

# WHELEN<sup>®</sup>

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## Installation Guide: SmartLogic™ Flasher

### 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®, 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.**
- **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!**

### Selecting a mounting location...

One of the most common places chosen is against the rear wall of the cab. This is a good choice for several reasons, such as good air circulation and heat dissipation.

- **The unit should be mounted on a flat, metal surface to aid heat dissipation. Be sure that this surface is not one that either generates or is exposed to excessive heat during normal operation of the vehicle.**
  - **Do not select a location where the unit will be exposed to potential damage from any unsecured or loose equipment in the vehicle.**
  - **The mounting area should be easily accessible for wiring and service purposes. Be sure that the backside of the proposed mounting surface does not hide any wires, cables, fuel lines, etc., that could be damaged by drilling the mounting holes.**
  - **Be sure the area selected will not allow the unit to be exposed to water! Select a location towards the middle of the cab. Be sure that the mounting location is a minimum of 8" from the cab floor.**
  - **When the best mounting location has been determined, securely fasten the unit to its mounting surface using the supplied hardware.**
1. Position the unit in its proposed mounting location to ensure that it fits properly. With the unit in place, insert an awl or other suitable tool into the mounting hole area of the power supply and scribe the areas that are to be drilled.
  2. Remove the unit from its mounting location and, using a drill bit sized for a #10 sheet metal screw, drill a hole in each of the areas scribed in the previous step.
  3. Return the unit to its mounting location. Using the supplied #10 sheet metal screws, secure it onto its mounting surface.

### Wiring...

#### Power

Install the power pigtail assembly into its receptacle. Using appropriately sized wire, extend these wires from the flasher towards the vehicle battery.

Connect the Negative (-) wire to the NEG (-) battery terminal.

Connect the Positive (+) wire to a 40 Amp fuse block and then to the POS (+) battery terminal. **Do not install the fuse until all the wiring is complete!**

### Inputs/Outputs

There are a total of 8 inputs and 8 outputs. Each are programmable through the software interface. Each output is fused at 5 Amps. Do not install fuses larger than 5 amps! In their default configuration, the inputs will operate as follows:

| Input #<br>Activated | Result                                            |
|----------------------|---------------------------------------------------|
| 1                    | Outputs 1 & 2 will flash SignalAlert 75 (Phase 1) |
| 2                    | Outputs 3 & 4 will flash SignalAlert 75 (Phase 1) |
| 3                    | Outputs 5 & 6 will flash SignalAlert 75 (Phase 2) |
| 4                    | Outputs 7 & 8 will flash SignalAlert 75 (Phase 2) |
| 5                    | Not used in the default configuration             |
| 6                    | Not used in the default configuration             |
| 7                    | Not used in the default configuration             |
| 8                    | Initiates Low Power mode for Outputs 1 thru 8     |

### Grounds

8 terminals are provided for convenient electrical grounding.

### Photocell

If required, a Photocell may be connected to the flasher at the designated location shown.

### LED Indicators...

#### Input Indicators

There is a corresponding Green LED indicator for each input. Each input indicator will light when a signal has been detected at a given input.

#### Output Indicators

There is a corresponding multi-colored diagnostic LED indicator for each output. The indicator's behavior reflects the state of the output itself.

**Green** - The indicator will display a Green LED to indicate that its output is active. The Green indicator will flash at approximately the same rate as the pattern being displayed.

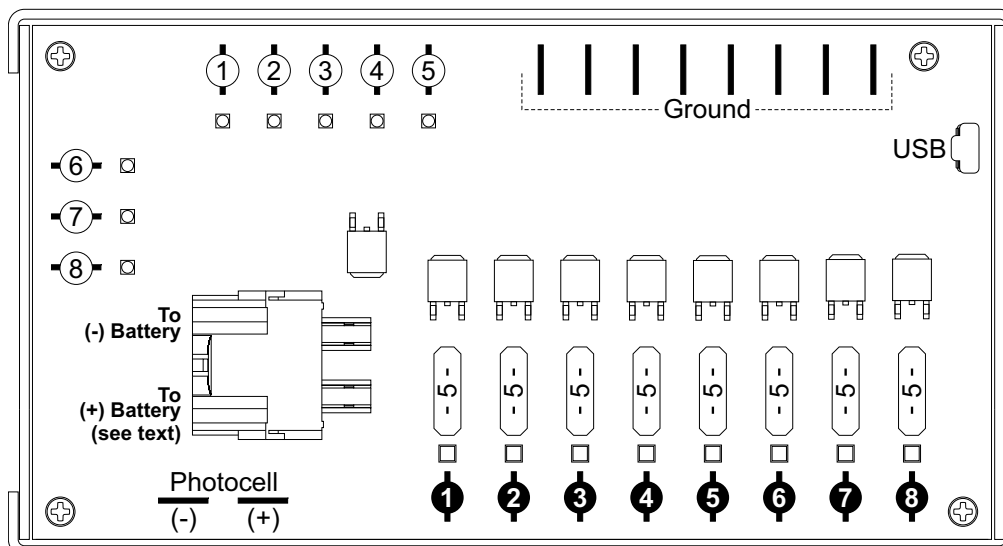
**Red (Flashing)** - The indicator will display a flashing Red LED when a low current condition (such as an open circuit or failed lighthouse) has been detected.

