INSTALLATION AND MAINTENANCE INSTRUCTIONS

ENGLISH

L-Series with LED Indoor Selectable-Output Horn Strobes and Strobes

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I56-0022-000

Manual is for use with the following models:

Horn Strobes
Standard Wall Mount Horn Strobes: P2RLED, P2RLED-B, P2WLED, P2WLED-B, P2RLED-P, P2WLED-P, P2RLED-SP, P2WLED-SP
Compact Wall Mount Horn Strobes: P2GRLED, P2GRLED-B, P2GWLED, P2GWLED-B
Standard Ceiling Mount Horn Strobes: PC2RLED, PC2RLED-B, PC2WLED, PC2WLED-B

2-Wire Strobes
Standard Wall Mount Strobes: SRLED, SRLED-B, SWLED, SWLED-B, SRLED-P, SWLED-P, SRLED-SP, SWLED-CLR-ALERT, SWLED-ALERT*
Compact Wall Mount Strobes: SGRLED, SGRLED-B, SGWLED, SGWLED-B
Ceiling Mount Strobes: SCRLED, SCRLED-B, SCWLED, SCWLED-B, SCWLED-CLR-ALERT, SCRLED-P, SCWLED-P

Language designators: “-B” are bilingual (English/French). “-P” are plain versions (no wording). “-SP” are marked “FUEGO”
*Amber lenses are for use in UL applications.

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Section 1: Introduction

1.1 Product Specifications

Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
Humidity Range:	10 to 93% Non-condensing
Strobe Flash Rate	1 flash per second
Nominal Voltage:	Regulated 24 VDC
Operating Voltage Range:	16 to 33V (24V nominal)
Input terminal wire gauge:	12 to 18 AWG

1.2 Dimensions and Mounting Options

Wall Mounted Product	**Length**	**Width**	**Depth**	**Mounting Options**
Standard Strobe and Horn Strobe (including lens)	5.67" (144 mm)	4.7" (119.4 mm)	2.07" (52.6 mm)	Standard 2-Wire Indoor Products: 4" x 4" x 1½", Single Gang, Double Gang, 4" Octagon, SBBRL/WL (wall), SBBGRL/WL (wall) Compact 2-Wire Indoor Products: Single Gang, SBBGRL/WL (wall)
Compact Strobe and Horn Strobe (including lens)	5.27" (133.7 mm)	3.45" (87.8 mm)	2.07" (52.6 mm)	
Standard device (including lens) with SBBRL/WL Surface Mount Back Box	5.77" (146.7 mm)	4.82" (122.3 mm)	3.92" (99.6 mm)	
Compact device (including lens) with SBBGRL/WL Surface Mount Back Box	5.38" (136.7 mm)	3.57" (90.8 mm)	3.62" (92 mm)	
NOTE: SBBRL/WL Surface Mount Back Box intended only for standard horn strobes and strobes. SBBGRL/WL Surface Mount Back Box intended for compact horn strobes and strobes.				

Ceiling Mounted Product	**Diameter**	**Depth**	**Mounting Options**
Strobe and Horn Strobe (including lens)	6.83" (173.5 mm)	2.07" (52.6 mm)	2-Wire Indoor Products: 4" x 4" x 1½", Single Gang, Double Gang, 4" Octagon, SBBCRL/WL (ceiling)
Strobe and Horn Strobe (including lens) with SBBCRL/WL Surface Mount Back Box	6.92“ (175.8 mm)	4.57“ (116 mm)	

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

1.3 Before Installing

Please read the System Sensor Audible Visible Application Reference Guide, which provides detailed information on notification devices, wiring and special applications. Copies of this manual are available from System Sensor. NFPA 72 and NEMA and CAN/ULC S524 guidelines should be observed.

Important: The notification appliance used must be tested and maintained following requirements of NFPA 72 in UL applications or CAN/ULC S536 in ULC applications.

1.4 General Description

System Sensor series of notification appliances offer a wide range of audible and visible devices for life safety notification. Our 2-wire horn strobes and strobes come with 8 field selectable tone and volume combinations and 7 field selectable candela settings. The devices are intended for indoor applications and approved for wall-mount and ceiling-mount installations. Strobes and horn strobes are available in standard and compact versions.

Two-wire horn strobes and strobes are public mode notification appliances intended to alert occupants of a life safety event. The horn is listed to ANSI/UL 464/ULC-S525 requirements (public mode) and the strobe is listed to ANSI/UL 1638/ULC-S526 (public mode).

