
1. Introduction

The Model 5395 is a notification and auxiliary power expander that provides up to 6 amps of regulated, 24 volt power for powering notification appliances and auxiliary devices. The 5395 provides its own AC power connection, battery charging circuit, and battery connections. Used with security and fire panels, the 5395 enables you to connect and distribute power to many more devices than your panel may normally allow.

- Comparison to the Silent Knight Model 5295

The 5395 signal inputs operate the same way as the signal inputs on the Model 5295 Signal Power Expander. Two of the configurations described on page 5 are the same as the two configurations on the 5295. However, pay close attention to the output and input terminal numbers before replacing a Model 5295 with the Model 5395. The terminal assignments of inputs 1 and 2 are reversed on the 5395, and there are additional terminals on the 5395 that are not on the 5295 panel.

- Input Configurations

The 5395 has two optically isolated signaling inputs that provide the signal connection from the main control panel to the 5395 (see page 4 for more details).

- Output Configurations

The 5395 has four power-limited notification outputs that can be configured in various combinations of class A and Class B circuits (see page 5 for more details).

- Auxiliary Power Configurations

The 5395 has a dedicated, power-limited, auxiliary output that can be configured in two different ways. The auxiliary output can either be non-resettable (always on), or configured to switch off when the AC power goes off to conserve the battery standby power. When the auxiliary power is configured to switch off, there is a 30 second delay before the auxiliary power is turned off after the AC power goes off (see page 19 for more details).

- Form C Trouble Relay

The 5395 includes a general trouble relay that will de-energize for any trouble situation on the 5395 (see page 12 for more details).

- Earth Fault Detection

The 5395 monitors for earth faults to the system power or system ground. When detected, the system de-energizes the trouble relay and the input supervision relays (see page 28 for details).

- ANSI Temporal Code

The 5395 provides two configuration options that will drive outputs with the ANSI temporal code if the inputs are on constant (see page 18 for details).

2. UL Requirements

When installed in accordance with NFPA 72 rules, the 5395 is listed to meet UL 1481 standards and can be connected to UL Listed devices suitable for local service.

The 5395 is also listed to meet UL 864 standards and power limiting requirements.

The 5395 is compatible with any UL listed control unit utilizing reverse polarity supervised notification outputs, using 24 VDC regulated outputs.

3. System Overview

CAUTION

Each output circuit is rated at 3 amps. **DO NOT OVERLOAD.** Overloading a circuit will cause it to shut down (power limit). The circuit will automatically reset once you remove the overload condition.

3.1 Terminal Descriptions and Electrical Ratings

Table 3-1. Terminal Descriptions

Terminal #	Description	Ratings
TB1		
1	AC (black—"hot")	120 VAC 60 Hz
2	Earth Ground	
3	AC (white—"neutral")	
TB2		
1	Auxiliary Power (-)	24 VDC 3.0 amps
2	Auxiliary Power (+)	
3	Notification 4 Output (-)	24 VDC 3.0 amps
4	Notification 4 Output (+)	
5	Notification 3 Output (-)	24 VDC 3.0 amps
6	Notification 3 Output (+)	
7	Notification 2 Output (-)	24 VDC 3.0 amps
8	Notification 2 Output (+)	
9	Notification 1 Output (-)	24 VDC 3.0 amps
10	Notification 1 Output (+)	
11	Normally Closed contact	2.5 A @ 250 VAC or 2.5 A @ 30 VDC
12	Common	
13	Normally Open contact	
14	Input 2	9 - 30 VDC
15	Input 2 (-)	
16	Input 2 (+)	
17	Input 1	9 - 30 VDC
18	Input 1 (-)	
19	Input 1 (+)	

Even though each output is rated for 3 amps, the total current draw from the 4 outputs and the auxiliary power must not exceed 6 amps of notification power.

3.2 Signal Input Terminals

Terminals 14 through 19 are polarized signal input terminals. They provide the signaling connection from the main panel to the 5395. See Figure 4-2 on page 11 for more details.

Section 5 shows connections to specific Silent Knight fire and security panels.

The main panel supervises its notification circuits used for communicating with the 5395 the same way it supervises ordinary notification circuits. The signal inputs on the 5395 monitor the polarity of the voltage coming from the main panel's notification circuits to determine when to operate the notification circuits on the 5395. The 5395 emulates the trouble behavior of a normal notification circuit by breaking the EOL supervision current for internal or output trouble conditions on the 5395.

Note that the 5395 will accurately sense the polarity of the main panel's notification circuits to drive the outputs whether or not the supervision connection is intact. The following situations will disconnect the EOL supervision at the signal inputs and indicate a trouble condition:

- Low AC power
- Low Battery condition
- Earth ground fault to the system power or system ground
- Auxiliary output power-limited condition
- EOL supervision trouble or power-limited condition at an output

Trouble conditions will not necessarily occur for both inputs when the trouble is specific to a particular output. Only the signal input controlling the output circuit that is in trouble will indicate a trouble condition. Below are examples where both inputs do NOT indicate trouble for a trouble occurring at only one output circuit.

Example 1: If input 1 controls all four outputs, a fault on any output will cause input 1 to indicate trouble. The fault does not affect input 2.

Example 2: If input 1 controls outputs 1 and 2, and input 2 controls outputs 3 and 4, a fault condition on output 3 or 4 will cause input 2 to indicate trouble. The fault does not affect input 1.

Note: Once the inputs are driven with forward polarity to activate the outputs, the main control panel will not be able to sense trouble conditions through its notification circuit connected to the 5395 input circuits. Use the 5395 trouble relay when it is necessary to monitor trouble conditions and active alarm conditions at the same time.

Section 7 explains the significance of each trouble condition in more detail.

3.3 Notification Output Terminals

Terminals 3 through 10 are the notification output terminals. Each of the four outputs is rated at 3 amps, though you can only draw a total of 6 amps from the 5395. The 5395 outputs are short-circuit protected (power limited) according to UL 864 standards. Overcurrent indicators are yellow LEDs. The output voltage can vary depending on the load and input voltage.

The four power-limited notification outputs can be configured as follows:

- Four class B circuits
- Two class A circuits
- One class A and two class B circuits
- Class B, ANSI temporal-coded circuits

One or both 5395 signal inputs control the notification outputs, depending on the specific configuration setup. Possible configurations for the 5395 are:

For Option:	These Inputs:	Control These Outputs:	As:
1	Input 1	All outputs	Class B circuits
2	Input 1 or Input 2	Outputs 1, 2, 3, and 4	Class B ANSI temporal-coded circuits
3	Input 1 Input 2	Outputs 1 and 2 Outputs 3 and 4	Class B circuits Class B circuits
4	Input 1 Input 2	Output 1 Outputs 2, 3, and 4	Class B circuits Class B circuits
5	Input 1	Outputs 1-2 and 3-4	Class A circuit pairs
6	Input 1 Input 2	Outputs 1 and 2 Outputs 3 and 4	Class B ANSI temporal-coded circuits Class B circuits
7	Input 1 Input 2	Outputs 1-2 Outputs 3-4	Class A circuit pair Class A circuit pair
8	Input 1 Input 2	Outputs 1-2 Outputs 3 and 4	Class A circuit pair Class B circuits

You can select which input controls which output, and which inputs are class A and class B using the 5-position DIP switch on the printed circuit board. Refer to page 17 for DIP switch settings.

4. Installation

Before installing the 5395, the AC input must first be wired into the building's main electrical power through the TB1 terminals (see page 11). Shut off the electrical power to the 5395, and then complete the general installation of the 5395 using the information in this section.

4.1 Mounting

Mount the 5395 in locations that meet the following temperature and humidity requirements. Do not expose the 5395 panel to conditions outside of these ranges.

Temperature	0° C-49° C (32° F-120° F)
Humidity	10%-85% at 30° C (86° F) noncondensing

When mounting on interior walls, use appropriate screw anchors in plaster. When mounting on concrete, especially when moisture is expected, first attach a piece of 3/4-inch plywood to the concrete surface. Attach the 5395 to the plywood.

4.2 Wire Routing

To avoid induced noise (transfer of electrical energy from one wire to another), keep input wiring isolated from high current output and power-limited wiring. Induced noise can interfere with telephone communication or even cause false alarms. Avoid pulling one multiconductor cable for the entire system. Instead, separate high current input/output from low current. Separate power-limited from non-power-limited wiring. Non-power-limited wiring must be enclosed in conduit.

Wiring within the cabinet should be routed around the perimeter of the cabinet. It should not cross the printed circuit board where it could induce noise into the sensitive microelectronics or pick up unwanted RF noise from the switching power supply circuit.

There must be at least 1/4 inch spacing between high and low voltages.

All wiring must be within the range of 12-18 American Wire Gauge (AWG)

Non power limited wiring must be run in conduit separately from power-limited wiring.

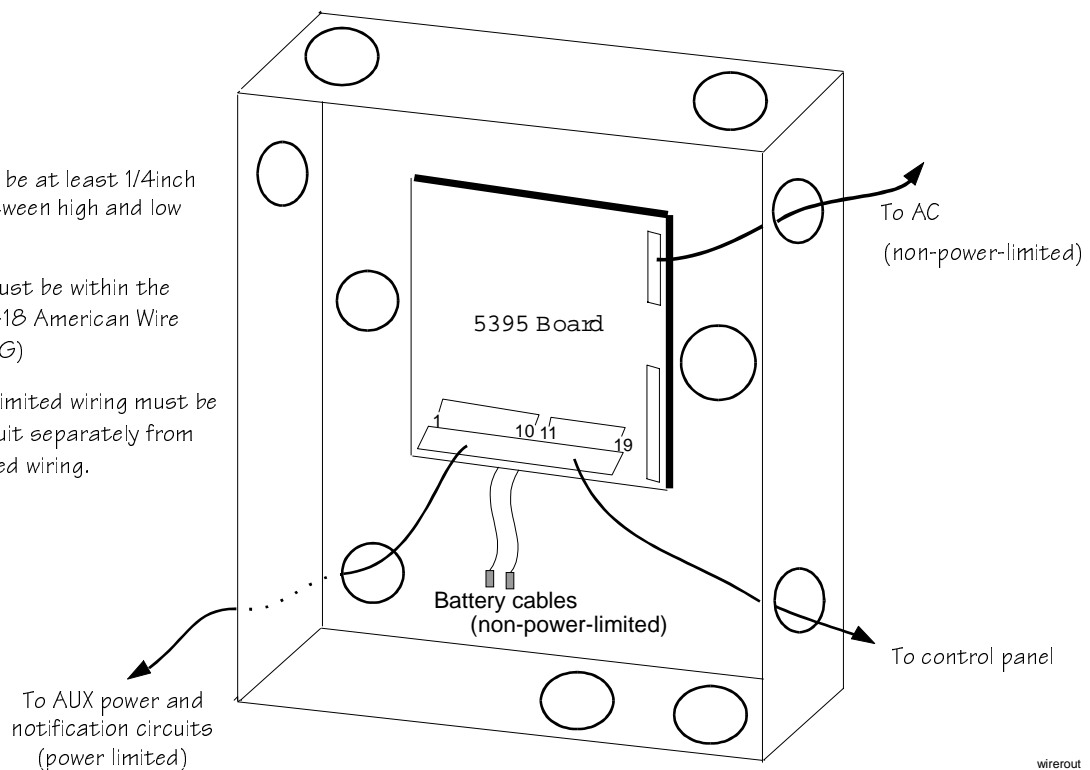


Figure 4-1. Sample Wire Routing

4.3 Current Requirements (Standby and Alarm)

4.3.1 Current Drawn From Host Panel

Table 4-1 shows the 5395 current draw requirements from the main control panel when the panel's notification circuit is in alarm. The current draw from the main panel when it is supervising the 5395 is the same current draw that would be present when the main panel supervises an ordinary notification circuit.