**Red (Steady)** - The indicator will display a steady Red LED when a high current condition (such as a short circuit) has been detected.

**IMPORTANT!** If the diagnostic indicator is displaying a Red LED, either steady or flashing, the cause must be identified and remedied before returning the vehicle to active duty.

### USB Port...

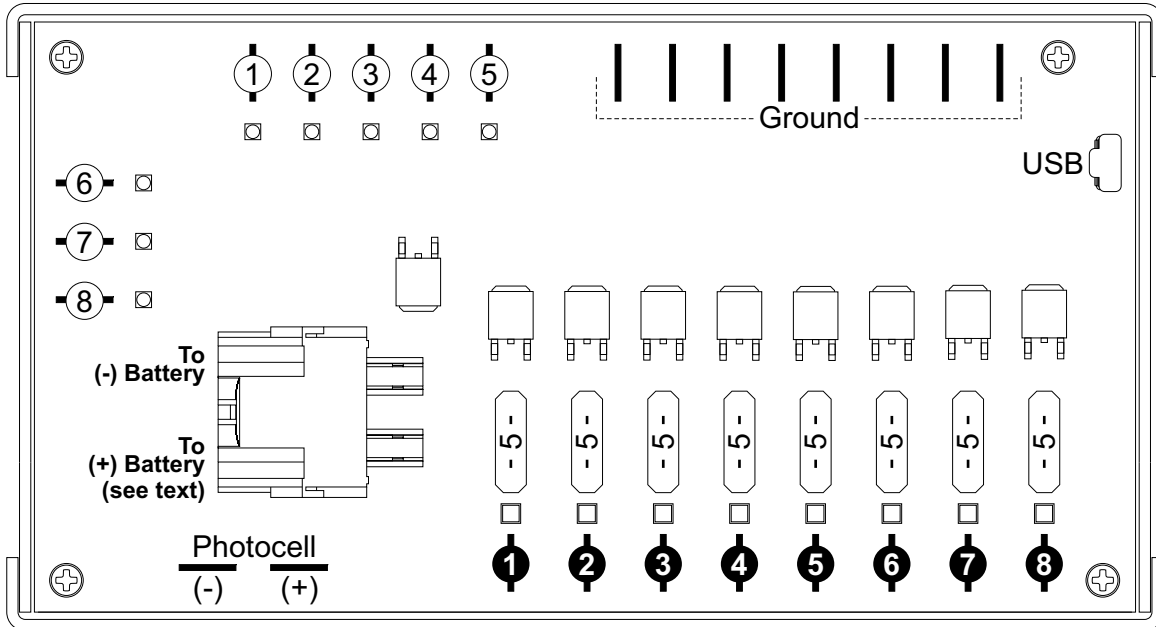
The USB port is for use with the programming software.



- = Input (1 thru 8)
- = Output (1 thru 8)

# Configuration Record:

*For future reference, record the destination of each output and input.*



- = Input (1 thru 8)
- = Output (1 thru 8)

| Description: | Assigned To: |
|--------------|--------------|
|--------------|--------------|

|           |       |
|-----------|-------|
| Output #1 | _____ |
| Output #2 | _____ |
| Output #3 | _____ |
| Output #4 | _____ |
| Output #5 | _____ |
| Output #6 | _____ |
| Output #7 | _____ |
| Output #8 | _____ |
|           |       |
| Input #1  | _____ |
| Input #2  | _____ |
| Input #3  | _____ |
| Input #4  | _____ |
| Input #5  | _____ |
| Input #6  | _____ |
| Input #7  | _____ |
| Input #8  | _____ |

