Content

Section 5
System Configuration

Section 6
System Operation

Appendix A
Compatible Devices

Section 1
Overview

1.1   SK-2224 Description

The Model SK-2224 is a two zone, 24-volt fire control panel having the following features:

- Two Class B zones

- Two notification circuits rated at 1.25 amp each

- 2.5 amp power supply

- Dedicated alarm and trouble relays

- Auxiliary power output (.5 amp max.) for powering special applications, such as door holders.

- Enhanced Verification Mode, a built-in feature that distinguishes two-wire smoke detectors from pull stations.

- Housed in a 12.75"W x 15"H x 3.25"D metal cabinet

- Cabinet supports two 7.0 AH backup batteries

1.2   How to Contact Silent Knight

If you have a question or encounter a problem not covered in this manual, contact Silent Knight Technical Support at 800-328-0103 (or 612-493-6455). To order parts, contact Silent Knight Sales at 800-446-6444 (or 612-493-6435).

Section 2
Agency Requirements

2.1 FCC Warning

This device has been verified to comply with FCC Rules Part 15. Operation is subject to the two following conditions: (1) This device may not cause radio interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

2.2 Underwriters Laboratories (UL)

The SK-2224 is UL listed as a control unit for use in NFPA 72 systems. If the SK-2224 and its accessories are to be used as part of a UL installation, carefully read the UL requirements in this section. For more information on NFPA 72 standards, refer to the *NFPA National Fire Alarm Code, 1996 Edition*.

2.2.1 Requirements for All Installations

General requirements are described in this section. When installing an individual device, refer to the specific section of the manual for additional requirements.

1. All field wiring must be installed in accordance with NFPA 70 National Electric Code.

2. Use UL listed smoke detectors and notification appliances compatible with the SK-2224 from those specified in the Appendix to this manual.

3. If you are using the smoke verification feature:

   - Do not use smoke detectors with built-in alarm verification.

   - Select "Enhanced Mode" if the installation includes pull stations or water flow switches.

   - Select the "no alarm delay" option for all smoke verification zones.

4. A full system checkout must be performed any time the panel is programmed.

5. UL installations require use of Model 7628 EOL resistor assembly.

2.2.2 Requirements for Local Protected Fire Alarm Systems

At least one UL listed supervised notification appliance must be used.

Section 3
Before You Begin Installing

3.1   What's in the Box?

The Model SK-2224 ships with the following hardware:

Table 3-1: Contents of Shipping Box

Main Part	Containing		Part Number
	Part	**Quantity/Item**	
A Cabinet			122509
	Panel Bag	1 Control Board	202224
		1 Installation Manual	151051
	Hardware Bag	2 #8 Screws	119152
		2 #8 Nuts	119538
		3 Self-tapping Screws	119296
		1 Earth Ground Wire	140668
		1 Battery Wire Harness	130420
		1 battery Jumper	140694
A Transformer	120 Vrms @ 60Hz used with SK-2224		115061
	or a		
	230 Vrms at 50Hz used with SK-2224HV		115031
A Viewing Bezel			122508
4 End-of-line Resistors			7628

Note: See Section 3.6 for assembly instructions.

3.2   SK-2224 Board Layout

Figure 3-1 shows the SK-2224 circuit board including location of terminals, connectors, dip switches, and LEDs.
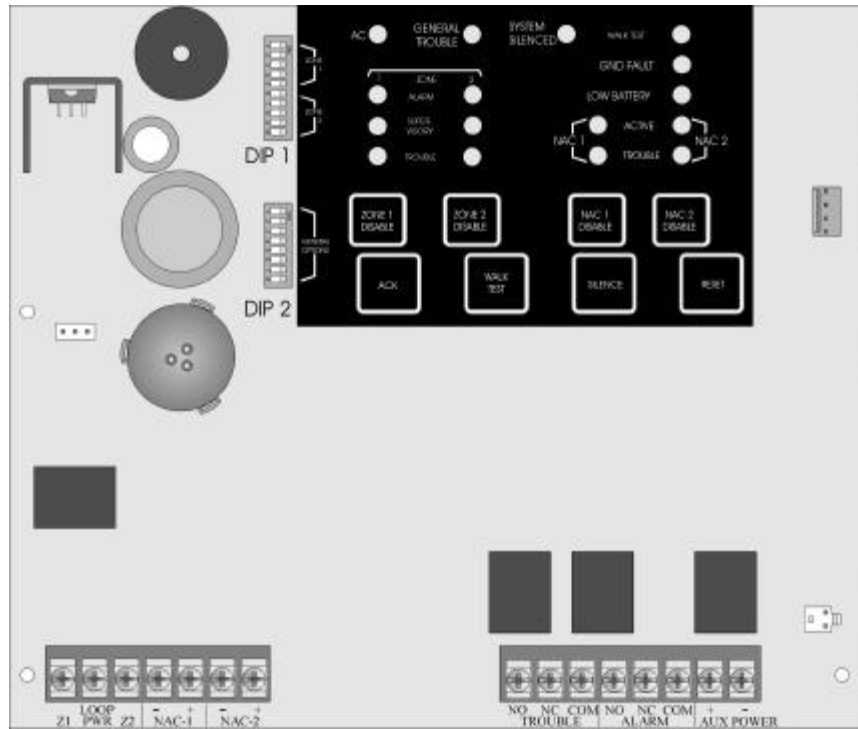
Figure 3-1 Model SK-2224 Layout