Table 4-1. 5395 Alarm Current Drawn From Main Panel

	Panel Voltage	Current
Alarm Current (for typical voltages) drawn from main panel's notification circuits.	12 VDC	6.5 mA
	24 VDC	One input circuit: 15 mA Both input circuits: 30 mA

4.3.2 Current Drawn from Battery

Backup batteries used with the 5395 must be UL listed 7 AH batteries, such as the Silent Knight Model 6712. See page 16 for battery installation.

The following is the maximum current draw from the auxiliary power terminals for standby calculations. These currents assume 24 or 60 hours of standby time followed by 5 minutes of maximum alarm current.

- **195 mA for 24 Hours of Auxiliary Standby Current**
- **39 mA for 60 Hours of Auxiliary Standby Current**

The above numbers were calculated assuming the use of 7 AH batteries at 100% of rated capacity.

The total current of the 5395, plus all items attached to it, must not exceed 6 A when the panel is in alarm. Use Table 4-2 on page 9 to ensure that the current does not exceed 6 A and, that the desired amount of standby is possible for the battery intended to be used with the 5395.

Table 4-2. Battery Calculation Worksheet

	Device	Number of Devices	Current per Device	Standby Current	Alarm Current
	<i>For each device use this formula: This column X This column = Current per number of devices.</i>				
	5395 Distributed Power Module (Current draw from battery)	1	Standby: 75 mA Alarm: 100 mA	75 mA	
A	5395 Current			75 mA	100 mA
	Auxiliary Devices	<i>Refer to device manual for current ratings.</i>			
			Alarm/Standby mA	mA	mA
			Alarm/Standby mA	mA	mA
			Alarm/Standby mA	mA	mA
			Alarm/Standby mA	mA	mA
B	Auxiliary Devices Current			mA	mA
	Notification appliances	<i>Refer to device manual for current ratings.</i>			
			Alarm: mA	0 mA	mA
			Alarm: mA	0 mA	mA
			Alarm: mA	0 mA	mA
			Alarm: mA	0 mA	mA
C	Notification Appliances Current			0 mA	mA
D	Total current ratings of all devices in system (line A + line B + line C)			mA	mA
E	Total current ratings converted to amperes (line D x .001):			A	A
F	Number of standby hours (24 or 60 for NFPA 72, Chapter 1, 1-5.2.5).			H	
G	Multiply lines E and F. Total standby AH			AH	
H	Alarm sounding period in hours. (For example, 5 minutes = .0833 hours.)				H
I	Multiply lines E and H. Total alarm AH				AH
J	Add lines G and I. Total standby and alarm AH			AH	
K	Multiply line J by 1.20. (20% extra insurance to meet desired performance) Total ampere-hours required			AH	

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4.4 Connecting the 5395 to a Control Panel

Figure 4-2 shows the general layout of the 5395 PC board. This section also provides specific wiring details for accessories.

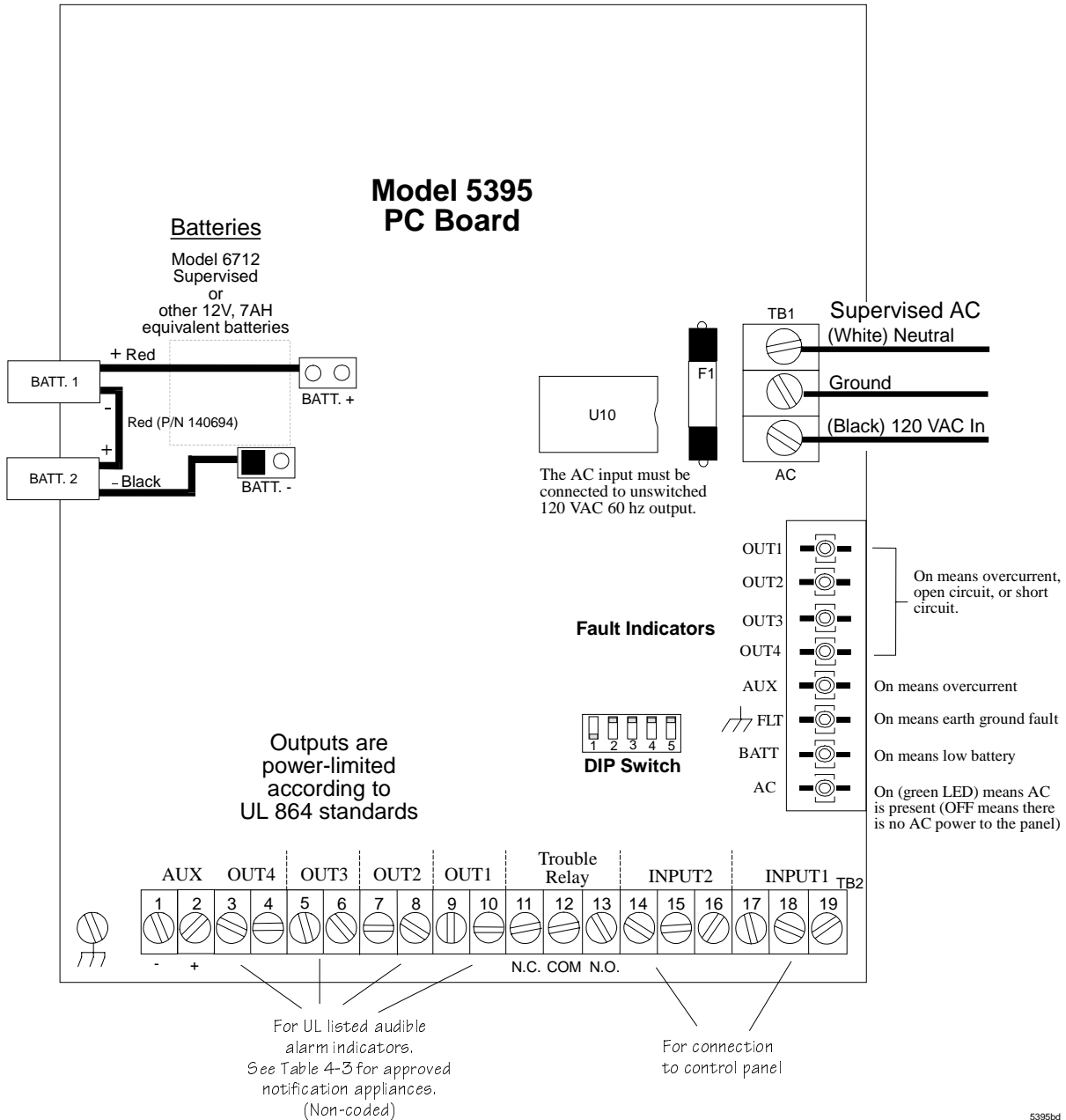


Figure 4-2. Model 5395 PC Board Layout

Consult your control panel manual for specific wiring information on the control panel being used. If you are using a Silent Knight control panel, see page 20 for connections.

4.4.1 Trouble Relay

The 5395 board has a Form C trouble relay built into terminals 11-13. The relay provides a normally open and a normally closed contact, both of which are rated at 2.5A. The trouble relay will deactivate under any trouble condition.

A typical application of the trouble relay is to connect the 5395 normally closed (N.C.) contacts in series with the EOL supplied with the fire panel. This will cause a trouble on the fire panel when the 5395 opens its trouble contacts.

Note: The N.C. contact is the relay contact that is closed when the 5395 has power and there are no trouble conditions.

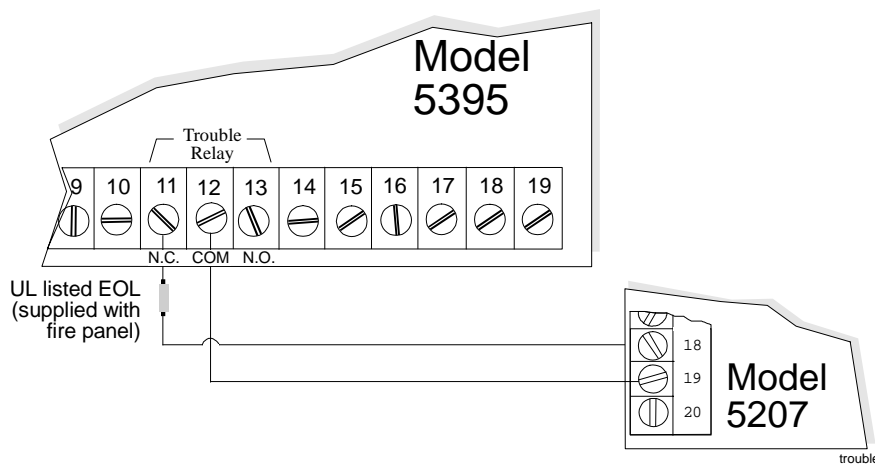


Figure 4-3. Trouble Relay Connection Example

4.4.2 Class A Supervised Wiring

Figure 4-4 shows how to wire for Class A input and output supervision. Use in/out wiring methods for proper supervision. (See page 15 for notification appliances that must be used with the 5395.)

