

2562119D REV. D 911

Safety Message to Installers and Service Personnel of Warning Light Equipment

▲ WARNING

People's lives depend on your proper installation and servicing of Federal Signal products. It is important to read and follow all instructions shipped with this product and the original product. In addition, listed below are some other important safety instructions and precautions you should follow:

- To properly install this device, 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.
- If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment.
- 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 device 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 lighting 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.

Overview

The Model 331105, SMC5 is a full featured directional light control. It is designed to operate the full selection of Federal Signal SignalMaster® directional lights from four to eight heads (continuous or split) at 12 V or 24 V. High current switching ability allows two full, eight-head, halogen SignalMasters to be directly controlled by a single 331105 controller. The controller is protected against reverse polarity by a 2 A fuse and a diode. Each SignalMaster lightbar requires an installer-supplied 20 A fuse.

This model provides six distinctive directional signals. There are standard left-arrow, center-out and right-arrow patterns as well as special left-arrow, center-out, and right-arrow patterns that comply with CAC Title 13, Article 22 if used with the appropriate SignalMaster directional lightbar selected from the models in Tables 1 and 2 on page 2.

Table 1 Halogen SignalMaster directional warning lights
(for CAC Title 13, Article 22 compliance)

| Model | Length | Lamps | Cable | Lenses |
|--------|--------|--------------|-------|--------|
| 320142 | 20 in | 4 | 30 ft | Amber |
| 320162 | 31 in | 6 | 15 ft | Amber |
| 320612 | 31 in | 6 | 30 ft | Amber |
| 320172 | 42 in | 8 | 15 ft | Amber |
| 320182 | 42 in | 8 | 30 ft | Amber |
| 320192 | 42 in | 8 | 50 ft | Amber |
| 320602 | 84 in | 8+ DOT Strip | 35 ft | Amber |

Table 2 VPX SignalMaster directional warning lights
(for CAC Title 13, Article 22 compliance)

| Model | Length | Lamps | Cable | LEDs | Lenses |
|--------|--------|-------|-------|-------|--------|
| 320900 | 20 in | 4 | 30 ft | Amber | Amber |
| 320905 | 31 in | 6 | 15 ft | Amber | Amber |
| 320910 | 31 in | 6 | 30 ft | Amber | Amber |
| 320915 | 31 in | 6 | 60 ft | Amber | Amber |
| 320920 | 42 in | 8 | 15 ft | Amber | Amber |
| 320925 | 42 in | 8 | 30 ft | Amber | Amber |
| 320930 | 42 in | 8 | 60 ft | Amber | Amber |
| 320935 | 51 in | 8 | 30 ft | Amber | Amber |
| 320940 | 51 in | 8 | 50 ft | Amber | Amber |

The WARN function provides a non-directional flash pattern for use when a directional signal may not be appropriate. One pattern can be selected from the 16 patterns available, which include 13 standard patterns and three patterns compliant with CAC Title 13, Article 22. Some patterns are optimized for LED products and flash too fast for a halogen lightbar. The default pattern is the classic SMC warn pattern with the center lighthoods alternating with the lighthoods on each end.

The AUX function provides an installer-selectable flash pattern for two auxiliary light heads. The AUX function operates external lamps (if installed) independently only if one of the five available patterns other than Pattern 6 (all on) or null is selected (Table 6 on page 11.) Each of the two auxiliary channels can flash a 55 W load. A pattern with the outputs set to remain on constantly is available. This will allow a pair of strobe beacons or similar devices with an internal flasher to be turned on by using the AUX switch.

This controller also incorporates a turn signal override. When each of the override inputs for the turn signal is wired directly to the respective turn signal circuit of the vehicle, the appropriate end module flashes in sync with the turn signal or hazard lights. When connected, the turn signal feature overrides any other function of the Model 331105, shutting off the directional lightbar during the turn, and returning to the previously active pattern when the turn signal is cancelled. These inputs activate with a connection to positive 12 Vdc to 24 Vdc. They should be left disconnected when not needed.

When standard directional signal operation is selected, the lamps illuminate sequentially in a sweeping

motion until all are illuminated and then repeat. When Title 13 Mode is selected, the lamps are extinguished more quickly than in standard mode. Title 13 Mode provides patterns that comply with the 40 percent to 60 percent on-time, and flash rate of 60 FPM to 120 FPM, which are requirements of CAC Title 13, Article 22.

