

Safety Message to Installers and Operators of Warning Lights

⚠ WARNING

People's lives depend on your proper installation and operation 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 a light assembly, you must have a good understanding of automotive electrical procedures and systems, along with proficiency in the installation and use of safety warning equipment.
- When installing equipment or wiring inside airbag equipped vehicles, the installer **MUST** ensure that the equipment or wiring is installed **ONLY** in areas recommended by the vehicle manufacturer. Failure to observe this warning will reduce the effectiveness of the airbag, damage the airbag, or potentially damage or dislodge the equipment, causing serious injury or death.
- When drilling into a vehicle structure, be sure that both sides of the surface are clear of anything that could be damaged.
- A light system is a high current device. In order for it to function properly, a separate ground connection must be made. If practical, it should be connected to the negative battery terminal. At a minimum, it may 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 the light system controls so the **VEHICLE** and **CONTROLS** can be operated safely under all driving conditions.
- If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment.
- This product contains high intensity LED devices. To prevent eye damage, **DO NOT** stare into the light beam at close range.
- You should frequently inspect the light system 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.

Product Overview

The Serial Interface Module is a device to communicate with Convergence Network controlled lightbars. To minimize the number of discrete wires to the lightbar, control lead functions are wired to the Interface Module. The information is converted to a digital format and communicated to the lightbar via the serial communication cable. Lightbar patterns can be changed through the programming procedure.

Control leads can also activate an Internal SignalMaster™ controller. If preferred, an external Federal Signal SignalMaster controller can link with the Interface Module and directly control SignalMaster operation.

The Serial Interface Module can be identified by part number 8583446 on the nameplate located on the top of the housing. A 3-foot-long, 24-conductor, control-link cable harness is also provided for external connection (J1) to the Interface Module.

Unpacking the Product

After unpacking the product, inspect it for damage that may have occurred in transit. If it has been damaged or is missing a part, 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. If you are missing any parts, contact Customer Support at 1-800-264-3578, (708-534-3400) 7 A.M. to 5 P.M., Monday through Friday (CT).

Programming the Lightbar

⚠ 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 close range. Do not stare directly into the lights at close range or permanent damage to your eyesight may occur.*

Before permanently installing the Serial Interface Module (described on page 8), test and program the lightbar. Each mode patterns is programmed independently of the other. If you want to program the lightbar after you connect a progressive slide switch, the programming sequence must be MODE 3, MODE 2, MODE 1, and then INTERSECTION.

A number of different flash patterns are available for the three modes of lightbar operation. When you use the SW1 flash pattern pushbutton, the lightbar momentarily turns off before flashing the next pattern. To cycle up or down through the flash patterns, set SW2 Switch 5 as shown in Table 1 on page 3.

In addition, the FRONT/REAR lightheads can be set for +BAT cutoff or enable. The INTERSECTION mode has one of three options, HIGH (+BAT maintained), TAP II (push-on/push-off) or an 8-SECOND TIMEOUT.

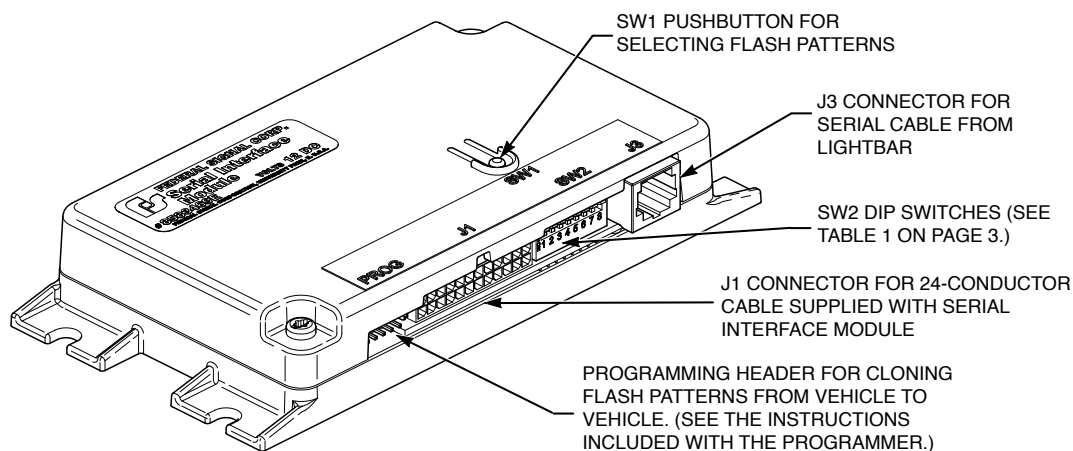
The SignalMaster can also be set for INTERNAL or EXTERNAL control (see Table 1).