Class A Output Notification Circuits

The configuration shown in Figure 4-4 shows two, 3-amp devices wired as class A circuits. When you are using the outputs as class A circuits, loop the wiring back to the corresponding circuit pair. For class A wiring, no external EOL is necessary since it is built into the 5395 board.

Class A Supervised Input Circuits

The configuration shown in Figure 4-4 shows class A supervised wiring from a fire panel to the Model 5395 board. Pay close attention to the polarities when wiring a panel to the 5395 and follow these requirements:

- When wiring to terminal 18 on the 5395, you must use two separate wires. Do not loop a single wire or twist two conductor wires together.
- Do not use notification appliances on class A circuits connected to a 5395 for input. The 5395 will detect voltage across the input circuits, but is not designed to pass the added current load from notification appliances.

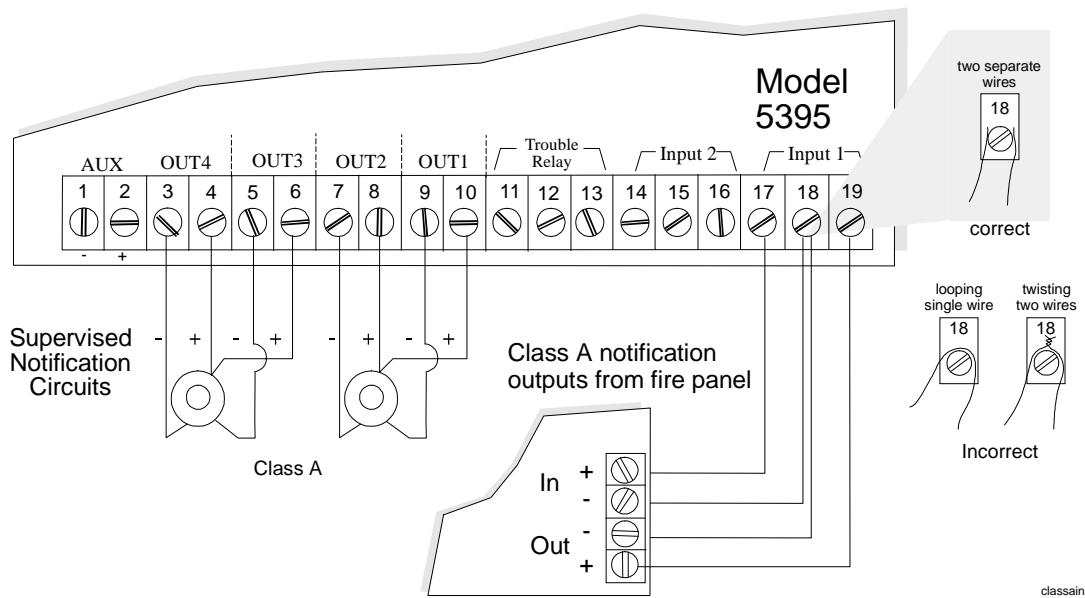


Figure 4-4 Class A Supervised Input/Output Connections

4.4.3 Class B Supervised Wiring

Figure 4-5 shows how to wire for Class B input and output supervision. Use in/out wiring methods for proper supervision. (See page 15 for notification appliances that can be used with the 5395.)

Class B Output Notification Circuits

Figure 4-5 shows four, 1.5 amp devices wired as class B circuits.

Place a 4.7k ohm EOL resistor (provided) at the end of each loop to enable notification output supervision when using all outputs as class B notification circuits. The 4.7k EOLs must be wired to the terminals whether or not you are using all output terminals.

Class B Supervised Input Circuits

Figure 4-5 shows class B supervised wiring from a fire panel to the Model 5395 board.

Use an EOL resistor as shown to enable notification input supervision. Some panels use EOLs that have a different value than the 4.7k ohm EOL resistor used by the 5395. In this case, the EOL must be UL listed for the fire panel (not the 5395).

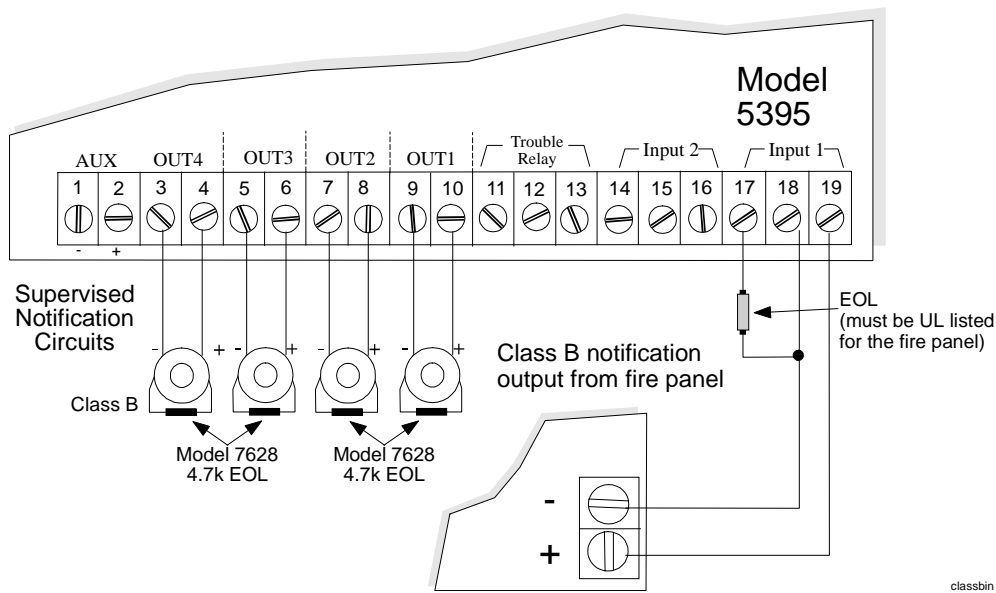


Figure 4-5. Class B Supervised Input/Output Connections

4.5 UL Listed Notification Appliances

For proper operation, you must use polarized devices with a Model 7628 4.7k ohm EOL resistor on each loop. All supervised notification appliances used with the Model 5395 must be polarized.

Table 4-3. UL Listed Notification Appliances (24 VDC)

Manufacturer	Model Number	Device Type
Faraday	6126B-U-14-24VDC	Horn/Strobe
Federal Signal	VALS	Horn/Strobe
Federal Signal	450-D	Horn
Gentex	HG124	Horn
Gentex	SHG24L	Horn Strobe
Gentex	SHG24H	Horn Strobe
System Sensor	MA/SS/24I	Horn/Strobe
System Sensor	MASS2415ADA	Horn/Strobe
System Sensor	MASS2475ADA	Horn/Strobe
System Sensor	MASS24110ADA	Horn/Strobe
System Sensor	SS2415ADA	Strobe
System Sensor	SS2475ADA	Strobe
System Sensor	SS24110ADA	Strobe
Wheelock	34T-24-R	Alarm Horn
Wheelock	46T-G10-24-R	Bell
Wheelock	7001T-24-W-FR	Strobe Horn
Wheelock	7002T-24-W-FR	Strobe Horn
Wheelock	E-7025-WH-24-VF-R	Strobe Speaker
Wheelock	E-7025-WH-24-VF-W	Strobe Speaker
Wheelock	E-7070-WH-24-VF-R	Strobe Speaker
Wheelock	E-7070-WH-24-VF-W	Strobe Speaker
Wheelock	E-9025-WH-24-CF-W	Strobe Speaker
Wheelock	E-9070-WH-24-CF-W	Strobe Speaker
Wheelock	E-7025-WM-24-VF-R	Strobe Speaker
Wheelock	E-7025-WM-24-VF-W	Strobe Speaker
Wheelock	E-7070-WM-24-VF-R	Strobe Speaker
Wheelock	E-7070-WM-24-VF-W	Strobe Speaker
Wheelock	E-7025-WS-24-VF-R	Strobe Speaker
Wheelock	E-7025-WS-24-VF-W	Strobe Speaker
Wheelock	E-7070-WS-24-VF-R	Strobe Speaker
Wheelock	E-7070-WS-24-VF-W	Strobe Speaker
Wheelock	E-9025-WS-24-CF-W	Strobe Speaker
Wheelock	E-9070-WS-24-CF-W	Strobe Speaker
Wheelock	ET-1010-WS-24 HF-R	Strobe Speaker
Wheelock	ET-1070-WS-24-VF-R	Strobe Speaker
Wheelock	ET-1080-WS-24-VF-R	Strobe Speaker
Wheelock	ET-1090-WS-24-CF-W	Strobe Speaker
Wheelock	ET-1070-WM-24-VF-R	Strobe Speaker
Wheelock	ET-1070-WM-24-VF-W	Strobe Speaker
Wheelock	ET-1080-WM-24-VF-R	Strobe Speaker

continued on next page

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Manufacturer	Model Number	Device Type
Wheelock	ET-1080-WM-24-VF-W	Strobe Speaker
Wheelock	EW-EH1-R	Slow Whoop Horn
Wheelock	MB-G6-24-R	Motor Bell
Wheelock	MB-G10-24-R	Motor Bell
Wheelock	MBS-G6-24-W-HF-R	Motor Bell with Strobe
Wheelock	MBS-G10-24-W-HF-R	Motor Bell with Strobe
Wheelock	MIZ-24-R	Mini-Horn
Wheelock	MIZ-24-W	Mini-Horn
Wheelock	MIZ-24-WS-VF-R	Mini-Horn
Wheelock	MIZ-24-WS-VF-W	Mini-Horn/Strobe
Wheelock	MIZ-24-WS-VF-R	Mini-Horn/Strobe
Wheelock	MT-12/24-R	Strobe Horn
Wheelock	MT-24-WM	Strobe Horn
Wheelock	MT-24-WM-VF-R	Strobe Horn
Wheelock	Series HS	Strobes
Wheelock	Series LS	Strobes
Wheelock	V7001T-24-W-FR	Strobe Horn
Wheelock	WST-24-FR	Strobe
Wheelock	WS1T-24-FR	Strobe
Wheelock	WS3T-24-FR	Strobe

4.6 Battery Connection

You must use two backup batteries with the 5395. Use 12 VDC, 7 AH gel cell batteries, such as the Silent Knight Model 6712. It is recommended that you replace the batteries every five years. The following steps and diagram explain how to connect the batteries.

