

## Safety Message to Installers of Warning Light Equipment

### **⚠ WARNING**

**People's lives depend on your safe installation of our products. It is important to read, understand, and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:**

- To properly install the equipment described in this instruction sheet, you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and use of safety warning equipment.
- DO NOT install equipment or route wiring in the deployment path of an airbag.
- Locate the control head so the VEHICLE and CONTROLS can be operated safely under all driving conditions.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could get damaged.
- After installation and testing are complete, provide a copy of these instructions to instructional staff and all operating personnel.
- File these instructions in a safe place and refer to them when maintaining or reinstalling the product.

**Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.**

## Overview

The 6-Button Control Head for Wireless Lightbar Systems is designed to operate with special Federal Signal lightbar models in the ARJENT® S2, LEGEND®, and RAYDIAN® S2 series. It has six backlit pushbuttons and a slide switch with LED indicators for activating different functions. The commands to the lightbar are transmitted via radio waves, using advanced encryption methods. The 12 Vdc power for the control head comes from a 3-wire power connector on its right side. To conserve the vehicle battery when the ignition is off, a built-in ignition timer turns off the lightbar after a programmed number of hours have lapsed.

You can select one of six preprogrammed keypad configurations. Each keypad has between one and three flashing modes, producing distinct flash patterns. You can also change the default flash patterns assigned to the MODE buttons and slide switch modes. The remaining switches (buttons or slide switch) activate additional lightbar functions, such as front or rear light cutoff, takedown or worklights, alley lights, low power, and SIGNALMASTER™ directional and warn patterns. For more information, see "Selecting a Keypad Configuration" on page 6 and "Selecting a Flash Pattern" on page 7.

## Product Specifications

Dimensions:

Height	3.17 in (8.05 cm)
Width	2.93 in (7.45 cm)
Depth of Housing	1.08 in (2.75 cm)
Depth of Switches	2.00 in (5.10 cm)
Weight:	0.29 lb (0.13 kg)

## Unpacking the Product

After unpacking the control head, inspect it for damage that may occurred in transit. If it has been damaged, do not attempt to install or operate it. File a claim immediately with the carrier, stating the extent of the damage. Carefully check all envelopes, shipping labels, and tags before removing or destroying them. Ensure that the parts listed in *Table 1* are contained in the packing carton.

*Table 1: Parts list*

Qty.	Description
1	Swivel Mount Kit with 3 Screws
2	Mounting Clips
4	Clip Screws
1	Velcro Hook
1	Velcro Loop
1	Sheet of Adhesive Button Legends
1	12-inch Power Lead Wire Assembly

## Mounting the Control Head

The control head is supplied with hardware for two mounting methods: swivel mount or a hook-and-loop mount. A hinged bracket mount is also available, but not included. The mounting method depends on the mounting location, available room, and user preference.

### **⚠ WARNING**

#### **MOUNTING PRECAUTION**

**Unreliable switch activation and loss of “tactile feedback” will result if the method for mounting the control head allows the keypad to move. DO NOT mount the control head on padded surfaces.**

**Failure to heed this warning could result in driver distraction or error when operating the vehicle, causing serious injury or death to you or others.**

### **⚠ WARNING**

#### **AIRBAG DEPLOYMENT**

**Do not install equipment or route wiring in the deployment path of an airbag.**

**Failure to observe this warning will reduce the effectiveness of the airbag or potentially dislodge the equipment, causing serious injury to you or others.**

### Swivel Mounting:

1. Choose a location for the control head that allows the vehicle and controls to be operated safely at all times.
2. Loosely attach the mounting clips to the back of the control head's housing with the mounting clip screws (*Figure 1*). The beveled edges of the clips must face the center of the housing as shown in the illustration.
3. Slide the swivel mount into place and tighten the clips, making sure you can remove the swivel mount.
4. Remove the swivel mount assembly and set the control head aside.
5. Using the swivel mount assembly as a guide, scribe the three drill-position marks at the selected mounting location.

