INSTALLATION AND MAINTENANCE INSTRUCTIONS

SpectrAlert Horns, Strobes, and Horn/Strobes

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

For use with the following models:

Horns:	**12/24 volt:**	**H12/24**
Strobes:	**12 volt:**	**S1215, S121575**
	24 volt:	**S2415, S2430, S241575, S2475, S24110**
Combo:	**12 volt:**	**P1215, P121575**
	24 volt:	**P2415, P2430, P241575, P2475, P24110**

Add suffix "K" for weatherproof horn and horn/strobe, red housing only.
Add suffix "K" for outdoor strobe only, red housing only.
Add suffix "F" for units marked FUEGO, "EV" for EVAC, or "AG" for AGENT, available on 241575, red housing only.
Add suffix "P" for plain (non-printed) 241575 only.
Add suffix "RLP" for Red Lens, "ALP" for Amber Lens, "GLP" for Green Lens, or "BLP" for Blue Lens. Available on 2475 plain, red housing only.
Add suffix "W" for white housing models.
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; 5,593,569

Specifications

Voltage Range:	DC or Full-Wave Rectified
Horn:	10.5 to 30 Volts
Strobes & Horn/Strobes:	12-volt models – 10.5 to 17 volts; 24-volt models – 20 to 30 volts
(with MDL module):	12-volt models – 11 to 17 volts; 24-volt models – 21 to 30 volts
	NOTE: Horn and combo units will operate on walk tests with on-time durations of 1 sec. or greater.
Flash Rate:	1 Flash Per Second
Operating Temperature:	32° F to 120° F (0° C to 49° C)
K Series:	Horn and horn/strobe models are indoor listed, having a temperature range of 32° F to 150° F (0° C to 66° C) and are Rainproof per UL50 (NEMA 3R). Strobe only models have a temperature range of –40° F to 158° F (–40° C to 70° C), and are indoor/outdoor listed per UL1638 and indoor listed per UL1971. The S24110K is rated 60 candela @ –40° C. S2475K and S241575K are rated 41 candela @ –40° C.
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 ahead) Models with 30, 75 or 110 are rated for that candela. Models with a red, amber, green or blue lens are listed at 75 candela per UL 1638.
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, FM, CSFM, MEA. K Series models are UL, CSFM, MEA listed only.

Note: For clear lens models only, 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.

General Description

The SpectrAlert series notification appliances are designed to meet the requirements of most agencies governing these devices, including: NFPA, ADA, 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 series can be installed in systems using 12- or 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).

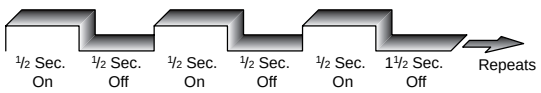
NOTICE: This manual shall be left with the owner/user of this equipment.

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.

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

Strobe Only:

	AVERAGE CURRENT (mA)												PEAK CURRENT (mA)												IN RUSH CURRENT (mA)											
	12V Models								24V Models				12V Models								24V Models				12V Models								24V Models			
	10.5V		12V		17V		20V		24V		30V		10.5V		12V		17V		20V		24V		30V		10.5V		12V		17V		20V		24V		30V	
Candela	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR
15	133	159	114	157	81	128	50	61	43	60	38	60	460	460	450	460	420	480	135	204	135	208	135	185	80	108	92	124	140	190	97	129	116	152	147	198
15/75	168	182	142	171	99	150	56	65	49	64	44	62	490	520	490	520	460	480	150	199	150	207	150	198	76	104	88	126	160	185	97	135	116	164	147	211
30	NA	NA	NA	NA	NA	NA	78	84	67	82	58	72	NA	NA	NA	NA	NA	NA	183	201	183	219	183	216	NA	NA	NA	NA	NA	NA	97	129	116	152	147	198
75	NA	NA	NA	NA	NA	NA	145	170	123	159	102	141	NA	NA	NA	NA	NA	NA	350	440	340	460	330	480	NA	NA	NA	NA	NA	NA	190	240	230	280	290	380
110*	NA	NA	NA	NA	NA	NA	169	220	140	191	115	174	NA	NA	NA	NA	NA	NA	460	560	450	570	420	620	NA	NA	NA	NA	NA	NA	190	230	220	290	290	370

*75cd models with colored lens

Horn Only:

			AVERAGE CURRENT (mA)											
			12V Models						24V Models					
			10.5V		12V		17V		20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	10	11	10	10	14	14	19	21	25	18	29	26
		Non	10	16	10	19	14	25	17	29	23	34	30	42
	Low	Temp	NA	NA	NA	NA	NA	NA	11	12	13	13	17	15
		Non	NA	NA	NA	NA	NA	NA	12	16	14	19	17	24
3000 Hz Interrupt.	High	Temp	11	13	11	11	16	16	24	26	28	23	37	33
		Non	11	17	11	21	14	28	19	34	27	39	35	45
	Low	Temp	NA	NA	NA	NA	NA	NA	14	14	17	15	21	19
		Non	NA	NA	NA	NA	NA	NA	13	18	16	21	22	25