3.3   Electrical Specifications

Table 3-2: Electrical Specifications

Circuit	Rating
Primary AC	*120 Vrms at 60 Hz, or 230 Vrms at 50 Hz
Total External DC Load	2.5A @ 24 VDC
+24V Auxiliary Power	19.8 V to 28.0 V, 0.5 A max.
Trouble & Alarm Relays	2.5 A @ 30 VDC resistive
Notification Appliance Power	19.8 V to 28.0 V, 1.25 A max. each
Smoke Detector Power	19.8 V to 28.0 V, 1.0 A max.
Battery Charging Voltage	27.0 - 27.6 V
Maximum Battery Charging Current	750 mA
Minimum Low Battery Detect	20.4 V
Minimum Low AC Detect	100 Vrms at 60 Hz, full load

*Note: * For 120 Vrms transformer is provided with SK-2224 control panels and the 230 Vrms transformer is pro-vided with the SK-2224HV control panel.*

3.4   Environmental Specifications

Table 3-3: Environmental Specifications

Storage Temperature:	40 - 75 ° C
Operating Temperature:	0 - 49 ° C
Humidity:	10 - 85% non-condensing

It is important to protect the SK-2224 control panel from water. To prevent water damage, the following conditions should be AVOIDED when mounting the units:

• Do not mount directly on exterior walls, especially masonry walls (condensation)

• Do not mount directly on exterior walls below grade (condensation)

• Protect from plumbing leaks

• Protect from splash caused by sprinkler system inspection ports

• Do not mount in areas with humidity-generating equipment (such as dryers, production machinery)

3.5 Mounting the SK-2224

Read the environmental specifications in Section 3.4 before mounting the cabinet.

The panel should be accessible to main drop wiring runs. It should be mounted as close to the center of the building as possible and located within a secured area, but should be accessible for testing and service. End-users responsible for maintaining the panel should be able to hear alarms and troubles. When selecting a location, keep in mind that the panel itself is the main source of alarm and trouble annunciation.

Mount the cabinet so it is firmly secured to the wall surface. When mounting the cabinet on concrete, especially when moisture is expected, attach a piece of 3/4-inch plywood to the concrete surface and then attach the cabinet to the plywood. Also mount any other modules to the plywood.

Follow these steps to mount the control panel cabinet:

1. Place the cabinet on the mounting surface, level the cabinet and mark the top two mounting holes.

2. Screw the top two mount screws about 3/4 of the way into the mounting surface.

3. Hang the control panel cabinet on the top mounting screws through the top mounting screw keyholes.
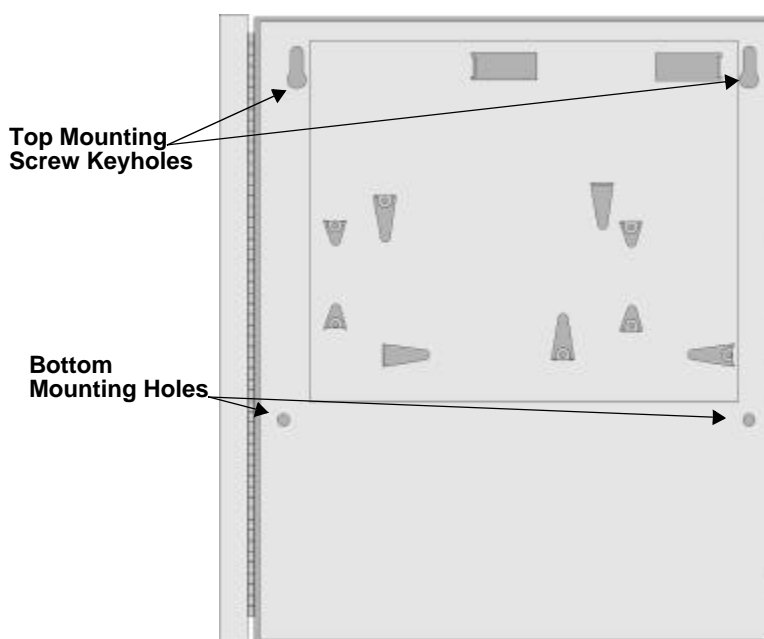
Figure 3-2 Cabinet Mounting Holes

