INSTALLATION AND MAINTENANCE INSTRUCTIONS

SpectrAlert Ceiling Mount Series Strobes, and Horn/Strobes

SYSTEM SENSOR®
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SPECTRAlert

For use with the following models:

Strobes: 24 volt: SC2415W, SC241575W, SC2430W, SC2475W, SC2495W, SC24115W, SC24177W

Horn/Strobes: 24 volt: PC2415W, PC241575W, PC2430W, PC2475W, PC2495W, PC24115W, PC24177W

Remove suffix "W" for red models.
Add suffix "P" for models with plain housing.
The Products to which this manual applies may be covered by one or more of the following U.S. Patent numbers: 5,914,665; 5,850,178; 5,598,139; 6,049,446; 6,057,778; D424465

Specifications

Mechanical

Input Terminals:	12 to 18 AWG (3.31 to 0.82 mm^2)
Overall Dimensions:	6.8″ diameter (173 mm)
Operating Temperature:	32° F to 120° F (0° C to 49° C)

Electrical

Voltage Range:	DC or Full-Wave Rectified
15 candela through 115 candela models	
Strobes & Horn/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 & Horn/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
	NOTE: Horn/Strobes units will operate on walk tests with on-time durations of 1 sec. or greater.
Flash Rate:	1 Flash Per Second
Light Output:	Models with 15 only in the model number are listed at 15 candela.
	Models with 1575 are listed at 15 candela per UL 1971 but will provide 75 candela on axis (straight down).
	Models with 30, 75, 95, 115, 177 are for that candela.
Sound Output:	Sound output levels are established at Underwriters Laboratories in their reverberant room. Always use the sound output specified as UL Reverberant Room when comparing products.
Listings:	UL S5512 Strobe, UL S4011 (Combo)

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.

General Description

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

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

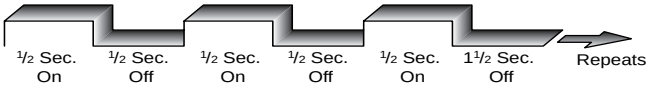
NOTICE: This manual shall be left with the owner/user of this equipment.

Fire Alarm System Considerations

Temporal and Non-Temporal Coded Signals:

The American National Standards Institute and the National Fire Alarm Code require that all horns used for building evacuation installed after July 1, 1996, must produce Temporal Coded Signals.

Signals other than those used for evacuation purposes do not have to produce the Temporal Coded Signal. Temporal coding is accomplished by interrupting a steady sound in the following manner:



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 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 the subsequent charts 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.

Figure 1A: Current Draw Measurements (Average Mean Method)

NOTE: The SC24177 and PC24177 strobes were only tested at the 20-33 Volt-FWR limits and 16-33 Volt DC limits, all other SC and PC 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.

Ceiling Mount Strobe Only:

	Average Mean Current (mA) 24V Models							Peak Current (mA) 24V Models							In Rush Current (mA) 24V Models						
	16V		20V	24V		33V		16V		20V	24V		33V		16V		20V	24V		33V	
Candela	DC	FWR	FWR	DC	FWR	DC	FWR	DC	FWR	FWR	DC	FWR	DC	FWR	DC	FWR	FWR	DC	FWR	DC	FWR
15	63	79		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	119	109		68	79	56	73	238	288		226	318	218	298	94	116		137	179	184	244
75	179	167		127	140	101	126	418	436		398	462	384	486	99	118		133	177	186	238
95	278	231		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

Ceiling Mount Horn/Strobe 15 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	78	80	71	89	70	94
		Non	78	80	71	89	70	94
	Low	Temp	71	69	62	74	59	77
		Non	71	69	62	74	59	77
3000 Hz Interrupt.	High	Temp	91	94	75	94	76	99
		Non	91	94	75	94	76	99
	Low	Temp	72	70	64	77	63	81
		Non	72	70	64	77	63	81

Ceiling Mount Horn/Strobe 1575 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	90	88	79	96	76	105
		Non	90	88	79	96	76	105
	Low	Temp	83	77	70	81	65	88
		Non	83	77	70	81	65	88
3000 Hz Interrupt.	High	Temp	115	139	83	101	82	110
		Non	115	139	83	101	82	110
	Low	Temp	84	78	72	84	69	92
		Non	84	78	72	84	69	92

Ceiling Mount Horn/Strobe 30 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	110	105	91	113	85	116
		Non	110	105	91	113	85	116
	Low	Temp	103	94	82	98	74	99
		Non	103	94	82	98	74	99
3000 Hz Interrupt.	High	Temp	125	108	95	118	91	121
		Non	125	108	95	118	91	121
	Low	Temp	104	95	84	101	78	103
		Non	104	95	84	101	78	103