Horn/Strobe 15 cd:

			AVERAGE CURRENT (mA)											
			12V Models						24V Models					
			10.5V		12V		17V		20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	143	170	124	167	95	142	69	82	68	78	67	87
		Non	143	170	124	167	95	142	67	90	66	94	68	103
	Low	Temp	NA	NA	NA	NA	NA	NA	61	73	56	73	55	76
		Non	NA	NA	NA	NA	NA	NA	62	77	57	79	55	85
3000 Hz Interrupt.	High	Temp	144	172	125	168	97	144	74	87	71	83	75	94
		Non	144	173	125	168	95	146	69	95	70	99	73	106
	Low	Temp	NA	NA	NA	NA	NA	NA	64	75	60	75	59	80
		Non	NA	NA	NA	NA	NA	NA	63	79	59	81	60	86

Horn/Strobe 1575 cd:

			AVERAGE CURRENT (mA)											
			12V Models						24V Models					
			10.5V		12V		17V		20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	178	193	152	181	113	164	75	86	74	82	73	88
		Non	178	193	152	181	113	164	73	94	72	98	74	104
	Low	Temp	NA	NA	NA	NA	NA	NA	67	77	62	77	61	77
		Non	NA	NA	NA	NA	NA	NA	68	81	63	83	61	86
3000 Hz Interrupt.	High	Temp	179	195	152	183	115	166	80	91	77	87	81	95
		Non	179	196	152	183	113	168	75	99	76	103	79	107
	Low	Temp	NA	NA	NA	NA	NA	NA	70	79	66	79	65	81
		Non	NA	NA	NA	NA	NA	NA	69	83	65	85	66	87

Horn/Strobe 30 cd:

			AVERAGE CURRENT (mA)					
			24V Models					
			20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	97	105	92	100	87	98
		Non	95	113	90	116	88	114
	Low	Temp	89	96	80	95	75	87
		Non	90	98	81	101	75	96
3000 Hz Interrupt.	High	Temp	102	108	95	105	95	105
		Non	97	116	94	121	93	117
	Low	Temp	92	96	84	97	79	91
		Non	91	100	83	103	80	97

Horn/Strobe 75 cd:

			AVERAGE CURRENT (mA)					
			24V Models					
			20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	164	191	148	167	131	167
		Non	163	188	146	169	132	169
	Low	Temp	156	182	136	162	119	156
		Non	157	182	137	162	119	157
3000 Hz Interrupt.	High	Temp	169	196	151	172	139	174
		Non	164	192	150	175	137	177
	Low	Temp	159	184	140	164	123	160
		Non	158	188	139	163	124	162

Horn/Strobe 110 cd and 75 cd with colored lens

			AVERAGE CURRENT (mA)					
			24V Models					
			20V		24V		30V	
Tone	High/Low Volume	Temp /Non	DC	FWR	DC	FWR	DC	FWR
Electro-mech.	High	Temp	188	241	165	209	144	200
		Non	186	238	163	211	145	202
	Low	Temp	180	232	153	204	132	189
		Non	181	232	154	204	132	190
3000 Hz Interrupt.	High	Temp	193	246	168	214	152	207
		Non	188	242	167	217	150	210
	Low	Temp	183	234	157	206	136	193
		Non	182	232	156	205	137	195

Sound Output Guide			UL Reverberant Room dBA@ volts DC						Anechoic dBA @10 ft./volts DC					
			10.5	12	17	20	24	30	10.5	12	17	20	24	30
Temporal	Low Volume	Electromechanical	NA	NA	NA	75	75	79	NA	NA	NA	94	96	98
		3000 Hz Interrupted	NA	NA	NA	75	79	79	NA	NA	NA	94	96	98
	High Volume	Electromechanical	75	75	79	82	82	82	94	95	98	100	101	102
		3000 Hz Interrupted	75	75	79	82	85	85	94	95	98	100	101	102
Non-Temporal	Low Volume	Electromechanical	NA	NA	NA	79	82	85	NA	NA	NA	94	96	98
		3000 Hz Interrupted	NA	NA	NA	82	82	85	NA	NA	NA	94	96	98
	High Volume	Electromechanical	79	79	85	85	88	88	94	95	98	100	101	102
		3000 Hz Interrupted	79	82	85	88	88	88	93	95	98	100	101	102

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.

Horn Selections

Horns are factory set for high volume, temporal code, and electromechanical tone.

