



273 Branchport Avenue
 Long Branch, NJ 07740
 (800) 631-2148
 www.wheelockinc.com

Thank you for using our products.
INSTALLATION INSTRUCTIONS
SERIES HS4 HIGH INTENSITY
FOUR WIRE APPLIANCES

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

GENERAL:

Wheelock's Series HS4 High Intensity Horn Strobes can provide a non-synchronized strobe appliance when connected directly to a Fire Alarm Control Panel (FACP), or provide a synchronized strobe appliance when used in conjunction with a Sync Module (SM), Dual Sync Module (DSM) or Wheelock's Power Supplies. The HS4 allows for independent operation of the strobe circuit and the horn circuit. It is the ideal choice for retrofit applications as well as new installations. The HS4 Appliances are UL Listed under Standard 1971 for Signaling Devices for the Hearing Impaired and UL Standard 464 for Audible Signal Appliances. It is listed for **indoor use only** and can be mounted to double-gang, 4" backbox, 100mm European backbox or SHBB surface backbox (See Mounting Options). The strobes use a Xenon flashtube with solid state circuitry enclosed in a rugged Lexan® lens to provide maximum visibility and reliability for effective visible signaling.

The horn portion of the HS4 Appliances can be field set to provide either Continuous Horn or Code 3 Horn. They can provide a continuous horn when connected directly to the Fire Alarm Control Panel (FACP), or synchronized code 3 horn when used in conjunction with the Sync Module (SM), Dual Sync Module (DSM) or Wheelock's Power Supplies. HS4 appliances can be field set to provide either High (HI) dBA, Medium (MED) dBA or Low (LO) dBA sound output. The audible portion of the HS4 appliances can be used on coded systems in which the applied voltage is cycled on and off.

The HS4 is designed for use with either filtered DC or unfiltered Full-Wave-Rectified (FWR) input voltage. All inputs are polarized for compatibility with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP).

NOTE: "Lexan" is a registered trademark of General Electric Corporation.

NOTE: All CAUTIONS and WARNINGS are identified by the symbol . All warnings are printed in bold capital letters.

WARNING: THE STROBE APPLIANCE IS A "FIRE ALARM DEVICE - DO NOT PAINT."

WARNING: PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE USING THIS PRODUCT. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, CANDELA SETTING, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

SPECIFICATIONS:

| Model | Regulated Voltage VDC/VRMS | Voltage Range Limit Per UL 1971 VDC/VRMS | Strobe Candela (cd) | Mounting Options |
|------------|----------------------------|--|---------------------|------------------|
| HS4-24150C | 24 | 16.0-33.0 | 150 | Ceiling A,B,C,D |
| HS4-24185W | 24 | 16.0-33.0 | 185 | Wall A,B,C,D |

| Model | Regulated Voltage | Lo | | Med | | Hi | |
|------------|-------------------|-------|-------|-------|-------|-------|-------|
| | | MEAN | RMS | MEAN | RMS | MEAN | RMS |
| HS4-24185W | 16.0VDC | 0.014 | 0.018 | 0.020 | 0.033 | 0.035 | 0.067 |
| | 24.0VDC | 0.017 | 0.024 | 0.026 | 0.052 | 0.055 | 0.098 |
| | 33.0VDC | 0.021 | 0.027 | 0.035 | 0.068 | 0.069 | 0.110 |
| HS4-24150C | 16.0VRMS | ----- | 0.016 | ----- | 0.028 | ----- | 0.052 |
| | 24.0VRMS | ----- | 0.031 | ----- | 0.043 | ----- | 0.075 |
| | 33.0VRMS | ----- | 0.041 | ----- | 0.050 | ----- | 0.094 |

| Description | Volume | Reverberant Per UL 464 | | |
|-----------------|--------|------------------------|-------|---------|
| | | 16.0VDC | 24VDC | 33.0VDC |
| Continuous Horn | Low | 80 | 83 | 86 |
| | Medium | 85 | 88 | 91 |
| | High | 88 | 91 | 93 |
| Code 3 Horn | Low | 75 | 79 | 82 |
| | Medium | 80 | 84 | 86 |
| | High | 84 | 87 | 89 |

NOTE: THE MAXIMUM WIRE IMPEDANCE BETWEEN STROBES SHALL NOT EXCEED 35 OHMS. THE MAXIMUM NUMBER OR STROBES ON A SINGLE NOTIFICATION APPLIANCE CIRCUIT SHALL NOT EXCEED 47.

