

## INSTRUCTION SHEET FOR SIGNALMASTER™ MODEL 330103

### SAFETY MESSAGE TO INSTALLERS

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 this light: 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 air bag.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.
- In order for the light to function properly, a good ground connection must be made. At a minimum, it must be attached to a solid metal body or chassis part that will provide an effective ground path as long as the light system is to be used.
- Locate light control so the VEHICLE and CONTROL can be operated safely under all driving conditions.
- Do not attempt to activate or deactivate light control while driving in a hazardous situation.
- This product controls high intensity LED devices. To prevent eye damage, DO NOT stare into the light beam at close range.
- You should frequently inspect the light to ensure that it is operating properly and that it is securely attached to the vehicle.
- File these instructions in a safe place and refer to them when maintaining and/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.

#### I. GENERAL.

The Federal Signal SignalMaster Model 330103 is an economical, low profile, solid state, directional light control that is designed to operate with any of Federal Signal's SignalMaster series eight-lamp directional lights. This control will also operate two sets of external lamps (Federal Signal Models 320102, SMLED1, 320112, and 320721, or other 50 watt lamps). The unit is reversed polarity protected to avoid damage if the positive and negative power connections are connected incorrectly.

This model provides three distinctive directional signals, left arrow, right arrow, and center out. An alternating flash pattern produces a warning signal for use when a directional signal may not be appropriate. In addition, an auxiliary flash pattern alternately flashes the external lamps. When a directional signal is selected, the lamps individually activate sequentially in a sweeping motion until all eight are illuminated. The slide switch overrides the WARN and AUX functions

An auxiliary input and output are provided for integrating external controls and lights into the SignalMaster system. When properly connected, a positive (+)12 volts applied to the AUX IN terminal will activate the alternating flash pattern. The AUX OUT terminal can activate a ground-activated relay ( user-supplied) when the AUX switch is operated.

#### WARNING

These lights are intended for **secondary** warning only. They are **not** intended for use as a primary warning system.

#### II. SPECIFICATIONS.

Input Voltage	11VDC to 16VDC.
Polarity	Negative ground only.
Operating Temperature Range	-30° C to +65° C.
Standby Current	Zero amperes.
+BAT Fuse	25 amperes.
+IGN/BAT Fuse	1 ampere.
AUX OUT Fuse	1 ampere.
Output Drive Capability (Total)	
Directional	8, 27 watt lamps.
Auxiliary	4, 27 watt lamps (2 per output) or 2, 50 watt lamps (1 per output).
Flash Rate:	
Directional	35 patterns/min.
Warn	60 patterns/min.
Dimensions:	
Height	1-1/2"
Width	6-1/8"
Depth	5"
Shipping Weight	2.0 lbs.

#### III. INSTALLATION.

#### WARNING

When installing equipment inside air bag equipped vehicles, the installer **MUST** ensure that the equipment is installed **ONLY** in areas recommended by the vehicle manufacturer.

Failure to observe this warning will reduce the effectiveness of the air bag, damage the air bag, or potentially damage or dislodge the equipment, causing serious injury or death to you or others.

##### A. *SignalMaster Light Assembly.*

Install the light assembly as described in the instructions packed with the 320340 universal mounting kit. Route the cable near the eventual location of the control unit.

##### B. *Control Unit.*

See figure 1. The supplied mounting bracket allows the control unit to be mounted in a variety of positions. To install the control unit, proceed as follows:

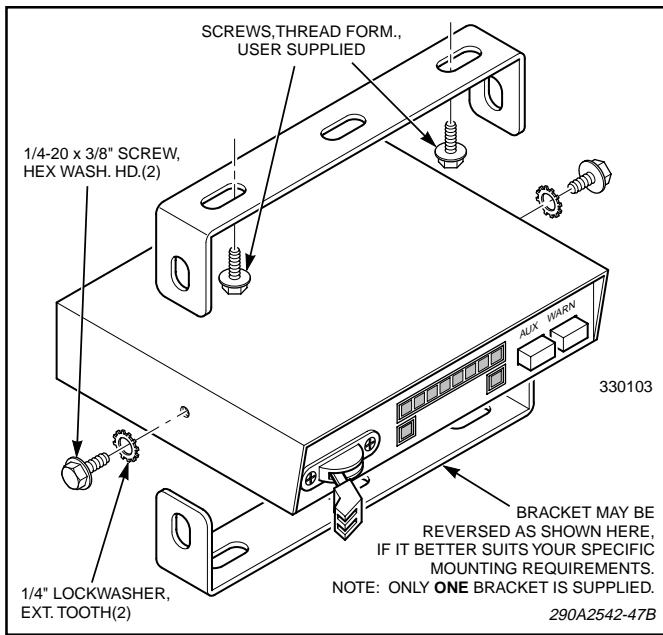


Figure 1.

**CAUTION**

Install the control unit in an adequately ventilated area. Never install near heater ducts.

**NOTE**

When selecting a mounting location for the control unit, it is necessary to keep in mind the SignalMaster cable length. Plan wiring and cable routing before installation.

1. Select a mounting location for the control unit that allows the vehicle and controls to be operated safely at all times.
2. Use the mounting bracket as a template and scribe two drill position marks at the selected mounting location.

**CAUTION**

Before drilling holes in ANY part of a vehicle, be sure that both sides of the mounting surface are clear of parts that could be damaged; such as brake lines, fuel lines, electrical wiring or other vital parts.

3. Drill two holes at the previously scribed position marks.
4. Secure the mounting bracket to the mounting surface with two user-supplied, thread-forming, 1/4-20 screws.

C. *Electrical Connections.*

**WARNING**

Failure to observe this WARNING may result in fire, burns or blindness.

If shorted to vehicle frame, high current conductors can cause hazardous sparks resulting in electrical fires or molten metal.

DO NOT connect this system to vehicle battery until ALL other electrical connections are made and mounting of all components is complete.

Verify that no short circuits exist, before connecting to the Positive (+) battery terminal.

The control unit is supplied with a six-position connector and a eleven-position connector to perform the electrical installation. User-supplied, 14-gauge red and black wires are required for the (+) BAT and (-) GND connections on the six-position connector. User-supplied, 18-gauge red and green wires are required for the (+) BAT/IGN and CASE GROUND connections on the six-position connector. In addition, user-supplied 18-gauge wire is used for the AUX IN and AUX OUT connections. Using figure 2 as a guide, complete this portion of the installation as follows:

1. Power Connections.

**CAUTION**

To avoid damage and ensure proper operation, the red and black wires **MUST** be installed in the six-position connector as shown in figure 3.

- a. Strip 1/4" of insulation off of each wire. See figure 3. Use small blade screwdriver to depress spring in connector, insert proper wire and remove screwdriver to release spring.
- b. Connect the red and black 14-gauge wires to the connector as shown in figure 3.
- c. Route the red and black 14-gauge wires through the firewall and toward the battery. Connect the black wire to a good frame ground near the battery. In most vehicles, a wire from the negative terminal of the battery is routed and attached to the body/frame at the fender. This is a convenient point to connect the 14-gauge black wire. Do not connect the red wire to the (+) positive terminal at this time.
- d. Connect the 18-gauge red and green wires to the connector as shown in figure 3.

**IMPORTANT**

The 18-gauge red wire's termination point determines when the directional signal can be activated. When the wire is attached to a vehicle fuse that is powered when the ignition switch is in the run or start position, the vehicle's ignition switch must be in the run or start position to operate the directional signal. When the wire is attached to the vehicle battery, the directional signal can be operated at any time. Note that the unit draws no current when in the "off" position.

- e. Select the desired termination point. As applicable, route the 18-gauge red wire toward the vehicle fuse