When LOW (current) operation is selected, the lamps turn on then off in sequence until a pattern is completed. When FAST is selected, the chosen pattern sequences at an increased rate.

Although the controller operates at 12 Vdc to 24 Vdc, ensure that the SignalMaster lightbar is of the proper voltage for the electrical system of the vehicle. Do not operate a 12 V SignalMaster at 24 V or a 24 V SignalMaster at 12 V, or shortened lamp life will result.

Model 331105 Controller Specifications

Electrical

| | |
|----------------------------------|--|
| Input Voltage: | 11 Vdc to 28 Vdc |
| Polarity: | Negative ground only |
| Operating Temperature Range: | -30 °C to +65 °C |
| Standby Current: | 7 mA (0.007 A) |
| Lightbar Fuse: | 20 A, installer-provided; 40 A for two lightbars |
| +IGNITION Fuse: | 2 A |
| Output Drive Capability (Total): | Directional: Sixteen 27 W lamps on 8 channels Auxiliary: Four 27 W lamps (two per output) Two 55-watt lamps (1 per output) |
| Normal Directional Flash Rate: | Approximately 30 patterns per minute |
| Fast Directional Rate: | Approximately 45 patterns per minute |

Dimensions

| | |
|------------------|----------|
| Height: | 1-1/2 in |
| Width: | 6-1/8 in |
| Depth: | 5 in |
| Shipping Weight: | 2.5 lb |

Table 3 Parts list

| Qty. | Description | Part No. |
|-------------|--|-----------------|
| 1 | Controller | 331105 |
| 1 | Terminal Spade, Yellow, #10, 12–10 AWG | 224297 |
| 1 | Terminal Spade, Blue, #10, 16–14 AWG | 224298 |
| 1 | Mounting Bracket | 8573070 |
| 2 | Lockwasher, Ext. Tooth, 1/4" | 7075A007 |
| 2 | Screw, Hex Head, 1/4"-20, Taptite | 7011164-08 |

Installing the SignalMaster Lightbar

Install the light assembly as described in the instructions included with the SignalMaster. Route the cable to the planned location of the controller.

Installing the Mounting Bracket for the Controller

The supplied mounting bracket allows the controller to be mounted in a variety of positions. To install the mounting bracket:

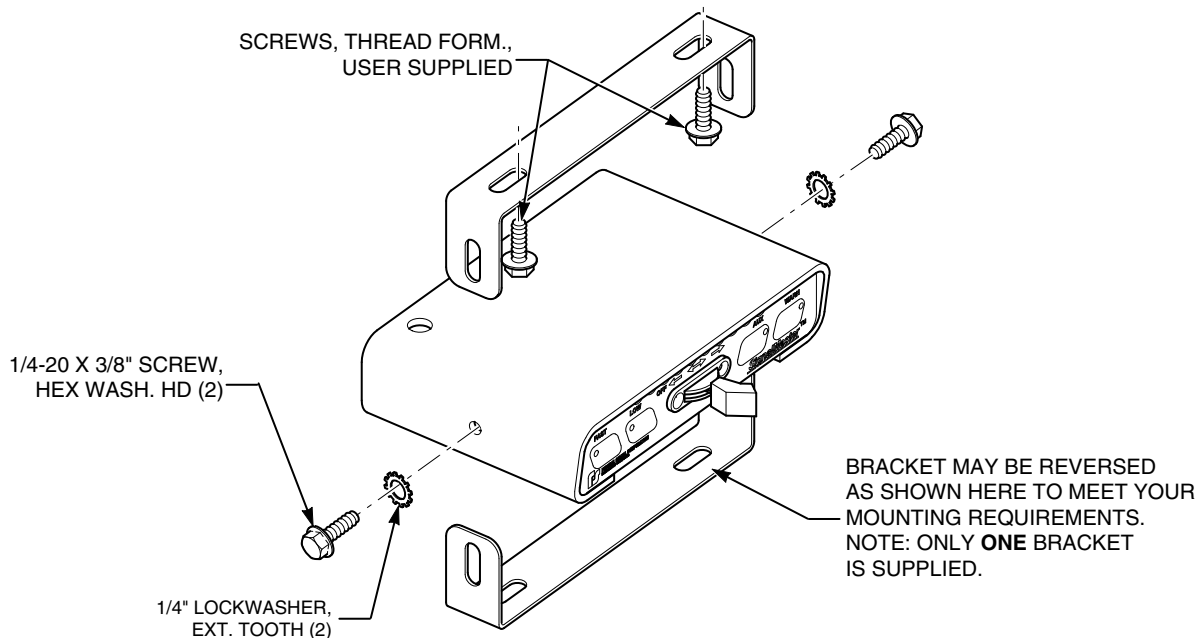
NOTICE

CONTROLLER REQUIRES VENTILATION—*This controller needs to radiate heat. Do not install the unit in an area where it cannot dissipate heat into the air. Do not mount the unit near a heater duct.*