Tones:

Two tones may be selected using the jumper plugs located on the printed circuit board. With the jumper offset, the tone is the Electromechanical sound. With the jumper in place, the tone is a 3 kHz sound.

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

Temp/Non-Temp:

Temporal coding or Non-Temporal coding can be selected using the jumper plugs located on the printed circuit board. With the jumper offset, the tone pattern is the Temporal Coded Signal. With the jumper in place, the Non-Temporal code (continuous) tone is active.

High/Low Volume:

High or low volume may be selected using the jumper plugs located on the printed circuit board. With the jumper in place, the sound output level is the high level. With the jumper offset, the sound output level is the low level. The low volume setting must NOT be used when the device is powered from a 12-volt panel.

NOTE: Always power down devices before setting jumpers.

System Operation: Non-Synchronized Devices

Figure 1A. Any combination of models powered by a 2-wire circuit:

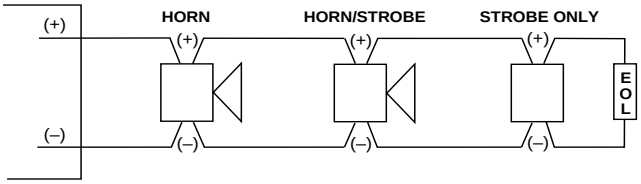


Figure 1B: Horns and strobes powered in tandem:

NOTE: Supply power must be continuous for proper operation.

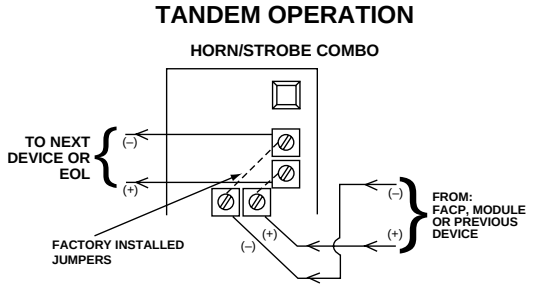


Figure 3: Removal of horns and strobes from mounting plates:

To remove units from mounting plates, insert screwdriver as shown to unlock snap. While pushing in screwdriver to release the snap, pull back on the horn/strobe. Hinge the horn/strobe module, disengage the Locking Rib, and lift the horn/strobe away from the mounting plate.

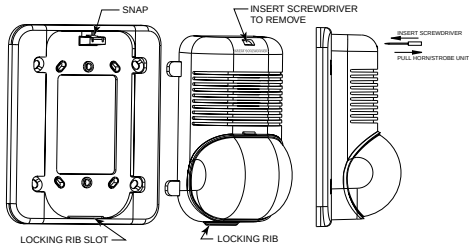


Figure 2A. Any combination of models powered by a 4-wire circuit to provide independent horn and strobe operation (Remove factory installed jumpers, see Figure 2B):

NOTE: Strobes must be powered continuously for horn operation.

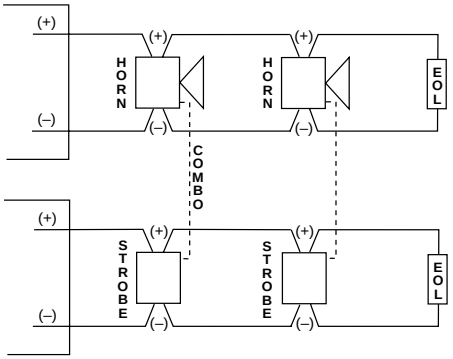
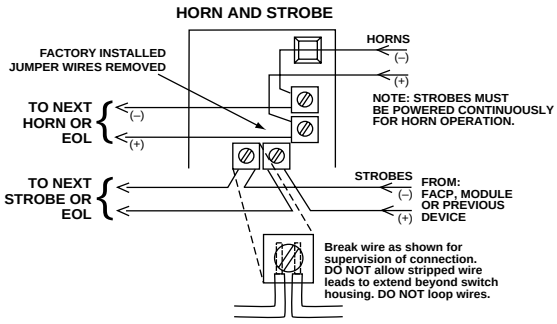


Figure 2B: Horns and strobes powered independently (Horn operated on coded power supply):

NOTE: Strobes must be powered continuously for horn operation.



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 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.

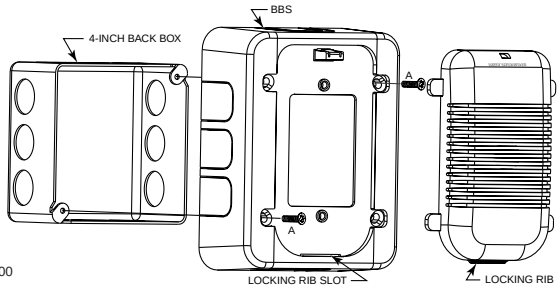
Three-Year Limited Warranty

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.