Two-wire amber ALERT strobes are private mode notification appliances intended to alert trained personnel to investigate a life safety event. The 2-wire strobe is listed to ANSI/UL 1638 (Private mode). (Not listed for Canadian applications)

System Sensor notification appliances are designed to be used in 24VDC systems. System Sensor AV devices can be activated by a compatible fire alarm control panel or power supply. Refer to the appropriate fire alarm control panel manufacturer or power supply for more information.

System Sensor wall 2-wire horn strobes and strobes are electrically backward compatible with the previous generation of notification appliances. They come enabled with System Sensor synchronization protocol which requires connections to a power supply capable of generating the System Sensor synchronization pulses, a FACP NAC output configured to System Sensor synchronization protocol, or the use of a synchronization module to generate the synchronization protocol.

1.5 Fire Alarm System Considerations

The National Fire Alarm and Signaling Code, NFPA 72, and The National Building Code of Canada require that all notification appliances used for building evacuation produce temporal coded signals. Signals other than those used for evacuation purposes do not have to produce the temporal coded signal. System Sensor recommends spacing notification appliances in compliance with NFPA 72 (UL applications) or CAN/ULC S524 (ULC applications).

1.6 System Design

The system designer must make sure that the total current draw by the devices on the loop does not exceed the current capability of the panel supply, and that the last device on the circuit is operated within its rated voltage. The current draw information for making these calculations can be found in the tables within the manual. For convenience and accuracy, use the voltage drop calculator on the System Sensor website (www.systemsensor.com).

When calculating the voltage available to the last device, it is necessary to consider the voltage due to the resistance of the wire. The thicker the wire, the smaller the voltage drop. Wire resistance tables can be obtained from electrical handbooks. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be for circuits that are not fault tolerant. Total number of strobes on a single NAC must not draw more current than supported by the Fire Alarm Control Panel (FACP).

Section 2: Configurations for Notification Appliances

2.1 Available Tones

System Sensor offers a wide variety of tones for your life safety needs. Temporal 3 pattern is specified by ANSI and NFPA 72 for standard emergency evacuation signaling: ½ second on, ½ second off, ½ second on, ½ second off, ½ second on, 1½ off, and repeat.

To select the tone, turn the rotary switch on the back of the product to the desired setting. (See Figure 1.)

Available horn settings can be found in Table 1.

2.2 Available Candela Settings

System Sensor offers a wide range of candela settings for your life safety needs. To select your candela output, turn the rotary switch on the back of the product to the desired candela setting. (See Figure 2.) Table 2 shows available candela options.

The candela setting can be verified from the front of the unit by looking through a small window on the front of the product. (See Figure 19 for window location on device.) All products meet the light output profiles specified in the appropriate UL Standards. (See Figures 3, 4, and 5.)

Figure 1 Audio Selector

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Figure 2 Candela Selector

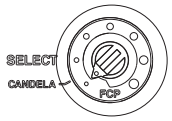

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Table 1 Horn Tones

Pos	Tone	Volume Setting
1	Temporal 3	High
2	Temporal 3	Low
3	Non-Temporal	High
4	Non-Temporal	Low
5	3.1 KHz Temporal 3	High
6	3.1 KHz Temporal 3	Low
7	3.1 KHz Non-Temporal	High
8	3.1 KHz Non-Temporal	Low

Figure 3 Light Output –Horizontal Dispersion

Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
55	45
60	40
65	35
70	35
75	30
80	30
85	25
90	25
Compound 45 to the left	24
Compound 45 to the right	24
*Tolerance of ±1 degree is permitted.	

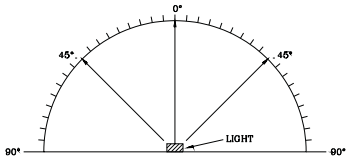

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Figure 4 Vertical Dispersion– Wall to Floor

Degrees*	Percent of Rating
0	100
5-30	90
35	65
40	46
45	34
50	27
55	22
60	18
65	16
70	15
75	13
80	12
85	12
90	12

*Tolerance of ±1 degree is permitted.

