

Selectable Output

Four-wire Horn Strobes – Ceiling Mount

For use with the following models:
Ceiling Mount Horn Strobes: PC4RL and PC4WL

| 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 12VDC or regulated 24DC/FWR |
| Operating Voltage Range: | 8 to 17.5V (12V nominal) or 16 to 33V (24V nominal) |
| Operating Voltage with MDL3 Sync Module: | 8.5 to 17.5V (12V nominal) or 16.5 to 33V (24V nominal) |
| Input terminal wire gauge: | 12 to 18 AWG |

| DIMENSIONS FOR PRODUCTS AND ACCESSORIES | | |
|---|--------------------|-------------------|
| CEILING PRODUCTS | Diameter | Depth |
| Horn Strobe | 6.83" (173.5mm) | 2.47" (62.7mm) |
| Horn Strobe with SBBCRL/WL Surface Mount Back Box | 6.92" (175.8mm) | 2.50" (63.5mm) |

| MOUNTING BOX OPTIONS |
|--|
| 4-wire Indoor Products |
| 4" x 4" x 1½", Double Gang, 4" Octagon, SBBCRL/WL (ceiling) |

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

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 guidelines should be observed.

Important: The notification appliance used must be tested and maintained following NFPA 72 requirements.

GENERAL DESCRIPTION

System Sensor series of notification appliances offer a wide range of audible and visible devices for life safety notification. Our 4-wire horn strobes come with 10 field selectable tone and volume combinations and 7 field selectable candela settings. Intended for indoor applications and approved for ceiling mount installations.

4-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 requirements (public mode) and the strobe is listed to ANSI/UL 1638 (public mode).

System Sensor strobes are designed to be used in 12 VDC, 24VDC, or 24V FWR (full wave rectified) 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 ceiling 4-wire horn strobes are electrically backward compatible with the previous generation, since 1996, 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 MDL3 module to generate the synchronization protocol.

FIRE ALARM SYSTEM CONSIDERATIONS

The National Fire Alarm and Signaling Code, NFPA 72, requires that all notification appliances, 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. System Sensor recommends spacing notification appliances in compliance with NFPA 72.

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. The total number of strobes on a single NAC must not exceed 69 for 24 volt applications.

AVAILABLE TONES

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

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.

NOTE: The standard mini-horn sound is 3.1 kHz. The legacy sound of the SpectraAlert Advance line is EM (Electro-mechanical): this hops frequencies between 2Hz and 4Hz. For EM Coded positions, temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output will remain constantly on.

FIGURE 1. AUDIO SELECTOR



AUDIO SELECT

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TABLE 1. HORN TONES

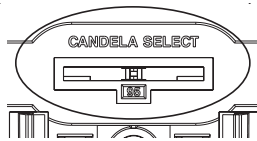
| Pos | Tone | Volume Setting |
|-----|----------------------|----------------|
| 1 | Temporal | High |
| 2 | Temporal | Low |
| 3 | Non-Temporal | High |
| 4 | Non-Temporal | Low |
| 5 | 3.1 kHz Temporal | High |
| 6 | 3.1 kHz Temporal | Low |
| 7 | 3.1 kHz Non-Temporal | High |
| 8 | 3.1 kHz Non-Temporal | Low |
| 9 | Coded | High |
| 10 | 3.1 kHz Coded | High |

AVAILABLE CANDELA SETTINGS

System Sensor offers a wide range of candela settings for your life safety needs. In order to select your candela output, adjust the slide switch on the rear of the product to the desired candela setting on the selector switch. (See Figure 2.)

The candela setting can also be verified by looking into the small window on the front of the unit. See Table 3 for candela settings for ceiling products. All products meet the light output profiles specified in the appropriate UL Standards. (See Figures 3 to 5.)

FIGURE 2. CANDELA SELECTOR



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CURRENT DRAW AND AUDIBILITY RATINGS

The 4-wire device provides two independent circuits, one for the Horn and another for the Strobe. The current draw for each Strobe setting is listed in Table 3, and audibility ratings for each Horn Tone setting is listed in Table 4.