Ceiling Mount Horn/Strobe 75 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	194	168	150	174	130	169
		Non	194	168	150	174	130	169
	Low	Temp	187	157	141	159	119	152
		Non	187	157	141	159	119	152
3000 Hz Interrupt.	High	Temp	197	188	154	179	136	174
		Non	197	188	154	179	136	174
	Low	Temp	188	158	143	162	123	156
		Non	188	158	143	162	123	156

Ceiling Mount Horn/Strobe 95 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	238	222	176	207	151	206
		Non	238	222	176	207	151	206
	Low	Temp	231	211	167	192	140	189
		Non	231	211	167	192	140	189
3000 Hz Interrupt.	High	Temp	278	225	180	212	157	211
		Non	278	225	180	212	157	211
	Low	Temp	232	212	169	195	144	193
		Non	232	212	169	195	144	193

Ceiling Mount Horn/Strobe 115 cd:

			Average Mean Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	305	256	214	264	185	255
		Non	305	256	214	264	185	255
	Low	Temp	298	245	205	249	174	238
		Non	298	245	205	249	174	238
3000 Hz Interrupt.	High	Temp	308	259	218	269	191	260
		Non	308	259	218	269	191	260
	Low	Temp	299	246	207	252	178	242
		Non	299	246	207	252	178	242

Ceiling Mount Horn/Strobe 177 cd:

			Average Mean Current (mA) 24V Models							
			16V	20V	24V		33V			
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR		
Electro-mech.	High	Temp	468	367	314	334	237	284		
		Non	468	367	314	334	237	284		
	Low	Temp	461	354	305	319	226	267		
		Non	461	354	305	319	226	267		
3000 Hz Interrupt.	High	Temp	471	371	318	339	243	289		
		Non	471	371	318	339	243	289		
	Low	Temp	462	356	307	322	230	271		
		Non	462	356	307	322	230	271		

Figure 1B: Current Draw Measurements (Average RMS Method)

NOTE: The SC24177 and PC24177 strobes were only tested at the 20-33 Volt-FWR limits and 16-33 Volt DC limits, all other SC and PC 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.

Ceiling Mount Strobe Only:

	Average RMS Current (mA) 24V Models						
	16V		20V	24V		33V	
Candela	DC	FWR	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

Ceiling Mount Horn/Strobe 15 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	89	95	84	108	83	117
		Non	89	95	84	108	83	117
	Low	Temp	82	84	75	93	72	100
		Non	82	84	75	93	72	100
3000 Hz Interrupt.	High	Temp	92	98	88	113	89	122
		Non	92	98	88	113	89	122
	Low	Temp	83	85	77	96	76	104
		Non	83	85	77	96	76	104

Ceiling Mount Horn/Strobe 1575 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	101	105	94	115	91	129
		Non	101	105	94	115	91	129
	Low	Temp	94	94	85	100	80	112
		Non	94	94	85	100	80	112
3000 Hz Interrupt.	High	Temp	104	108	98	120	97	134
		Non	104	108	98	120	97	134
	Low	Temp	95	95	87	103	84	116
		Non	95	95	87	103	84	116

Ceiling Mount Horn/Strobe 30 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	127	127	113	132	107	142
		Non	127	127	113	132	107	142
	Low	Temp	120	116	104	117	96	125
		Non	120	116	104	117	96	125
3000 Hz Interrupt.	High	Temp	130	130	117	137	113	147
		Non	130	130	117	137	113	147
	Low	Temp	121	117	106	120	100	129
		Non	121	117	106	120	100	129

Ceiling Mount Horn/Strobe 75 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	224	202	190	202	172	197
		Non	224	202	190	202	172	197
	Low	Temp	217	191	181	187	161	180
		Non	217	191	181	187	161	180
3000 Hz Interrupt.	High	Temp	227	205	194	207	178	202
		Non	227	205	194	207	178	202
	Low	Temp	218	192	183	190	165	184
		Non	218	192	183	190	165	184

Ceiling Mount Horn/Strobe 95 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	284	266	236	242	209	247
		Non	284	266	236	242	209	247
	Low	Temp	277	255	227	227	198	230
		Non	277	255	227	227	198	230
3000 Hz Interrupt.	High	Temp	287	269	240	247	215	252
		Non	287	269	240	247	215	252
	Low	Temp	278	256	229	230	202	234
		Non	278	256	229	230	202	234