1. Connect the black wire to the negative (-) side of battery #2.
2. Connect the jumper wire provided (P/N 140694) from the positive (+) side of battery #2 to the negative side of battery #1.
3. Connect the red wire to the positive (+) side of battery #1.

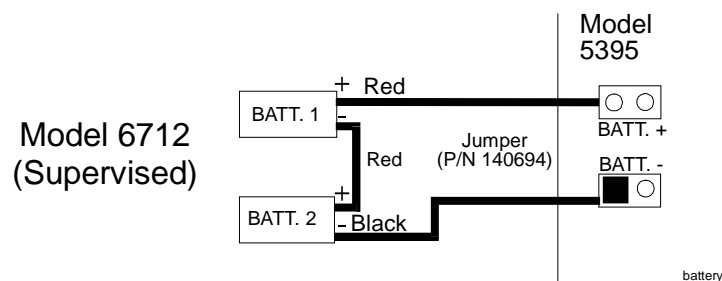


Figure 4-6. Battery Connection

4.7 DIP Switch Settings

A 5-position DIP switch on the 5395 board allows you to select the following:

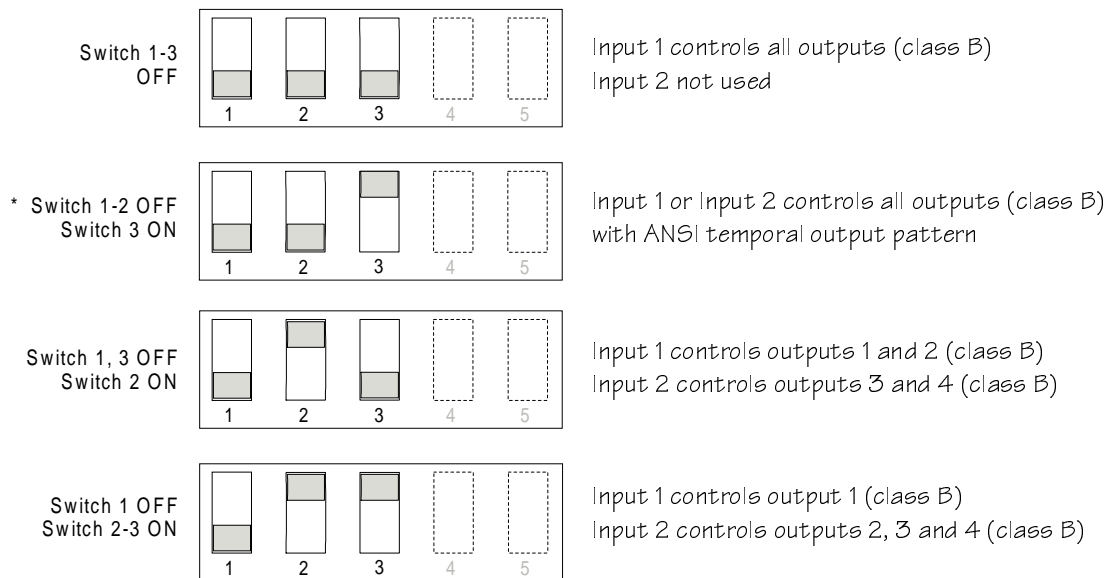
- How long the 5395 will wait before indicating a loss of AC.
- Which input (Input 1 or Input 2) will control the notification outputs.
- Which outputs to wire as class A and class B.
- Auxiliary power state.
- Which outputs to operate as steady outputs or ANSI temporal.

Refer to Figure 4-2 on page 11 for the location of the DIP switch on the 5395 board.

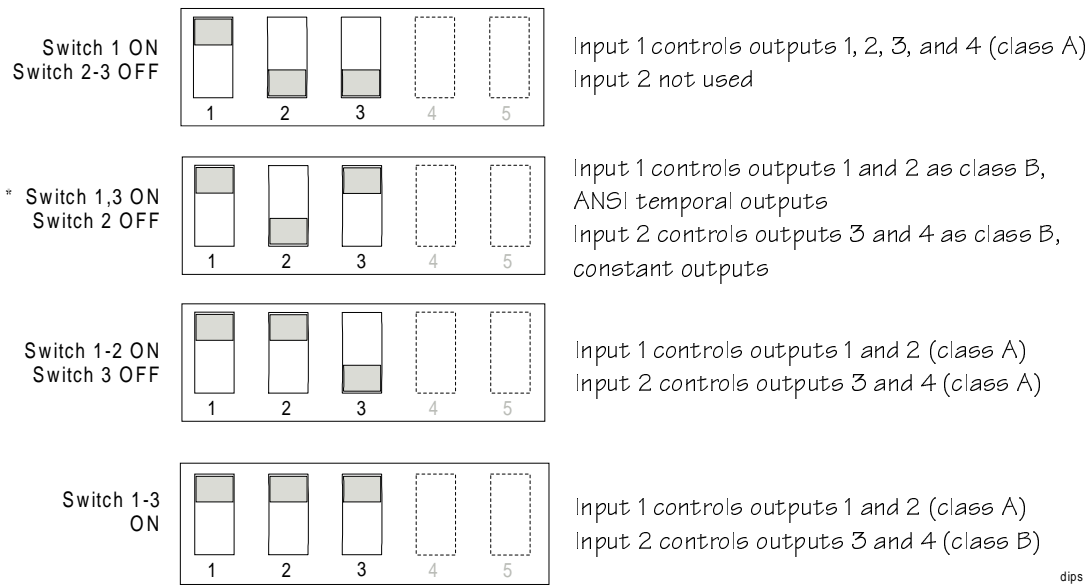
4.7.1 Selecting the Input/Output Configuration

Figure 4-7 shows the position of each switch on the DIP switch for various input and output configurations. The position of switch 4 and 5 do not affect the relationship of inputs to outputs.

Note: The 5395 checks switches 1, 2, and 3 only when powering up the 5395. If you change these switch settings, you must remove both the AC power and the battery to force the 5395 to recognize the new switch settings.



* See the following information about ANSI temporal-coded outputs

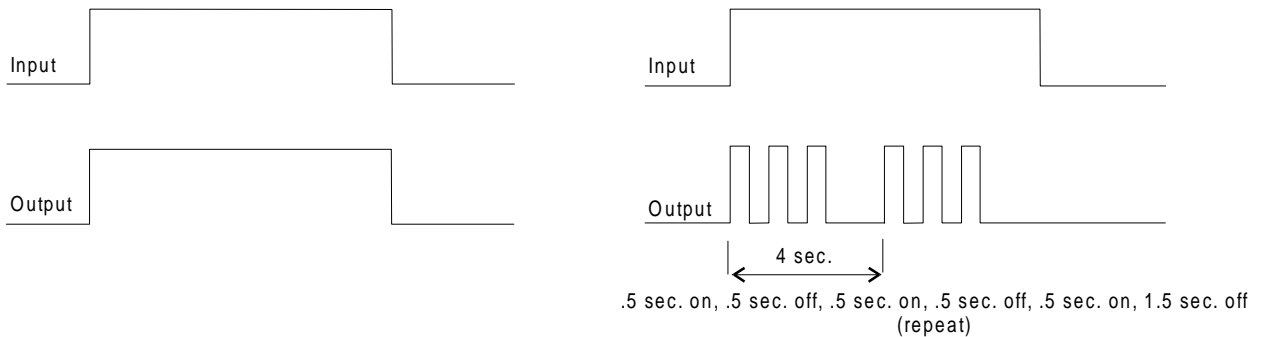


* See the following information about ANSI temporal-coded outputs

Figure 4-7. Setting DIP Switches 1-3

Special Note for Input/Output Configurations That Select ANSI Temporal-Coded Outputs

The DIP switch settings marked with an asterisk (*) in Figure 4-7 are designed to produce ANSI temporal-coded outputs from a constant on input. The figures shown below compare the output patterns of configurations before and after the addition of this feature.



Standard 5395 Input to Output Relationship

Input/Output Relationship for ANSI Temporal-coded Options

With this new feature, a steady signal can produce the pattern shown above for panels not previously able to do so.

Note: The 5395 can also produce other temporal patterns if the patterns appear at the inputs for the non-ANSI temporal configurations.

4.7.2 Setting the Loss of AC Delay

Normal selection for reporting loss of AC is 6 hours.

The ON position is for test purposes only and the normal position for switch 4 is OFF. For testing the Low AC reporting, you can temporarily turn switch 4 ON without removing power. *Remember to turn the switch OFF when testing is complete.*

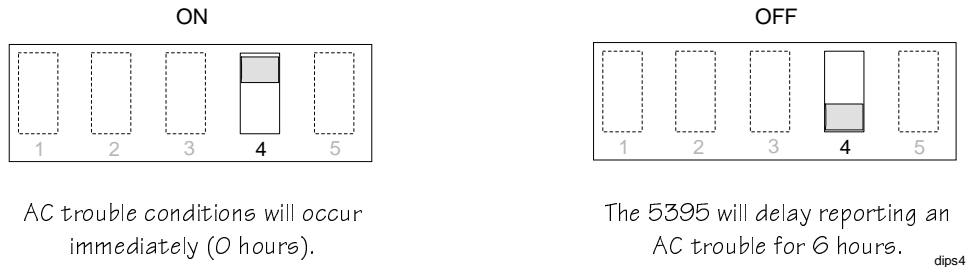


Figure 4-8. Setting DIP Switch 4

4.7.3 Setting the Auxiliary Output

Switch 5 on the DIP switch determines how the auxiliary power operates on the 5395.

The 5395 checks switch 5 only when powering up the 5395. If you change this switch, you must remove both the AC power and the battery to force the 5395 to recognize the new switch setting.

