



A Division of Pittway
 3825 Ohio Avenue, St. Charles, Illinois 60174
 1-800-SENSOR2, FAX: 630-377-6495
 www.systemsensor.com

SpectrAlert SP2C Series Ceiling Mount Speaker/Strobes for Fire Protective Signaling Systems

For use with the following models: SP2C2415, SP2C241575, SP2C2430, SP2C2475, SP2C2495, SP2C24115, SP2C24177
 U.S. Patent Nos. 5,850,178; 5,598,139; 6,049,446; 6,057,778; D424465



Specifications: Speaker

Mechanical

Input Terminals: 12 to 18 AWG
 (3.31 to 0.82 mm²)
 Speaker Size: 4 inches
 (101 mm)
 Overall Dimensions: 6.8" diameter
 (173 mm)

Electrical

Voltage Input: 25 volts or 70.7 volts
 (nominal)
 Frequency Range: 400 - 4000 Hz
 Power: 1/4, 1/2, 1 and 2 Watts
 Operating
 Temperature Range: 32° to 120°F
 (0° to 49°C)
 Listings: UL S4048 Speaker/Strobe

Specifications: Strobe

Voltage Range: DC or Full-Wave Rectified
 15 through 115 candela models
 Strobes: 16 to 33 volts DC or Full Wave Rectified
 (with MDL module): 17 to 33 volts DC or Full Wave Rectified
 177 candela models only
 Strobes: 16 to 33 volts DC; 20 to 33 volts Full
 Wave Rectified
 (with MDL module): 17 to 33 volts DC; 21 to 33 volts Full
 Wave Rectified
 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 down).
 Models with 15, 30, 75, 95, 115 and 177
 are listed for that candela.

Note: Strobes have a 16–33 Volt Operating Range Limit. Do not exceed the maximum number of 70 strobe lights when connecting the MDL Sync module zone with a maximum line impedance of 4 Ohms per loop.

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 SP2C series ceiling mount speaker/strobe 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 SP2C series ceiling mount 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 SP2C series ceiling mount speaker/strobes are designed to meet the requirements of most agencies governing these devices, including: NFPA, 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.

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

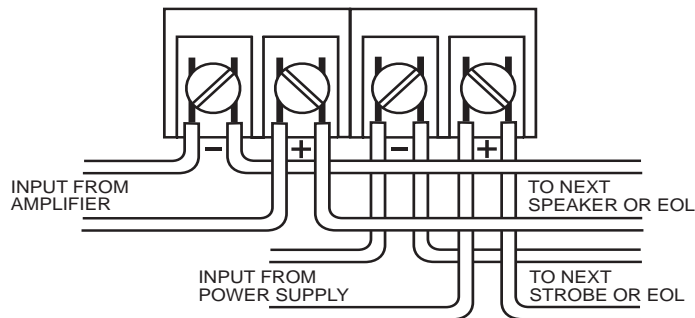
Example: Assume you have 10 devices on a zone and each requires 50 mA average and 2000 Ft. of 14 AWG wiring (total length = outgoing + return). The voltage at the end of the loop is 0.050 amps per device x 10 devices x 3 ohms 1,000 ft. x 2000 ft = 3 volts drop.

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 SpectraAlert's operating voltage range to determine acceptable voltage drop.

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.

Figure 1. Electrical connections:



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

Table 2. Current draw of strobes:

NOTE: The SP2C24177 strobes were only tested at the 20-33 Volt-FWR limits and 16-33 Volt DC limits, all other SP2C strobes were only tested at the 16-33 Volt-FWR/DC limits. This does not include the 80% low end or 110% high end voltage limits.

Average Mean Method:

Candela	Average Mean Current (mA)								Peak Current (mA)								In Rush Current (mA)							
	24V Models								24V Models								24V Models							
	16V		20V		24V		33V		16V		20V		24V		33V		16V		20V		24V		33V	
	DC	FWR	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	
15	78	81		48	55	41	51	164	232		170	242	170	224	91	118		133	177	188	252			
15/75	81	94		56	62	47	62	174	238		172	258	168	228	91	115		134	179	182	237			
30	114	91		68	79	56	73	238	288		226	318	218	298	94	116		137	179	184	244			
75	179	179		127	140	101	126	418	436		398	462	384	486	99	118		133	177	186	238			
95	223	227		153	173	122	163	540	562		534	560	518	552	92	115		132	176	187	244			
115	290	232		191	230	156	212	644	668		612	712	576	728	81	108		118	175	174	249			
177	453		338	291	300	208	241	952		1092	912	1104	872	1184	79		148	126	170	171	234			

Average RMS Method:

Candela	Average RMS Current (mA)								
	24V Models								
	16V		20V		24V		33V		
	DC	FWR	FWR	DC	FWR	DC	FWR	DC	FWR
15	74	71		61	74	54	74		
15/75	86	81		71	81	62	86		
30	112	103		90	98	78	99		
75	209	178		167	168	143	154		
95	269	242		213	208	180	204		
115	336	300		257	268	218	248		
177	521		412	394	370	315	327		

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 2. Voltage and Power Selection:

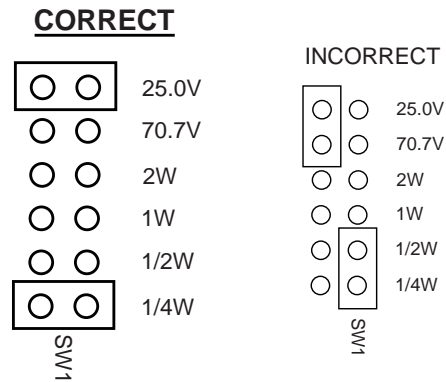


Table 1. Sound levels for each transformer power tap:

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

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

2. See Figure 2 as an example of how to select a 1/4 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 1/4, 1/2, 1 or 2 Watts. Table 1 lists the UL reverberant and anechoic output sound levels for each power tap on the SP2C series ceiling mount speaker/strobes.

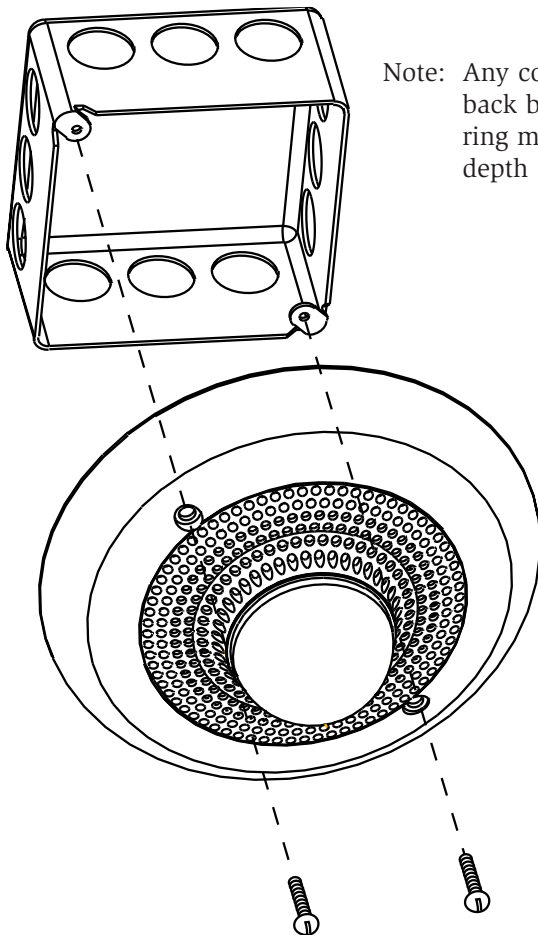
CAUTION

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.

Mounting

The SP2C series ceiling mount speaker/strobe can be flush mounted on a 4" x 4" x 2-1/8" back box. Use two 8-32 x 1-3/4" pan head screws to attach the speaker to the back box (See Fig. 3).

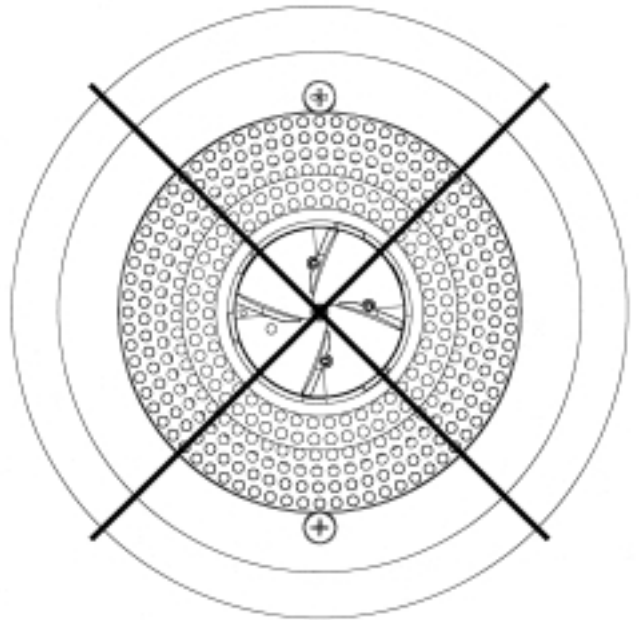
Figure 3: Flush mount back box



Note: Any combination of 4"x4" back box and extension ring may not exceed a depth of 3-5/8".

Figure 4: Positioning for maximum brightness

NOTE: For maximum brightness, unit must be mounted with flash angles as shown.



Please refer to insert for the Limitations of Fire Alarm Systems



The Limitations of Ceiling Mount 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.