



A Division of Pittway  
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# SpectrAlert SP2 Series Wall Speaker/Strobes for Fire Protective Signaling Systems



For use with the following models: SP2R2415, SP2R2430, SP2R241575, SP2R2475, SP2R24110, SP2W2415, SP2W2430, SP2W241575, SP2W2475, SP2W24110  
U.S. Patent Nos. 5,593,569; 5,914,665; 5,850,178; 5,598,139; 6,049,446; 6,127,935

### Specifications: Speaker

#### Mechanical

Input Terminals: 12 to 18 AWG (3.31 to 0.82 mm<sup>2</sup>)  
Speaker Size: 4 inches (101 mm)  
Overall Dimensions: 8.25" x 4.9"

#### Electrical

Voltage Input: 25 volts or 70.7 volts (nominal)  
Frequency Range: 400 – 4000 Hz  
Power: ¼, ½, 1 and 2 Watts

#### Operating

Temperature Range: 32° to 120°F (0° to 49°C)  
Listings: UL

Note: As tested by UL (reference revised 1971 STD, sections/paragraphs 27A.1-27A.5 and 48.4), the maximum number of synchronous strobe lights that can be connected to the MDL synch module is 70. The maximum impedance between the adjacent units is 250 ohms.

### Specifications: Strobe

Voltage Range: DC or Full-Wave Rectified  
20 to 30 volts, (21 to 30 with MDL module)  
Flash Rate: 1 flash per second  
Light Output: Models with 1575 are listed at 15 candela per UL1971 but will provide 75 candela on axis (straight ahead).  
Models with 15, 30, 75 or 110 are rated for that candela.

**NOTICE:** This manual shall be left with the owner/user of this equipment.

### General Description

The National Fire Protection Association (NFPA) has published standards and recommended practices for the speaker/strobes described in this manual. As a result, the installer must be familiar with these requirements as well as all local codes and special requirements of the authority having jurisdiction.

The SpectrAlert SP2 series speakers can be operated with distribution amplifiers having an output voltage of either 25 volts or 70.7 volts.

The speakers operate at any one of four input power levels. The output sound level is selected at the time of installation, but can be changed, if necessary.

The speaker is also equipped with a capacitive input to allow for DC supervision.

The SpectrAlert SP2 series strobe can be installed in systems using 24-volt panels having DC or full-wave rectified (FWR) power supplies. The strobes can also be installed in applications requiring synchronization (MDL required) or applications that do not require synchronization (no module required).

The SpectrAlert SP2 series speaker/strobes are designed to meet the requirements of most agencies governing these devices, including: NFPA, ADA, The National Fire Alarm Code, UL, CSFM, MEA. Also, check with your local Authority Having Jurisdiction for other codes or standards that may apply.

### Power Supply Considerations For Strobes

Panels typically supply DC filtered voltage or FWR (full-wave rectified) voltage. The system design engineer must

calculate the number of units used in a zone based on the type of panel supply. Be certain the sum of all the device currents do not exceed the current capability of the panel. Calculations are based on using the device current found in Table 2 and must be the current specified for the type of panel power supply used.

### Wire Sizes

The designer must be sure that the last device on the circuit has sufficient voltage to operate the device within its rated voltage. When calculating the voltage available to the last device, it is necessary to consider the voltage drop due to the resistance of the wire. The thicker the wire, the less the voltage drop. Generally, for purposes of determining the wire size necessary for the system, it is best to consider all of the devices as "lumped" on the end of the supply circuit (simulates "worst case").

#### Typical wire size resistance:

- 18 AWG solid: Approximately 8 ohms/1,000 ft.
- 16 AWG solid: Approximately 5 ohms/1,000 ft.
- 14 AWG solid: Approximately 3 ohms/1,000 ft.
- 12 AWG solid: Approximately 2 ohms/1,000 ft.

Example: Assume you have 10 devices on a zone and each requires 50 mA average and 2000 Ft. of 14 AWG wiring (total length = outgoing + return). The voltage at the end of the loop is 0.050 amps per device x 10 devices x 3 ohms/1,000 ft. x 2000 ft = 3 volts drop.