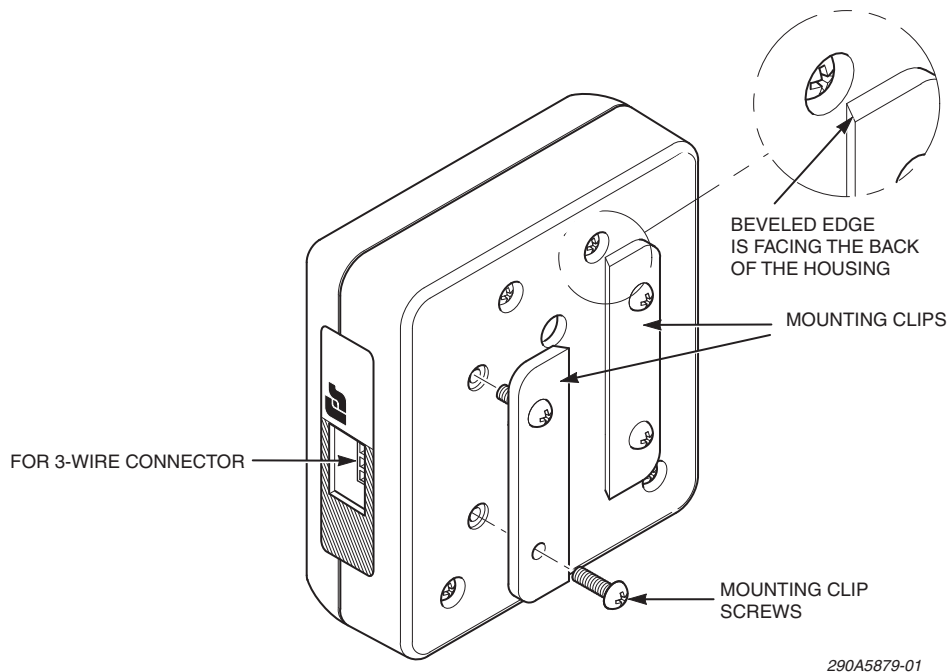


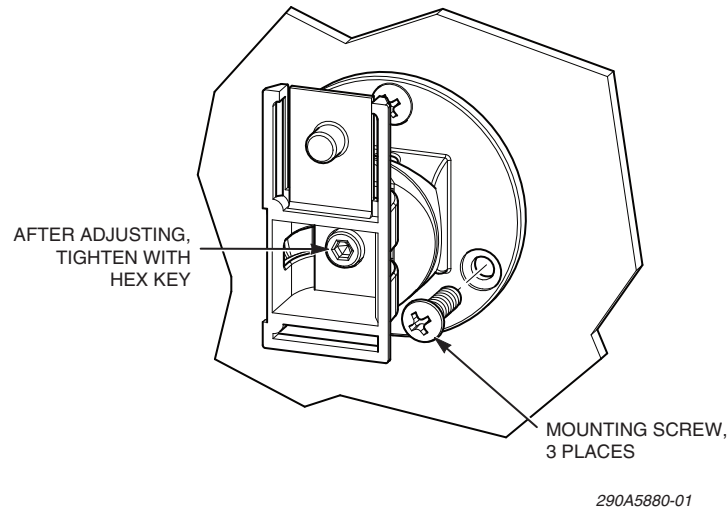
Figure 1: Mounting clips installed on back of control head

### NOTICE

#### DRILLING PRECAUTIONS

**Before drilling holes, check the area into which you plan to drill to ensure you do not damage vehicle components while drilling. All drilled holes should be deburred and all sharp edges should be smoothed. All wires going through drilled holes should be protected by a grommet or convolute/split-loom tubing.**

6. Drill three 1/8-inch mounting holes at the marked positions.
7. Secure the swivel mount assembly to the mounting surface with the three Phillips head screws (*Figure 2* on page 4).



*Figure 2: Swivel mount assembly secured to mounting surface*

8. Adjust the swivel mount assembly for maximum access to the 6-button controller.
9. Tighten the hex-head screw using a 3 mm hex key or 7/64-inch hex key (*Figure 2*).
10. Slide the controller onto the swivel mount assembly.

### ***Hook-and-Loop Mounting:***

**NOTE:** The hook-and-loop mounting method is for storing the control head when it is not in use. The hook-and-loop material may not provide sufficient rigidity for proper operation of the control head.

