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Selectable Output Strobes, Horns, and Horn/Strobes

For use with the following models: P2R, P2RH, P2RK, P2RHK, P2W, P2WH, P4R, P4RH, P4RK, P4RHK, P4W, P4WH, SR, SRH, SRK, SRHK, SW, SWH, PC2R, PC2RH, PC2RK, PC2RHK, PC2W, PC2WH, PC4R, PC4RH, PC4RK, PC4RHK, PC4W, PC4WH, SCR, SCRH, SCRK, SCRHK, SCW, SCWH, HR, HRK, HW, SR-P, SW-P, SRH-P, SWH-P, P2R-P, P2W-P, P2RH-P, P2WH-P, SCR-P, SCW-P, SCRH-P, SCWH-P, PC2R-P, PC2W-P, PC2RH-P, PC2WH-P, P4R-P, P4RH-P, P4W-P, P4WH-P, SR-SP, SRH-SP, P2R-SP, P2RH-SP, SCW-SP, SCWH-SP, PC2W-SP, PC2WH-SP

Specifications

General Specifications

Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
K Series Operating Temperature:	-40°F to 151°F (FM approved to -31°F); See note for Table 2.
Humidity Range:	10 to 93% non-condensing (indoor products)
Strobe Flash Rate:	1 flash per second
Nominal Voltage:	Regulated 12DC/FWR or regulated 24DC/FWR ¹
Operating Voltage Range:	8 to 17.5 V (12V nominal) or 16 to 33 V (24 nominal)
Operating Voltage with MDL:	9 to 17.5 V (12V nominal) or 17 to 33 V (24 V nominal)

¹P, S, PC, & SC products will operate at 12 V nominal only for 15 & 15/75 cd.

Mechanical Specifications

Input terminal wire gauge:	12 to 18 AWG
Ceiling mount dimensions (including lens):	6.8" diameter × 2.5" high (173 mm diameter × 64 mm high)
Wall mount dimensions (including lens):	5.6"L × 4.7"W × 2.5"D (142 mm L × 119 mm W × 64 mm D)
Horn dimensions:	5.6"L × 4.7"W × 1.3"D (142 mm L × 119 mm W × 33 mm D)

The products in this manual may be covered by one or more of the following patents:
 5,914,665; 5,850,178; 5,598,139; 6,049,446; 6,522,261; 6,661,337; 6,822,400; 6,833,783; 6,856,241.

General Description

The SpectrAlert Advance series of notification appliances offers a comprehensive range of red and white wall, ceiling, and outdoor products including horns, strobes, and horn/strobes. These products are electrically backward compatible with the previous generation of notification appliances. While there are products specifically designed for use on the ceiling or the wall, the products are listed to be used in either application, i.e., wall products could be used on the ceiling. SpectrAlert products are designed to be used in either 12 or 24 volt DC or full wave rectified (FWR) systems. If required, the MDL module may be used in order to provide synchronization.

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

Fire Alarm System Considerations

The National Fire Alarm Code, NFPA 72, requires that all horns, used for building evacuation installed after July 1, 1996, produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal.

Power Supply Considerations

Panels typically supply DC filtered voltage or FWR (full wave rectified) voltage. The system design engineer must calculate the number of units used on a loop based on the type of panel supply. Be certain the sum of all the device currents does not exceed the current capability of the panel.

Calculations are based on using the device current found in the subsequent charts and must be compatible with the current specified for the panel or 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 smaller 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 to simulate worst case. For the most accurate voltage drop calculations use the System Sensor voltage drop calculator available on the web or CD-ROM.

Approximate wire resistance:

- 18 AWG solid: 8 ohms/1000 ft.
- 16 AWG solid: 5 ohms/1000 ft.
- 14 AWG solid: 3 ohms/1000 ft.
- 12 AWG solid: 2 ohms/1000 ft.

NOTE: If Class A wiring is installed, the wire length may be up to twice as long as on non-fault tolerant circuits.

NOTE: For 24 volt applications, the total number of strobes on a single NAC must not exceed 40, with a maximum loop resistance of 120 ohms. For 12 volt applications, the total number of strobes must not exceed 12, with a maximum loop resistance of 30 ohms.

Candela Selection for P, S, PC, & SC series models

For strobe candela selection, adjust the slide switch located on the rear of the product while watching the viewing window under the reflector on the front of the unit. Use Table 1 to determine current draw at various candela settings. Table 2 can be used to derate the candela rating for low temperature operation. Tables 3 & 4 can be used to determine strobe light output at various viewing angles.