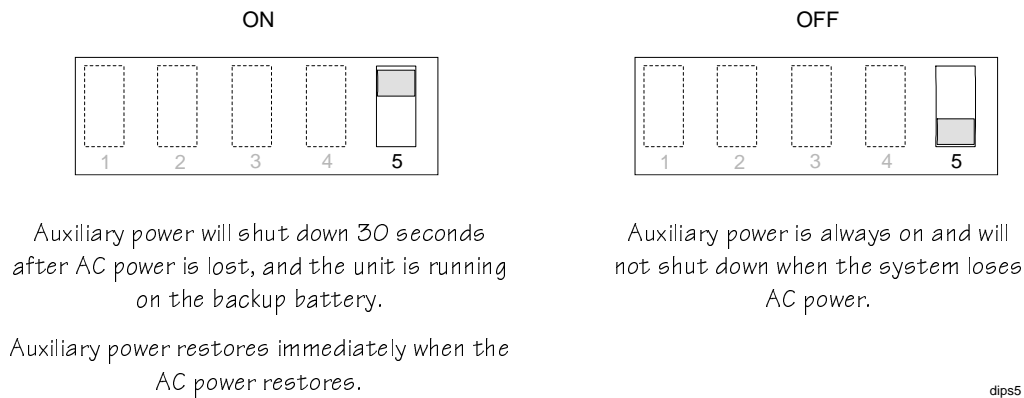


Figure 4-9. Setting DIP Switch 5

5. Connection to Silent Knight Panels

The drawings in this section show you how to connect the 5395 to compatible Silent Knight panels. See panel installation manuals for more information.

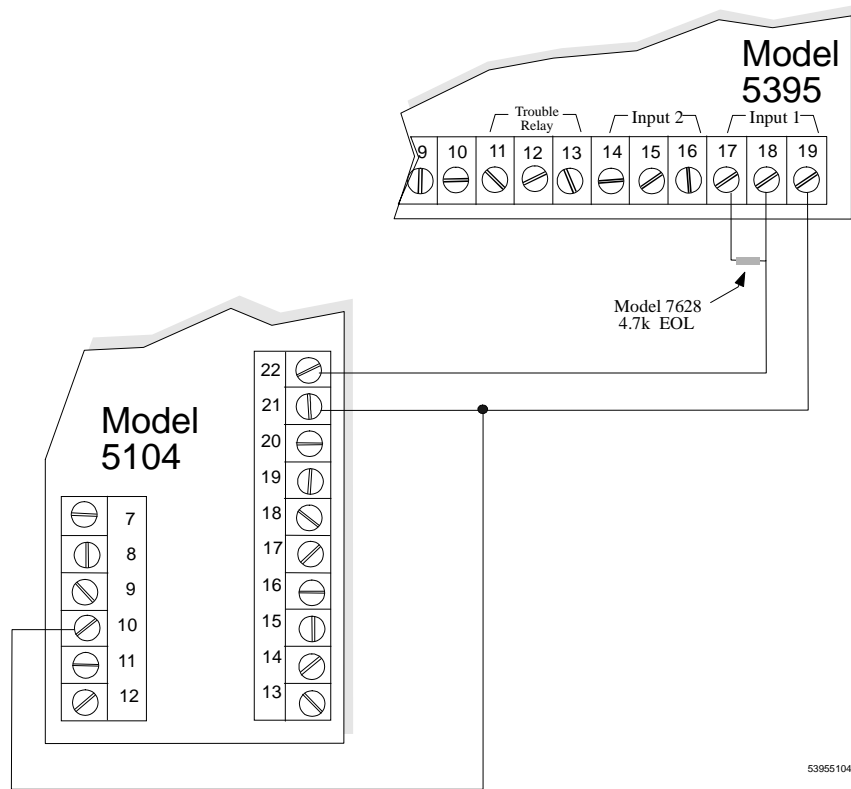


Figure 5-1. Connection to 5104 Fire Communicator

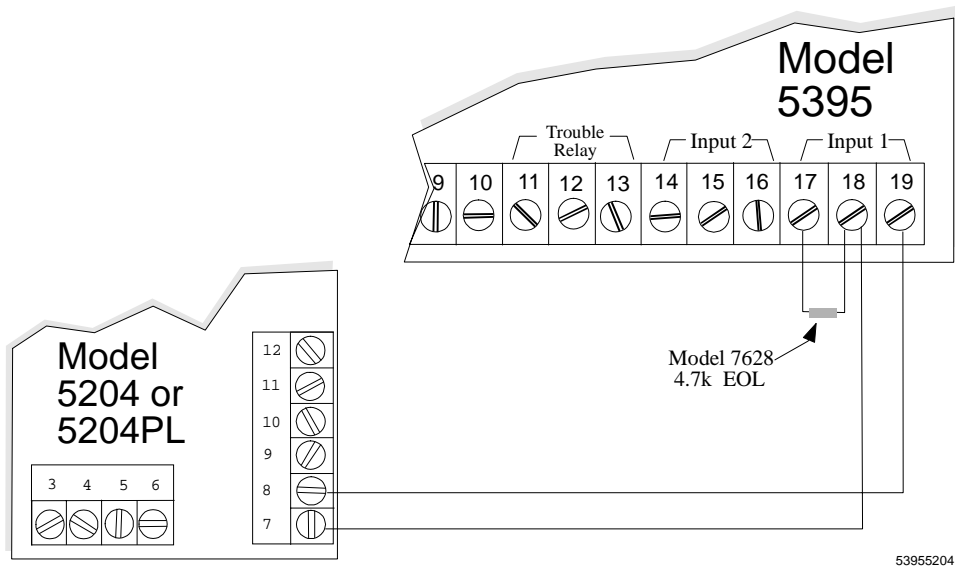


Figure 5-2. Connection to 5204 Fire Control/Communicator

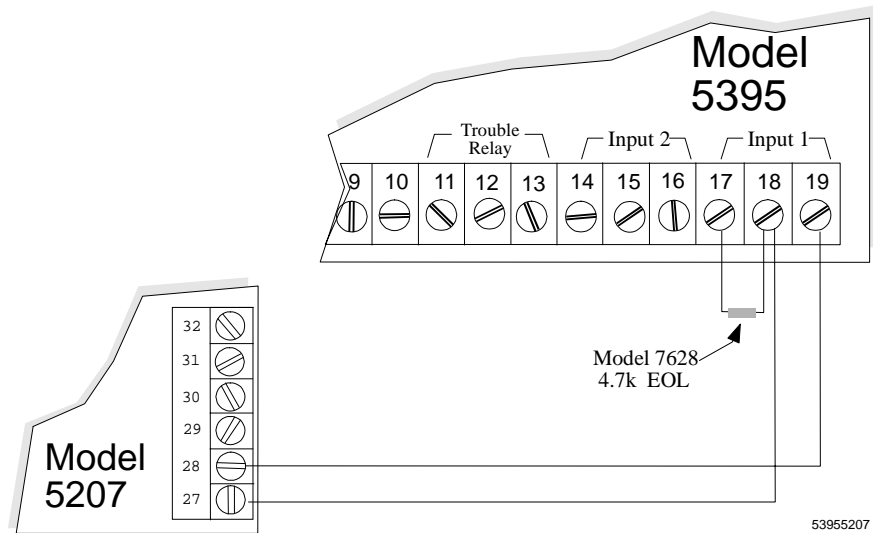


Figure 5-3. Connection to 5207 Fire Control/Communicator

Model 5395 Distributed Power Module

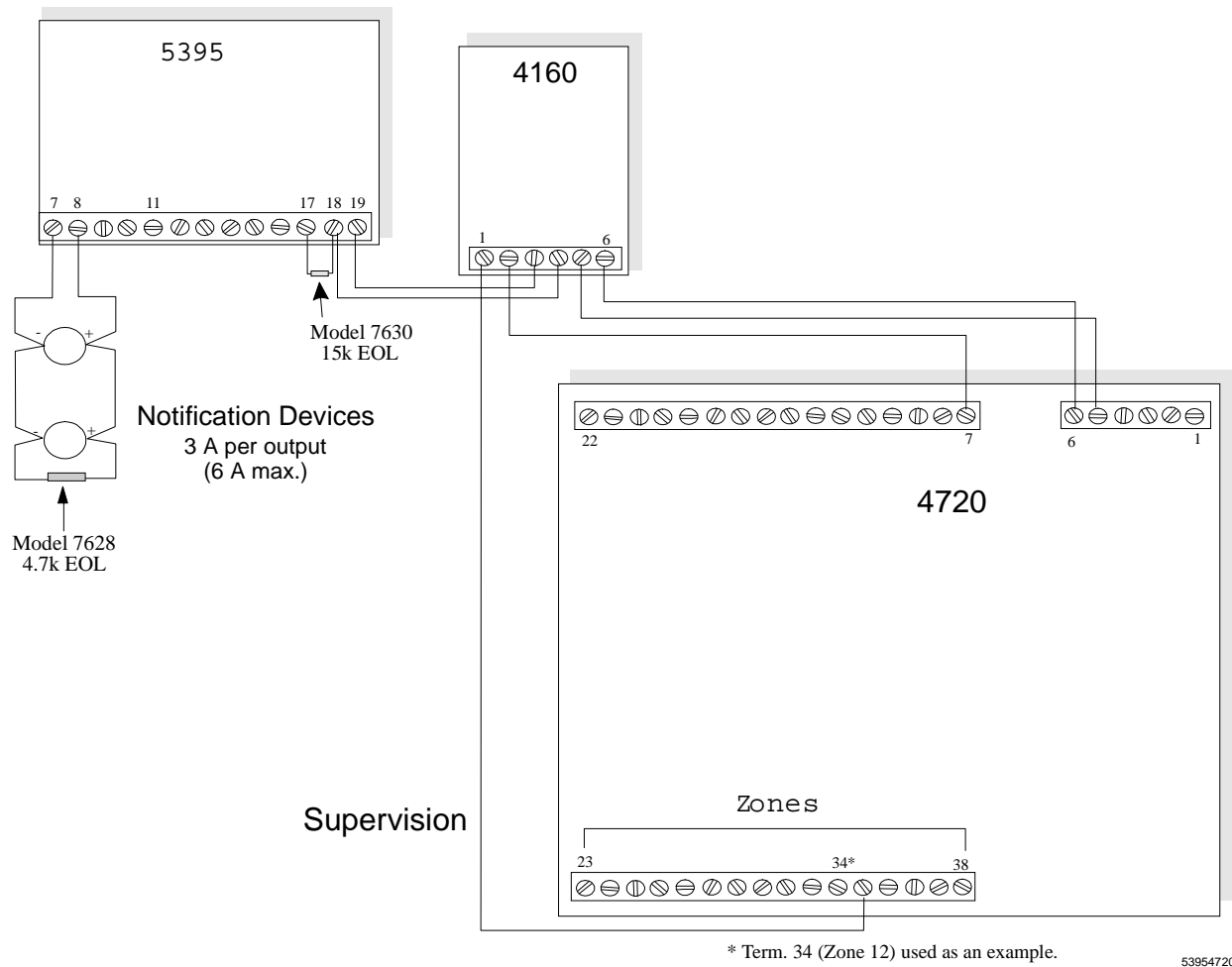


Figure 5-4. Connection to 4720 Control/Communicator and 4160 Supervision Module

6. Sample Applications

The drawings in this section show various 5395 configurations, including daisy-chaining.