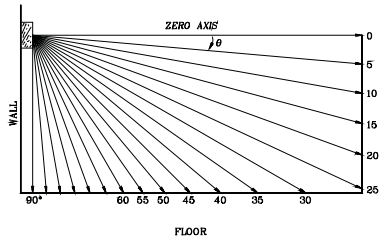

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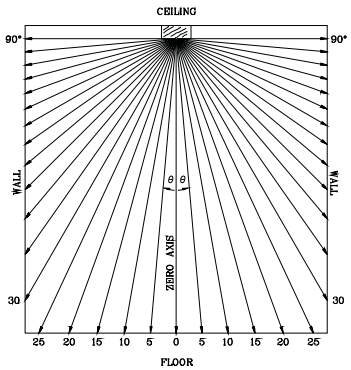
Figure 5 Light output - vertical dispersion, ceiling to walls to floor

Degrees*	Percent of Rating
0	100
5-25	90
30-45	75
50	55
60	45
65	35
70	35
75	30
80	30
85	25
90	25

*Tolerance of ±1 degree is permitted.



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2.3 Current Draw and Audibility ratings

For the strobe, the current draw for each setting is listed in Table 2. For the horn strobe, the current draw and audibility settings are listed in Table 3. Reference binational harmonized standard UL 464/ULC-S525 for minimum sound level requirements.

Table 2 UL/ULC Maximum Strobe Current Draw (mA)

Candela Rating	16-33 VDC	
	Wall	Ceiling
15	18	18
30	22	22
75	70	70
95	75	75
110	85	—
115	—	90
135	105	—
150	—	110
177	—	115
185	120	—
FCP*	(future)	(future)
*FCP Fire Control panel, future use		

Table 3 UL/ULC Maximum Horn Strobe Current Draw (mA) and Sound Output (dBa)

			Current Draw (mA RMS), Horn Strobe, Candela Range (15-185 cd), FCP*										Sound Output (dBA)
Pos	Tone	Volume Setting	16-33 Volts										16-33 V
			15cd	30cd	75cd	95cd	110cd WALL	115cd CEILING	135cd WALL	150cd CEILING	170cd CEILING	185cd WALL	DC
1	Temporal 3	High	35	38	87	92	94	120	189	189	190	190	87
2	Temporal 3	Low	35	38	87	92	94	120	135	135	145	145	79
3	Non-Temporal	High	50	52	87	92	94	120	127	127	135	135	87
4	Non-Temporal	Low	35	38	87	92	94	120	125	125	130	130	79
5	3.1 KHz Temporal 3	High	35	38	87	89	91	115	155	155	165	165	86
6	3.1 KHz Temporal 3	Low	35	38	87	89	91	115	128	130	135	135	80
7	3.1 KHz Non-Temporal	High	40	42	87	89	91	115	125	125	135	135	86
8	3.1 KHz Non-Temporal	Low	35	38	87	89	91	115	120	120	130	130	80

To calculate sound dispersal per UL464 or ULC-S525, refer to Table 4.

Table 4 Directional Characteristics

Horizontal Axis	
Angle	**Decibal loss (dBA)**
0° (ref)	0 (ref)
+/- 30	-3
+/- 50	-6
Vertical Axis	
Angle	**Decibal loss (dBA)**
0° (ref)	0 (ref)
+/- 20	-3
+/- 60	-6

Section 3: Installation

3.1 Wiring and Mounting

All wiring must be installed in compliance with the National Electric Code (UL applications), (Canadian Electric Code (ULC applications), and local codes as well as the authority having jurisdiction. Wiring must not be of such length or wire size which would cause the notification appliance to operate outside of its published specifications. Improper connections can prevent the system from alerting occupants in the event of an emergency.

Wire sizes up to 12 AWG (2.5 mm²) may be used with the mounting plate. The mounting plate ships with the terminals set for 12 AWG field wiring.

Make wire connections by stripping about $^{3}/_{8}$" of insulation from the end of the field wire. Then slide the bare end of the wire under the appropriate clamping plate and tighten the clamping plate screw.

We provide a wire strip guide. See Figure 6 for wiring terminals and strip guide reference.

3.2 Wiring Diagrams

The 2-wire horn strobe and strobe only require two wires for power and supervision. (See Figure 7.)

Shorting Spring Feature. These appliances enable system continuity checks of field wiring on the mounting plate before appliances are installed. The mounting plate has a shorting spring between terminals 2 and 3 that will automatically disengage when the product is installed, to enable supervision of the final system. (See Figure 6.)