NOTE: When selecting a mounting location for the control unit, it is necessary to keep in mind that some SignalMaster models have cables which are 15-feet long. Plan wiring and cable routing before installation. Nine-conductor extension cables are available if needed.

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. See Figure 1.

Figure 1 Bracket positions and hardware



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NOTICE

DRILLING PRECAUTIONS—When drilling holes, check the area into which you are drilling to be sure that you do not damage vehicle components. All drilled holes should be deburred and all sharp edges should be smoothed. All wire routing going through drilled holes should be protected by a grommet or convolute/split-loom weaving.

3. Drill a hole sized for the installer-provided hardware to be used in step 4 at each drill-position mark.
4. Secure the mounting bracket to the mounting surface with two installer-supplied, thread-forming, 1/4" screws or other hardware appropriate for the installation.
5. Before fastening the controller to the bracket, continue with the electrical connections as described in the next sections.

Connecting Power to the Controller

⚠ WARNING

HIGH-CURRENT ARCING—Do not connect this system to the vehicle battery until all other electrical connections are completed, and you have verified no shorts exist. High-current shorts can cause hazardous sparks or burning wire resulting in an electrical fire.

The controller is equipped with a 15-position connector and two insulated spade connectors. Also required are installer-supplied red and black wires of the proper gauge for the current and run length of the specific installation. For the recommended wire gauge, see Table 4. The ground wire should be sized to handle the total current used by the lightbar(s) and controller.

Table 4 Minimum wire gauge

| Distance to Battery | One SignalMaster 20 A Peak | Two SignalMasters with a Shared Wire 20 A Peak |
|---------------------|-------------------------------|--|
| 5 ft | 18 AWG | 16 AWG |
| 10 ft | 16 AWG | 14 AWG |
| 20 ft | 12 AWG | 10 AWG |
| 30 ft | 12 AWG | 8 AWG |
| 40 ft | 10 AWG | 8 AWG |

If only one lightbar is to be connected, select a red wire of the appropriate gauge. If two lightbars are to be installed, it is recommended that each lightbar has its own fused connection to the battery. Two lightbars can share the battery connection if the wire and fuse are appropriately sized.

Installer-supplied 18 AWG red wire is required for the connection of the controller to the positive power source. Installer-supplied 18 AWG wire is used for the optional AUX IN, RELAY, and TURN SIGNAL OVERRIDE connections.

To make the power connections to the controller:

1. Strip 1/4" of insulation from the main ground wire and crimp the proper spade connector onto it.

⚠ WARNING

BATTERY EXPLOSION—To avoid a battery explosion, always disconnect the negative battery cable first and reconnect it last. Avoid causing a spark when connecting near or to the battery. The gases produced by a battery can cause a battery explosion that could result in vehicle damage and serious injury.

NOTICE

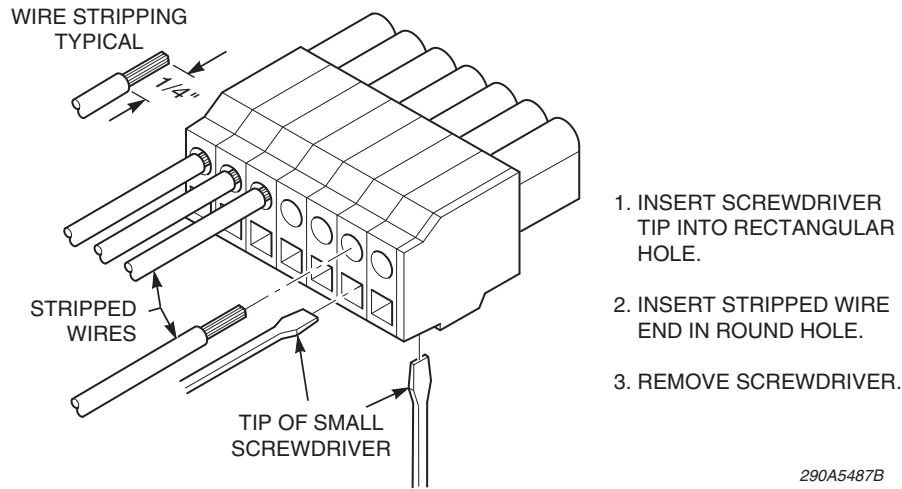
CONNECTING THE RED AND BLACK WIRES—To avoid damage and ensure proper operation, the red and black wires **MUST** be installed as shown in Figure 3 on page 7.