6.1 Notification Power Applications

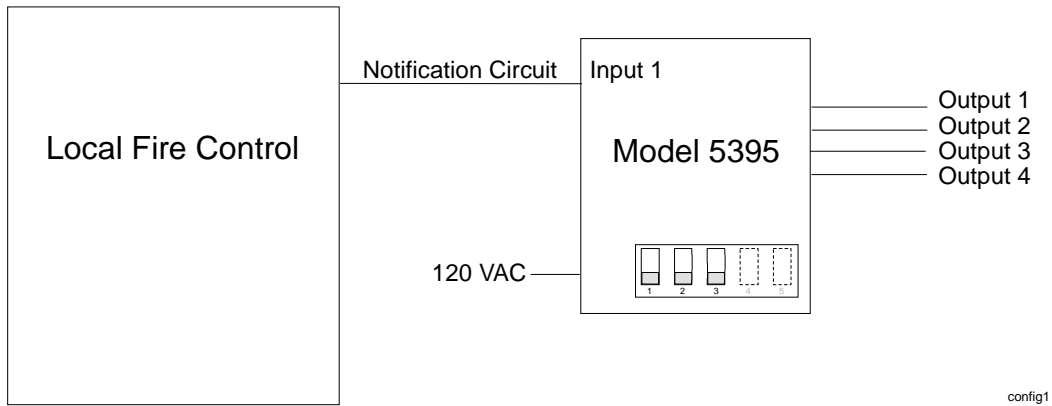


Figure 6-1. Input 1 Activates All Four Outputs

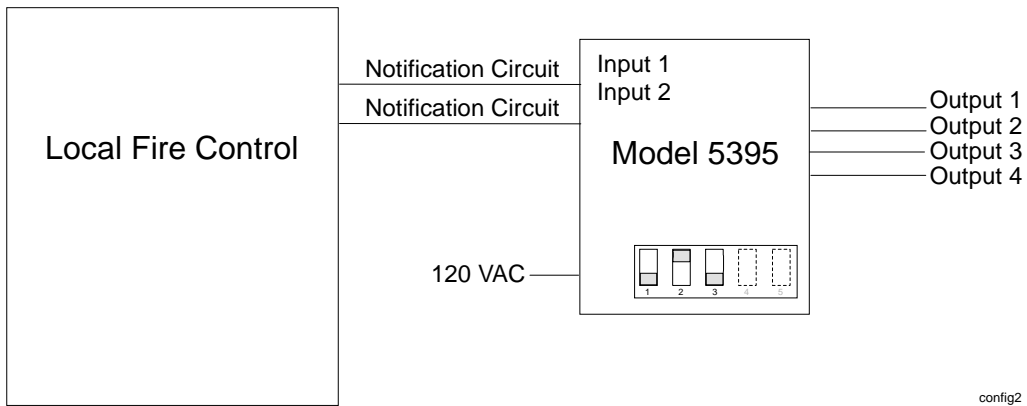
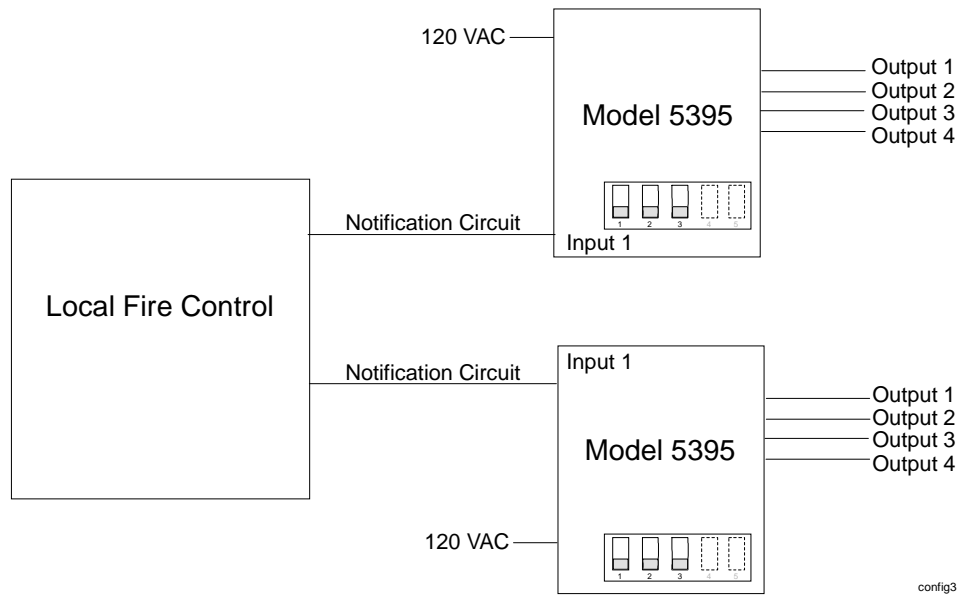
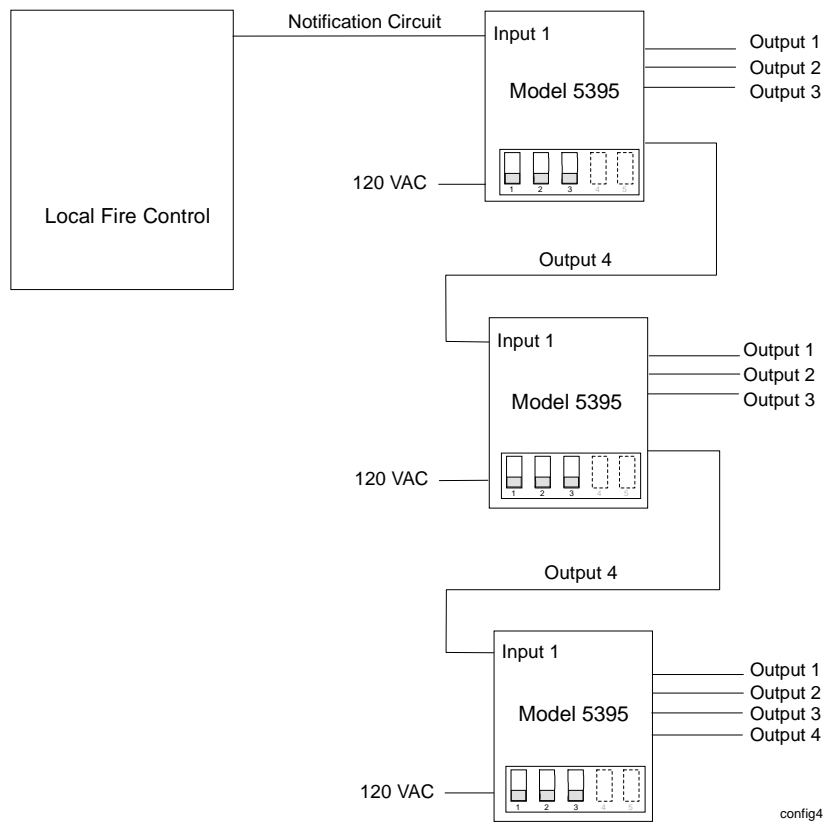


Figure 6-2. Input 1 Activates Outputs 1 and 2; Input 2 Activates Outputs 3 and 4



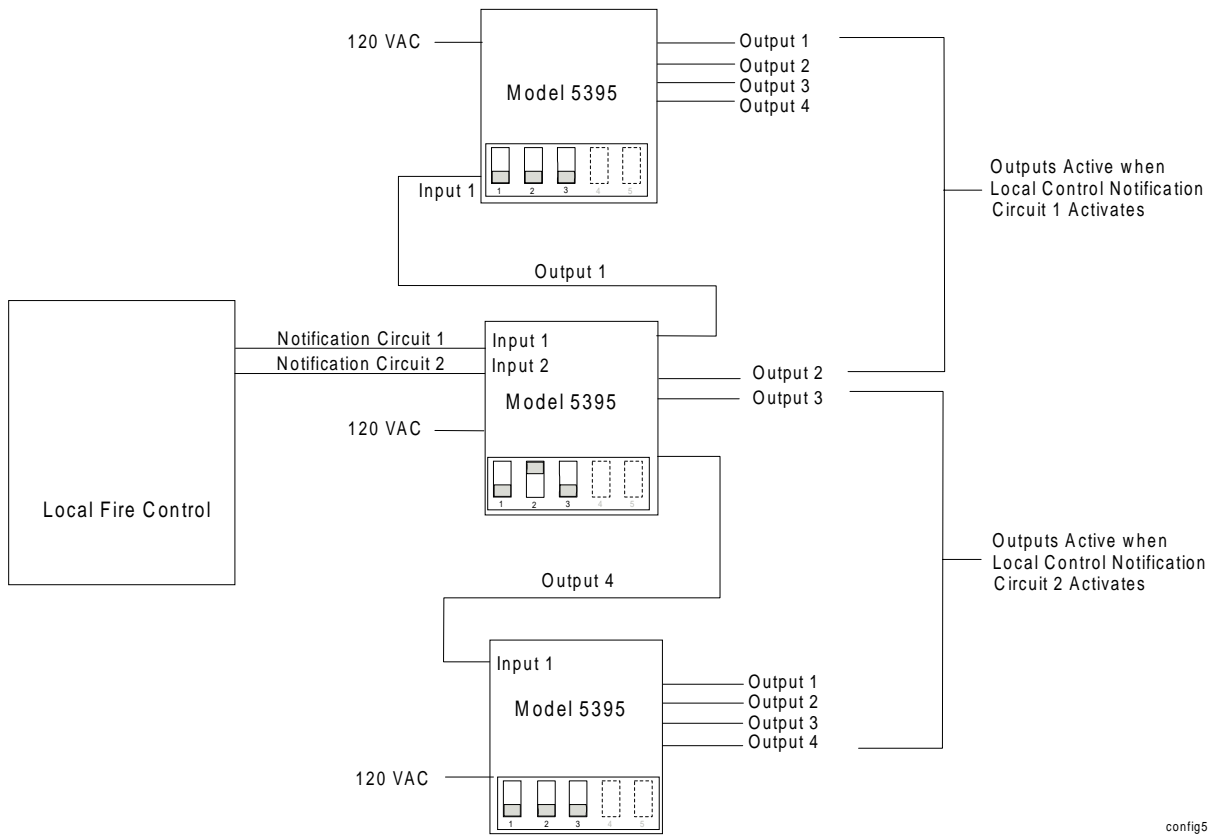
config3

Figure 6-3. One Control Activating Two Model 5395s



config4

Figure 6-4. One Control Activating Three Model 5395s in Series



config5

Figure 6-5. Each Control Signal Circuit Activates Five Output Circuits

6.2 Non-Resettable Power Application

The 5395 provides a dedicated 3-amp auxiliary power output that you can select as non-resettable (output is always on). See Section 4.7.3 for setting the auxiliary power. If you need more than 3 amps, wire the inputs as shown in Figure 6-6.

