

WHELEN[®]

ENGINEERING COMPANY INC.

51 Winthrop Road
Chester, Connecticut 06412-0684
Phone: (860) 526-9504
Fax: (860) 526-4078
Internet: www.whelen.com
Sales e-mail: autosale@whelen.com
Canadian Sales e-mail: canadiansales@whelen.com
Customer Service e-mail: custserv@whelen.com

Installation Guide:
Avenger™ Series LED Dash Light
Models: AVN1* (Single w/Cigar Cord)
AVN1# (Single/Split w/Cigar Cord)
AVN2 (Dual w/Cigar Cord)**
AVNS1* (Single w/Sync)
AVNS2 (Dual w/Sync)**

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.

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.**
- **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!**

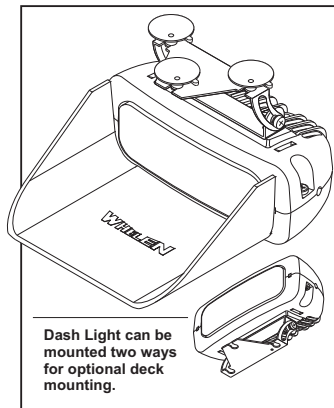
Mounting:

CAUTION! Nighttime operation of this product may produce reflected light within the vehicle! Use with caution!

CAUTION: This product has been designed to rest on top of the vehicle dashboard. Suction cups are used to prevent lateral movement while the vehicle is in motion. These suction cups should not be used to suspend this product above the dashboard.

1. Secure the lower mounting bracket to the Avenger™ (the Dual Avenger uses two brackets).
2. Slide the suction cups onto the upper mounting bracket and secure the upper mounting bracket onto the lower mounting bracket.
3. Attach the reflector tape to the visor hood and secure the visor hood to the unit.
4. With the Avenger resting on the top of the dashboard, apply the suction cups to the windshield. **Do not locate the Avenger in any location where it will interfere with the drivers ability to safely operate the vehicle. Refer to the safety warnings on the cover of this manual.**
5. Adjust the angle of the Avenger bracket until the visor hood is in full contact with the windshield.

There are holes on the upper bracket to be used if permanent mounting is desired. Using the upper bracket as a template, mark the areas where the mounting holes are to be drilled. Secure the unit using the appropriate hardware (customer supplied).



Wiring:

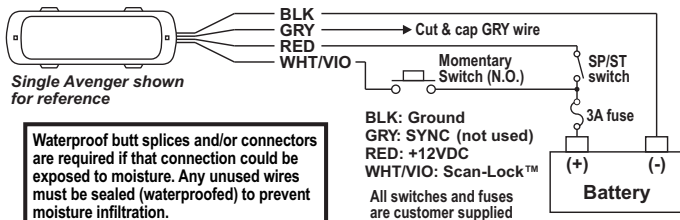
IMPORTANT AIR BAG WARNING! Do not install this product or route any wires in the air bag deployment zone of your vehicle. Equipment mounted or located in air bag deployment zones will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual to learn the air bag deployment zones for the vehicle. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.

The standard Avenger uses a cigar cord for power connection and no further wiring is necessary. This cord has a built in Power switch and a Scan-Lock™ pattern selection momentary switch. The Sync models must be wired as outlined below.

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!

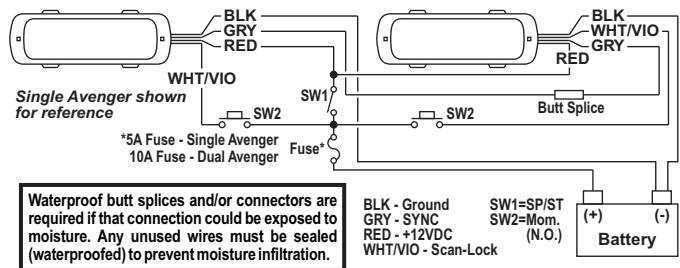
One (1) Sync Avenger (single or double)

1. Extend the RED wire to a Single Pole/Single Throw switch. From this switch, extend a wire to +12VDC. See the appropriate Parts Diagram for fusing information.
2. Extend the BLACK wire to chassis ground.
3. The GREY wire is not used. Cut & cap this wire.



Two (2) or more Sync Avengers (single or double)

1. Extend the RED wire from each Avenger to a Single Pole/Single Throw switch. From this switch, extend a wire to +12VDC. See the appropriate Parts Diagram for fusing information.
2. Extend the BLACK wires from each Avenger to chassis ground.
3. Butt splice the two GREY wires together.



Flash Pattern Selection:

To advance to the next flash pattern, press the pattern selection switch for less than 1 second. To cycle backwards to previous patterns, press the pattern selection switch for more than 1 second.