Figure 6 Wiring Terminals, Shorting Spring, and Strip Guide

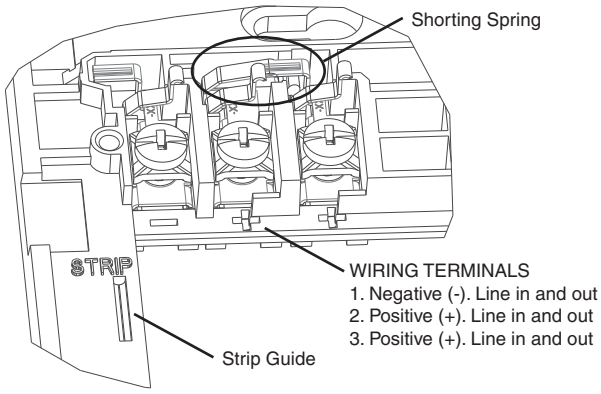
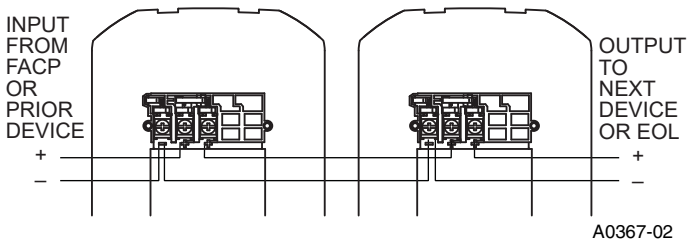


Figure 7 System Wiring



3.3 Install Back Box

1. Attach back box to wall or ceiling.
   - Junction boxes are mounted per industry standard. (See Figures 8, 9 and 12.)
   - The surface mount back box may be secured directly to the wall or ceiling. Use of grounding bracket with ground screw is optional. (See Figures 10, 11 and 13.)
   - ***Note for positioning:*** *Wall mount back boxes*: Mount with the up arrow pointing up. (See Figure 16.)
   - ***Note for positioning:*** *Ceiling mount back boxes: C*eiling surface mount back box SBBCR/WL is a common back box for ceiling horn strobes, strobes, speakers, and speaker strobes. Use the top (SPK) mounting holes for ceiling speaker and speaker strobe products. Use the bottom (STR) mounting holes for ceiling horn strobe and strobe installation needs.. (See Figure 15.)
2. Select appropriate knockouts and open as needed.
   - Threaded knockout holes are provided for the sides of the box for ¾ inch and ½ inch conduit adapter. Knockout holes in the back of the box can be used for ¾ inch and ½ inch rear entry.
   - *If using the ¾ inch knockout:* To remove the ¾ inch knockout, place the blade of a flat-head screwdriver along the outer edge and work your way around the knockout as you strike the screwdriver. (See Figure 17a.)
     NOTE: Use caution not to strike the knockout near the top edge of the surface mount back box.
   - *V500 and V700 raceway knockouts* are also provided. Use V500 for low profile applications and V700 for high profile applications. To remove the knockout, turn pliers up. (See Figure 17b.)

3.4 Install Mounting Plate and Appliance

1. Attach mounting plate using the provided Philips head screws. Junction box uses 2 screws. Surface mount backbox uses 4 screws. (See Figures 8 – 13.)
2. Connect field wiring according to terminal designations. (See Figures 6 and 7.)
3. If the product is not to be installed at this point, use the protective dust cover to prevent contamination of the wiring terminals on the mounting plate.
4. To attach product to mounting plate:
   - Remove the protective dust cover.
   - Hook the tabs on the top of the product housing into the grooves on mounting plate.

– Pivot the product into position to engage the terminals on the mounting plate. Make sure that the tabs on the back of the product housing fully engage with the mounting plate.
– Hold product in place with one hand, and secure product by tightening the single mounting screw in the front of the product housing.

CAUTION:
The “hold in place” snaps are not intended to secure the product to the back box. The product must be secured to the back box using the screws provided

CAUTION:
Factory finish should not be altered: Do not paint!

CAUTION:
Do not over tighten mounting plate screws; this may cause mounting plate to flex.

3.5 Remove a Ceiling Model Appliance

Ceiling models only: To remove the product from the mounting plate, loosen the captive mounting screw and press the locking button. (See Figure 14.)