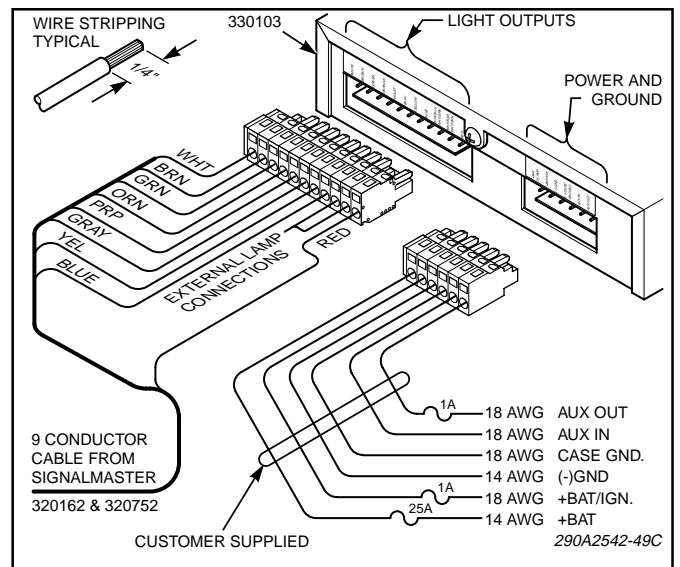


Figure 2.

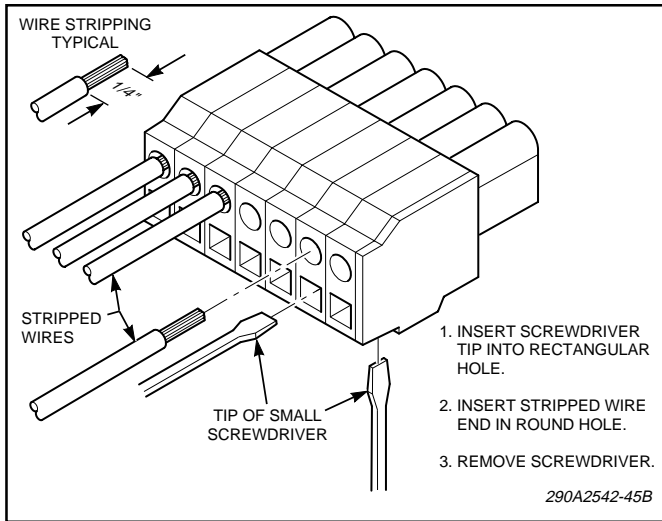


Figure 3.

block or through the firewall toward the battery. Install a user-supplied, 1-ampere, in-line fuse in the 18-gauge red wire as close to the power source as possible and terminate as required.

f. Route the 18-gauge green wire to a known good chassis ground near the 330103 control. To provide a good ground connection, scrape any painted surface to bare metal.

2. AUX IN and AUX OUT Connections.

When a positive (+)12 volts is applied to the AUX IN connection, the alternating flash pattern is activated. The AUX OUT connection will provide a ground to activate a ground-activated relay ( user-supplied) when the AUX switch is operated. To perform the wiring for these connections, proceed as follows (see figures 2 and 3):

**CAUTION**

To avoid damage and ensure proper operation, the wires **MUST** be installed in the six- position connector as shown in figure 3.

a. Connect a user-supplied 18-gauge wire to the six-position connector's AUX IN connection. Route the wire to a user-supplied external switch which will provide a positive (+) 12-volts (such as Federal Signal Model SW400SS) when activated.

b. Connect a user-supplied 18-gauge wire to the six-position connector's AUX OUT connection. Route the wire to a user-supplied ground-activated relay for activation of an external device. Install a user-supplied, 1-ampere, in-line fuse between the control and the relay.

3. SignalMaster Cable Connections.

a. Route the SignalMaster cable towards the control unit, while being careful not to scrape the wires on any sharp edges.

b. If necessary, cut the cable to the appropriate length.

c. Connect the 18-gauge wires and 16-gauge red wire to the eleven-position connector as shown in figures 2 and 3. Positions 9 and 10 are used for external lamp connections. Each of these two positions provides an alternating ground signal to activate external lamps.

D. Inspection and Final Installation.

1. Ensure that there are no loose wire strands or other bare wires which may cause a short circuit. Also, all wires must be protected from any sharp edges which could eventually cut through the insulation.

2. Plug the six-position connector into the mating connector on the control unit, and apply pressure until it locks into place.

3. Plug the eleven-position connector into the mating connector on the control unit, and apply pressure until it locks into place.

4. Connect the remaining end of the 14-gauge red wire from the six-position connector to the (+) positive terminal of the battery using an in-line, user-supplied, fuseholder and 25A fuse. Locate the fuse as near the battery as possible to protect the entire length of wire.