Ceiling Mount Horn/Strobe 115 cd:

			Average RMS Current (mA) 24V Models					
			16V		24V		33V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	351	324	280	302	247	291
		Non	351	324	280	302	247	291
	Low	Temp	344	313	271	287	236	274
		Non	344	313	271	287	236	274
3000 Hz Interrupt.	High	Temp	354	327	284	307	253	296
		Non	354	327	284	307	253	296
	Low	Temp	345	314	273	290	240	278
		Non	345	314	273	290	240	278

Ceiling Mount Horn/Strobe 177 cd:

			Average RMS Current (mA) 24V Models							
			16V	20V	24V		33V			
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR		
Electro-mech.	High	Temp	536	441	417	404	344	370		
		Non	536	441	417	404	344	370		
	Low	Temp	529	428	408	389	333	353		
		Non	529	428	408	389	333	353		
3000 Hz Interrupt.	High	Temp	539	445	421	409	350	375		
		Non	539	445	421	409	350	375		
	Low	Temp	530	430	410	392	337	357		
		Non	530	430	410	392	337	357		

Figure 1C: Sound Pressure Measurements

Sound Output Guide			Sound pressure dBA @10 ft./volts DC		
			16	24	33
Temporal	Low Volume	Electromechanical	75	75	79
		3000 Hz Interrupted	75	75	79
	High Volume	Electromechanical	79	82	82
		3000 Hz Interrupted	79	82	82
Non-Temporal	Low Volume	Electromechanical	75	82	82
		3000 Hz Interrupted	79	82	85
	High Volume	Electromechanical	82	85	85
		3000 Hz Interrupted	82	85	85

Horn Selections

The horns on SpectAlert horn/strobe combo units are factory set for high volume, temporal code, and electromechanical tone.

Tones:

Electromechanical or 3kHz tones may be field-selected using the dipswitch selector (See Figs. 2B and 3B for dipswitch location).

NOTE: When powered from FWR supply, tones will be modulated(turned on and off) by 120Hz causing the tones to sound diferent from DC power.

Temp/Non-Temp:

Temporal coding or Non-Temporal coding can also be field-selected using the dipswitch.

High/Low Volume:

High or low volume may also be field-selected using the dipswitch.

System Operation: Non-Synchronized Devices

Figure 2A. Any combination of models powered by a 2-wire circuit:

NOTE: Supply power must be continous for proper operation.

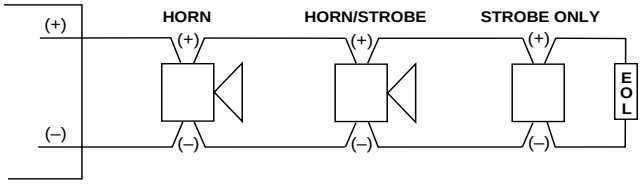


Figure 2B: Horns and strobes powered in tandem:

NOTE: Supply power must be continuous for proper operation.

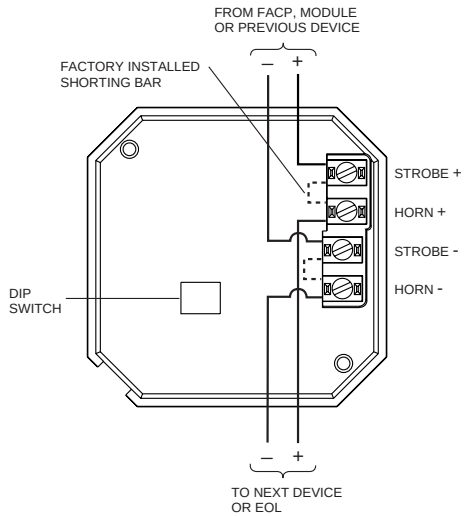


Figure 1D: Positioning for Maximum Brightness

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

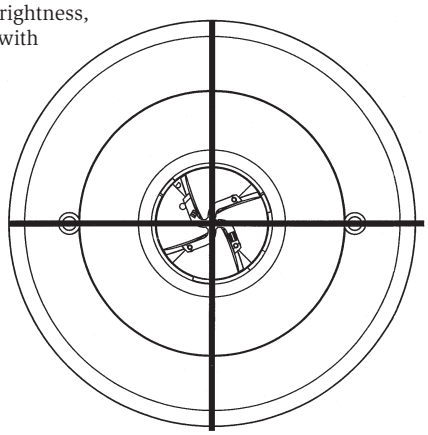


Figure 3A. Any combination of models powered by a 4-wire circuit to provide independent horn and strobe operation (Remove factory installed jumpers, see Figure 3B):

NOTE: Strobes must be powered continuously for horn operation.