Wiring the Interface Module for Testing and Programming

To wire the Interface Module for programming before permanent installation:

1. See Figure 1. Connect the serial cable from the lightbar to the J3 output jack of the Interface Module.
2. Connect the three-foot-long, 24-conductor cable to the J1 input connector of the Interface Module.

Figure 1 Connectors and switches on the Serial Interface Module



3. Connect the WHITE wire, from the supplied J1 cable harness on the Interface Module to a 1 A fuse.
4. Connect the fuse end of the WHITE wire from the supplied J1 cable harness as close as possible to switched ignition power. Power should also be present in the cranking start position.
5. Connect the BLACK and BLACK/WHITE wire from the supplied J1 cable harness to battery ground. Use 16 AWG wire to extend cable length.

Quick Testing the Lightbar

Before programming and testing flash patterns, perform the LIGHTBAR TEST to ensure that all LEDs light properly by following these steps:

NOTE: This feature does not test the STEADY BURN LED lightheads.

The SW2 Switch 3 must be in the UP position for the LIGHTBAR TEST (Table 1 below).

Applying 12 Vdc to the LIGHTBAR TEST control wire activates a test pattern that illuminates each head sequentially. At the end of the sequence, the ALLEY and TAKEDOWN lights turn on.

For lightbars with SpectraLux® Technology (Valor™ and Vision SLR), refer to the manual shipped with the lightbar for the test sequence. SCENE LIGHT is unavailable with this switch setting..

Table 1 SW-2 DIP switch settings in the Interface Module

SW2 Switch Number	Switch Setting		SignalMaster Function and Control Wires (See the wiring harnesses on page 11 and 12.)
	Up (OFF)	Down (ON)	
1	✓		FRONT/REAR LEDs cut off (deactivate) when 12 Vdc is applied their control wires.
1		✓	FRONT/REAR LEDs enable (activate) when 12 Vdc is applied to their control wires.
2	✓		Keep in OFF position
3	✓ ✓	✓ ✓	INTERSECTION is on when 12 Vdc is applied to blue/black wire. LIGHTBAR TEST is on when 12 Vdc is applied to black/white/red wire. SCENE LIGHT, LEFT is on when 12 Vdc is applied to blue/black wire. SCENE LIGHT, RIGHT is on when 12 Vdc is applied to black/white/red wire. NOTE: INTERSECTION and LIGHTBAR TEST are unavailable with the SCENE LIGHT ON (down) switch setting. SCENE LIGHT activation is available only in lightbars with SpectraLux Technology (Valor and Vision SLR).
4	✓		SignalMaster, EXTERNAL control
4		✓	SignalMaster, INTERNAL control
5	✓		Cycle forward through the selection of flash patterns
5		✓	Cycle backward through the selection of flash patterns
6	✓		Operation Mode
6		✓	Program Mode
7	Switch for INTERSECTION operational settings (Table 2 on page 5)		
8	Switch for INTERSECTION operational settings (Table 2)		

Programming the Flash Patterns

Before programming CUT OFF, program the lightbar flash patterns. To access flash patterns, ensure that SW2 Switch 1 is OFF.

NOTE: Cruise lights are also available in MODES 1 and 2.