NOTE: SpectrAlert products set at 15 and 15/75 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V operating voltages when set to any other candela settings.

Table 1. Current Draw (mA)

	Candela	8–17.5 Volts		16–33 Volts	
		DC	FWR	DC	FWR
Strobe (Standard Candela Range)	15	123	128	66	71
	15/75	142	148	77	81
	30	NA	NA	94	96
	75	NA	NA	158	153
	95	NA	NA	181	176
	110	NA	NA	202	195
Strobe (High Candela Range)	115	NA	NA	210	205
	135	NA	NA	228	207
	150	NA	NA	246	220
	177	NA	NA	281	251
	185	NA	NA	286	258

Table 2.

Listed candela rating	Candela rating at –40°F
15 cd	See Note
15/75 cd	
30 cd	
75 cd	9.8
95 cd	16.2
110 cd	29.7
115 cd	41.4
135 cd	44.6
150 cd	49.5
177 cd	81.4
185 cd	72.2

NOTE: The 15, 15/75, and 30 cd settings are not intended for use at temperatures below 32°F.

Table 3. Horizontal Plane Light Distribution for Wall and Ceiling Applications

Horizontal Angle	% of rated light output
0	100
45	75
90	25

Table 4. Vertical Plane Light Distribution for Wall Applications

Vertical Angle	% of rated light output
0	100
45	34
90	12

Horn Selection for P, PC, & H series models

Horn setting selection is accomplished by using the rotary switch on the back of the product (see Table 5). The current draw for various horn settings for horn and 4-wire horn/strobe products is listed in Table 6. The current draw for various horn and candela settings for 2-wire horn/strobe products (P2 series) is shown in Table 7 & 8. The sound measurements for various horn settings are shown in Table 9 for horn and horn/strobe products.

Table 5. Horn Patterns

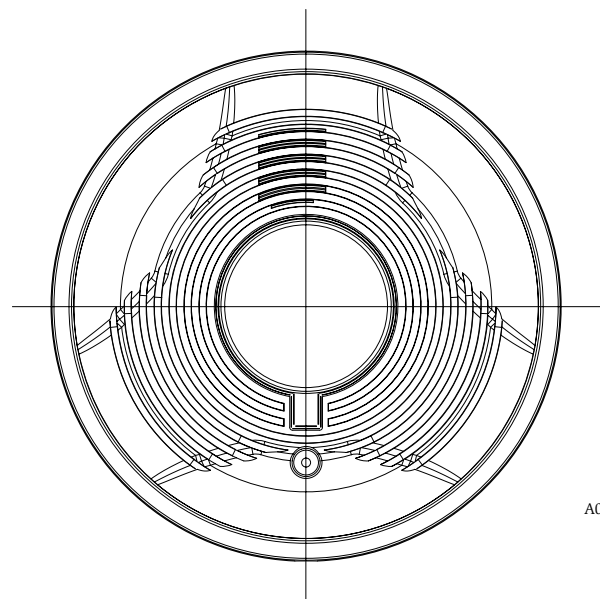
Setting	Repetition Rate	dB Out
1	Temporal horn	High
2	Temporal horn	Medium
3	Temporal horn	Low
4	Normal horn	High
5	Normal horn	Medium
6	Normal horn	Low
7	Externally coded	High
8	Externally coded	Medium
9	Externally coded	Low

NOTE: In positions 7, 8, and 9, temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output will remain constantly on. Positions 7, 8, and 9 are not available on 2-wire horn/strobe products.

Table 6. Horn Current Draw (mA)

Sound Pattern	dB	8–17.5 Volts		16–33 Volts	
		DC	FWR	DC	FWR
Temporal	High	57	55	69	75
Temporal	Medium	44	49	58	69
Temporal	Low	38	44	44	48
Non-temporal	High	57	56	69	75
Non-temporal	Medium	42	50	60	69
Non-temporal	Low	41	44	50	50
Coded	High	57	55	69	75
Coded	Medium	44	51	56	69
Coded	Low	40	46	52	50

NOTE: Ceiling products have their maximum brightness on the two axes shown below.