1. Choose a location for the control head that allows the vehicle and controls to be operated safely at all times.

**NOTE:** The mounting surfaces of the hook-and-loop pad must be clean and dry for proper adhesion. If necessary, use a mixture of isopropyl alcohol and water to clean the mounting surfaces.

2. Remove the paper backing from the hook pad and affix the pad to the back of the control head.
3. Remove the paper backing from the loop pad and affix the pad to the mounting surface.
4. Place the control head in position by mating the hook and loop surfaces, pressing firmly.

## Making the Electrical Connections

The special lightbar models for wireless systems have no control wires. Follow the instructions shipped with the lightbars to connect their power and ground wires.

The 12 Vdc power for the control head comes from a 3-wire power connector on its right side (*Figure 1* on page 3). Extend the wires, if needed, with 18 AWG minimum wire.

1. Connect the red wire to the positive (+BAT) battery terminal switch.
2. Connect the white wire to a circuit controlled by the vehicle ignition switch.
3. Connect the black wire to a known good vehicle ground.

## Safety Message to Operators

### WARNING

**People's lives depend on your safe installation of our products. It is important to read, understand, and follow all instructions shipped with the products. In addition, listed below are some other important safety instructions and precautions you should follow:**

- Be aware that the use of your visual signaling device does not give you the right to force your way through traffic. Your emergency lights and actions are REQUESTING the right-of-way.
- Although your warning system is operating properly, it may not alert everyone. People may not see or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Situations may occur which obstruct your warning when natural or man-made objects are between your vehicle and others, such as raising your hood or trunk lid. If these situations occur, be especially careful.
- At the start of your shift, you should ensure that the light system is securely attached to the vehicle and operating properly.

**Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.**

## Operating the Control Head

The control head is shipped fully programmed with default keypad functions, flash patterns, and ignition timer settings. No further programming is necessary, unless you want to change the settings.

The buttons are positioned 1 to 6 from upper left to lower right. When you unplug the power connector from the control head and plug it back in, the control head first lights the button that corresponds to the keypad number (*Figure 3* on page 10). The button then blinks the number of times that correspond to the keypad number. After that, all buttons remain off when the ignition is off or light up dimly when ignition is in the accessories or start position.

When the ignition is off, the buttons and slide switch do not respond when selected. When the ignition is in the accessories or start position, the press of a button sends a radio command to the lightbar and a second press turns it off. If the button has more than one function, each

press steps through the functions until a final press turns it off. To indicate the transmission of a command, the keypad buzzer beeps and the selected button lights up to full brightness.

Some buttons are dependent, which means that pressing another button turns them off. Dependent buttons include flashing Modes 1 to 3 and SIGNALMASTER directional signals.

For more information, see "Selecting a Keypad Configuration" below and "Selecting a Flash Pattern" on page 7. See also "Setting the Ignition Timer" on page 8.

**⚠ WARNING**

**HEED THE LIGHTBAR FAILURE ALARM**

**The lightbar and control head are wireless devices and may lose communication, which can affect the operation of the system. Heed the lightbar failure alarm. Adjust your driving and use extra caution around your vehicle as if the lightbar was not operating. When working outside your vehicle, periodically check your warning lights to make sure they are working.**

**Failure to heed this warning may result in serious injury or death to you or others.**

## The Lightbar Failure Alarm

The control head monitors the state of the lightbar through its wireless connection. When there is a problem with the lightbar, such as a loss of power or a loss of wireless transmission, an alarm activates. The alarm consists of a shrieking buzzer and three lit keypad LEDs. The alarm stops when the lightbar resumes normal operation.

If the problem persists, you can turn off the alarm by turning off all active switches, unplugging the power connector from the control head, or turning the ignition off. You must determine the cause of the lightbar failure before continuing. For example, the lightbar may not be getting the power to turn on or did not receive the radio-transmitted command to turn off.

**⚠ WARNING**

**PRECAUTIONS FOR KEYPAD PROGRAMMING**

**Property damage, serious injury, or death to you or others may result if the keypad is improperly programmed. Programming is to be performed at the time of the control head's installation. It is NOT intended for operators to "customize" the control head's operation for their individual preferences. It is the installer's responsibility to determine compatibility, suitability, and ensure proper programming of the system. In addition, the person responsible for programming MUST be familiar with local codes and procedures for the safe operation of emergency-vehicle siren and lights.**

## Selecting a Keypad Configuration

Table 2 on page 9 and Figure 3 on page 10 show the six selectable keypad configurations with the functions of each button and slide switch position.