IMPORTANT: The lightbar must turn off before it displays the next flash pattern. To ensure that you do not miss a pattern choice, push SW1 once, wait for the lightbar to turn off, and then observe the next pattern.

To program the flash patterns:

1. Enter Program Mode:
 - a. Remove ignition power.
 - b. Turn ON (down position) Switch 6 on SW2.
 - c. Apply ignition power.
2. Program MODE 3:
 - a. Activate MODE 3 with +BAT.
 - b. Push and release SW1 until the flash pattern you want appears.
 - c. Remove +BAT from MODE 3.
3. Program MODE 2:
 - a. Activate MODE 2 with +BAT.
 - b. Push and release SW1 until the flash pattern you want appears.
 - c. Remove +BAT from MODE 2.
4. Program MODE 1:
 - a. Activate MODE 1 with +BAT.
 - b. Push and release SW1 until the flash pattern you want appears.
 - c. Remove +BAT from MODE 1.
5. Program INTERSECTION:
 - a. Activate MODE 1 and INTERSECTION with +BAT.
 - b. Push and release SW1 until the flash pattern you want appears.
 - c. Remove +BAT from MODE 1 and INTERSECTION.
6. Exit Program Mode:
 - a. Return Switch 6 on SW2 to the OFF (up) position.
 - b. Remove ignition power.

Programming Front/Rear Cut Off

The active state for FRONT CUT OFF and REAR CUT OFF are not independent. As set at the factory, 12 Vdc must be applied for the front and rear light heads of the lightbar to cut off. To initiate front and rear light head ENABLE with the application of 12 Vdc, see “Front Cutoff” and “Rear Cutoff” in “Lightbar Functions Activated via the CAT5 Cable (Excluding SignalMaster)” on page 6.

CUT OFF must be programmed after the MODE/INTERSECTION pattern. To enable pattern selection, SW2 Switch 1 must be off (Table 1 on page 3).

With the SS2000 controller, if FRONT CUT OFF is preferred in MODE 1, set the active state for ENABLE (apply 12 Vdc to activate the lightheads). The lead wire for FRONT CUT OFF is then connected directly to the MODE 2 lead wire.

The active state for CUT OFF is programmable. The factory setting for FRONT and REAR CUT OFF is to activate when 12 Vdc is applied); FRONT and REAR CUTOFF must share the same active state.

FRONT and REAR CUT OFF can be programmed to activate when 12 Vdc is removed from the respective control leads. To change the active states for FRONT and REAR CUT OFF, remove ignition power to the Serial Interface Module. Refer to Table 1 on page 3 for the DIP switch settings.

Programming the Intersection Function

The INTERSECTION function can be programmed to be activated for HIGH (+BAT maintained), or TAP II (+BAT, push on/push off), or 8-SECOND TIMEOUT (activated by +BAT). The factory setting for INTERSECTION is HIGH (+BAT maintained).

To change the active state for the INTERSECTION Mode, remove ignition power to the interface module. Refer to Table 2 for the DIP switch settings on SW2. OFF is the up position and ON is the down position.

Table 2 SW2 switch settings for INTERSECTION operation

Operational Settings	SW2	
	SW7	SW8
HIGH (+BAT maintained)	OFF (up)	OFF (up)
TAP II (+BAT, push on/push off)	ON (down)	OFF (up)
8-SECOND TIMEOUT (activated by +BAT)	OFF (up)	ON (down)

Selecting External SignalMaster Control

The Serial Interface Module is factory-configured for INTERNAL control (see the next section). When the Serial Interface Module is configured for EXTERNAL SignalMaster control, an external Federal Signal SignalMaster controller, or an SS2000SM Series siren, can be used to control the SignalMaster in all Convergence Network controlled lightbars.

For the 36" Arjent S2, a four-head external SignalMaster is required. For the 44" Arjent S2, external SignalMaster controllers must be six-head. For 53" and longer models and the Valor and Vision SLR models, an eight-head SignalMaster controller is required.