The same number of devices using 12 AWG wire will produce only 2 volts drop. The same devices using 18 AWG wire will produce 8 volts drop. Consult your panel manufacturer's specifications, as well as SpectrAlert's operating voltage range to determine acceptable voltage drop.

Note: If class "A" wiring is installed, the wire length may be up to 4 times the single wire length in this calculation.

## Installation

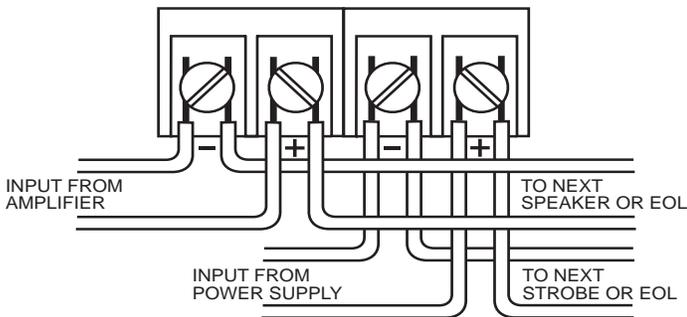
All wiring must be installed in compliance with the National Electrical Code (NEC) and applicable local codes as well as special requirements of the authority having jurisdiction, using the proper wire size. This also includes all applicable NFPA Standards, ANSI/UL 1480, UL 1971 and NEC 760.

## Electrical

1. Connect the speaker/strobe as shown in Figure 1. Keep in mind that even though the speaker and strobe are a single mechanical unit, they are electrically independent and require separate power sources.

**NOTE:** Do NOT loop electrical wiring under terminal screws. Wires connecting the device to the control panel must be broken at the device terminal connection in order to maintain electrical supervision.

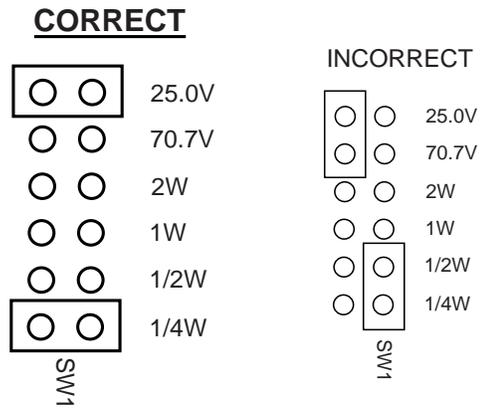
**Figure 1. Electrical connections:**



**NOTE:** Supply power for strobe must be continuous for proper operation.

2. See Figure 2 as an example of how to select a ¼ Watt input when a 25 volt amplifier is being used. Notice that the header, SW1, has two shunts. One shunt is used to select either 25 or 70.7 volts input. The other shunt is used to select input power of ¼, ½, 1 or 2 Watts. Table 1 lists the UL reverberant and anechoic output sound levels for each power tap on the SP2 series speaker/strobes.

**Figure 2. Voltage and Power Selection:**



**Table 1. Sound levels for each transformer power tap:**

	2 W	1 W	1/2 W	1/4 W
UL Reverberant (dBA @ 10 ft.)	84	81	78	75
Anechoic (dBA @ 10 ft.)	87	84	81	78

### CAUTION

Signal levels exceeding 130% rated signal voltage can damage the speaker. Consequently, an incorrect tap connection may cause speaker damage. This means that if a 25V tap is selected when a 70.7V amplifier is being used, speaker damage may result. Therefore, be sure to select the proper taps for the amplifier voltage/input power level combination being used.