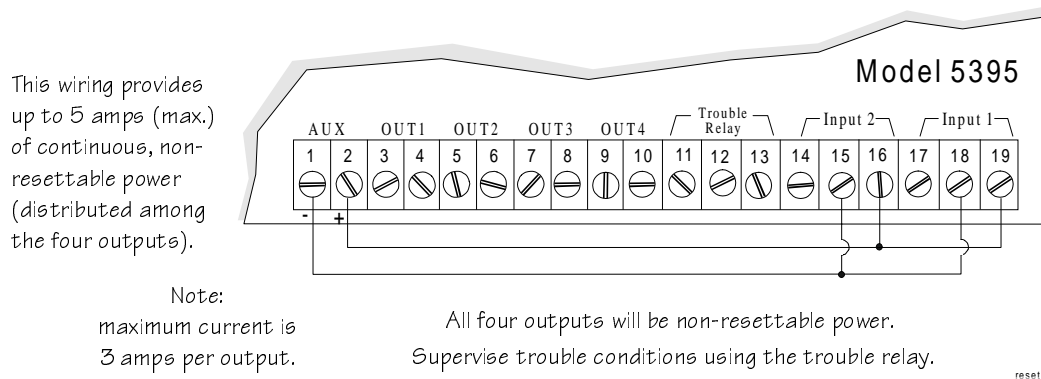


Figure 6-6. Auxiliary Output Wiring for Non-Resettable Power

6.3 Door Holder Application

In a typical door holder application, the door holder power must be released to close all fire doors under the following conditions:

- Any active alarm condition.
- AC power is no longer present (to conserve backup battery power).

To close the fire doors in these situations, wire an N.C. programmable relay from the fire panel in series with the auxiliary power to the door holders as shown in Figure 6-7.

The circuit shown in Figure 6-7 will provide up to 3 amps of door holder power. (See Section 6.2 if you need more than 3 amps of auxiliary power.) The power in this example is released when AC power is off for 30 seconds or more, or when the relay from the fire panel becomes open. You would have to use the equivalent of a programmable relay from a fire panel that is programmed to open under alarm conditions. See page 19 for selecting auxiliary power options.

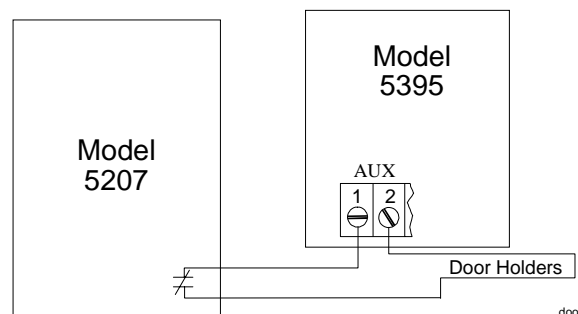


Figure 6-7. Door Holder Wiring Example

7. Troubleshooting

Light-emitting diodes (LEDs) indicate fault conditions. This section describes the LED states and provides trouble condition details.

7.1 LEDs

The eight LEDs indicate a fault condition in one of the circuits (either outputs 1 through 4, auxiliary power, earth fault, low AC, or battery). A fault condition in the LED's corresponding circuit will turn on the LED (labeled on the board). Their functions are as follows:

LED	Color	Description
OUT1	Yellow	When ON, output circuit 1 is in trouble or in an overcurrent state.
OUT2	Yellow	When ON, output circuit 2 is in trouble or in an overcurrent state.
OUT3	Yellow	When ON, output circuit 3 is in trouble or in an overcurrent state.
OUT4	Yellow	When ON, output circuit 4 is in trouble or in an overcurrent state.
AUX	Yellow	When ON, the auxiliary power output is in an overcurrent state.
FLT	Yellow	When ON, an earth ground fault on the unit exists.
BATT	Yellow	When ON, a low battery condition exists.
AC	Green	When OFF, there is no AC power to the unit. Under normal conditions, this LED is ON to indicate the presence of AC power.

See page 11 for locations of LEDs.

7.2 Trouble Conditions

Trouble Condition	What Happens
<p>Low AC (AC input voltage is low or off for 6 hours or longer.)</p>	<p>Input 1 and Input 2 supervision loops open after a 6 hour delay. The green AC LED turns off as soon as low AC or loss of AC occurs (does not wait 6 hours). The trouble relay is de-energized after a 6 hour delay. The trouble restores within 1 minute of the AC voltage restoring to a normal level.</p>
<p>Low Battery (Battery voltage is less than 21.4 VDC.)</p>	<p>Input 1 and Input 2 supervision loops open. The yellow “BATT” LED turns on. The trouble relay is de-energized. The trouble restores when battery voltage is greater than 22.4 VDC.</p>
<p>Earth Ground Fault (The earth terminal is connected to one of the positive or negative terminals on the output or auxiliary output circuits.)</p>	<p>Input 1 and Input 2 supervision loops open. The yellow “FLT” LED turns on. The trouble relay is de-energized. The trouble restores when the fault between the earth ground and one of the output circuit terminals is removed.</p>
<p>Power Limit At AUX (Current draw at the auxiliary power terminals is exceeding 3.0 amps.)</p>	<p>Power disconnects at the AUX terminal. Input 1 and Input 2 supervision loops open. The yellow “AUX” LED turns on. The trouble relay is de-energized. The trouble restores when the overcurrent condition no longer exists. When a circuit goes into a power limited state, it will reverse the polarity of the voltage at the terminals and verify the load. If it is more than 1k ohms, the power limit will self-restore. This does not automatically occur for some devices typically connected to auxiliary power. Power limit conditions do not restore in reverse polarity monitoring if the devices are not polarized (for example, some door holder devices). To allow automatic restores for power-limited auxiliary circuits, it is recommended that all non-polarized devices be polarized using a diode in series with each device.</p>
<p>Power-limited OUTPUT (Current draw at an output terminal is exceeding 3.0 amps.)</p>	<p>Power at the OUTPUT is disconnected. Input 1 and Input 2 supervision loops open. The corresponding yellow LED turns on. The trouble relay is de-energized. The trouble restores when the overcurrent condition no longer exists.</p>
<p>EOL supervision trouble (Equivalent resistance of the EOL resistor is outside the range 2k - 10k.)</p>	<p>Input 1 and Input 2 supervision loops open. Corresponding yellow LED turns on. The trouble relay is de-energized. Trouble restores if an EOL within (2k-10k) appears at the output terminals.</p>

Appendix

UL Listed Notification Appliances

For proper operation, you must use polarized devices with a Model 7628 4.7k ohm EOL resistor on each loop. All supervised notification appliances used with the 5395 must be polarized.

Notification Appliances

The chart below lists notification appliances compatible with the 5395.

Manufacturer	Model	Type
Faraday	446	Vibrating Bell
Faraday	476	Vibrating Bell
Faraday	477	Single Stroke Bell
Faraday	5333	Multi-Tone Horn)
Faraday	5336	Multi-Tone Horn/Strobe
Faraday	5337	Multi-Tone Horn/Strobe
Faraday	5338	Multi-Tone Horn/Strobe
Faraday	5343	Single Tone Horn/Strobe
Faraday	5346	Electronic Horn with Strobe
Faraday	5347	Electronic Horn with Strobe
Faraday	5348	Single Tone Horn/Strobe
Faraday	5373	8-Tone Horn/Strobe
Faraday	5376	8-Tone Horn/Strobe
Faraday	5377	8-Tone Horn/Strobe
Faraday	5378	8-Tone Horn/Strobe
Faraday	5383	8-Tone Horn/Strobe with Sync Strobe
Faraday	5386	8-Tone Horn/Strobe with Sync Strobe
Faraday	5387	8-Tone Horn/Strobe with Sync Strobe
Faraday	5388	8-Tone Horn/Strobe with Sync Strobe
Faraday	5405	Sync Control Unit
Faraday	5508	Single Gang Sync Strobe
Faraday	5509	Strobe
Faraday	5510	Strobe
Faraday	5511	Strobe
Faraday	5512	Strobe
Faraday	5516	Strobe
Faraday	5517	Strobe
Faraday	5518	Strobe
Faraday	5519	Strobe
Faraday	5521	4" Square Sync Strobe