To select external SignalMaster control, remove ignition power and return SW2 Switch 4 to the OFF (up) position. To wire the SignalMaster for external control, see page 12.

Selecting Internal SignalMaster Control (Factory Default)

Internal control uses the on-board SignalMaster controller in the lightbar to generate directional warning patterns. With internal operation, an external SignalMaster controller is not needed. A standard low-current switch box can activate the internal SignalMaster controller. To wire the SignalMaster for internal control, see page 11.

1. Remove ignition power to the Serial Interface Module.
2. Move SW2 Switch 4 to the ON (down) position (see Table 1 on page 3).

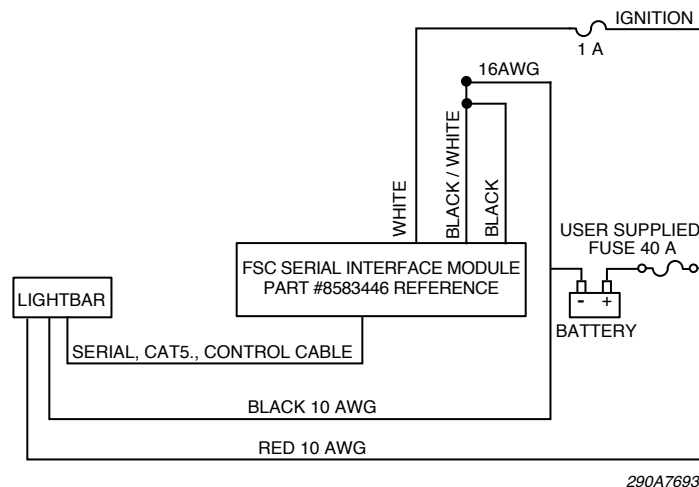
Lightbar Functions Activated via the CAT5 Cable (Excluding SignalMaster)

⚠ 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 close range. Do not stare directly into the lights at close range or permanent damage to your eyesight may occur.

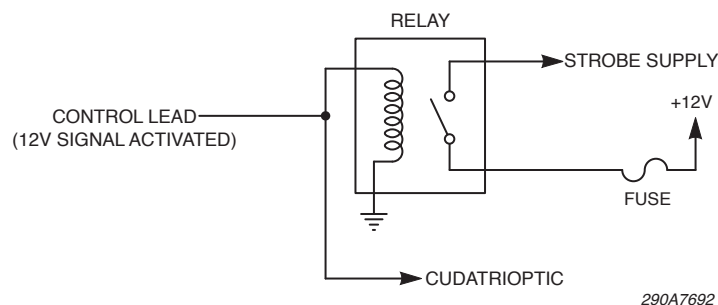
For a block wiring diagram, see Figure 2. For wiring schematics of the controller's functions to the cable harness supplied with the Interface Module, see Figure 4 (internal control) on page 11 and Figure 5 (external control) on page 12. If additional wire is necessary for the harness (except ground), 22 AWG wire is adequate. The ground wires must be extended with wire that is 16 AWG or better. All inputs are active HIGH.

Figure 2 Wiring block diagram



NOTE: Powering multiple devices with a common control lead may cause one or more units to briefly remain functional after signal power is removed. For example, due to the high input filter capacitance, a strobe supply can briefly supply the current required to signal a lightbar function to remain ON. If necessary, use a relay to isolate devices with large filter capacitors. For the schematic, see Figure 3.

Figure 3 Relay for isolating devices with large filter capacitors



To activate a mode, apply 12 Vdc to a MODE control lead. There are three prioritized modes of operation available with MODE 3 as the highest priority. MODE 3 overrides MODE 2, and MODE 2 overrides MODE 1. One of the available flash patterns can be programmed to each mode input. To program a flash pattern, see “Programming Flash Patterns on page 4.

Steady Burn Red

When the lightbar is equipped with a STEADY BURN RED LED module, applying 12 Vdc to the control lead causes that module to operate when any mode input is selected.