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Table 7. 2-wire Horn/Strobe Standard Candela Range (15–115 cd) Current Draw (mA)

DC Input	8–17.5 Volts		16–33 Volts						
	15	15/75	15	15/75	30	75	95	110	115
Temporal High	137	147	79	90	107	176	194	212	218
Temporal Medium	132	144	69	80	97	157	182	201	210
Temporal Low	132	143	66	77	93	154	179	198	207
Non-temporal High	141	152	91	100	116	176	201	221	229
Non-temporal Medium	133	145	75	85	102	163	187	207	216
Non-temporal Low	131	144	68	79	96	156	182	201	210
FWR Input									
Temporal High	136	155	88	97	112	168	190	210	218
Temporal Medium	129	152	78	88	103	160	184	202	206
Temporal Low	129	151	76	86	101	160	184	194	201
Non-temporal High	142	161	103	112	126	181	203	221	229
Non-temporal Medium	134	155	85	95	110	166	189	208	216
Non-temporal Low	132	154	80	90	105	161	184	202	211

Table 8. 2-wire Horn/Strobe High Candela Range (135–185 cd) Current Draw (mA)

DC Input	16–33 Volts				FWR Input	16–33 Volts			
	135	150	177	185		135	150	177	185
Temporal High	245	259	290	297	Temporal High	215	231	258	265
Temporal Medium	235	253	288	297	Temporal Medium	209	224	250	258
Temporal Low	232	251	282	292	Temporal Low	207	221	248	256
Non-temporal High	255	270	303	309	Non-temporal High	233	248	275	281
Non-temporal Medium	242	259	293	299	Non-temporal Medium	219	232	262	267
Non-temporal Low	238	254	291	295	Non-temporal Low	214	229	256	262

Table 9. Horn & Horn/Strobe Output (dBA)

Switch Position	Sound Pattern	dB	8–17.5 Volts		16–33 Volts	
			DC	FWR	DC	FWR
1	Temporal	High	78	78	84	84
2	Temporal	Medium	74	74	80	80
3	Temporal	Low	71	73	76	76
4	Non-temporal	High	82	82	88	88
5	Non-temporal	Medium	78	78	85	85
6	Non-temporal	Low	75	75	81	81
7*	Coded	High	82	82	88	88
8*	Coded	Medium	78	78	85	85
9*	Coded	Low	75	75	81	81

*Horn & 4-wire Horn/Strobe only

Wiring

Figure 1. Non-Synchronized devices; any combination of models powered by a 2-wire circuit

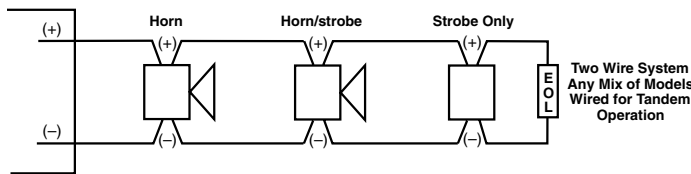
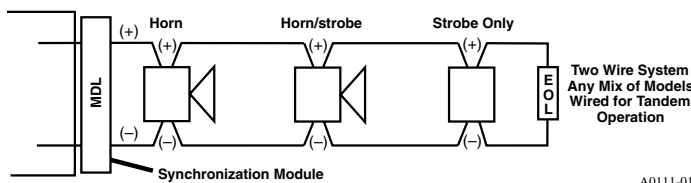
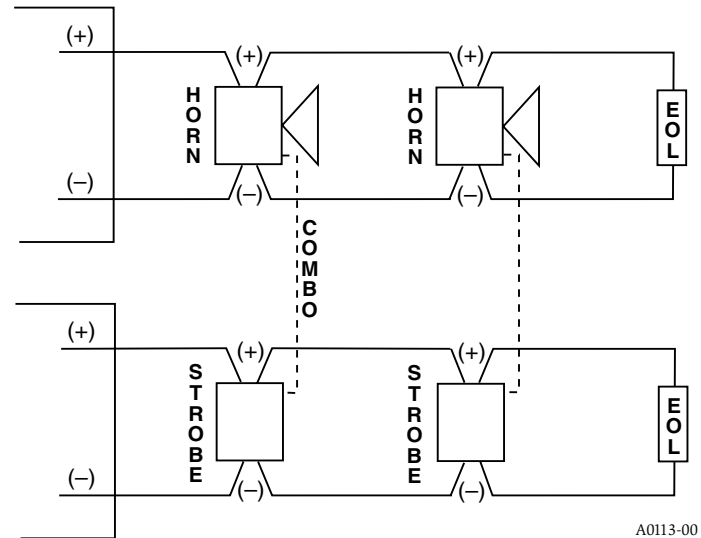


Figure 2. Synchronized devices; any combination of models powered by a 2-wire circuit



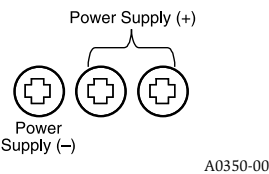
NOTE: For further information on synchronization see MDL, panel, or power supply installation manual.

