Installation and Operation Instructions

Low Frequency Speaker with Amplifier

IMPORTANT! Read all instructions before installing and using. Installer: This manual must be delivered to the end user.

WARNING!
Failure to install or use this product according to manufacturer's recommendations may result in property damage, serious injury, and/or death to those you are seeking to protect!

Do not install and/or operate this safety product unless you have read and understood the safety information contained in this manual.

1. **Proper installation combined with operator training in the use, care, and maintenance of emergency warning devices are essential to ensure the safety of emergency personnel and the public.**
2. **Emergency warning devices often require high electrical voltages and/or currents. Exercise caution when working with live electrical connections.**
3. **This product must be properly grounded. Inadequate grounding and/or shorting of electrical connections can cause high current arcing, which can cause personal injury and/or severe vehicle damage, including fire.**
4. **Proper placement and installation is vital to the performance of this warning device. Install this product so that output performance of the system is maximized and the controls are placed within convenient reach of the operator so that they can operate the system without losing eye contact with the roadway.**
5. **Do not install this product or route any wires in the deployment area of an air bag. Equipment mounted or located in an air bag deployment area may reduce the effectiveness of the air bag or become a projectile that could cause serious personal injury or death. Refer to the vehicle owner's manual for the air bag deployment area. It is the responsibility of the user/operator to determine a suitable mounting location ensuring the safety of all passengers inside the vehicle particularly avoiding areas of potential head impact.**
6. **It is the responsibility of the vehicle operator to ensure daily that all features of this product work correctly. In use, the vehicle operator should ensure the projection of the warning signal is not blocked by vehicle components (i.e., open trunks or compartment doors), people, vehicles or other obstructions.**
7. **The use of this or any other warning device does not ensure all drivers can or will observe or react to an emergency warning signal. Never take the right-of-way for granted. It is the vehicle operator's responsibility to be sure they can proceed safely before entering an intersection, drive against traffic, respond at a high rate of speed, or walk on or around traffic lanes.**
8. **This equipment is intended for use by authorized personnel only. The user is responsible for understanding and obeying all laws regarding emergency warning devices. Therefore, the user should check all applicable city, state, and federal laws and regulations. The manufacturer assumes no liability for any loss resulting from the use of this warning device.**

Specifications

Input Voltage:	12VDC
Input Current:	8A @ 12VDC Nominal (100W) 16A @ 12VDC Nominal (2 x 100W)
Standby Current:	<0.125mA
Fuse:	20A
Operating Frequency Range:	125Hz - 1kHz
Output Power:	2 x 100W Max. (8Ω Speaker)
Temp. Range:	-40ºC - 65ºC -40ºF - 149ºF

WARNING!
Sirens produce loud sounds that may damage hearing.

- **Wear hearing protection when testing**
- **Use siren only for emergency response**
- **Roll up windows when siren is operating**
- **Avoid exposure to the siren sound outside of vehicle**

IMPORTANT WARNINGS TO USERS OF SIRENS: "Wail" and "Yelp" tones are in some cases (such as the state of California) the only recognized siren tones for calling for the right of way. Ancillary tones such as "Air Horn", "Hi-Lo", "Hyper-Yelp", and "Hyper-Lo" in some cases do not provide as high a sound pressure level. It is recommended that these tones be used in a secondary mode to alert motorists to the presence of multiple emergency vehicles or to the momentary shift from the primary tone as an indication of the imminent presence of any emergency vehicle.

Low Frequency Configuration

Low Frequency Tone - The Low Frequency feature will only operate when the primary siren system is generating a tone. When there is a signal from a primary siren and the Low Frequency input is activated, the Low Frequency Siren can generate one of three Low Frequency tones. The Low Frequency input can be activated with a momentary switch and the Low Frequency Siren will generate the Low Frequency tone for 7.5 to 60 seconds based on the Time-Out configuration settings (see Low Frequency Time-Out).