2. Connect the black ground wire to the lug as shown in Figure 3 on page 7. Securely tighten the binding screw using a 1/4" flat-tip screwdriver passing through the opening in the cover.
3. Route the ground wire through the firewall and toward the battery. Connect it to a good frame ground near the battery. For gauge recommendations, see Table 4. In most vehicles a wire from the negative terminal of the battery is routed and attached to the screw at the body/frame at the fender.
4. Connect the red wire from the nine-conductor cable of the SignalMaster to the vehicle battery through a fuse holder that is located as close to the battery as possible. The fuse should be a 20 A to protect a single lightbar and 40 A if two lightbars are to be protected by a single fuse. **Do not install the fuse until all other electrical connections have been made.** To run between the fuses and each SignalMaster, use a properly-sized red wire. If a single conductor will be used to provide power to two SignalMaster lightbars, ensure that the wire is of the recommended gauge for the total load. For wire gauge recommendations, see Table 4 on page 5.
5. Select a termination point for the 18 AWG red power wire from the controller. As applicable, route the 18 AWG red wire toward the vehicle fuse block or through the firewall toward the battery. If the controller power is to be connected to the battery, use an installer-supplied in-line fuse in the 18 AWG red wire as close to the battery as possible and terminate it as required. If the red wire is to be terminated to the fuse block, and will be active only when powered by the ignition switch, select an appropriate fused circuit.

IMPORTANT: The termination point of the 18 AWG red wire from the controller 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 ignition switch must be in the run position to operate the directional signal. When the wire is attached to the vehicle battery, the directional signal can be operated at any time. To avoid draining the battery, Federal Signal recommends that the power wire from the controller be terminated to a switched source. **NOTE:** The controller draws 7 mA (0.007 A) in the off position when connected directly to the battery.

6. See Figures 2 and 3 on page 7. Strip 1/4" of insulation from all wires that you plan to connect to the 15-position terminal block of the controller. Make all of the required connections to the terminal block as described in the next section.
7. Connect the 18 AWG red wire to the position labeled on the terminal block for +12-24 Vdc.