Front Cutoff

12 Vdc applied to the FRONT CUT OFF control lead deactivates the selected MODE operation to the front of the lightbar. Only the rear lights will function. Additionally, with FLASH TAKEDOWN/ALLEY active, only the alley lights flash. See also “Programming Front/Rear Cut Off” on page 4.

Rear Cutoff

12 Vdc applied to the REAR CUT OFF control lead deactivates the selected MODE operation on the rear of the lightbar. Only the front lights function. See also “Programming Front/Rear Cut Off” on page 4.

Intersection

Modes 1, 2, or 3 need to be active to initiate the INTERSECTION feature. The factory setting activates the INTERSECTION Mode when 12 Vdc is applied to the control lead for INTERSECTION. When 12 Vdc is removed, the lightbar returns to the original mode of operation. Additional programming for alternative configurations of this feature are described in the sections “Programming the Intersection Function” on page 5.

Flash Takedown Alley

Applying 12 Vdc to the FLASH TAKEDOWN/ALLEY control lead flashes the ALLEY lights and TAKEDOWN lights. MODE 1, 2, or 3 must be in operation for the FLASH TAKEDOWN/ALLEY feature to function.

Alley Lights

Applying 12 Vdc to the LEFT or RIGHT ALLEY control leads activates the corresponding alley light.

Takedown

Applying 12 Vdc to the Takedown control lead illuminates the TAKEDOWN lights. TAKEDOWN overrides the FLASH TAKEDOWN/ALLEY and FRONT CUTOFF modes of operation.

Low Power

⚠ WARNING

LOW POWER PRECAUTION — Enabling the Low Power Mode in the lightbar causes the light output of the lightbar to fall below current light output standards and guidelines for emergency warning lights. Use extreme caution when using this mode. Ensure that the ambient light conditions are low enough that you are seen, and that the reduction of glare from the lightbar is safer than full light output in the situation. Failure to heed this warning may result in serious injury or death to you or others in your vicinity.

LOW POWER mode is disabled when the lightbar is in MODE 3 or INTERSECTION Mode.

Applying 12 Vdc to the control lead for LOW POWER mode dims the LEDs to 25 percent of their full brightness. LOW POWER mode is only functional in MODE 1 or MODE 2 operation. LOW POWER is disabled when switching to another mode of operation, including INTERSECTION mode.

To enter LOW POWER mode again, disconnect 12 Vdc from the lead for LOW POWER Mode and reapply 12 Vdc to the lead for LOW POWER Mode after a mode change occurs.

Under dark conditions, a lightbar with an ambient light sensor automatically dims. Under bright conditions, the lightbar returns to full brightness. If MODE 3 or INTERSECTION is activated, the lightbar returns to full brightness in the dark and dims when MODE 3 or INTERSECTION is deactivated.

To override autodimming, toggle the LOW POWER wire ON then OFF.

Scene Light, Left

The SCENE LIGHT, LEFT option is available only in lightbars with SpectraLux Technology (Valor and Vision SLR).

To use SCENE LIGHT, LEFT with the Serial Interface Module, you must place SW2 Switch 3 in the down position (ON). INTERSECTION is unavailable with this switch setting.

Scene Light, Right

The SCENE LIGHT, RIGHT option is available only in lightbars with SpectraLux Technology (Valor and Vision SLR).

To use the SCENE LIGHT, RIGHT with the Serial Interface Module, you must place SW2 Switch 3 in the down position (ON). The LIGHTBAR TEST is unavailable with this switch setting.

Lightbar Test

See “Quick Testing the Lightbar” on page 3.

Installing the Serial Interface Module

NOTICE

INSTALLATION PRECAUTIONS — Do not install the Interface Module in an area where it cannot dissipate heat into the air. Do not mount the unit near a heater duct. The Interface Module also is not waterproof. It must be mounted in a location which is sheltered from falling rain, snow, standing water, etc.

Plan all wiring and cable routing before the installation.