4. Insert the bottom two mounting screws into the cabinet's bottom mounting holes.

5. Tighten all four mounting screws until the cabinet is properly secured.

6. Insert all cabinet components. See Section 3.6.

3.6   Assembly

The components listed in Table 3-1 are all packed with in the cabinet and require some assembly. Follow these steps to assemble the cabinets inside the cabinet:

1. Remove keys from small manila envelope taped to the top of the cabinet.

2. Unlock the cabinet door.

3. Remove the packing material and the SK-2224 components.

4. Snap the bezel into the opening in the front of the cabinet. See Figure 3-3.
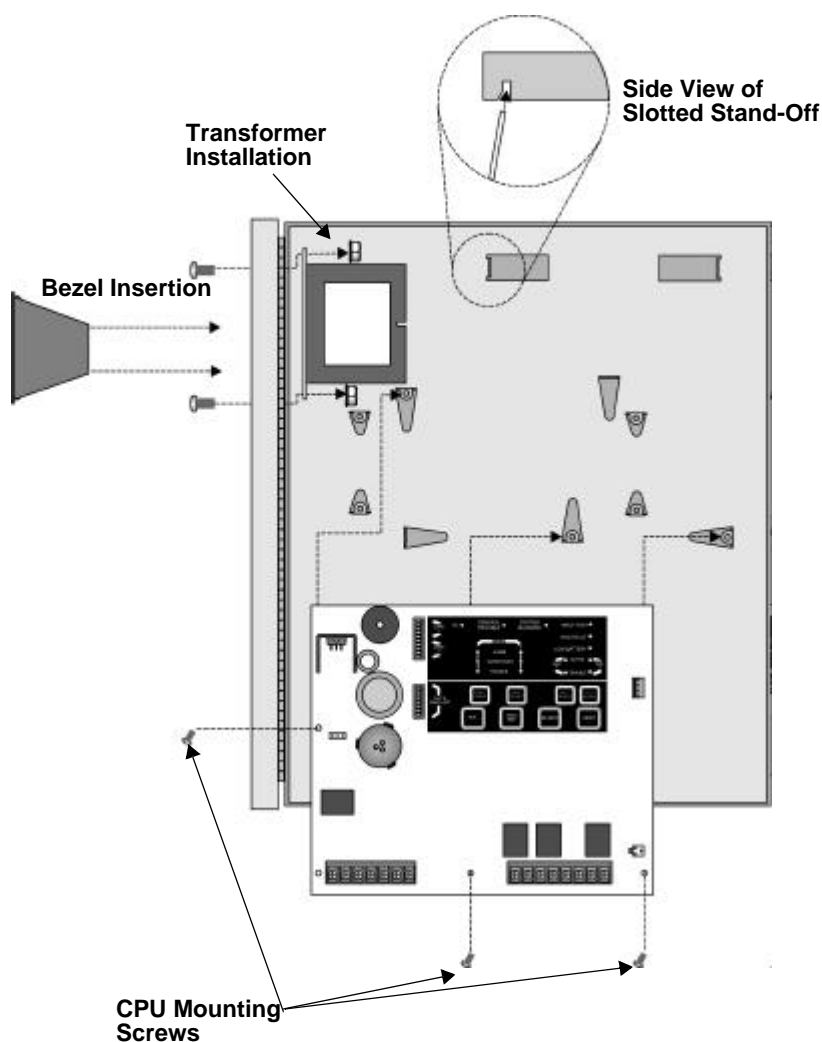
Figure 3-3 SK-2224 Assembly Diagram

Note: The bezel will fit in only one way.

5. With the two #8 Screws and the two #8 nuts (with built in washers), mount the transformer in the holes in the upper left hand corner of the cabinet. See Figure 3-3.

6. With the three Self-trapping screws mount the control board on the cabinet stand-offs.

Note: See Section 4 for transformer connections and battery connections.