The available tones are:

- Divide main amplifier signal by 4 (1/4 Octave)
- Divide main amplifier signal by 2 (1/2 Octave)
- Divide main amplifier signal by 4 & 2 (1/4 & 1/2 Octave)

To configure the Low Frequency Tone, set the DIP switches according to Table 1.

Low Frequency Time-Out - A momentary switch, such as the vehicle horn ring, can be used to activate the Low Frequency tone. The Low Frequency Time-Out can be configured to operate from 7.5 to 60 seconds. If the Low Frequency input is activated by a toggle On/Off switch the Time-Out feature will shut off the Low Frequency tone after the configured time has expired. The Low Frequency input will have to be turned off before it can be activated again.

To configure the Low Frequency Time-Out set the DIP switches according to Table 1.

Table 1

	SW1	SW2	SW3	SW4	SW5	SETTING
Time-Out Selection	0	0	0			7.5 seconds - Default
	0	0	1			15 seconds
	0	1	0			22.5 seconds
	0	1	1			30 seconds
	1	0	0			37.5 seconds
	1	0	1			45 seconds
	1	1	0			52.5 seconds
	1	1	1			60 seconds
Frequency Divide Selection				0	0	Divide main amplifier signal by 4 (1/4 Octave) - Default
				0	1	Divide main amplifier signal by 2 (1/2 Octave)
				1	0	Divide main amplifier signal by 4 & 2 (1/4 & 1/2 Octave)
				1	1	Divide main amplifier signal by 4 (1/4 Octave)

Installation and Mounting

The Low Frequency Amplifier may be mounted in the trunk or a console near the primary siren. There are four mounting slots on the Low Frequency Amplifier. All connections are made on one side of the siren. Mount the siren to allow for easy access to this side. All connections are made to the quick disconnect harness. See wiring diagram on page 9 for details.

Note: The safety of the vehicle occupants as well as the ease of operation and convenience to the operator should be the prime consideration when mounting the siren and controls.

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. Ease of operation and convenience to the operator should be the prime consideration when mounting the siren and controls. Adjust the mounting angle to allow maximum operator visibility. Do not mount the Control Head Module in a location that will obstruct the drivers view. Mount the microphone clip in a convenient location to allow the operator easy access. Devices should be mounted only in locations that conform to their SAE identification code as described in SAE Standard J1849. For example, electronics designed for interior mounting should not be placed underhood, etc. Controls should be placed within convenient reach* of the driver or if intended for two person operation the driver and/or passenger. In some vehicles, multiple control switches and/or using methods such as "horn ring transfer" which utilizes the vehicle horn switch to toggle between siren tones may be necessary for convenient operation from two positions.

Convenient reach is defined as the ability of the operator of the siren system to manipulate the controls from their normal driving/riding position without excessive movement away from the seat back or loss of eye contact with the roadway.

Notes:

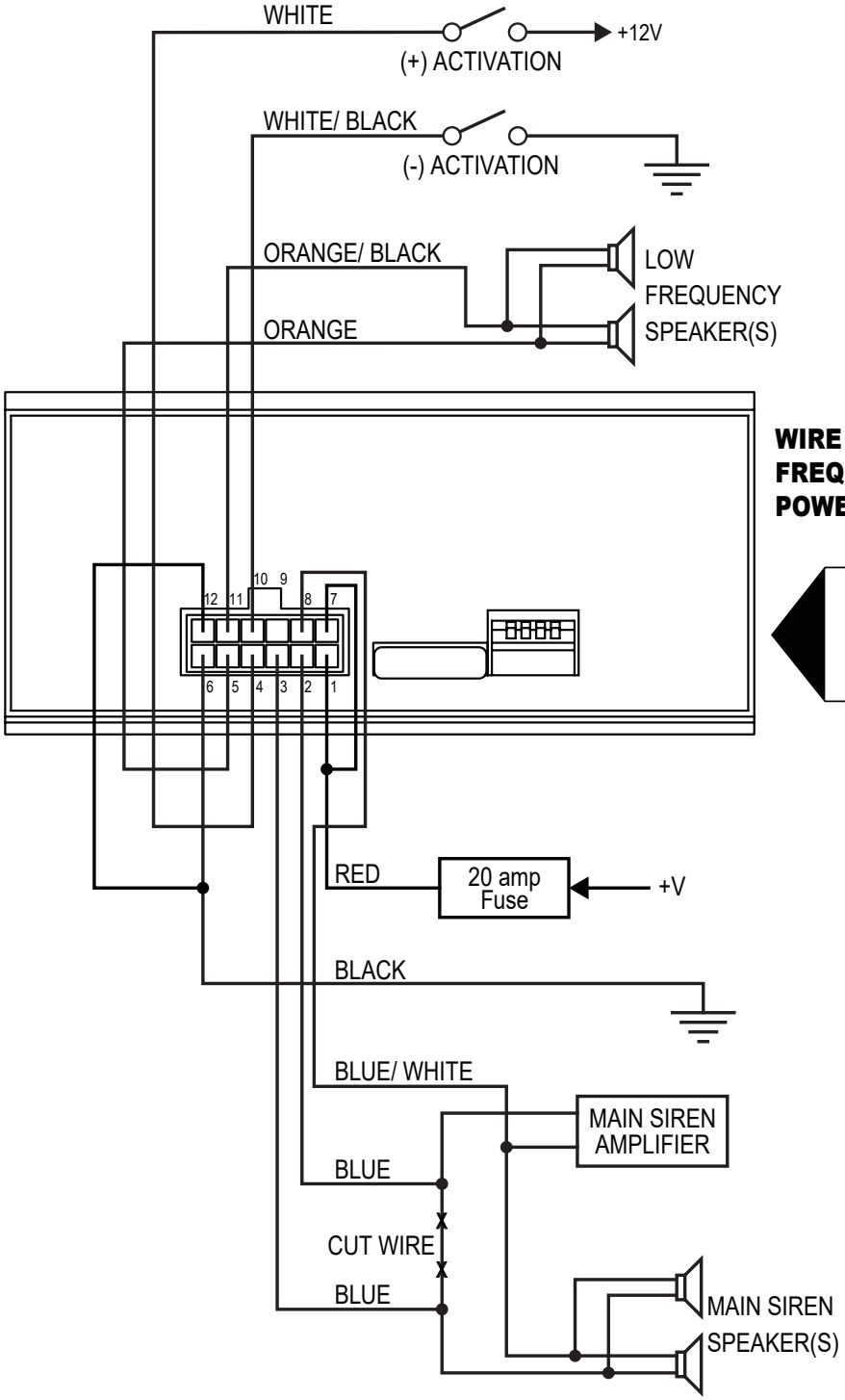
1. **Larger wires and tight connections will provide longer service life for components. For high current wires it is highly recommended that terminal blocks or soldered connections be used with shrink tubing to protect the connections. Do not use insulation displacement connectors (e.g., 3M Scotchlock type connectors).**
2. **Route wiring using grommets and sealant when passing through compartment walls. Minimize the number of splices to reduce voltage drop. All wiring should conform to the minimum wire size and other recommendations of the manufacturer and be protected from moving parts and hot surfaces. Looms, grommets, cable ties, and similar installation hardware should be used to anchor and protect all wiring.**
3. **Fuses or circuit breakers should be located as close to the power takeoff points as possible and properly sized to protect the wiring and devices.**
4. **Particular attention should be paid to the location and method of making electrical connections and splices to protect these points from corrosion and loss of conductivity.**
5. **Ground termination should only be made to substantial chassis components, preferably directly to the vehicle battery.**
6. **Circuit breakers are very sensitive to high temperatures and will "false trip" when mounted in hot environments or operated close to their capacity.**

The user should install a fuse sized to approximately 125% of the maximum Amp capacity in the supply line and each switched circuit to protect against short circuits. For example, a 30 Amp fuse should carry a maximum of 24 Amps. DO NOT USE 1/4" DIAMETER GLASS FUSES AS THEY ARE NOT SUITABLE FOR CONTINUOUS DUTY IN SIZES ABOVE 15 AMPS. Fuses or circuit breakers should be located as close to the power takeoff points as possible and properly sized to protect the wiring and devices.