5. Read and understand paragraph IV OPERATION, and test for proper operation of all functions.

6. Secure the mounting bracket to the control unit with the 1/4-20 hex head, thread forming screws and 1/4" external tooth lock washers (see figure 1).

**IV. OPERATION.**

**SAFETY MESSAGE TO OPERATORS**

Peoples' lives depend on your safe use of our products. Listed below are some important safety instructions and precautions you should follow:

- Although your warning system is operating properly, it may not be completely effective. People may not see or heed your warning signal. You must recognize this fact and continue driving cautiously.
- Also, situations may occur which obstruct your warning signal 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.
- This product controls high intensity LED devices. To prevent eye damage, DO NOT stare into the light beam at close range.
- At the start of your shift, you should ensure that the light is securely attached and all lamps are operating properly. The LED display on the control only simulates the operation of the lamps.
- If a selected function does not perform properly or if any of the lamps remain illuminated when the control is off, disconnect the power connector from the control unit and contact the nearest service center.

Failure to follow these safety precautions may result in property damage, serious injury, or death to you, to passengers, or to others.

**RETAIN AND REFER TO THIS MESSAGE**

See figure 4. All controls utilized during normal operation of the SignalMaster directional light are located on the front panel of the control unit. The LED display simulates the light pattern being executed by the directional light.

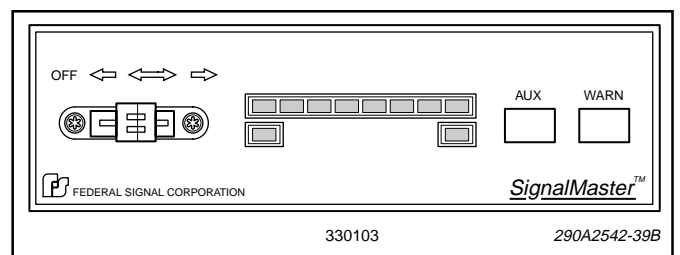


Figure 4.

A. *Slide Switch.*

1. LEFT (Position 1).

In this position, the light produces a left arrow flashing pattern, instructing traffic to move left.

2. CENTER OUT (Position 2).

In this position, a center out flashing pattern is produced, instructing traffic to move around either side of the vehicle.

3. RIGHT (Position 3).

In this position, the light produces a right arrow flashing pattern, instructing traffic to move right.

B. *WARN switch.*

When this switch is pressed, an alternating pattern is produced. The four middle lights activate alternately with the two outside lights on each side. The slide switch will override this pattern.

C. *AUX switch.*

1. When this switch is pressed, external lamps alternately flash at a constant rate. The wiring configuration determines the flash combination of the external lamps. The slide switch will override the external lamp pattern when the AUX switch is depressed, but will not override the AUX OUT terminal output.

2. If connected, the six-position connector's AUX OUT connection provides a ground to activate a user-supplied relay to control an external device.

D. *Auxiliary Input.*

If connected, application of a positive (+) 12-volts to the AUX IN connection on the six-position connector produces the WARN pattern described above. When the positive (+) 12-volts is

removed from the AUX IN connection, the WARN pattern will stop. Slide switch activation will override the WARN pattern.

V. **SERVICE.**

A. *General.*

Servicing, other than cosmetic features, should be performed by a qualified Federal Signal service center. If the control unit is not working properly, disconnect all electrical connections starting with the six-position power connector. Remove the control unit from the mounting bracket. Send the unit to the nearest authorized service center or the Federal Signal service department.

Communication and shipments should be addressed to:

Service Department  
Federal Signal Corporation  
2645 Federal Signal Drive  
University Park, IL 60466

1-800-433-9132

After servicing is complete, perform a test of all functions to ensure the control unit is operating properly.

B. *Replacement Parts List.*

Description	Part Number
Printed Circuit Board Assembly	2001136-01
Knob, Pushbutton	8573065
Knob, Slide Switch	8536C1041
Bezel, Slide Switch	8573060
Connector, Female, 6-position	140325-04
Connector, Female, 11-position	140325-09
Bracket, Mounting	8573070
Screw, Hex Head, Mounting	7011164-08
Lockwasher, 1/4"	7075078
Chassis	8573068
Cover	8573066