User-supplied #8 mounting hardware is required.

Dimensions:

Length: 6.25 in (159 mm)

Width: 3.16 in (80 mm)

Height: 1.06 in (27 mm)

To install the Interface Module:

1. Use the Interface Module as a template and scribe four drill position marks at the selected mounting location. Mounting centers are 2 in (51 mm) x 5.95 in (151 mm).

⚠ WARNING

DRILLING PRECAUTION — DO NOT drill holes in ANY part of the Interface Module. Damage to the unit, serious injury or death to you or others may result.

2. Drill four mounting holes sized for #8 mounting hardware at the position marks.
3. Secure the Interface Module to the mounting surface.

Wiring the Serial Interface Module to Power and Ground

⚠ 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 or death.

⚠ WARNING

SEAT REMOVAL PRECAUTION — If a vehicle seat is temporarily removed, verify with the vehicle manufacturer if the seat needs to be recalibrated for proper airbag deployment. Failure to observe this warning may cause serious injury or death.

To wire the Serial Interface Module to power and ground:

1. Connect the WHITE wire, from the supplied J1 cable harness on the Interface Module to a 1 A fuse.
2. Connect the fuse end of the WHITE wire as close as possible to switched ignition power. Power should also be present in the cranking start position.
3. Connect the BLACK and BLACK/WHITE wire from the supplied J1 cable harness to battery ground. Use 16 AWG wire to extend cable length.
4. Insulate spliced leads with twist-on wire connectors. Fold and seal unused leads. Use wire ties and hold-downs for strain relief.

Wiring the SignalMaster

⚠ 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 close range. Do not stare directly into the lights at close range or permanent damage to your eyesight may occur.

Depending on length, lightbars have a four-, six-, or eight-head SignalMaster. Be sure to use the proper controller to match the number of SignalMaster heads in the lightbar.

If SignalMaster operation is not initiated by a control head or external controller, the SignalMaster LED heads flash according to the selected mode (1, 2, or 3) of operation.

External SignalMaster

The Interface Module can be configured from the factory default of Internal operation (see the next section) to External operation. The Interface Module drives each SignalMaster head independently via an external Federal Signal SignalMaster controller or an SS2000SM series siren. Either device will provide an independent ground signal to illuminate each head.

For SignalMaster control functions wired to 12 Vdc for External Control, see Figure 5 on page 12.

Internal SignalMaster (Factory Default)

The Interface Module SignalMaster control leads are defined in Table 3. The SignalMaster can be configured from External to Internal operation. +BAT applied to the specified control lead activates the internal SignalMaster controller in the lightbar. See Figure 4 on page 11.

Getting Technical Support and Service

Federal Signal Corporation will service your equipment or provide technical assistance with any problems that cannot be handled locally. Any product returned to Federal Signal for service, inspection, or repair must be accompanied by a Return Material Authorization number. The RMA number can be obtained from your local distributor or Federal Signal. Please provide a brief explanation of the service requested or the nature of the malfunction. Contact your local dealer/distributor for replacement parts availability or contact the Service Department (7 A.M. to 5 P.M., Monday through Friday, Central Time) at:

Federal Signal Corporation
2645 Federal Signal Drive
University Park, IL 60484-3167
1-800-433-9132, 1-708-534-3400
800-343-9706 (fax)
E-mail: empserviceinfo@fedsig.com
www.fedsig.com

Returning a Product to Federal Signal

Before returning a product to Federal Signal, call 800-264-3578 (Law Enforcement), 800-824-0254 (Amber/Heavy Duty), 1-800-264-3578 (Fire EMS), or 1-708-534-3400 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
Public Safety Systems
2645 Federal Signal Drive
University Park, IL 60484-3167
Attn: Service Department
RMA: # _____
1-800-433-9132, 1-708-534-3400
1-800-343-9706 (fax)

Figure 4 SignalMaster control functions wired to 12 Vdc for Internal Control (factory default)