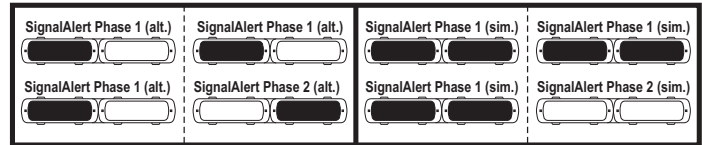
To reset to the factory default pattern: With power to the lighthouse off, press and hold the pattern selection switch. Turn the lighthouse on and keep the pattern selection switch depressed for at least 5 seconds before releasing.

Flash patterns for both Avengers are listed below.

Synchronizing the Single Avenger - To sync two or more lighthoods, configure all lighthoods to display the same **Phase 1** pattern. When the lighthoods are activated, the patterns displayed will be synchronized. To configure specific lighthoods to alternate their patterns with other lighthoods, advance the pattern of either lighthouse to the **Phase 2** mode of the current pattern.

Synchronizing the Dual Avenger - The dual Avenger has 4 unique modes for each syncable pattern; Alternating Phase 1, Alternating Phase 2, Simultaneous Phase 1 and Simultaneous Phase 2. In Alternating mode, the left lighthouse in a dual Avenger alternates with the right lighthouse. In Simultaneous mode, the left and right lighthouse in a dual Avenger flash simultaneously.

This diagram shows the relationship between two, dual sync'd Avengers. Keep in mind that all Avengers connected by the Grey wire must be configured to flash the same pattern (as shown, both Avengers are displaying Signal Alert™).



NOTE: BOLD = California Title XIII Compliant Pattern *Italic* = SYNC Patterns

Flash Patterns - Single Avenger w/Cigar Cord (Model AVN1*)

- | | | |
|--------------------------|----------------------|-----------------------|
| 1. SignalAlert™ 75 | 10. SingleFlash 120 | 19. TripleFlash™ 75 |
| 2. CometFlash® 75 | 11. SingleFlash 300 | 20. TripleFlash™ 120 |
| 3. DoubleFlash 75 | 12. DoubleFlash 150 | 21. SigAlert Cal.™ |
| 4. SingleFlash 75 | 13. ComAlert™ 150 | 22. Action SF 60/120 |
| 5. ComAlert™ 75 | 14. ActionFlash™ 50 | 23. Action SF120/TF75 |
| 6. LongBurst™ 75 | 15. ActionFlash™ 150 | 24. CalScan™ |
| 7. PingPong™ 75 | 16. ModuFlash™ | 25. ActionScan™ |
| 8. SingleFlash 60 | 17. DoubleFlash 120 | 26. SigAlert Steady™ |
| 9. SingleFlash 90 | 18. PingPong™ 120 | 27. Steady |

Flash Patterns - Single Avenger w/o Cigar Cord (Model AVN1S*)

- | | | |
|--------------------------------|------------------------------|------------------------|
| 1. <i>SignalAlert™ 75-PH.1</i> | 13. PingPong™ 75-PH.1 | 25. PingPong™ 120 |
| 2. <i>SignalAlert™ 75-PH.2</i> | 14. PingPong™ 75-PH.2 | 26. TripleFlash™ 75 |
| 3. CometFlash® 75-PH.1 | 15. SingleFlash 60 | 27. TripleFlash™ 120 |
| 4. CometFlash® 75-PH.2 | 16. SingleFlash 90 | 28. SigAlert Cal.™ |
| 5. DoubleFlash 75-PH.1 | 17. SingleFlash 120 | 29. Action SF 60/120 |
| 6. DoubleFlash 75-PH.2 | 18. SingleFlash 300 | 30. Action SF 120/TF75 |
| 7. <i>SingleFlash 75-PH.1</i> | 19. DoubleFlash 150 | 31. CalScan™ |
| 8. <i>SingleFlash 75-PH.2</i> | 20. ComAlert™ 150 | 32. ActionScan™ |
| 9. ComAlert™ 75-PH.1 | 21. ActionFlash™ 50 | 33. SigAlert Steady™ |
| 10. ComAlert™ 75-PH.2 | 22. ActionFlash™ 150 | 34. Steady |
| 11. LongBurst™ 75-PH.1 | 23. ModuFlash™ | |
| 12. LongBurst™ 75-PH.2 | 24. DoubleFlash 120 | |

Flash Patterns - Dual Avenger w/Cigar Cord (Model AVN2**)