NOTES:

1. Regulated Voltage: 24VDC HS4 appliances are UL Listed to operate over a voltage range from 16.0VDC to 33.0VDC using filtered DC or unfiltered FWR input voltage.
2. Anechoic dBA is measured on-axis in a non-reflective (free field) test room using fast meter response. For peak dBA (measured with peak meter response), add 5dBA to anechoic values shown in Table 3. Reverberant dBA is a minimum UL rating based on sound power measurements in a reverberant test room.
3. Indoor operating temperature: +32°F to +120°F (0°C to +49°C) @ 85% RH.
4. Strobe flash rate over voltage range: 1.010 –1.045 without sync module, 1.000-1.020 with sync module

⚠ WARNING: FOR UL APPLICATIONS THESE APPLIANCES WERE TESTED TO THE OPERATING VOLTAGE LIMITS OF 16-33 VOLTS USING FILTERED (DC) OR UNFILTERED FULL-WAVE-RECTIFIED (FWR). DO NOT APPLY 80% AND 110% OF THESE VOLTAGE VALUES FOR SYSTEM OPERATION.

⚠ WARNING: CHECK THE MINIMUM AND MAXIMUM OUTPUT OF THE POWER SUPPLY AND STANDBY BATTERY AND SUBTRACT THE VOLTAGE DROP FROM THE CIRCUIT WIRING RESISTANCE TO DETERMINE THE APPLIED VOLTAGE TO THE STROBES.

| Table 4: Current Ratings (AMPS) | | |
|--|-------|-------|
| Rated Average Current | | |
| | 150cd | 185cd |
| 16.0VDC | 0.506 | 0.570 |
| 24.0VDC | 0.308 | 0.350 |
| 33.0VDC | 0.227 | 0.250 |
| 16.0VRMS | 0.773 | 0.865 |
| 24.0VRMS | 0.469 | 0.540 |
| 33.0VRMS | 0.398 | 0.415 |
| Rated Peak Current * | | |
| Voltage | 150cd | 185cd |
| 16.0VDC | 0.768 | 0.850 |
| 24.0VDC | 0.648 | 0.700 |
| 33.0VDC | 0.800 | 0.900 |
| 16.0VRMS | 2.400 | 2.500 |
| 24.0VRMS | 1.800 | 2.100 |
| 33.0VRMS | 1.800 | 2.000 |

* The time duration for the peak current is 1 millisecond.

NOTE: Inrush current is less than rated peak current.

When calculating the total average and peak currents: Use Table 3 to determine the highest value of “Rated Average Current” for an individual strobe (across the expected operating voltage range of the strobe), and use Table 3 to determine the highest value of “Rated Peak Current” of an individual strobe (across the expected voltage range of the strobe), then multiply these values by the total number of strobes; be sure to add the currents for any other appliances, including audible signaling appliances, powered by the same source and include any required safety factors.

If the peak current exceeds the power supplies’ peak/inrush capacity, the output voltage provided by the power supplies may drop below the listed voltage range of the appliances connected to the supply and the voltage may not recover in some types of power supplies. For example, an auxiliary power supply that lacks filtering at its output stage (either via lack of capacitance and/or lack of battery backup across the output) may exhibit this characteristic.

⚠ WARNING: MAKE SURE THAT THE TOTAL AVERAGE CURRENT AND TOTAL PEAK CURRENT REQUIRED BY ALL APPLIANCES THAT ARE CONNECTED TO THE SYSTEM’S PRIMARY AND SECONDARY POWER SOURCES, SIGNALING CIRCUITS, SM, DSM SYNC MODULES AND WHELOCK’S POWER SUPPLIES DO NOT EXCEED THE POWER SOURCES’ RATED CAPACITY OR THE CURRENT RATINGS OF ANY FUSES ON THE CIRCUITS TO WHICH THESE APPLIANCES ARE WIRED. OVERLOADING POWER SOURCES OR EXCEEDING FUSE RATINGS COULD RESULT IN LOSS OF POWER AND FAILURE TO ALERT OCCUPANTS DURING AN EMERGENCY, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

LIGHT DISTRIBUTION PER UL 1971:

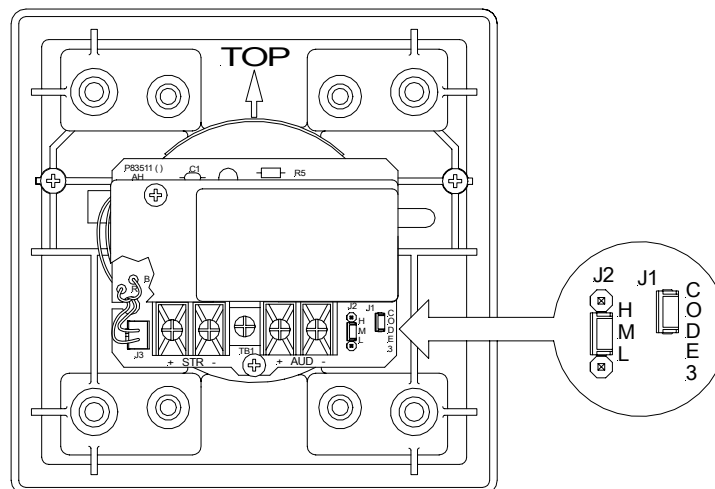
| Table 5: Horizontal and Vertical Plane | | | | | | | | |
|---|---------------------|--------------|-------------------|--------------|---------------------|--------------|-------------------|--------------|
| Angle (in deg.) | 150C | | | | 185W | | | |
| | Horizontal Plane | | Vertical Plane | | Horizontal Plane | | Vertical Plane | |
| | UL Min. | Typ. 150C | UL Min. | Typ. 177C | UL Min. | Typ. 150W | UL Min. | Typ. 177W |
| 0 | 150.0 | 212 | 150.0 | 214 | 185.0 | 237 | 185.0 | 242 |
| 5 | 135.0 | 198 | 135.0 | 207 | 166.5 | 218 | 166.5 | 239 |
| 10 | 135.0 | 172 | 135.0 | 203 | 166.5 | 195 | 166.5 | 231 |
| 15 | 135.0 | 168 | 135.0 | 200 | 166.5 | 195 | 166.5 | 228 |
| 20 | 135.0 | 167 | 135.0 | 196 | 166.5 | 190 | 166.5 | 228 |
| 25 | 135.0 | 169 | 135.0 | 194 | 166.5 | 193 | 166.5 | 224 |
| 30 | 112.5 | 162 | 112.5 | 187 | 138.8 | 183 | 166.5 | 218 |
| 35 | 112.5 | 163 | 112.5 | 182 | 138.8 | 185 | 120.3 | 210 |
| 40 | 112.5 | 152 | 112.5 | 172 | 138.8 | 175 | 85.1 | 200 |
| 45 | 112.5 | 134 | 112.5 | 160 | 138.8 | 155 | 62.9 | 184 |
| 50 | 82.5 | 102 | 82.5 | 137 | 101.8 | 121 | 50.0 | 155 |
| 55 | 67.5 | 93 | 67.5 | 130 | 83.3 | 109 | 40.7 | 152 |
| 60 | 60.0 | 93 | 60.0 | 109 | 74.0 | 103 | 33.3 | 123 |
| 65 | 52.5 | 84 | 52.5 | 88 | 64.8 | 93 | 29.6 | 97 |
| 70 | 52.5 | 79 | 52.5 | 70 | 64.8 | 88 | 27.8 | 78 |
| 75 | 45.0 | 72 | 45.0 | 65 | 55.5 | 82 | 24.1 | 70 |
| 80 | 45.0 | 67 | 45.0 | 48 | 55.5 | 77 | 22.2 | 54 |
| 85 | 37.5 | 72 | 37.5 | 43 | 46.3 | 81 | 22.2 | 49 |
| 90 | 37.5 | 55 | 37.5 | 38 | 46.3 | 64 | 22.2 | 49 |

⚠ WARNING: THE HS4 APPLIANCES MUST BE FIELD SET TO THE DESIRED TONE AND dBA SOUND OUTPUT LEVEL BEFORE THEY ARE INSTALLED. THIS IS DONE BY PROPERLY INSERTING JUMPER PLUGS IN ACCORDANCE WITH THESE INSTRUCTIONS. INCORRECT SETTINGS WILL RESULT IN IMPROPER PERFORMANCE, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

SOUND OUTPUT (SPL) SETTINGS:

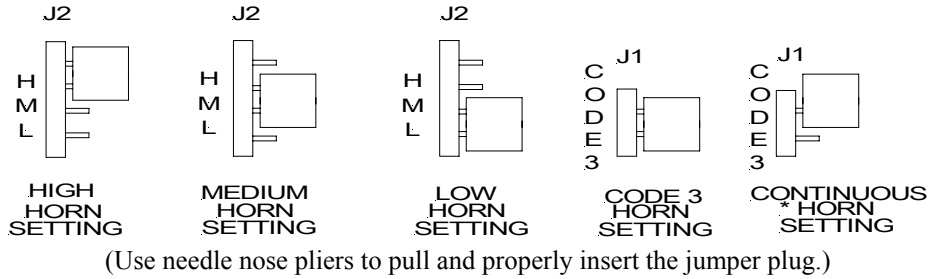
NOTE: The Code 3 Horn incorporates the temporal pattern (1/2 second on, 1/2 second off, 1/2 second on, 1/2 second off, 1/2 second on, 1-1/2 off and repeat) specified by ANSI/NFPA for standard emergency evacuation signaling. **The Code 3 Horn should be used only for fire evacuation signaling and not for any other purpose.**

Figure 1: Showing Location of Jumper Plugs



Factory setting is on Medium dB and Code 3.

Figure 2: Jumper Plug Settings for High, Medium, Low dB, Code 3 Horn and Continuous Horn Setting.



No jumper plug is needed for continuous horn setting. However, it is recommended that the jumper plug be retained in the unit for future use (if needed) as shown in Figure 2.

NOTE: The HS4 must be set for Code 3 horn when used with the sync module. Refer to Sync Module Installation Instruction sheets SM (P83123), DSM (P83177) and Wheelock’s Power Supplies for additional information. If the HS4 audible is connected to a coded system in accordance with Fig 3 the continuous horn setting must be used.

WIRING INFORMATION:

Figure 3: Audible signal and strobe operate independently.

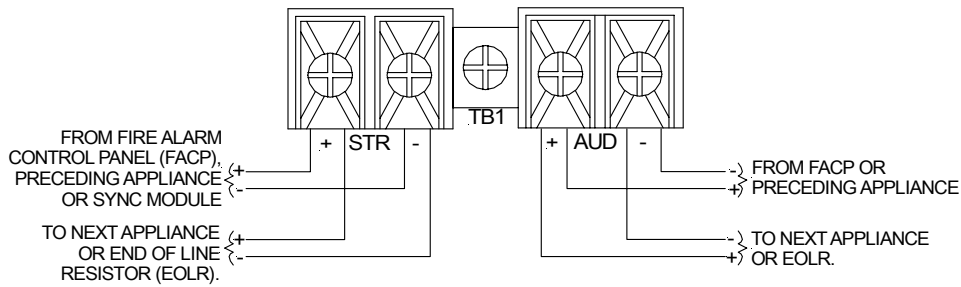
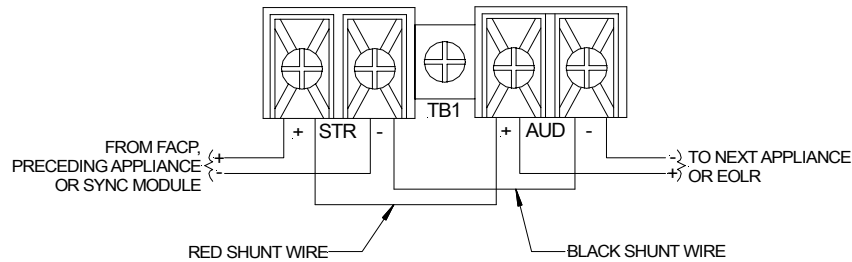
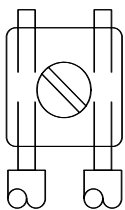


Figure 3A: Audible signal and strobe operate in unison. Red and black shunt wires are supplied.



CAUTION: Strobes are not designed to be used on coded systems in which the applied voltage is cycled on and off. The installation shown in figure 3A is NOT compatible with a coded system.

Figure 5.