Wiring Instructions

Harness Connections

The Low Frequency Amplifier is designed so that the main Harness can be connected to the vehicle battery at all times. The siren will enter into a low current standby mode when none of the inputs are activated. Connect the BLACK ground wire to the negative terminal of the battery. Use the appropriate wire gauge rated at 125% of the current required to operate the Low Frequency Amplifier (see Specifications for current draw). Connect the RED power wire through a fuse to the positive terminal of the battery. Use the appropriate wire gauge and fuse rated at 125% of the current required to operate the Low Frequency Amplifier (see Specifications for current draw). The fuse should be located as close as possible to the vehicle battery to protect the wiring. See Wiring Diagram for details.



WIRE CAPACITY REQUIREMENTS FOR LOW FREQUENCY SIREN AMPLIFIER (INCOMING POWER) - EACH SUPPLY AND GROUND WIRE:

Wire Length	Minimun Wire Gauge
0 -10 FEET	14 AWG
10 -20 FEET	12 AWG
20-30 FEET	10 AWG
30+ FEET	CONSULT FACTORY

Wire Color	Pin(s)	Function
Red	1 & 7	Power Input (+12VDC).
Blue	2 & 3	Connect these wires to the primary amplifier speaker output as shown in the wiring diagram.
Blue/White	8	
White	4	Connect to +12VDC to activate the low frequency tone. A momentary switch will start the built-in timer. The tone will cancel after the configured time-out expires. NOTE: A primary siren signal must be active for the low frequency siren to activate.
White/Black	10	Connect to GROUND to activate the low frequency tone. A momentary switch will start the built-in timer. The tone will cancel after the configured time-out expires. NOTE: A primary siren signal must be active for the low frequency siren to activate.
Orange	5	Low Frequency Speaker connection. DO NOT connect to a standard siren speaker. Route the ORANGE and ORANGE/BLACK wires from connector to the low frequency siren speaker. Use a minimum of 18 AWG wire to extend wires as needed. Connect the ORANGE wire to the speaker RED wire. Connect the ORANGE/BLACK wire to the speaker BLACK wire.
Orange/Black	11	
Black	6 & 12	Ground

Warranty

Manufacturer Limited Warranty Policy:

Manufacturer warrants that on the date of purchase this product will conform to Manufacturer's specifications for this product (which are available from the Manufacturer upon request). This Limited Warranty extends for Sixty (60) months from the date of purchase.

DAMAGE TO PARTS OR PRODUCTS RESULTING FROM TAMPERING, ACCIDENT, ABUSE, MISUSE, NEGLIGENCE, UNAPPROVED MODIFICATIONS, FIRE OR OTHER HAZARD; IMPROPER INSTALLATION OR OPERATION; OR NOT BEING MAINTAINED IN ACCORDANCE WITH THE MAINTENANCE PROCEDURES SET FORTH IN MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS VOIDS THIS LIMITED WARRANTY.

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This Limited Warranty defines specific legal rights. You may have other legal rights which vary from jurisdiction to jurisdiction. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages.

Product Returns:

If a product must be returned for repair or replacement*, please contact our factory to obtain a Return Goods Authorization Number (RGA number) before you ship the product to Code 3®, Inc. Write the RGA number clearly on the package near the mailing label. Be sure you use sufficient packing materials to avoid damage to the product being returned while in transit.

*Code 3®, Inc. reserves the right to repair or replace at its discretion. Code 3®, Inc. assumes no responsibility or liability for expenses incurred for the removal and /or reinstallation of products requiring service and/or repair.; nor for the packaging, handling, and shipping: nor for the handling of products returned to sender after the service has been rendered.

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