Figure 2 Wire insertion into terminal block



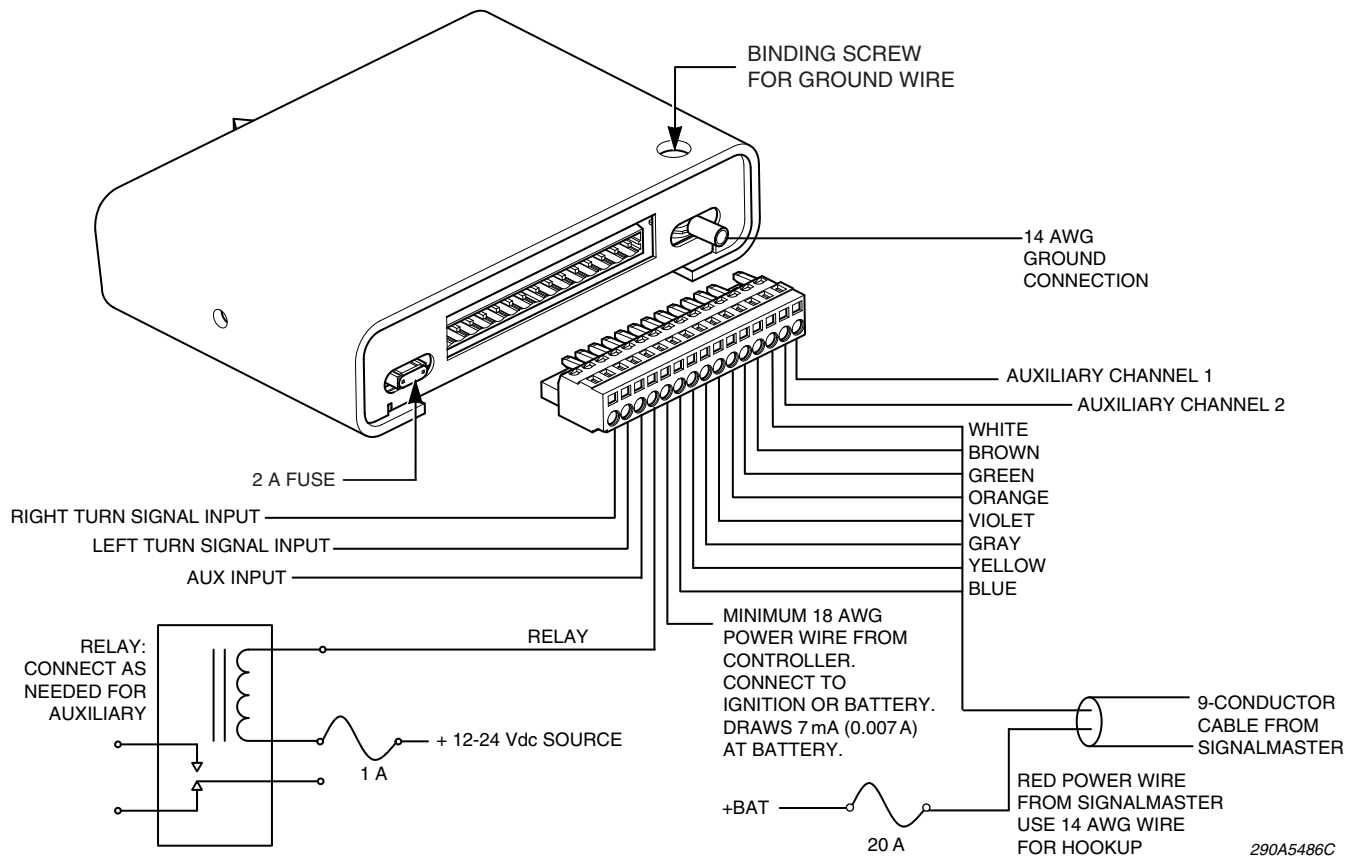
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Wiring the Six- and Eight-Head SignalMaster

To wire the SignalMaster:

1. Connect the colored wires from the nine-conductor cable to the locations specified in Figure 3 or on the label affixed to the controller housing.

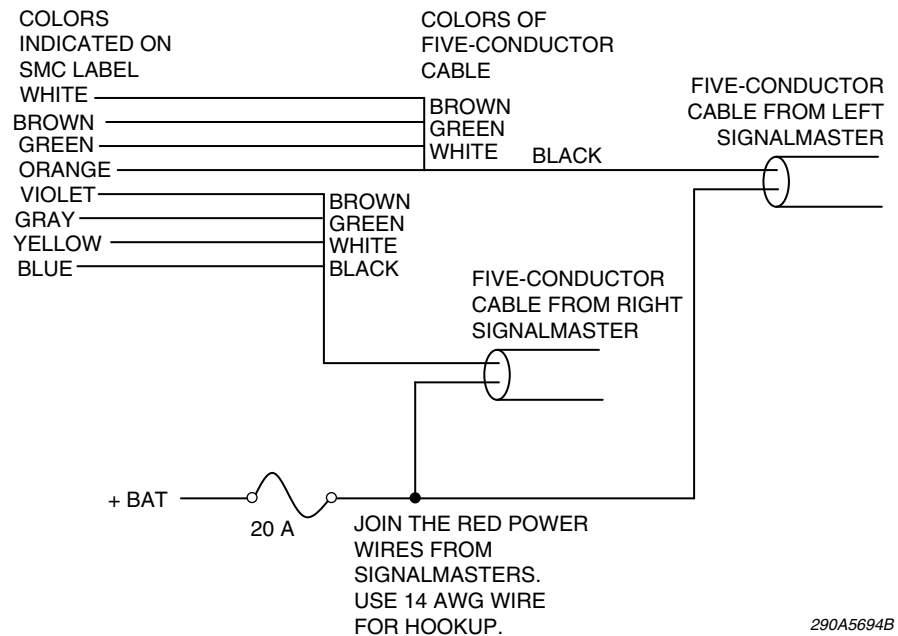
Figure 3 Wiring from SignalMaster to controller



NOTE: With the six-head SignalMaster lightbar, the white and blue wires are not needed and can be cut even with the cable sheath.