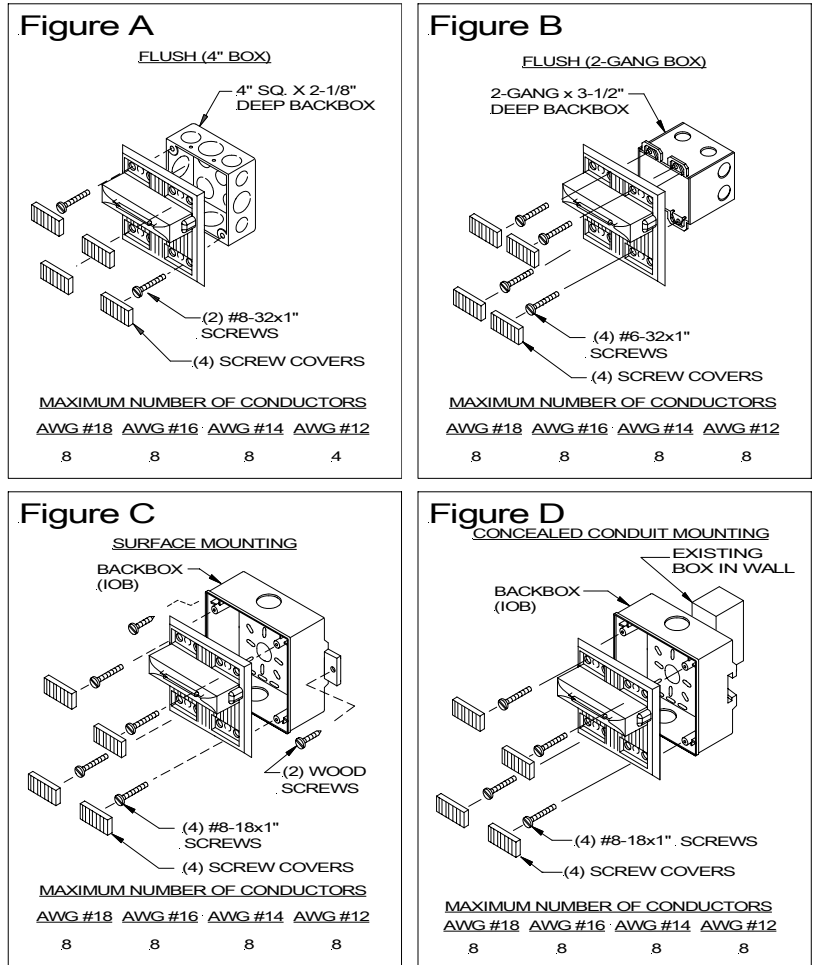


- 1) HS4 Appliances have in-out wiring terminals that accepts two #12 to #18 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8” inches for connection to screw terminals.
- 2) Break all in-out wire runs on supervised circuit supervision as shown in Figure 5. The polarity shown in the wiring diagrams is for the operation of the appliances. The polarity is reversed by the FACP during supervision.

MOUNTING OPTIONS:

⚠ CAUTION: The following figures show the maximum number of field wires (conductors) that can enter the backbox used with each mounting option. If these limits are exceeded, there may be insufficient space in the backbox to accommodate the field wires and stresses from the wires could damage the product.

Although the limits shown for each mounting option comply with the National Electrical Code (NEC), Wheelock recommends use of the largest backbox option shown and the use of approved stranded field wires, whenever possible, to provide additional wiring room for easy installation and minimum stress on the product from wiring.



MOUNTING PROCEDURES:

Use this mounting procedure to position the field wires in the backbox so that they use minimum space and produce minimum stress on the product. This is especially important for stiff, heavy gauge wires and wires with thick insulation or sheathing.

1. Connect field wires to the HS4 terminal block (polarity must be observed).
2. Bend the field wires up 90° at the connection to the terminal block.
3. Carefully push the field wires into the backbox by hand.
4. Carefully press the HS4 to the backbox, verifying that the HS4 is seated and aligned correctly.
5. Screw the HS4 to the backbox using the screws supplied. Refer to Mounting Options for screw size.

MOUNTING NOTES:

⚠ CAUTION: Check that the installed product will have sufficient clearance and wiring room prior to installing backboxes and conduit, especially if sheathed multiconductor cable or 3/4" conduit fittings are used.

1. Conduit entrances to the backbox should be selected to provide sufficient wiring clearance for the installed product.
2. When terminating field wires, do not use more lead length than required. Excess lead length could result in insufficient wiring space for the signaling appliance.
3. Do not pass additional wires (used for other than the signaling appliance) through the backbox. Such additional wires could result in insufficient wiring space for the signaling appliance.

⚠ CAUTION: If these appliances are operated within 15 inches of a person's ear, they can produce a sound pressure level that exceeds the maximum 120dBA permitted by ADA and OSHA rules. Exposure to such sound levels can result in damage to a person's hearing.

These appliances can produce a distinctive three pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 1999 Edition.