Figure 3. Any combination of models powered by a 4-wire circuit



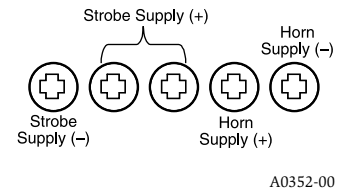
Terminal Definitions

Figure 4.



P2, PC2, S, SC, & H Series

Figure 5.



P4 & PC4 Series

Mounting

Figure 6.

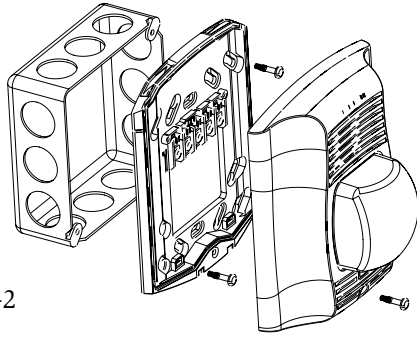
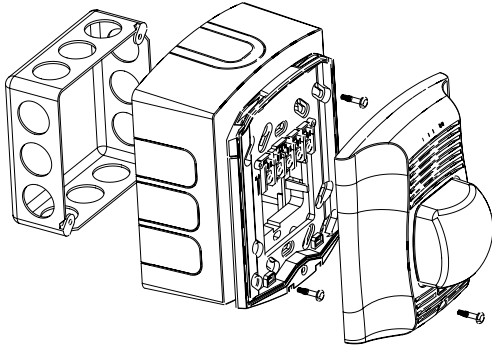


Figure 7.

Back box skirt
model numbers:
BBS-2, BBSW-2,
BBSC-2, and BBSCW-2



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A0349-00

Mounting (Wall or Ceiling)

1. Attach mounting plate to junction box as shown in Figure 6. The mounting plate is compatible with 4" square, double gang, and 4" octagon junction boxes (2-wire products may be used with a single gang box). If using a back box skirt, attach the mounting plate to the skirt and then attach the entire assembly to the junction box (see Figure 7).

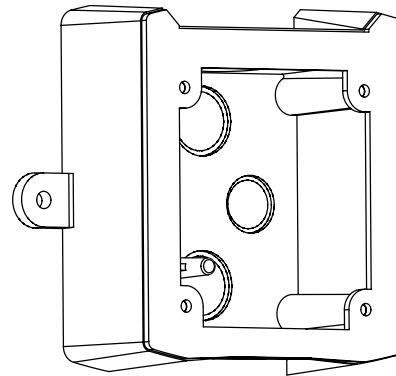
NOTE: For outdoor applications, the product must be

installed using the proper SpectrAlert Advance watertight junction box. The wall mount watertight junction box must be mounted with its internal post in the lower left corner as shown in Figure 8.

2. Connect field wiring according to terminal definitions.
3. If the product is not to be installed at this point, use the dust cover to prevent contamination of the wiring terminals of the mounting plate.
4. To attach product to mounting plate, hook tabs on the product housing into the grooves on mounting plate. Then, swing product into position to engage the pins on the product with the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.
5. Secure product by tightening the single mounting screw in the front of the product housing.

NOTE: Standard captured mounting screw may be replaced with enclosed torx screw for tamper resistance.

Figure 8.



A0354-00

Please refer to insert for the Limitations of Fire Alarm Systems

⚠ WARNING

The Limitations of Horn/Strobes

The horn and/or strobe will not work without power. The horn/strobe gets its power from the fire/security panel monitoring the alarm system. If power is cut off for any reason, the horn/strobe will not provide the desired audio or visual warning.

The horn may not be heard. The loudness of the horn meets (or exceeds) current Underwriters Laboratories' standards. However, the horn may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The horn 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 such as traffic, air conditioners, machinery or music appliances that may prevent alert persons from hearing the alarm. The horn may not be heard by persons who are hearing impaired.

NOTE: Strobes must be powered continuously for horn operation.

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 photoic 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 product 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 product. 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 replacement of any part of the product 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, Returns

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 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.

FCC Statement

SpectrAlert Strobes and Horn/Strobes have been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses,

and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.