2. For split SignalMasters where three- or four-head assemblies make up a full six- or eight-head SignalMaster assembly, connect the wires to the terminal blocks in order from left to right. The output labeled BLUE on the controller is for the rightmost lamp, and the one labeled WHITE is for the leftmost lamp. For an example of the connection of two four-head SignalMasters to the controller, see Figure 4.
3. When all electrical connections are completed, insert a 20 A fuse into the fuse holder in the SignalMaster red power wire.
4. Connect any optional auxiliary warning heads to the auxiliary circuits. The controller will provide a ground for the heads when they are to flash. Therefore, the positive side of the heads should be connected to a positive voltage source and protected with a fuse.

Figure 4 Connections for two four-head SignalMasters to the controller



5. The AUX IN can be used as an input to activate the warning pattern when an external input is available provided that a directional signal is not currently activated by the slide switch.

When the slide switch is activated, it overrides the auxiliary input (warning signal) and provides the selected directional signal instead.

When the slide switch is returned to the off position, the warning pattern resumes if the signal at the auxiliary input is still active. Connect the external controller in a manner to apply a positive 12-24 Vdc or ground. This particular input can be switched with either high-side or low-side activation provided that the off state is an open circuit.

⚠ WARNING

UNINTENDED DIRECTIONAL SIGNAL—Certain combinations of auxiliary and warn patterns may produce an unintended directional signal, particularly when the auxiliary heads are inline with the SignalMaster. Operate the selected warn and auxiliary patterns simultaneously and verify that no pseudo-directional pattern is produced over a period of several minutes. Failure to heed this warning could confuse drivers, causing serious injury or death.

6. The AUX button can be used to power an installer-supplied relay that activates other circuits when the AUX function is selected. The relay connection provides a ground to activate the relay (Figure 3 on page 7).
 - a. Select a relay with a rated capacity sufficient for the load to be switched.
 - b. Connect one leg of the relay coil to positive 12-24 Vdc. Use a 1 A fuse to protect the circuit.
 - c. Connect the remaining leg of the relay coil to the terminal marked RELAY. When the AUX button is pressed the terminal becomes a ground to activate the relay.

Connecting the Turn Signal Override

The controller can be connected so that a single end module flashes in sync with the vehicle turn signal. If any pattern is displayed when the turn signals are flashing, the pattern is suspended and the single head begins to flash. When the turn signal is returned to the off position, the suspended pattern re-activates after approximately one second. Each turn signal input at the rear of the controller must be tapped into its respective turn signal circuit for override to work. When the turn signal override is connected, turning on the vehicle hazard lights will activate both left and right heads.

To make the connections:

1. Run a 18 AWG wire from the input for the right turn signal to a suitable point on the circuit for the right turn signal.
2. Connect the left turn input into the left turn signal circuit. Consult the vehicle wiring diagram to find the appropriate connection points.

Mounting the Controller

To fasten the controller to the bracket:

1. Place the controller into the mounting bracket (Figure 1 on page 4).
2. Fasten the controller using the two self tapping screws provided.
3. Angle the controller for optimum visibility from the operator's position before tightening the screws.
4. Dress the cables and wires, and secure them out of the way.

Configuring the Controller

The controller has several installer-selectable options that you can select in Programming Mode after the installation and wiring of the SignalMaster system is complete. See the next section for programming instructions. For the functions of the controller buttons, see Figure 5 below and “Operating the SignalMaster Controller” on page 13.