TABLE 3. CEILING-MOUNT STROBE CURRENT DRAW (mA)

| Candela | 8-17.5 Volts | | 16-33 Volts | |
|---------|--------------|-----|-------------|-----|
| | DC | FWR | DC | FWR |
| 15 | 87 | 41 | 60 | |
| 30 | 153 | 63 | 86 | |
| 75 | - | 111 | 142 | |
| 95 | - | 134 | 164 | |
| 115 | - | 158 | 191 | |
| 150 | - | 189 | 228 | |
| 177 | - | 226 | 264 | |

NOTE: Products set at 15 and 30 candela automatically work on either 12V or 24V power supplies. The products are not listed for 12V DC operation when set to any other candela settings.

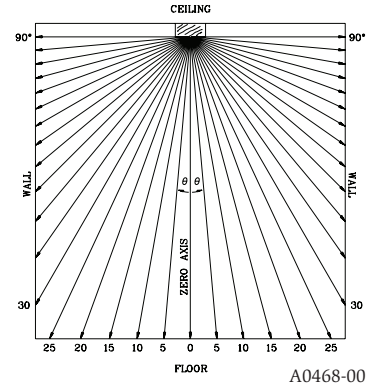
TABLE 4. HORN CURRENT DRAW (mA) AND SOUND OUTPUT - REVERBERANT (DBA)

| Pos | Tone | Volume Setting | 8-17.5 Volts | | 16-33 Volts | | Reverberant Sound Output (dBA) | | |
|-----|----------------------|----------------|--------------|-----|-------------|-----|--------------------------------|----|-----|
| | | | DC | FWR | DC | FWR | 8-17.5 V | | |
| | | | | | | | DC | DC | FWR |
| 1 | Temporal | High | 39 | 54 | 44 | 54 | 84 | 89 | 89 |
| 2 | Temporal | Low | 28 | 54 | 32 | 54 | 75 | 83 | 83 |
| 3 | Non-Temporal | High | 43 | 54 | 47 | 54 | 85 | 90 | 90 |
| 4 | Non-Temporal | Low | 29 | 54 | 32 | 54 | 76 | 84 | 84 |
| 5 | 3.1 kHz Temporal | High | 39 | 54 | 41 | 54 | 83 | 88 | 88 |
| 6 | 3.1 kHz Temporal | Low | 29 | 54 | 32 | 54 | 76 | 82 | 82 |
| 7 | 3.1 kHz Non-Temporal | High | 42 | 54 | 43 | 54 | 84 | 89 | 89 |
| 8 | 3.1 kHz Non-Temporal | Low | 28 | 54 | 29 | 54 | 77 | 83 | 83 |
| 9* | Coded | High | 43 | 54 | 47 | 54 | 85 | 90 | 90 |
| 10* | 3.1 kHz Coded | High | 42 | 54 | 43 | 54 | 84 | 89 | 89 |

* Settings 9 and 10 are not available on 2-wire horn strobes. Temporal coding must be provided by the NAC. If the NAC voltage is held constant, the horn output remains constantly on.

FIGURE 3. LIGHT OUTPUT - VERTICAL DISPERSION, CEILING TO WALLS TO FLOOR

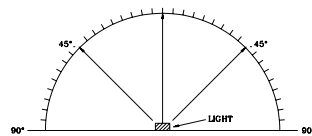
| Degrees* | Percent of Rating |
|----------|-------------------|
| 0 | 100 |
| 5-25 | 90 |
| 30-45 | 75 |
| 50 | 55 |
| 60 | 45 |
| 65 | 35 |
| 70 | 35 |
| 75 | 30 |
| 80 | 30 |
| 85 | 25 |
| 90 | 25 |



