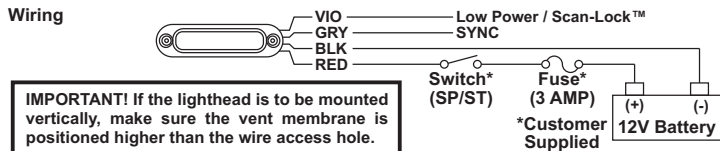
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Safety First: This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must 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.
- 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

1. Using the mounting gasket as a template, mark and drill the mounting holes and wire passage hole into the proposed mounting surface. **If the lighthead is to be mounted vertically, the vent membrane must be positioned higher than the wire passage hole.** Be sure to de-burr these three holes before continuing.
2. Install the slotted hole screw grommets provided into the ION™ as shown. Using appropriately sized wire, extend the ION wires through the mounting gasket and mounting surface. Install a switch and fuse (customer supplied) as specified and make all the electrical connections shown in the diagram below.
3. Secure the ION™ to the mounting surface using the hardware provided. **IMPORTANT! THE VENT MEMBRANE ON THE BACK OF THE LIGHTHEAD MUST BE POSITIONED DIRECTLY IN FRONT OF THE GASKET'S VENTILATION CHANNEL.** Refer to the Field Service Procedure guide included with your lighthead for important mounting information.



Operation

Low Power/Scan-Lock™ (VIO) - This wire controls both High/Low power and Scan-Lock pattern selection. **High/Low Power** - When the GRY wire is not grounded, applying +12VDC will change between High and Low Power. **Scan-Lock** - With the GRY wire grounded, turn on the lighthead. The VIO wire will now control Scan-Lock functions. When pattern selection has been completed, turn off the ION and remove the GRY wire from ground. The following paragraphs describe Scan-Lock operation.

Scan-Lock Operation

To advance to the next pattern, apply +VDC to the 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 lighthead. While applying +VDC to the VIO, turn the lighthead back on. Continue to apply voltage for 5 seconds.

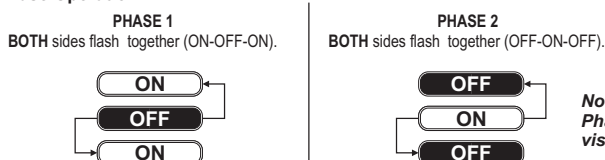
Lighthead configured to display the Phase 1 mode of a pattern will flash simultaneously. Any lighthead configured to display the Phase 2 mode will alternate with any Phase 1 lighthead with the same pattern.

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

To understand how to use the sync feature with more than two lighthead, the principles will be applied to a sample system consisting of 4 lighthead 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 lighthead. As shipped from factory, the lighthead 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.

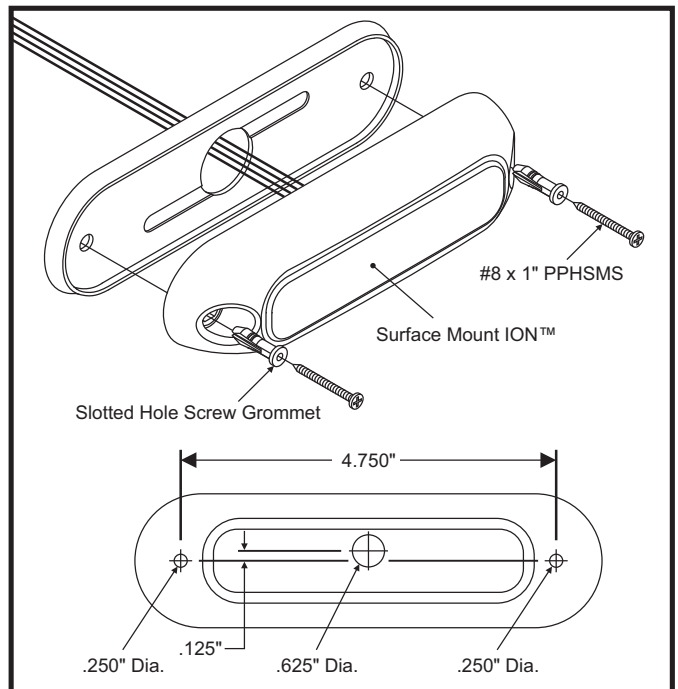
NOTE: SYNC-capable LED lighthead can be SYNCed to a SYNC-capable strobe power supply (such as the CS240S or UPS64LXA) by wiring their GREY wires together. When connected, LED lighthead in Phase 1 of a pattern will flash **simultaneously** with strobe lighthead connected to the GREEN wire outputs. LED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

Phase 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.



Pattern List:

Pattern#	Name	Cert.	Pattern#	Name	Cert.
1.	SignalAlert™ 75 PH1	1,2,3,4	18.	SingleFlash 90	1,2,3,4
2.	SignalAlert™ 75 PH2	1,2,3,4	19.	SingleFlash 120	1,2,3,4
3.	ComAlert™ 75 PH1	1,2,3,4	20.	SingleFlash 240	1, 3, 4
4.	ComAlert™ 75 PH2	1,2,3,4	21.	DoubleFlash 120	1,2,3,4
5.	CometFlash 75 PH1	1,2,3,4	22.	Tripleflash™ 120	1,2,3,4
6.	CometFlash 75 PH2	1,2,3,4	23.	ComAlert™ 150	1,2,3
7.	LongBurst™ 75 PH1	1,2,3,4	24.	PingPong™ 120	1,2,3,4
8.	LongBurst™ 75 PH2	1,2,3,4	25.	ActionFlash™ 60	1,2, 4
9.	PingPong™ 75 PH1	1,2,3,4	26.	ActionFlash™ 120	1,2,3,4
10.	PingPong™ 75 PH2	1,2,3,4	27.	Action SF 60/120	1,2, 4
11.	SingleFlash 75 PH1	1,2,3,4	28.	Action SF120/TF75	1,2,3,4
12.	SingleFlash 75 PH2	1,2,3,4	29.	ModuFlash	
13.	DoubleFlash 75 PH1	1,2,3,4	30.	CalScan	1,2,3,4
14.	DoubleFlash 75 PH2	1,2,3,4	31.	ActionScan	1, 3, 4
15.	Tripleflash™ 75 PH1	1,2,3,4	32.	SigAlert STEADY	
16.	Tripleflash™ 75 PH2	1,2,3,4	33.	STEADY	
17.	SingleFlash 60	1,2, 4			

Bold = SYNC Pattern
PH1 = Phase 1 PH2 = Phase 2

Note: Each pattern is certified compliant in up to 4 classifications, shown in the "Cert" column:

1. SAE
2. CA Title XIII
3. NFPA
4. KKK

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.