Figure 5 Model 331105 SMC5 controller

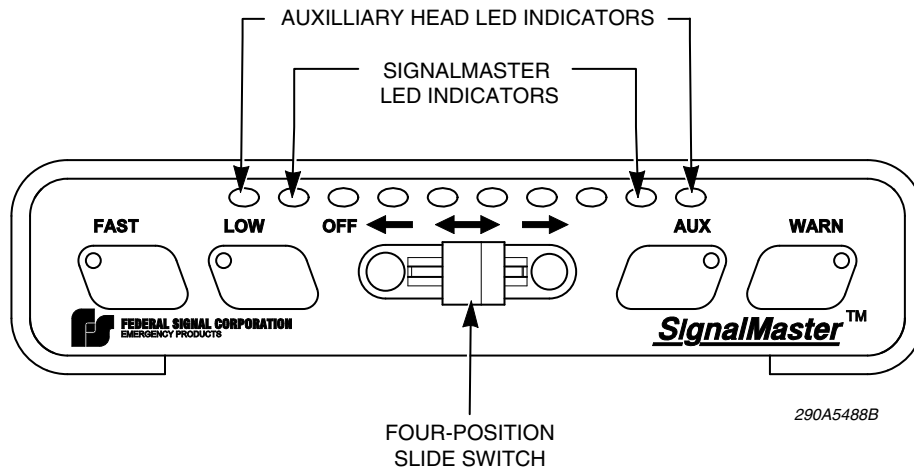


Table 5 Standard warn patterns

| Pattern No. | Description |
|-------------|---|
| 0 | Null (no pattern) |
| 1 | Center light alternate with lights at each end |
| 2 | The lights alternate on each half of the lightbar |
| 3 | Alternating pairs |
| 4 | Two-head groups, center out |
| 5 | Moving triple flash |
| 6 | Ripple with emphasis at end |
| 7 | Jumping pairs |
| 8 | Alternating odds and evens |
| 9 | Quad flash with full lightbar accent |
| 10 | Random 1, single heads |
| 11 | Random 2, moving gap |
| 12 | Ripple out, fast |
| 13 | Alternating pairs, fast |

Table 6 Auxiliary patterns

| Pattern No. | Description |
|-------------|--|
| 0 | Null (no pattern) |
| 1 | Single Alternating 95 FPM * |
| 2 | Single simultaneous 95 FPM |
| 3 | Alternating double flash 95 FPM |
| 4 | Single alternating 120 FPM |
| 5 | Simultaneous double flash 60 FPM |
| 6 | All on; for control of external loads only |

* Default pattern

Table 7 Warn patterns compliant with CAC Title 13, Article 22

| Pattern No. | Description |
|-------------|---|
| 0 | Null (no pattern) |
| 1 | Alternating, two-head flash on each end |
| 2 | Alternating in/out |
| 3 | Alternating odds/evens |

Entering Program Mode

With the vehicle ignition turned on and the directional light turned off, press the FAST and LOW buttons simultaneously (See Figure 5 on page 10). Both buttons remain lit indicating that the controller is now in Programming Mode. Select one or more of the following features before exiting Program Mode. See “Exiting Program Mode” at the end of this section.

- **Selecting a Six- or Eight-Head Output**

To select a six- or eight-head output for six- or eight-head SignalMasters, press the FAST button until the correct number of lighthoods flashes simultaneously. The indicator LEDs on the controller mimic the pattern of flashing heads on the SignalMaster.

- **Selecting a Split or Standard Lightbar**

To select a split SignalMaster (three- or four-head lightbars) or a standard SignalMaster, press the LOW button to toggle between split or standard mode.

- **Selecting a Standard Warn Pattern**

To select a standard warning pattern, press the WARN button to cycle through the patterns until the pattern you want appears. For a description of the patterns, see Table 5 on page 10.

⚠ WARNING

UNINTENDED DIRECTIONAL SIGNAL—*Certain combinations of auxiliary and warn patterns may produce an unintended directional signal, particularly when the auxiliary heads are inline with the SignalMaster. Operate the selected warn and auxiliary patterns simultaneously and verify that no pseudo-directional pattern is produced over a period of several minutes. Failure to heed this warning could confuse drivers, causing serious injury or death.*

■ **Selecting an Auxiliary Pattern**

To select an auxiliary pattern, press the AUX button to cycle through the patterns until the pattern you want appears. For a description of the patterns, see Table 6 on page 11. Select Pattern 6 (all on) if the auxiliary outputs will be used to switch on a standalone warning light.

■ **Selecting Title 13 Mode**

Move the slide switch from OFF (Position 1) to the LEFT ARROW position (Position 2). The indicator LEDs and the SignalMaster lightbar display a more fluid pattern in which the lights extinguish sooner to comply with the light/dark timing requirements of Title 13. To select a different warn pattern, press the WARN button to display the next pattern in the sequence. For a description of the non-directional warn patterns, see Table 7 on page 11.

To return to Standard Mode, return the slide switch to OFF (Position 1) and then move it to the LEFT ARROW position (Position 2).

Exiting Program Mode

To exit Programming Mode, temporarily interrupt the power to the controller by turning off the vehicle ignition or removing the power fuse, depending on the termination point of the 18 AWG wire.

Safety Message to Operators of Warning Light Equipment

⚠ WARNING

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

- Do not attempt to activate or de-activate the light system control while driving in a hazardous situation.
- 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 manmade 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 controller and contact the nearest service center.

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

Operating the SignalMaster Controller

See Figure 5 on page 10. All controls for the SignalMaster directional lights are located on the front panel of the controller. The LED display simulates the active light pattern.