**Table 2. Current draw of strobes:**

Candela	AVERAGE CURRENT (mA)						PEAK CURRENT (mA)						IN RUSH CURRENT (mA)					
	24V Models						24V Models						24V Models					
	20V		24V		30V		20V		24V		30V		20V		24V		30V	
	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR
15	50	61	43	60	38	60	135	204	135	208	135	185	97	129	116	152	147	198
15/75	56	65	49	64	44	62	150	199	150	207	150	198	97	135	116	164	147	211
30	78	84	67	82	58	72	183	201	183	219	183	216	97	129	116	152	147	198
75	145	170	123	159	102	141	350	440	340	460	330	480	190	240	230	280	290	380
110	169	220	140	191	115	174	460	560	450	570	420	620	190	230	220	290	290	370

## Mounting

### Reversible strobe module

Should the back box be located near an obstruction such as a doorway, the strobe module is field-reversible (Fig. 3).

To reverse the strobe module: insert screwdriver, as shown in Fig. 3, to unlock snap. While pushing in the screwdriver, pull back on the strobe module. Hinge the strobe module, disengage the Locking Rib and lift the module away from the mounting plate. Turn the module so that it is upside down from its original position, re-insert the module into the mounting plate (be sure to insert the Locking Rib into the slot), and press the module into the mounting plate. The strobe module will make a “click” when it has locked into place. Turn the entire assembly so that the word “FIRE” is right side up. The unit can now be mounted.

### Flush mount back box

The speaker/strobe can be flush mounted on a 4" × 4" × 2<sup>1</sup>/<sub>8</sub>" back box (Fig. 4) as follows:

- Select the appropriate pair of diagonally opposite mounting holes in the speaker grille that will be used to attach the speaker/strobe to the back box. Do not insert any mounting screws at this point.
- Plug the two holes that **will not** be used for attachment, using two 8-32 × 1<sup>3</sup>/<sub>4</sub>" pan head screws and hex-nuts provided.
- Use the two remaining 8-32 × 1<sup>3</sup>/<sub>4</sub>" pan head screws to attach the speaker to the back box.

**NOTE:** Two drywall screws (provided) may be used to fasten the mounting plate to the wall. To use the drywall screws, it will be necessary to first loosen the strobe screw and hinge the strobe module away from the mounting plate.

### Surface mount with SP2-BBS back box skirt

An optional back box skirt is available to provide a finished appearance. Mount the skirt to the back box using the mounting screws provided with the skirt as follows:

- Select the appropriate pair of diagonally opposite mounting holes in the speaker grille that will be used to attach the speaker/strobe to the back box. Do not insert any mounting screws at this point.
- Plug the two holes that **will not** be used for attachment, using two 8-32 × 1<sup>3</sup>/<sub>4</sub>" pan head screws and hex nuts provided.
- Use the two remaining 8-32 × 1<sup>3</sup>/<sub>4</sub>" pan head screws to attach the speaker to the back box.

**NOTE:** Two drywall screws (provided) may be used to fasten the SP2-BBS to the wall.

**NOTE:** The back box or back box with extension ring combination must be 4" × 4" and more than 2<sup>1</sup>/<sub>8</sub>" deep if using a SP2-BBS.

**NOTE:** To surface mount the SP2 series speaker/strobe, the minimum depth required in the back box/extension ring combination, is 2<sup>5</sup>/<sub>8</sub>".