Mounting Diagrams:

Screw types used for mounting:
A = 8-32 x ¾ flat head
B = 6-32 x 1⅝ pan head

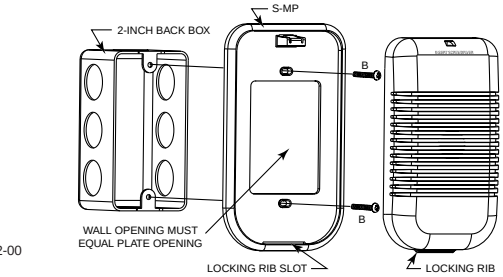
Horn surface mount:



A78-2670-00

1. Mount skirt to back box with screws A.
2. Complete field wiring.
3. Insert locking rib on unit into slot on skirt.
4. Press into skirt; unit will make a “click” when it has locked into place. (Note: Horn and skirt may also be mounted to a 2-inch box using screws B instead of screws A.)

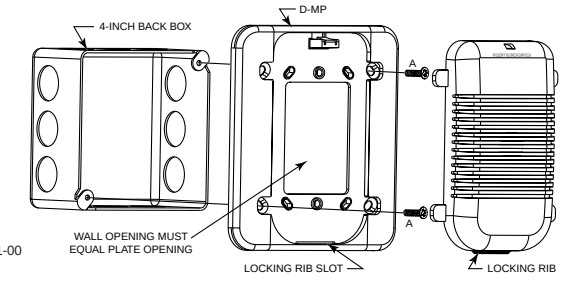
Horn direct mount:



A78-2672-00

1. Mount plate to back box using screws B.
2. Break off four tabs from unit.
3. Complete field wiring, making sure wall opening is large enough for terminals to fit through.
4. Insert locking rib into slot on plate.
5. Press into plate; unit will make a “click” when it has locked into place.

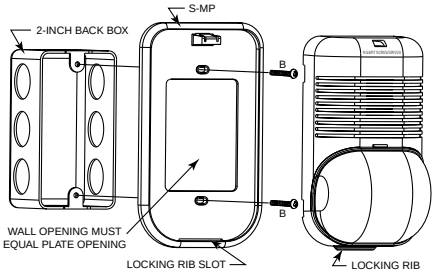
Horn with universal mounting plate:



A78-2671-00

1. Mount plate to back box using screws A, making sure wall opening is equal to the plate opening.
2. Complete field wiring.
3. Insert locking rib into slot on plate.
4. Press into plate, unit will make a “click” when it has locked into place.

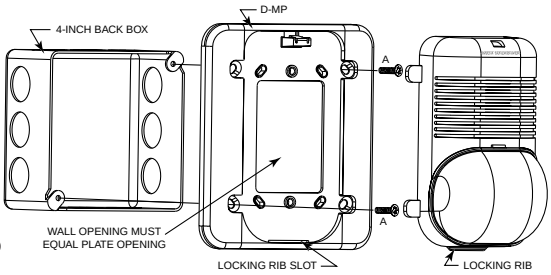
Strobe or Horn/Strobe with small footprint mounting plate:



A78-2675-00

1. Mount plate to back box using screws B.
2. Break off four tabs from unit.
3. Complete field wiring, making sure wall opening is large enough for terminals to fit through.
4. Insert locking rib into slot on plate.
5. Press into plate; unit will make a “click” when it has locked into place.

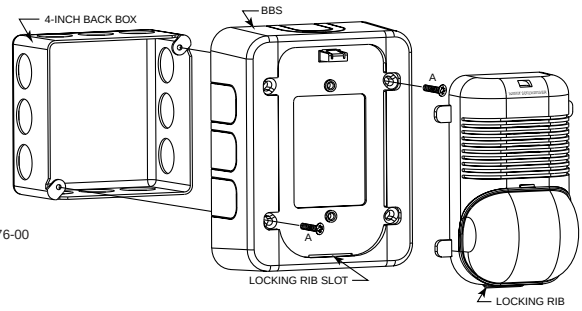
Strobe or Horn/Strobe with universal mounting plate:



A78-2674-00

1. Mount plate to back box using screws A, making sure wall opening is equal to the plate opening.
2. Complete field wiring.
3. Insert locking rib into slot on plate.
4. Press into plate, unit will make a “click” when it has locked into place.

Strobe or Horn/Strobe surface mount:



A78-2676-00

1. Mount skirt to back box with screws A.
2. Complete field wiring.
3. Insert locking rib on unit into slot on skirt.
4. Press into skirt; unit will make a “click” when it has locked into place. (Note: Strobe and skirt may also be mounted to a 2-inch box using screws B instead of screws A.)