Function Activation

The Model 331105 controller gives the function of the latest input priority. If a warning pattern is activated via the WARN button, and then the slide switch is activated, the controller switches from the warn pattern to the directional pattern to which the slide switch is set. When the slide switch is then set to the OFF position, the warning pattern resumes.

Slide Switch

The slide switch is a four-position switch with OFF and settings for the directional patterns LEFT ARROW, CENTER OUT, and RIGHT ARROW.

- **OFF (Position 1)**

Turns off the directional pattern.

- **LEFT ARROW (Position 2)**

Displays a left-arrow flash pattern that instructs traffic to move left.

- **CENTER OUT (Position 3)**

Displays a center-out flash pattern that instructs traffic to move around either side of the vehicle.

- **RIGHT ARROW (Position 4)**

Displays a right-arrow flash pattern that instructs traffic to move right.

WARN Button

Displays a non-directional warning pattern. See Table 5 on page 10 and Table 7 on page 11 for available patterns. The slide switch overrides the pattern.

AUX Button

Operates the external lamps (if installed) independently if one of the five patterns other than Pattern 6 (all on) is selected (Table 6 on page 11.) Auxiliary heads will NOT flash if left in Pattern 6 or in the Null pattern.

FAST Button

Increases the flash rate of the selected directional or WARN pattern. The rate of the AUX Button function is unaffected.

LOW Button

Changes all directional patterns to turn lamps on then off in sequence until a pattern is completed. The last lamp activated in the pattern will flash three times. The LOW setting also affects the warn signals by reducing the number of lighted lamps or dwell time. The selection of this function reduces the current draw for the light assembly's patterns. The AUX Button function is unaffected by the LOW Button. In Title 13 Mode, the LOW function is disabled.

Auxiliary Input

If connected at the time of installation, application of a positive (+) 12-24 Vdc or ground to the AUX IN connection produces the WARN pattern described above in "WARN Button." When the positive (+) 12-24 Vdc or ground is removed from the AUX IN connection, the WARN pattern stops. Slide switch activation also overrides the WARN pattern, turning it off and displaying the selected directional pattern. When the slide switch is returned to the OFF position, the warning pattern returns, provided there is an active signal at the auxiliary input. Typically, the operator has no direct control over the auxiliary input, because it would be tied to another separate device for its power signal.

Turn Signal Override

When the controller is installed with the turn signal override feature connected to the vehicle turn-signal circuit, the controller stops any active pattern and flashes the appropriate end lamps in sequence with the turn signals or hazard lights. No operator input is needed to activate this feature, if connected.

Testing the Installation

⚠ WARNING

LIGHT HAZARD—To be an effective warning device, an emergency warning system produces bright light that can be hazardous to your eyesight when viewed at a close range. Do not stare directly into the lights at a close range or permanent damage to your eyesight may occur.

After testing 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.

Do not test the 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. After testing is complete, provide a copy of these instructions to the instructional staff and all operating personnel.

Getting Technical Support and Service

If the controller is not working properly, remove the fuses before disconnecting the wires from the unit to prevent shorts. Disconnect all electrical connections starting with the power leads. Remove the controller from the mounting bracket. See "Returning a Product to Federal Signal" for further instructions.

For technical support, contact:

Federal Signal Corporation
Service Department
Public Safety Systems
Phone: 1-800-433-9132
Fax: 1-800-343-9706
Email: empSERVICEinfo@fedSIG.com

Ordering Replacement Parts

To order the replacement parts in Table 7, please contact your local dealer/distributor or:

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

Table 7 Replacement parts

| Qty. | Description | Part No. |
|------|-----------------------------------|------------|
| 1 | Controller | 330104 |
| 1 | Terminal Spade. #10, 16–14 AWG | 224298 |
| 1 | Mounting Bracket | 8573070 |
| 2 | Lockwasher, Ext. Tooth, 1/4" | 7075A007 |
| 2 | Screw, Hex Head, 1/4"-20, Taptite | 7011164-08 |

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.

Installation and Programming Instructions

- 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
Public Safety Systems
2645 Federal Signal Drive
University Park, IL 60484-3167
Attn: Service Department
RMA: # _____

800-433-9132
800-343-9706 (fax)
www.fedsig.com



2645 Federal Signal Drive, University Park, IL 60484-3167
Tel.: (800) 264-3578 • Fax: (800) 682-8022
www.fedsig.com

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