⚠ WARNING: WHEN INSTALLING STROBES IN AN OPEN OFFICE OR OTHER AREAS CONTAINING PARTITIONS OR OTHER VIEWING OBSTRUCTIONS, SPECIAL ATTENTION SHOULD BE GIVEN TO THE LOCATION OF THE STROBES SO THAT THEIR OPERATING EFFECT CAN BE SEEN BY ALL INTENDED VIEWERS, WITH THE INTENSITY, NUMBER, AND TYPE OF STROBES BEING SUFFICIENT TO MAKE SURE THAT THE INTENDED VIEWER IS ALERTED BY PROPER ILLUMINATION, REGARDLESS OF THE VIEWER'S ORIENTATION. FAILURE TO DO SO COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.

HS4 high intensity strobe models are Listed for use in sleeping or non-sleeping areas when installed in accordance with appropriate NFPA Standards and the Authority Having Jurisdiction.

⚠ WARNING: A SMALL POSSIBILITY EXISTS THAT THE USE OF MULTIPLE STROBES WITHIN A PERSON'S FIELD OF VIEW, UNDER CERTAIN CIRCUMSTANCES, MIGHT INDUCE A PHOTO-SENSITIVE RESPONSE IN PERSONS WITH EPILEPSY. STROBE REFLECTIONS IN A GLASS OR MIRRORED SURFACE MIGHT ALSO INDUCE SUCH A RESPONSE. TO MINIMIZE THIS POSSIBLE HAZARD, WHEELOCK STRONGLY RECOMMENDS THAT THE STROBES INSTALLED SHOULD NOT PRESENT A COMPOSITE FLASH RATE IN THE FIELD OF VIEW WHICH EXCEEDS FIVE (5) Hz AT THE OPERATING VOLTAGE OF THE STROBES. WHEELOCK ALSO STRONGLY RECOMMENDS THAT THE INTENSITY AND COMPOSITE FLASH RATE OF INSTALLED STROBES COMPLY WITH LEVELS ESTABLISHED BY APPLICABLE LAWS, STANDARDS, REGULATIONS, CODES AND GUIDELINES.

NOTE: NFPA 72/ANSI 117.1 conform to ADAAG Equivalent Facilitation Guidelines in using fewer, higher intensity strobes within the same protected area.

⚠ CAUTION: Check the installation instructions of the manufacturers of other equipment used in the system for any guidelines or restrictions on wiring and/or locating Notification Appliance Circuits (NAC) and notification appliances. Some system communication circuits and/or audio circuits, for example, may require special precautions to assure electrical noise immunity (e.g. audio crosstalk).

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital appliance, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in 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: 1) Reorient or relocate the receiving antenna, 2) Increase the separation between the equipment and receiver, 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected, and 4) Consult the dealer or an experienced radio/TV technician for help.

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IMPORTANT: READ SEPARATE "GENERAL INFORMATION" SHEET FOR INFORMATION ON THE PLACEMENT, LIMITATIONS, INSTALLATION, FINAL CHECKOUT, AND PERIODIC TESTING OF NOTIFICATION APPLIANCES.

Limited Warranty

Wheelock products must be used within their published specifications and must be PROPERLY specified, applied, installed, operated, maintained and operationally tested in accordance with these instructions at the time of installation and at least twice a year or more often and in accordance with local, state and federal codes, regulations and laws. Specification, application, installation, operation, maintenance and testing must be performed by qualified personnel for proper operation in accordance with all of the latest National Fire Protection Association (NFPA), Underwriters' Laboratories (UL), National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA), local, state, county, province, district, federal and other applicable building and fire standards, guidelines, regulations, laws and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ). Wheelock products when properly specified, applied, installed, operated, maintained and operationally tested as provided above are warranted against mechanical and electrical defects for a period of three years from date of manufacture (as determined by date code). Correction of defects by repair or replacement shall be at Wheelock's sole discretion and shall constitute fulfillment of all obligations under this warranty. THE FOREGOING LIMITED WARRANTY SHALL IMMEDIATELY TERMINATE IN THE EVENT ANY PART NOT FURNISHED BY WHEELOCK IS INSTALLED IN THE PRODUCT. THE FOREGOING LIMITED WARRANTY SPECIFICALLY EXCLUDES ANY SOFTWARE REQUIRED FOR THE OPERATION OF OR INCLUDED IN A PRODUCT. WHEELOCK MAKES NO REPRESENTATION OR WARRANTY OF ANY OTHER KIND, EXPRESS, IMPLIED OR STATUTORY WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER.

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9/03