3.5.1 Mounting Drawings

Figure 8 Mounting a Standard Wall Device (Double-gang box)

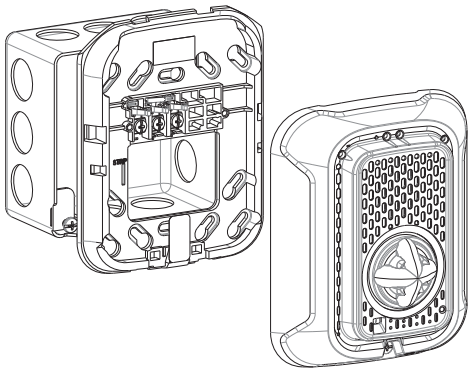


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Figure 9 Mounting a Compact Wall Device (Single-gang box)

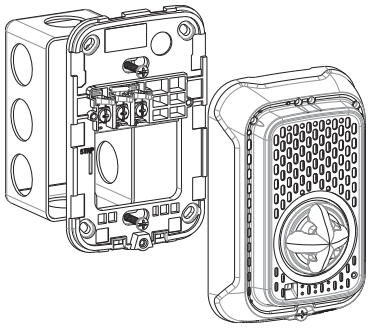

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Figure 10 Surface Mounting a Standard Wall Device (SBBRL/SBBWL)

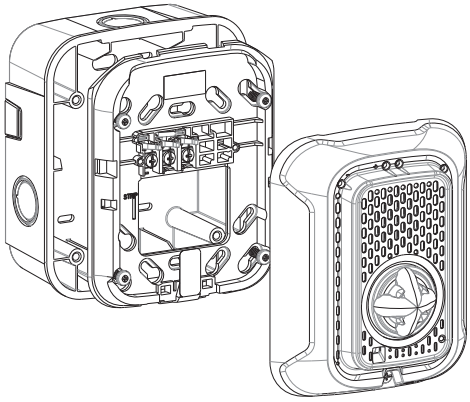

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Figure 11 Surface mounting a Compact Wall Device (SBBGRL/SBBGRL/SBBGWL)

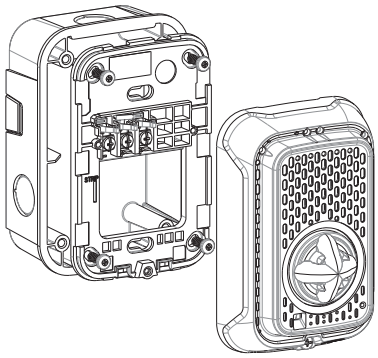

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Figure 12 Mounting a Ceiling Device (Double-Gang Box)

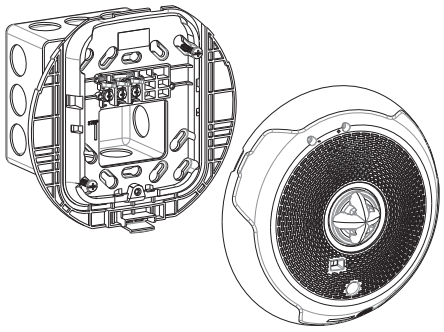

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Figure 13 Surface Mounting a Ceiling Device (SBBCRL/SBBCWL)

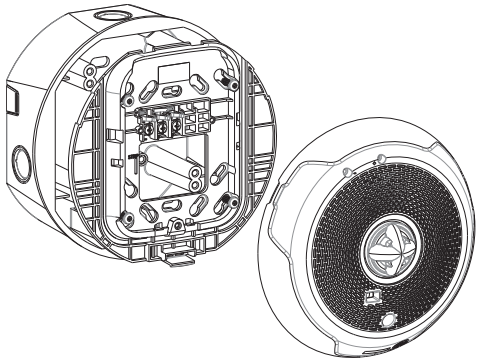

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Figure 14 Ceiling Device - Location of Locking Button

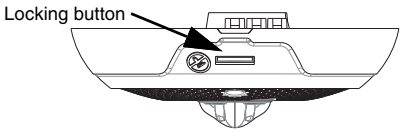

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Figure 15 Selecting screw location in a ceiling installation of a surface-mount back box

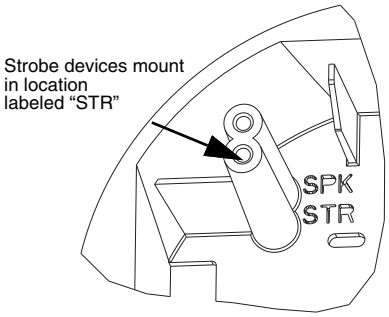

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Figure 16 Surface Mount Back Box “Up” Arrow

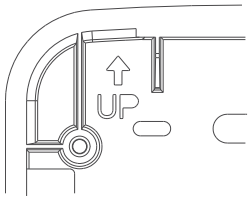

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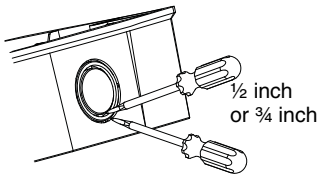
Figure 17 Knockout and V500/V700 Removal for Surface Mount Back Box

Figure 17A Knockout size



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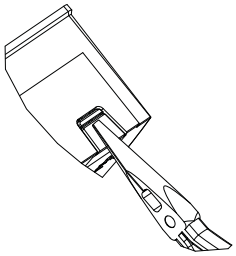
NOTE: Use caution not to strike the knockout near the top edge of the wall version of the surface mount back box.