Manufacturer	Model	Type
Faraday	5522	4" Square Sync Strobe
Faraday	6120	Horn
Faraday	6140	Horn
Faraday	6223	Horn
Faraday	6226	Horn/Strobe
Faraday	6227	Horn/Strobe
Faraday	6228	Horn/Strobe
Faraday	6243	Electron-Mechanical Horn
Faraday	6244	Electron-Mechanical Horn
Faraday	6245	Electron-Mechanical Horn
Faraday	6246	Electron-Mechanical Horn/Strobe
Faraday	6247	Electron-Mechanical Horn/Strobe
Faraday	6248	Electron-Mechanical Horn/Strobe
Faraday	6300	Mini-Horn
Faraday	6301	Mini-Horn
Faraday	6302	Mini-Horn
Faraday	6310	Mini-Horn/Strobe/Strobe
Faraday	6311	Mini-Horn/Strobe/Strobe
Faraday	6312	Mini-Horn/Strobe/Strobe
Faraday	6320	Sync Mini Horn/Strobe
Faraday	6321	Sync Mini Horn/Strobe
Faraday	6322	Mini Horn/Sync Strobe
Faraday	6380	8-Tone Electronic Signal
Federal Signal	450	Horn
Federal Signal	VALS	Horn/Strobe
Gentex	GX90-4	Horn
Gentex	GXS-4-15-1	Strobe
Gentex	GXS-4-1575	Strobe
Gentex	GX90S-4-15	Horn
Gentex	GX90S-4-1575	Horn
Gentex	HG124	Horn
Gentex	SHG24-1575	Horn/Strobe
Gentex	SHG24-15	Horn/Strobe
Gentex	GMH-24-X	Horn
Gentex	GMS-24-X	Horn/Strobe
Gentex	GMS-24-X	Horn/Strobe
Gentex	G0T24	Horn
Gentex	G0S24-X	Horn
Gentex	WGMS-24-X	Horn/Strobe
System Sensor	MASS241	Horn/Strobe
System Sensor	MASS24110ADA	Horn/Strobe
System Sensor	MASS2415ADA	Horn/Strobe
System Sensor	MASS2475ADA	Horn/Strobe
System Sensor	SS24110ADA	Strobe
System Sensor	SS2415ADA	Strobe

Manufacturer	Model	Type
System Sensor	SS2475ADA	Strobe
System Sensor	PS2415ADA	Mini-Horn/Strobe
System Sensor	PS241575ADA	Mini-Horn/Strobe
System Sensor	PS24110ADA	Mini-Horn/Strobe
System Sensor	PS2475ADA	Mini-Horn/Strobe
Wheelock	46T-G4-24-R	Bell
Wheelock	46T-G6-24-R	Bell
Wheelock	46T-G10-24-R	Bell
Wheelock	46T-G6-24-WS-24-HF-R	Strobe/Bell
Wheelock	46T-G10-24-WS-24-HF-R	Strobe/Bell
Wheelock	46T-G6-24-WH-24-HF-R	Strobe/Bell
Wheelock	46T-G10-24-WH-24-HF-R	Strobe/Bell
Wheelock	700IT-12\24-W-FR	Strobe Horn
Wheelock	7002T-12\24-W-FR	Strobe Horn
Wheelock	AES-DL1-R	Multitone Horn
Wheelock	AES-EL1-R	Multitone Horn
Wheelock	AES-DL1-WS-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WS-24-VF-R	Multitone Horn
Wheelock	AES-DL1-WH-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WH-24-VF-R	Multitone Horn
Wheelock	AES-DL1-WM-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WM-24-VF-R	Multitone Horn
Wheelock	AH-24-R	Horn
Wheelock	AMT-12\24-R	Strobe Horn
Wheelock	AMT-24-LS-VFR	Strobe Horn
Wheelock	AMT-24-LSM-VFR	Strobe Horn
Wheelock	AMT-24-IS-VFR	Strobe Horn
Wheelock	AS-2415-VFR	Strobe Horn
Wheelock	AS-241575-VFR	Strobe Horn
Wheelock	AS-2430-VFR	Strobe Horn
Wheelock	AS-2475-VFR	Strobe Horn
Wheelock	AS-24110-HFR	Strobe Horn
Wheelock	SM-12\24-R	Strobe Horn Controller
Wheelock	DSM-12\24-R	Strobe Horn Controller
Wheelock	CF-BF1	Chime
Wheelock	CF-BF1-R	Chime
Wheelock	CH-CF1	Chime
Wheelock	CH-CF1-R	Chime
Wheelock	CH-CF1-W	Chime
Wheelock	CH-DF1	Chime
Wheelock	CH-DF1-R	Chime
Wheelock	CH-BF1-WS-24-HF-R	Strobe Chime
Wheelock	CH-CF1-LS-24	Strobe Chime
Wheelock	CH-CF1-MS-24	Strobe Chime
Wheelock	CH-CF1-IS-24	Strobe Chime

Manufacturer	Model	Type
Wheelock	CH-CF1-LS-24-CFW	Strobe Chime
Wheelock	CH-CF1-MS-24-CFW	Strobe Chime
Wheelock	CH-CF1-IS-24-CFW	Strobe Chime
Wheelock	CH-CF1-WS-24-CF-W	Strobe Chime
Wheelock	CH-DF1-LS-24	Strobe Chime
Wheelock	CH-DF1-MS-24	Strobe Chime
Wheelock	CH-DF1-IS-24	Strobe Chime
Wheelock	CH-DF1-LS-24-VFR	Strobe Chime
Wheelock	CH-DF1-LSM-24-VFR	Strobe Chime
Wheelock	CH-DF1-MS-24-VFR	Strobe Chime
Wheelock	CH-DF1-IS-24-VFR	Strobe Chime
Wheelock	CH-DF1-WM-24-VFR	Strobe Chime
Wheelock	CH-DF1-WS-24-VF-R	Strobe Chime
Wheelock	DSM-12/24	Sync Module
Wheelock	EH-DL1-R	Electronic Horn
Wheelock	EH-EL1-R Electronic Horn	Electronic Horn
Wheelock	EHS-DL1-W-VF-R	Strobe Horn (single input)
Wheelock	EHS-EL1-W-VF-R	Strobe Horn (single input)
Wheelock	EH-DL1-WS-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WS-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-DL1-WH-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WH-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-DL1-WM-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WM-24-VF-R	Strobe Horn (dual input)
Wheelock	HSW-24-HFR	Remote Strobe
Wheelock	HS2W-24-HFR	Remote Strobe
Wheelock	HSPW-24-HFR	Remote Strobe
Wheelock	IS-24-VFR	Remote Strobe
Wheelock	IS1-24-VFR	Remote Strobe
Wheelock	IS3-24-VFR	Remote Strobe
Wheelock	ISP-24-HFR	Remote Strobe
Wheelock	LS-24-VFR	Remote Strobe
Wheelock	LS1-24-VFR	Remote Strobe
Wheelock	LS3-24-VFR	Remote Strobe
Wheelock	LSP-24-HFR	Remote Strobe
Wheelock	LSM-24-VFR	Remote Strobe
Wheelock	LS1M-24-VFR	Remote Strobe
Wheelock	LS3M-24-VFR	Remote Strobe
Wheelock	LSPM-24-VFR	Remote Strobe
Wheelock	MS-24-VFR	Remote Strobe
Wheelock	MS1-24-VFR	Remote Strobe
Wheelock	MS3-24-VFR	Remote Strobe
Wheelock	MSP-24-HFR	Remote Strobe
Wheelock	MB-G6-24-R	Motor Bell
Wheelock	MB-G10-24-R	Motor Bell

Manufacturer	Model	Type
Wheelock	MBS-G6-24-W-HF-R	Motor Bell with Strobe
Wheelock	MBS-G10-24-W-HF-R	Motor Bell with Strobe
Wheelock	MIZ-24-R	Mini-Horn
Wheelock	MIZ-24-W	Mini-Horn
Wheelock	MIZ-24-LS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-LSM-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-MS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-HSW-HFR	Mini-Horn/Strobe
Wheelock	MIZ-24-IS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-WS-VF-R	Mini-Horn/Strobe
Wheelock	MIZ-24-WS-VF-W	Mini-Horn/Strobe
Wheelock	MIZ-24-WH-VF-W	Mini-Horn/Strobe
Wheelock	MIZ-24-WM-VF-W	Mini-Horn/Strobe
Wheelock	MT-12/24-R	Strobe Horn
Wheelock	MT-24-LS-VFR	Strobe Horn
Wheelock	MT-24-LSM-VFR	Strobe Horn
Wheelock	MT-24-MS-VFR	Strobe Horn
Wheelock	MT-24-IS-VFR	Strobe Horn
Wheelock	MT-24-SL-VFR	Strobe Horn
Wheelock	MT-24-SLM-VFR	Synch. Multitone Strobe
Wheelock	MT-24-WM	Strobe
Wheelock	MT-24-WM-VFR	Horn
Wheelock	RS-2415-HFR	Strobe
Wheelock	RSP-2415-VFR	Strobe
Wheelock	RS-241575-VFR	Strobe
Wheelock	RSP-241575-VFR	Strobe
Wheelock	RS-2430-VFR	Strobe
Wheelock	RS-2430-HFR	Strobe
Wheelock	RS-2475-VFR	Strobe
Wheelock	RSP-2475-HFR	Strobe
Wheelock	RS-24110-HFR	Strobe
Wheelock	RSP-24110-HFR	Strobe
Wheelock	SL-24-VFR	Synchronized Remote Strobe
Wheelock	SL1-24-VFR	Synchronized Remote Strobe
Wheelock	SL3-24-VFR	Synchronized Remote Strobe
Wheelock	SLP-24-VFR	Synchronized Remote Strobe
Wheelock	SLM-24-VFR	Synchronized Remote Strobe
Wheelock	SL1M-24-VFR	Synchronized Remote Strobe
Wheelock	SL3M-24-VFR	Synchronized Remote Strobe
Wheelock	SLPM-24-VFR	Synchronized Remote Strobe
Wheelock	SHW-24-VFR	Synchronized Remote Strobe
Wheelock	SH2W-24-VFR	Synchronized Remote Strobe
Wheelock	SHPW-24-VFR	Synchronized Remote Strobe
Wheelock	SCM-24-R	Controller for Synchronized Strobes
Wheelock	SM-12/24-R	Sync Module

Manufacturer	Model	Type
Wheelock	SR-2415-VFR	Sync Strobe
Wheelock	SRP-2415-HFR	Sync Strobe
Wheelock	SR-241575-VFR	Sync Strobe
Wheelock	SRP-241575-VFR	Sync Strobe
Wheelock	SR-2475-VFR	Sync Strobe
Wheelock	SR-2475-HFR	Sync Strobe
Wheelock	SR-24110-HFR	Sync Strobe
Wheelock	SRP-24110-HFR	Sync Strobe
Wheelock	V700IT-12\24-W-FR	Strobe Horn
Wheelock	WM3T-24-FR	Remote Strobe
Wheelock	WM3T-24-VFR	Remote Strobe
Wheelock	WSIT-24-FR	Strobe
Wheelock	WS3T-24-FR	Strobe
Wheelock	WST-24-FR	Strobe