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FIGURE 4. LIGHT OUTPUT - HORIZONTAL DISPERSION

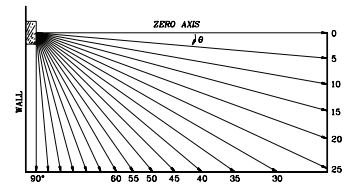
| Degrees* | Percent of Rating |
|--------------------------|-------------------|
| 0 | 100 |
| 5-25 | 90 |
| 30-45 | 75 |
| 50 | 55 |
| 55 | 45 |
| 60 | 40 |
| 65 | 35 |
| 70 | 35 |
| 75 | 30 |
| 80 | 30 |
| 85 | 25 |
| 90 | 25 |
| Compound 45 to the left | 24 |
| Compound 45 to the right | 24 |



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FIGURE 5. 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 |



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*Tolerance of ± 1 degree is permitted.

WIRING AND MOUNTING

All wiring must be installed in compliance with the National Electric Code and the 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 wiring.

Make wire connections by stripping about 3/8" of insulation from the end of the 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.

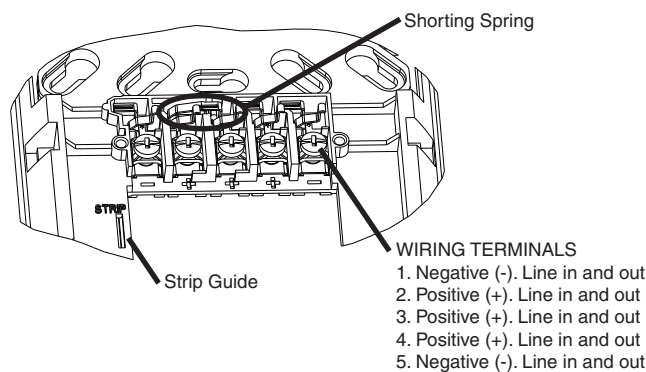
CAUTION

Factory finish should not be altered: Do not paint!

CAUTION

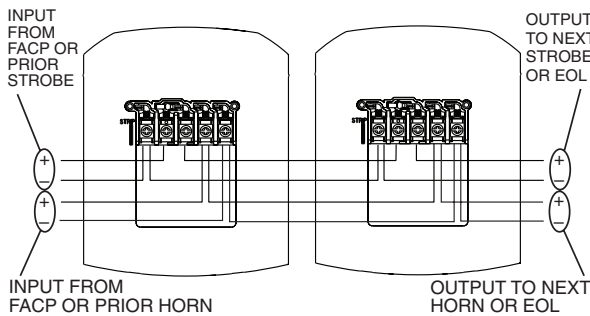
Do not over tighten mounting plate screws; this may cause mounting plate to flex.

FIGURE 6. WIRING TERMINALS, SHORTING SPRING, AND STRIP GUIDE



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FIGURE 7. 4-WIRE CIRCUIT



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SYSTEM WIRING

For 4-Wire installations, terminals 1, 2, and 3 connect to the strobe; terminals 4 and 5 connect to the horn. The horn and strobe circuits must be wired independently, and each circuit must be terminated with the appropriate EOL device. Removal of a notification device will result in an open circuit indication on the strobe loop.

NOTE: A shorting spring is provided between terminals 2 and 3 of the mounting plate to enable wiring checks after the system has been wired, but prior to installation of the final product. This spring will automatically disengage when the product is installed, to enable supervision of the final system. Only available on indoor products (non K-series).

SHORTING SPRING FEATURE

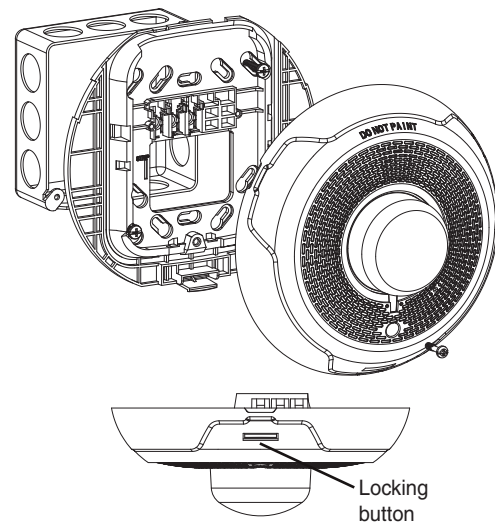
System Sensor notification appliances come with a shorting spring that is provided between terminals 2 and 3 of the mounting plate to enable system continuity checks after the system has been wired, but prior to installation of the final product. (See Figure 6.) This spring will automatically disengage when the product is installed, to enable supervision of the final system.