- | | | |
|------------------------|--------------------------|---------------------------|
| 1. SignalAlert™ 75-ALT | 19. SingleFlash 90-SIM | 37. PingPong™ 120-SIM |
| 2. SignalAlert™ 75-SIM | 20. SingleFlash 120-ALT | 38. TripleFlash™ 75-ALT |
| 3. CometFlash® 75-ALT | 21. SingleFlash 120-SIM | 39. TripleFlash™ 75-SIM |
| 4. CometFlash® 75-SIM | 22. SingleFlash 300-ALT | 40. TripleFlash™ 120-ALT |
| 5. DoubleFlash 75-ALT | 23. SingleFlash 300-SIM | 41. TripleFlash™ 120-SIM |
| 6. DoubleFlash 75-SIM | 24. DoubleFlash 150-ALT | 42. SigAlert Cal.™-ALT |
| 7. SingleFlash 75-ALT | 25. DoubleFlash 150-SIM | 43. SigAlert Cal.™-SIM |
| 8. SingleFlash 75-SIM | 26. ComAlert™ 150-ALT | 44. Action SF 60/120-ALT |
| 9. ComAlert™ 75-ALT | 27. ComAlert™ 150-SIM | 45. Action SF 60/120-SIM |
| 10. ComAlert™ 75-SIM | 28. ActionFlash™ 50-ALT | 46. Action SF120/TF75-ALT |
| 11. LongBurst™ 75-ALT | 29. ActionFlash™ 50-SIM | 47. Action SF120/TF75-SIM |
| 12. LongBurst™ 75-SIM | 30. ActionFlash™ 150-ALT | 48. CalScan™-ALT/SIM |
| 13. PingPong™ 75-ALT | 31. ActionFlash™ 150-SIM | 49. ActionScan™-ALT/SIM |
| 14. PingPong™ 75-SIM | 32. ModuFlash™-ALT | 50. SteadyFlash 60 |
| 15. SSNF 75 | 33. ModuFlash™-SIM | 51. SteadyFlash 75 |
| 16. SingleFlash 60-ALT | 34. DoubleFlash 120-ALT | 52. SteadyFlash 90 |
| 17. SingleFlash 60-SIM | 35. DoubleFlash 120-SIM | 53. SteadyFlash 120 |
| 18. SingleFlash 90-ALT | 36. PingPong™ 120-ALT | 54. Steady & Steady |

Flash Patterns - Dual Avenger w/o Cigar Cord (Model AVN2S**)

- | | | |
|--------------------------------|------------------------------|---------------------------|
| 1. <i>SignalAlert™ 75-PH.1</i> | 24. LongBurst™ 75-PH.4 | 47. ModuFlash™-ALT |
| 2. <i>SignalAlert™ 75-PH.2</i> | 25. PingPong™ 75-PH.1 | 48. ModuFlash™-SIM |
| 3. <i>SignalAlert™ 75-PH.3</i> | 26. PingPong™ 75-PH.2 | 49. DoubleFlash 120-ALT |
| 4. <i>SignalAlert™ 75-PH.4</i> | 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. TripleFlash™ 120-SIM |
| 12. DoubleFlash 75-PH.4 | 35. SingleFlash 120-ALT | 58. SigAlert Cal.™-ALT |
| 13. SingleFlash 75-PH.1 | 36. SingleFlash 120-SIM | 58. SigAlert Cal.™-SIM |
| 14. SingleFlash 75-PH.2 | 37. SingleFlash 300-ALT | 59. Action SF 60/120-ALT |
| 15. SingleFlash 75-PH.3 | 38. SingleFlash 300-SIM | 60. Action SF 60/120-SIM |
| 16. SingleFlash 75-PH.4 | 39. DoubleFlash 150-ALT | 61. Action SF120/TF75-ALT |
| 17. ComAlert™ 75-PH.1 | 40. DoubleFlash 150-SIM | 62. Action SF120/TF75-SIM |
| 18. ComAlert™ 75-PH.2 | 41. ComAlert™ 150-ALT | 63. CalScan™-ALT/SIM |
| 19. ComAlert™ 75-PH.3 | 42. ComAlert™ 150-SIM | 64. ActionScan™-ALT/SIM |
| 20. ComAlert™ 75-PH.4 | 43. ActionFlash™ 50-ALT | 65. SteadyFlash 60 |
| 21. LongBurst™ 75-PH.1 | 44. ActionFlash™ 50-SIM | 66. SteadyFlash 75 |
| 22. LongBurst™ 75-PH.2 | 45. ActionFlash™ 150-ALT | 67. SteadyFlash 90 |
| 23. LongBurst™ 75-PH.3 | 46. ActionFlash™ 150-SIM | 68. SteadyFlash 120 |
| | | 69. Steady & Steady |