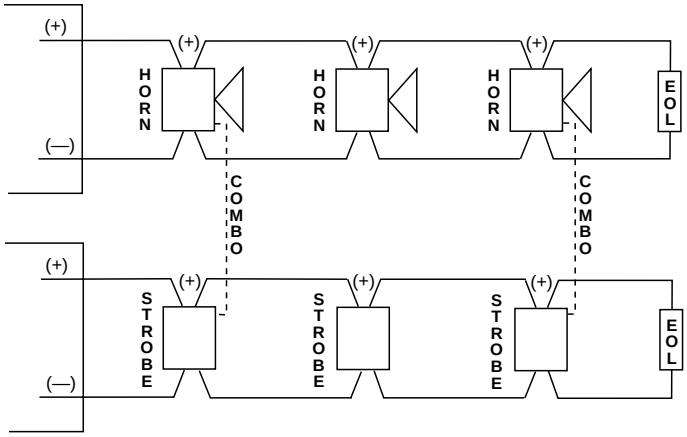
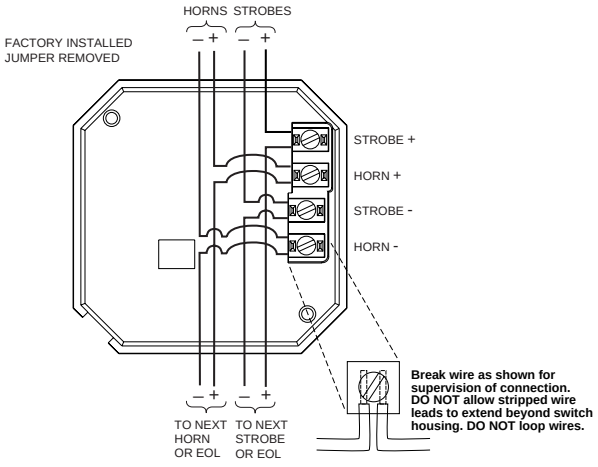


Figure 3B: Horns and strobes powered independently (Horn operated on coded power supply):

NOTE: Strobes must be powered continuously for horn operation.

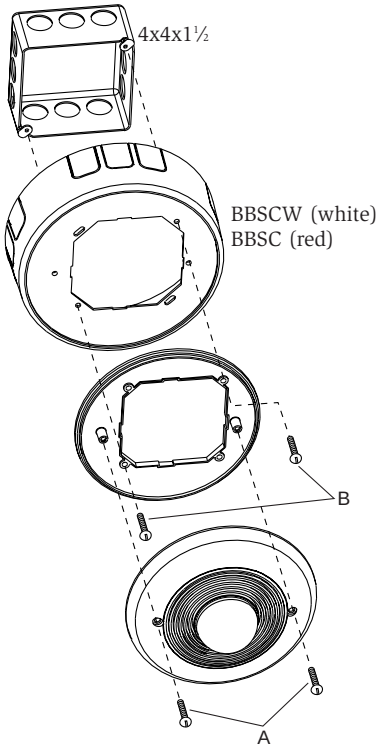


Mounting Diagrams:

Screw types used for mounting:
A = #8 plastite
B = 8-32 x 3/4 pan head

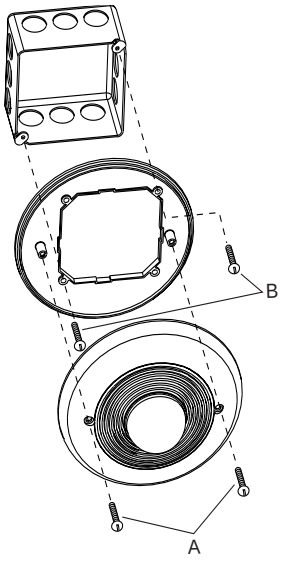
Strobe or Horn/Strobe surface mount:

1. Mount adapter plate and back box skirt to back box with screws B.
2. Complete field wiring.
3. Secure unit to skirt with screws A.



Strobe or Horn/Strobe with universal mounting plate:

1. Mount adapter plate to back box with screws B.
2. Complete field wiring.
3. Secure unit to plate with screws A.



Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

The Limitations of Ceiling Mount 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 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 horn. strobe, or horn/strobe 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 horn, strobe, or horn/strobe. 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 horn, strobe, or horn/strobe 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.