MOUNTING AND REMOVING APPLIANCE

1. Attach mounting plate to junction box with the two screws provided. (See Figure 8.)
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:
 - a. Remove the protective dust cover.
 - b. Hook the tabs on the top of the product housing into the grooves on mounting plate.
 - c. 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.
 - d. Hold product in place with one hand, and secure product by tightening the single mounting screw in the front of the product housing.

Ceiling Models only: To remove product from the mounting plate, loosen the captive mounting screw and press the locking button.

FIGURE 8. CEILING MOUNTING



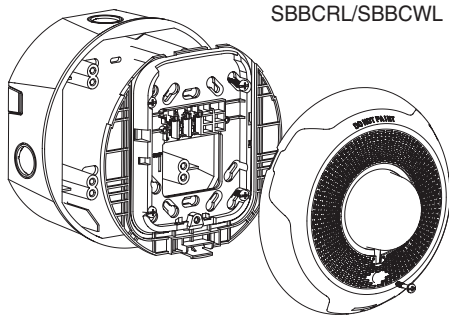
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INSTALLING A SURFACE MOUNT BACK BOX

1. The ceiling surface mount back box may be secured directly to the wall or ceiling. Use of grounding bracket with ground screw is optional. (See Figure 9.)
 2. The ceiling mount box can be used on ceiling horn strobes as well as ceiling speaker and speaker models. Use the STR cut-outs for ceiling horn strobe installation needs. (See Figure 11.)
 3. Threaded knockout holes are provided for the sides of the box for 3/4 inch and 1/2 inch conduit adapter. Knockout holes in the back of the box can be used for 3/4 inch and 1/2 inch rear entry.
 4. To remove the 3/4 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 12.)
- NOTE: Use caution not to strike the knockout near the top edge of the surface mount back box.**
5. V500 and V700 raceway knockouts are also provided. Use V500 for low profile applications and V700 for high profile applications.
 6. To remove the knockout, turn pliers up. (See Figure 12.)

FIGURE 9. SURFACE-MOUNTING ON CEILING



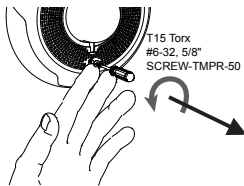
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TAMPER SCREW

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

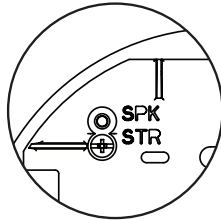
1. To remove the captive screw, back out the screw and apply pressure to the back of the screw until it disengages from the housing. Replace with Torx screw. (See Figure 10.)

FIGURE 10. TAMPER SCREW



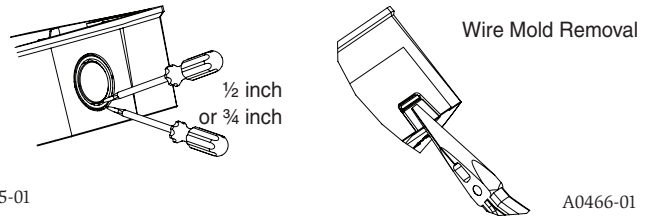
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FIGURE 11. CUT-OUTS FOR SPEAKER (SPK) AND STROBE (STR)



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FIGURE 12. KNOCKOUT AND V500/V700 REMOVAL FOR SURFACE MOUNT BACK BOX



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A0466-01

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.

FCC STATEMENT

System Sensor 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.

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/156-1558.pdf>

Speakers only: For the latest Important Assembly Information, please go to:
<http://www.systemsensor.com/en-us/Documents/156-6556.pdf>



Warranty



Limitations of Fire Alarm Systems



Speakers Only: Assembly Information