1. Press the top three buttons simultaneously. The buttons flash three times and the controller beeps three times to indicate it is ready to be reconfigured. The button that is not flashing identifies the keypad number. For example, if Keypad #1 is active, button #1 does not flash.

2. To select a configuration, press any of the flashing buttons or press the non-flashing button to re-select its associated configuration.
3. The button you select flashes and beeps the number of times that corresponds to the button's position on the keypad. The buttons are positioned 1 to 6 from upper left to lower right.
4. Exit Keypad Configuration Mode by removing power from the control head or letting the keypad time-out after approximately 15 seconds.

## Selecting a Flash Pattern

Each keypad has up to three switches, either buttons or slide switch positions, assigned to activating a flash pattern. About a dozen flash patterns are available for each mode.

### WARNING

#### LIGHT HAZARDS

**To be an effective warning device, this product produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into this lighting product at a close range or permanent damage to your eyesight may occur.**

### ***Selecting a Flash Pattern for a MODE Button***

To select a flash pattern for a MODE button:

1. Press the bottom three buttons simultaneously. The buttons flash three times and the controller beeps three times to indicate the keypad is ready to be programmed.
2. Buttons that are assigned flash patterns have flashing LEDs. To change the flash pattern assigned to a button, press the button repeatedly to step through the lightbar's flash patterns. The button's LED flashes twice as fast as the other buttons available for programming.
3. When the flash pattern you want appears on the lightbar, press a different flashing button to program a different button, or exit Programming Mode by either removing power or letting the keypad time-out after approximately 15 seconds.

### ***Selecting a Flash Pattern for a Slide Switch Mode Position***

To select a flash pattern for a slide switch mode position:

1. Simultaneously press the bottom three buttons. The buttons flash three times and the controller beeps three times to indicate the keypad is ready to be programmed.
2. Move the slide switch to an active position. The three buttons directly above the slide switch become active and the button corresponding to the selected slide switch position flashes twice as fast as the other two positions. Press this button repeatedly to step through the lightbar's flash patterns.
3. When the flash pattern you want appears on the lightbar, move the slide switch to another position to program another position, or exit Programming Mode by removing power or letting the keypad time-out after approximately 15 seconds.

## **Setting the Ignition Timer**

To conserve the vehicle battery, the control head includes a built-in ignition timer. If you press one or more buttons or select a slide switch position and then turn the ignition off, the timer keeps the selected functions on for the selected number of hours. The default number of hours is 0, which shuts the lightbar off immediately when the ignition is off. To indicate that the timer is on, LED 1 above the slide switch pulses slowly. Without ignition power, the switches do not accept user commands and the backlighting is off.

To change the timer setting:

1. Turn the ignition key to the accessories position.
2. Simultaneously press buttons 1, 3 and 5 (upper left and right and lower center). To indicate that the timer is ready to be reset, buttons in the top and middle rows flash, forming the letter "T."
3. Press buttons 1, 2, 3, 4, or 6 to choose the corresponding number of hours. Button 5 selects 8 hours.
4. Move the slide switch to Position 1 for 0 hours.
5. After you make your selection or after 5 seconds, the controller exits the Timer Programming Mode, beeping the number of hours selected.

To turn off the timed functions before the end of their scheduled duration:

1. Turn the ignition to the accessories position.
2. Turn off the buttons and slide switch.
3. Turn the ignition off.

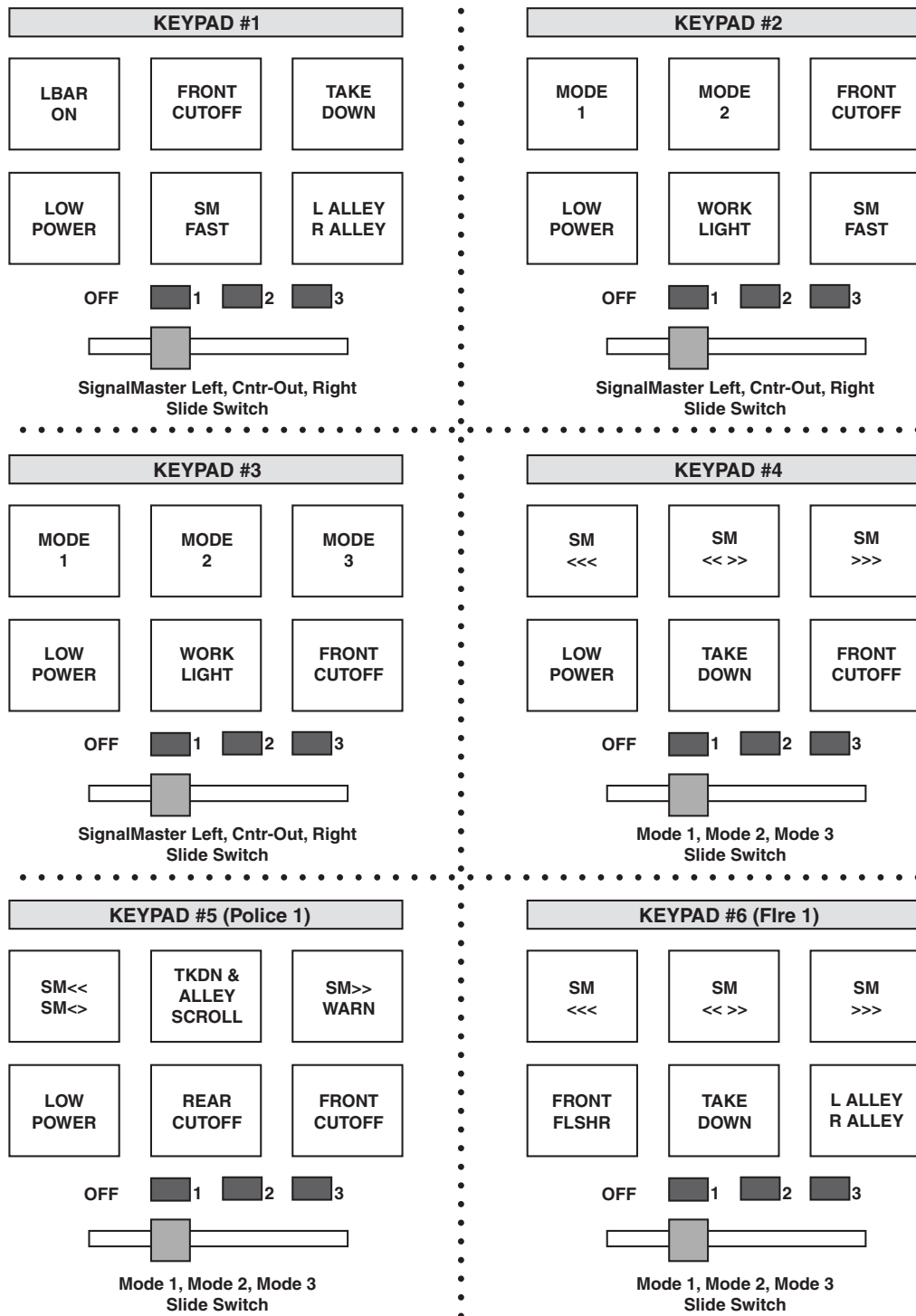


## Keypad Configurations

Table 2 defines the keypad functions. Figure 3 on page 10 shows the selectable keypad configurations.

Table 2: Configured keypad functions

<b>Legend</b>	<b>Description</b>
LBAR ON	Turns on the lightbar
SM <<<	SIGNALMASTER Left directional pattern
SM >>>	SIGNALMASTER Right directional pattern
SM << >>	SIGNALMASTER Center Out directional pattern
SM<< SM<>	Step-through selection of SIGNALMASTER Left and Center Out directional patterns
SM>> WARN	Step-through selection of SIGNALMASTER Right directional pattern and Warn pattern
SM FAST	Increases the build speed and the urgency of the SIGNALMASTER warning pattern
TKDN & ALLEY SCROLL	Step-through selection of Takedown and Left and Right Alley lights
L ALLEY/R ALLEY	Left Alley on the first push of the button and Right Alley on the second push
LOW POWER	Dims the lightbar approximately 50 percent
FRONT CUTOFF	Turns off lights on the front of the lightbar
REAR CUTOFF	Turns off lights on the rear of the lightbar
TAKEDOWN	Turns on bright white lights on the front of the lightbar
WORKLIGHT	Turns on bright white lights on the rear of the lightbar
FRONT FLASHER	Flashes halogen lights on the front of the lightbar in Modes 1, 2, and 3
MODES 1, 2, 3	Selectable flash patterns for MODE buttons or the slide switch