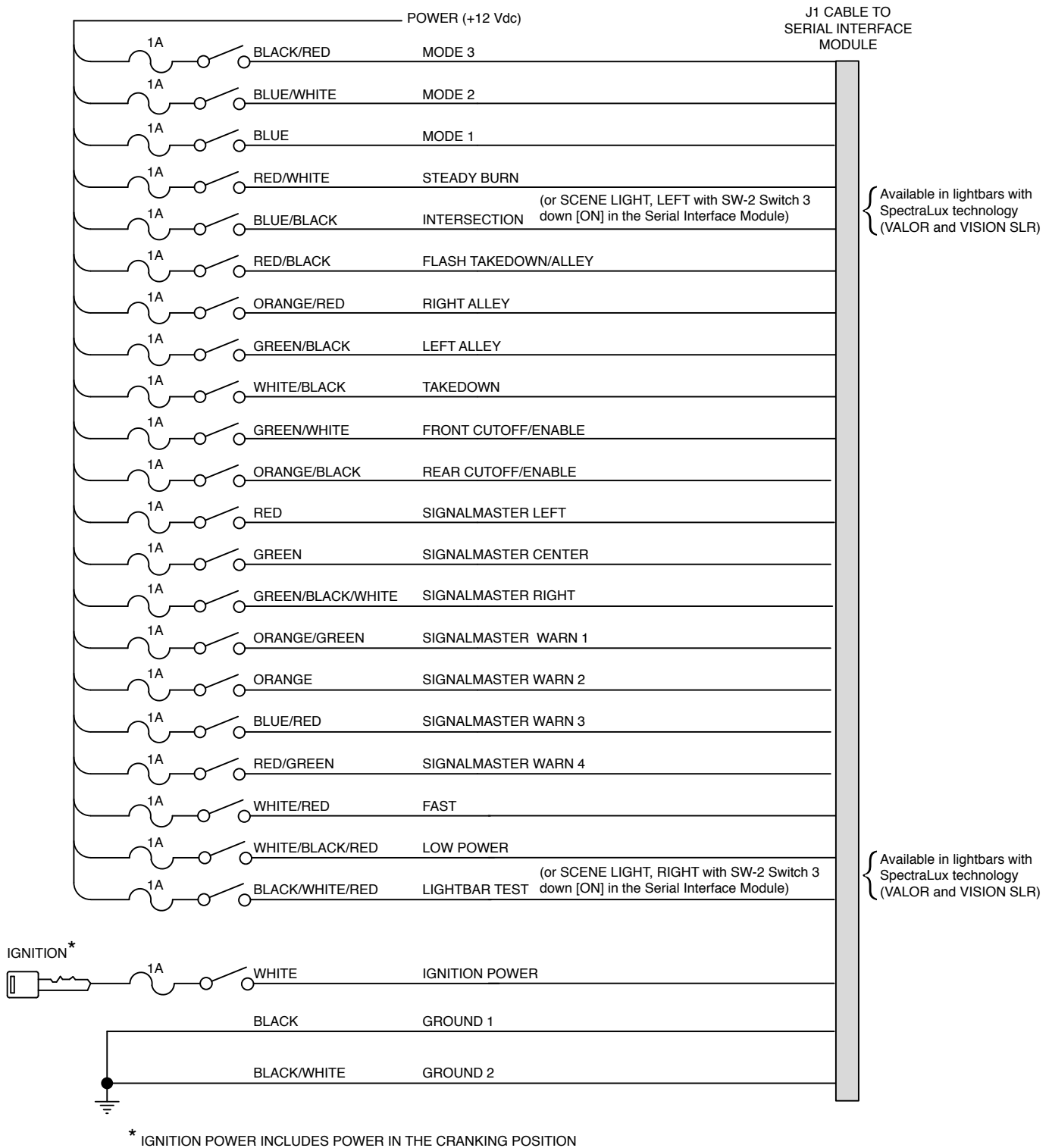
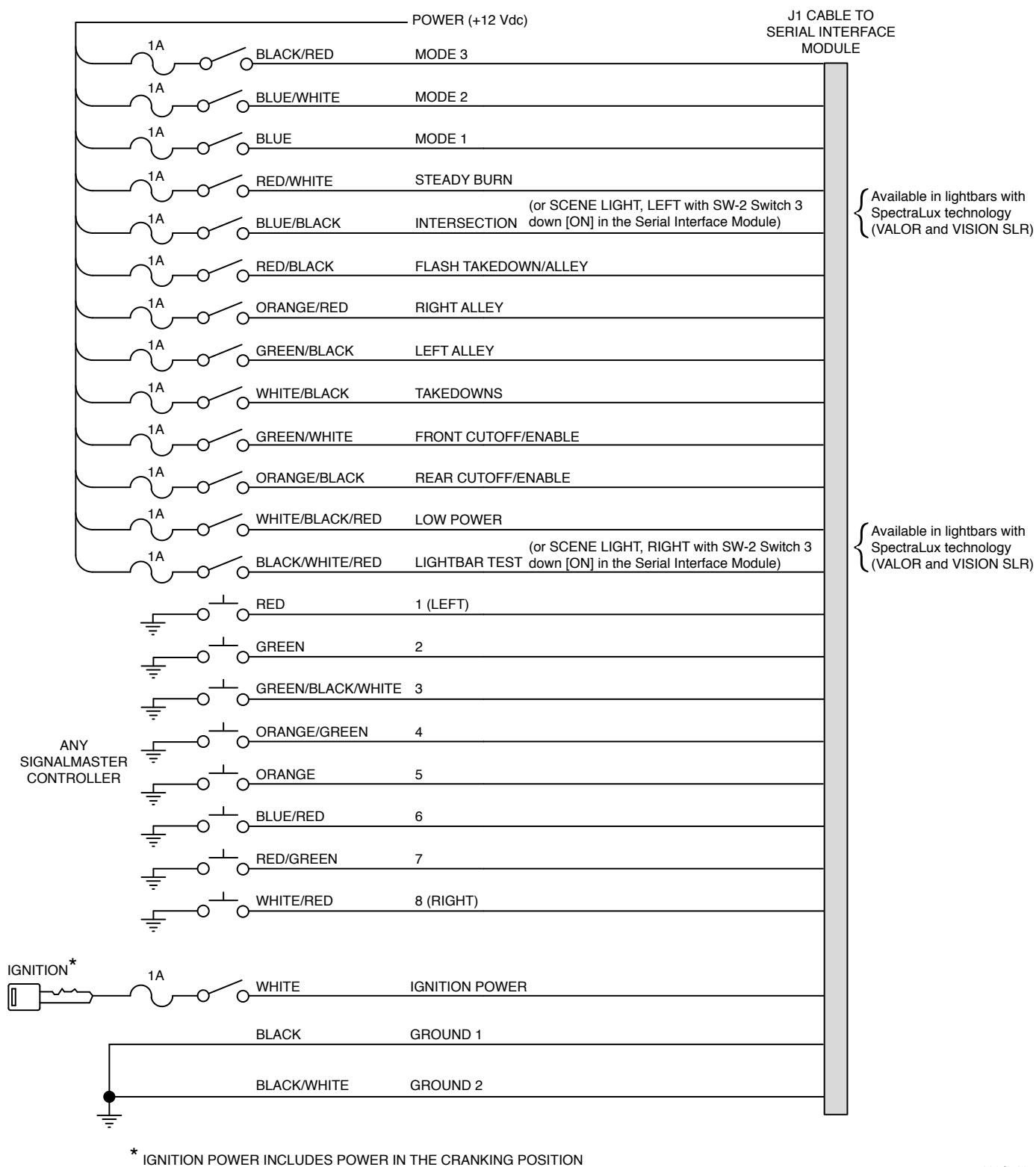


Figure 5 SignalMaster control functions wired to 12 Vdc for External Control



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