Figure 17B Wire Mold Removal



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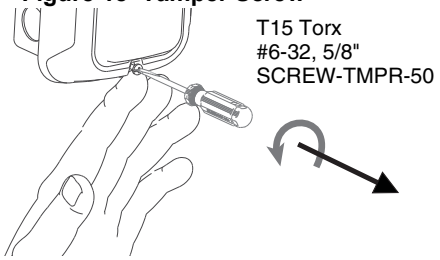
3.6 Tamper Screw

For tamper resistance, the standard captive screw may be replaced with a Torx screw, ordered separately.

To remove the captive screw, back out the screw and apply pressure to the back of the screw until it disengages from the housing. Replace with Torx screw. (See Figure 18.)

Figure 18 Tamper Screw



3.7 Test Points

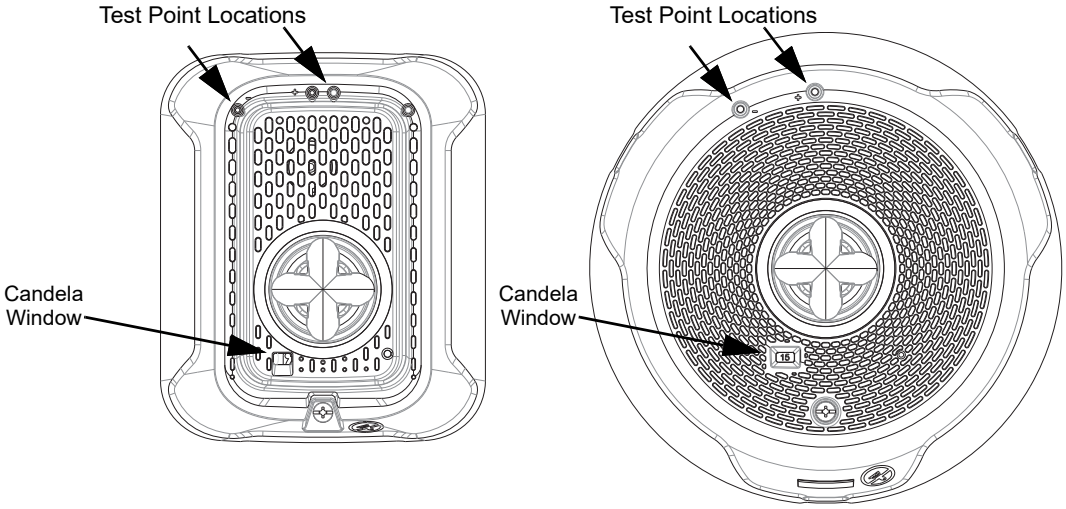
System Sensor L-Series with LED notification appliances come with diagnostic test points for ease of access with use of a digital voltage meter to measure device voltage without removing from the wall or ceiling.

1. Insert digital voltage meter positive probe into (+) test point.
2. Insert digital voltage meter negative probe into (-) test point.

NOTE: Marking indicates signal polarity when the circuit is active.

CAUTION:
Short circuiting of these test points may result in improper device operation.

Figure 19 Test Point Locations



⚠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 LEDs with associated lens system. 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.

FCC Statement

This equipment has 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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.
This Class B digital apparatus complies with Canadian ICES-003.

This symbol (shown left) on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, contact your local authorities or dealer and ask for the correct method of disposal.

Electrical and electronic equipment contains materials, parts and substances, which can be dangerous to the environment and harmful to human health if the waste of electrical and electronic equipment (WEEE) is not disposed of correctly.

Supplemental Information

For the latest Warranty information, please go to:
http://www.systemsensor.com/en-us/Documents/E56-4000.pdf

For Limitations of Fire Alarm Systems, please go to:
http://www.systemsensor.com/en-us/Documents/I56-1558.pdf

Speakers only: For the latest Important Assembly Information, please go to:
http://www.systemsensor.com/en-us/Documents/I56-6556.pdf

Warranty Information

Limitations of Fire Alarm Systems

Speakers Only: Assembly Information

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