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Figure 3: Selectable keypad configurations

## Applying the Replaceable Keypad Labels

Replaceable keypad labels identify the switches on the control head. A sheet of applicable function legends is supplied. Peel the appropriate labels from the sheet and apply them to the keypad in the areas shown in *Figure 4*. Verify that the label is properly tucked under the retaining ridge on the push-button.

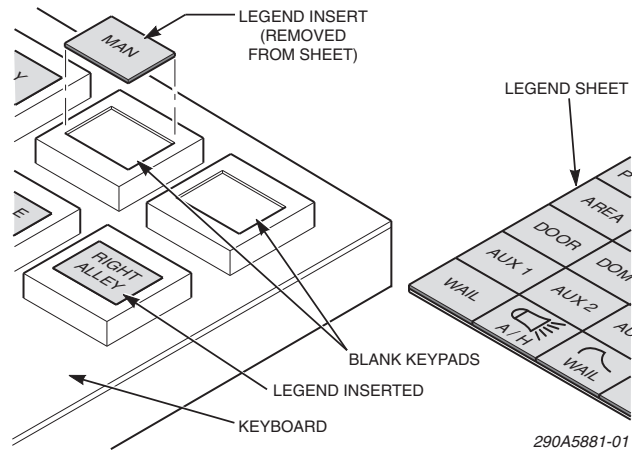


Figure 4: Replaceable keypad labels

## Testing the System

### ⚠ WARNING

#### SOUND HAZARD

**All effective sirens and horns produce loud sounds (120 dB) that may cause permanent hearing loss. Always minimize your exposure to siren sound and wear hearing protection. Do not sound the siren indoors or in enclosed areas where you and others will be exposed to the sound.**

After the installation, test the emergency warning system to ensure that it is operating properly. Also test all vehicle functions, including horn operation, vehicle safety functions, and vehicle lighting systems to ensure proper operation. Ensure that the installation has not affected the vehicle operation or changed any vehicle safety functions or circuits. After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.

Do not test the sound and light system of the vehicle while driving. Operating the vehicle warning systems may pose a hazard to the operator and other drivers if the systems do not function as expected. Test the vehicle only in a controlled environment.

## Getting Technical Support and Service

This control head has no field-serviceable parts. The factory will service the control head for you. If you are experiencing problems, please contact:

Service Department  
 Federal Signal Corporation  
 Phone: 1-800-433-9132  
 Fax: 1-800-343-9706  
 Email: [empserviceinfo@fedsig.com](mailto:empserviceinfo@fedsig.com)

## **Ordering Replacement Parts**

To order replacement parts, please contact your local dealer/distributor or:

Mobile Systems Customer Support  
Federal Signal Corporation  
Phone: 1-800-264-3578

## **Returning a Product to Federal Signal**

Before returning a product to Federal Signal, call 800-264-3578, 800-433-9132, or 800-824-0254 to obtain a Returned Merchandise Authorization number (RMA number). To expedite the process please be prepared with the following information:

- Your Federal Signal customer or account number.
- The purchase order number under which the items were purchased.
- The shipping method.
- The model or part number of the product being returned.
- The quantity of products being returned.
- Drop ship information as needed.
- Any estimate required.

When you receive your RMA Number:

- Write the RMA number on the outside of the box of returned items.
- Reference the RMA number on your paperwork inside of the box.
- Write the RMA number down, so that you can easily check on status of the returned equipment.

Send all material with the issued RMA Number to:

Federal Signal Corporation  
2645 Federal Signal Drive  
University Park, IL 60466  
Attn: Service Department  
RMA: # \_\_\_\_\_