Figure 3: Reversible strobe module

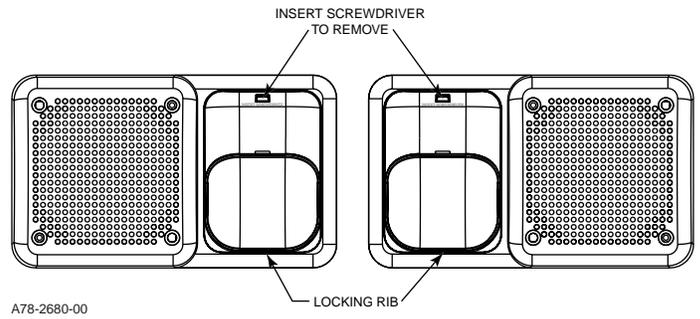


Figure 4: Flush mount back box

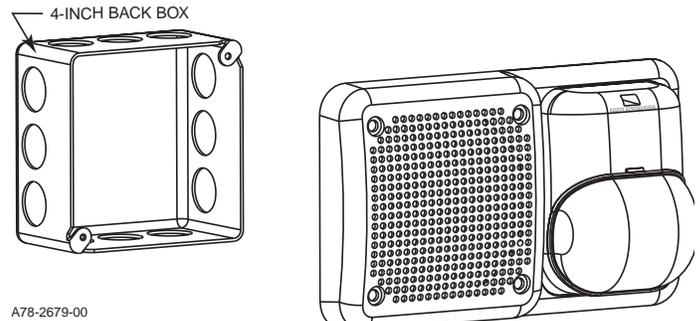


Figure 5: Surface mount with SP2-BBS back box skirt

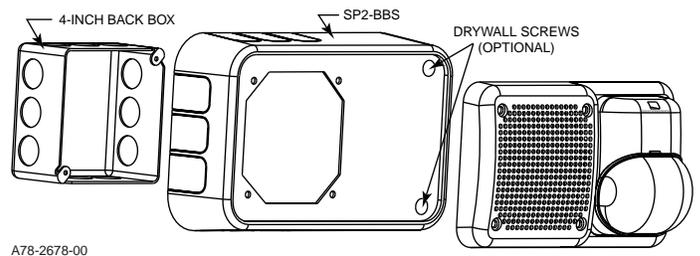
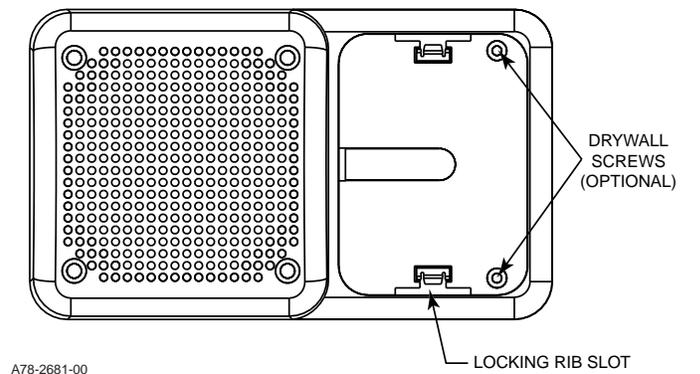


Figure 6: Mounting to irregular surfaces



## Please refer to insert for the Limitations of Fire Alarm Systems



### The Limitations of Speaker/Strobes

If either of the voltage select or power select shunts is not plugged into one of the appropriate option positions, the speaker will not sound and there will be no trouble indication at the panel. Always make sure that the individual speakers are tested after installation per NFPA regulations.

**The speaker may not be heard.** The loudness of the speaker meets (or exceeds) the current Underwriters Laboratories' standards. However, the speaker may not attract the attention of a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The speaker may not be heard if it is placed on a different floor from the person in hazard or if placed too far away to be heard over the ambient noise. Traffic, air conditioners, machinery, or music appliances may prevent even alert persons from hearing the alarm. The speaker may not be heard by persons who are hearing impaired.

**The signal strobe may not be seen.** The electronic visual warning signal

uses an extremely reliable xenon flash tube. It flashes at least once every second. The strobe must not be installed in direct sunlight or areas of high light intensity (over 60 foot candles) where the visual flash might be disregarded or not seen. The strobe may not be seen by the visually impaired.

**The signal strobe may cause seizures.** Individuals who have positive photic response to visual stimuli with seizures, such as persons with epilepsy, should avoid prolonged exposure to environments in which strobe signals, including this strobe, are activated.

The signal strobe cannot operate from coded power supplies. Coded power supplies produce interrupted power. The strobe must have an uninterrupted source of power in order to operate correctly. System Sensor recommends that the horn and signal strobe always be used in combination so that the risks from any of the above limitations are minimized.

### Three-Year Limited Warranty

System Sensor warrants its enclosed speaker to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this speaker. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the speaker which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture. After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Repair Department, RA

#\_\_\_\_\_, 3825 Ohio Avenue, St. Charles, IL 60174. Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture. In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other Warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.