# Wire Gauge Calculation Chart

## Maximum Current Draw Through The Wire

| Wire Gauge | 5 Amps     | 10 Amps    | 15 Amps      | 20 Amps      | 25 Amps      | 30 Amps      | 35 Amps      | 40 Amps      | 45 Amps      | 50 Amps      |
|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 22 AWG     | 6 Feet     | 3 Feet     | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 20 AWG     | 9.5 Feet   | 5 Feet     | 3 Feet       | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 18 AWG     | 15 Feet    | 7.5 Feet   | 5 Feet       | 4 Feet       | 3 Feet       | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 16 AWG     | 24.5 Feet  | 12 Feet    | 8 Feet       | 6 Feet       | 5 Feet       | 4 Feet       | 3.5 Feet     | 3 Feet       | Insufficient | Insufficient |
| 14 AWG     | 39 Feet    | 19.5 Feet  | 13 Feet      | 9.5 Feet     | 8 Feet       | 6.5 Feet     | 5.5 Feet     | 5 Feet       | 4.5 Feet     | 4 Feet       |
| 12 AWG     | 62 Feet    | 31 Feet    | 20.5 Feet    | 15.5 Feet    | 12.5 Feet    | 10.5 Feet    | 9 Feet       | 7.5 Feet     | 7 Feet       | 6 Feet       |
| 10 AWG     | 98 Feet    | 49 Feet    | 32.5 Feet    | 24.5 Feet    | 19.5 Feet    | 16.5 Feet    | 14 Feet      | 12.5 Feet    | 11 Feet      | 10 Feet      |
| 8 AWG      | 156 Feet   | 78 Feet    | 52 Feet      | 39 Feet      | 31 Feet      | 26 Feet      | 22.5 Feet    | 19.5 Feet    | 17.5 Feet    | 15.5 Feet    |
| 6 AWG      | 248.5 Feet | 124 Feet   | 82.5 Feet    | 62 Feet      | 49.5 Feet    | 41.5 Feet    | 35.5 Feet    | 31 Feet      | 27.5 Feet    | 25 Feet      |
| 4 AWG      | 395 Feet   | 197.5 Feet | 131 Feet     | 98.5 Feet    | 79 Feet      | 66 Feet      | 56.5 Feet    | 49.5 Feet    | 44 Feet      | 39.5 Feet    |
| 2 AWG      | 629 Feet   | 314 Feet   | 209 Feet     | 157 Feet     | 125.5 Feet   | 104.5 Feet   | 89.5 Feet    | 78.5 Feet    | 69.5 Feet    | 63 Feet      |

## Maximum Current Draw Through The Wire

| Wire Gauge | 55 Amps      | 60 Amps      | 65 Amps      | 70 Amps      | 75 Amps      | 80 Amps      | 85 Amps      | 90 Amps      | 95 Amps      | 100 Amps     |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 22 AWG     | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 20 AWG     | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 18 AWG     | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 16 AWG     | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 14 AWG     | 3.5 Feet     | 3 Feet       | 3 Feet       | 3 Feet       | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient | Insufficient |
| 12 AWG     | 5.5 Feet     | 5 Feet       | 5 Feet       | 4.5 Feet     | 4 Feet       | 4 Feet       | 3.5 Feet     | 3.5 Feet     | 3.5 Feet     | 3 Feet       |
| 10 AWG     | 9 Feet       | 8 Feet       | 7.5 Feet     | 7 Feet       | 6.5 Feet     | 6 Feet       | 6 Feet       | 5.5 Feet     | 5 Feet       | 5 Feet       |
| 8 AWG      | 14 Feet      | 13 Feet      | 12 Feet      | 11 Feet      | 10.5 Feet    | 10 Feet      | 9 Feet       | 8.5 Feet     | 8 Feet       | 8 Feet       |
| 6 AWG      | 22.5 Feet    | 20.5 Feet    | 19 Feet      | 17.5 Feet    | 16.5 Feet    | 15.5 Feet    | 14.5 Feet    | 14 Feet      | 13 Feet      | 12.5 Feet    |
| 4 AWG      | 36 Feet      | 33 Feet      | 30.5 Feet    | 28 Feet      | 26.5 Feet    | 24.5 Feet    | 23 Feet      | 22 Feet      | 21 Feet      | 19.5 Feet    |
| 2 AWG      | 57 Feet      | 52.5 Feet    | 48.5 Feet    | 45 Feet      | 42 Feet      | 39 Feet      | 37 Feet      | 35 Feet      | 33 Feet      | 31.5 Feet    |