3.7 Wiring Specifications

Induced noise (transfer of electrical energy from one wire to another) can cause false alarms or interfere with control panel operation in other ways.

To avoid induced noise, follow these guidelines:

*   Isolate input wiring from high current output and power wiring. Do not pull one multiconductor cable for the entire panel. Instead, separate the wiring as follows:

    High current input/output: AC power, speaker, and notification device wiring

    Low current input/output: Annunciator and zone loop wiring

    Audio input/output: Telephone wiring

*   Do not pull wires from different groups through the same conduit. If you must run them together, do so for as short a distance as possible or use shielded cable. Connect the shield to circuit ground at the panel. You must route high and low voltages separately.

*   Route the wiring within the cabinet around the perimeter of the cabinet. It should not cross the printed circuit board where it could induce noise into the sensitive microelectronics or pick up unwanted RF noise from the high speed circuits. See Figure 2 for an example.

*   High frequency noise, such as that produced by the inductive reactance of a speaker or bell, can also be reduced by running the wire through ferrite shield beads or by wrapping it around a ferrite toroid.
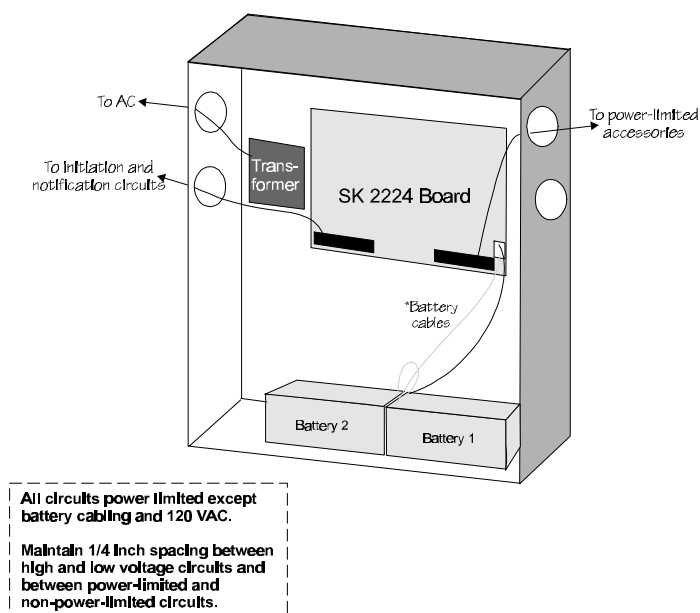
Figure 3-4 Wire Routing Example

3.8   Calculating Current Draw and Standby Battery

This section is for helping you determine the current draw and standby battery needs for your installation.

3.8.1   Maximum Battery Standby Load

Table 3-4 shows the maximum battery standby load for the SK-2224 based on 24 hours of standby. The standby load calculations of line D in the Current Draw Calculation Worksheet (Table 3-5) must be less than the number shown in Table 3-4 for the battery size used and standby hours required.

Table 3-4: Maximum Battery Standby Load

Rechargeable Battery Size	Max. Load for 24 hrs. Standby, 5 mins. Alarm
7 AH	270 mA

3.8.2   Current Draw Worksheet

Use this worksheet to determine current requirements during alarm/battery standby operation. (Copy this page if additional space is required.)

Table 3-5: Current Draw Calculations

	Device	Number of Devices	Current per Device		Standby Current	Alarm Current
	For each device, use this formula:	This Column X	This column	=	Current per number of devices	
	SK-2224 Panel	1	Standby:	100 mA	100 mA	
			Alarm:	250 mA		250 mA
A			**Current Subtotals:**		100 mA	250 mA
	Smoke Detectors	Refer to device manual for current ratings. See Appendix to this manual for max. # per loop.				
			Standby:	mA	mA	
			Alarm:	mA		mA
			Standby:	mA	mA	
			Alarm:	mA		mA
			Standby:	mA	mA	
			Alarm:	mA		mA
B			**Current Subtotals:**		mA	mA
	Notification Devices	refer to device manual for number of devices and current ratings.				
			Alarm:	mA		mA
			Alarm:	mA		mA
			Alarm:	mA		mA
			Alarm:	mA		mA
C			**Current Subtotals:**		mA	mA
	*Additional Devices					
			Standby:	mA	mA	
			Alarm:	mA		mA
			Standby:	mA	mA	
			Alarm:	mA		mA
D			**Current Subtotals:**		mA	mA
	total current rating of all devices in system (add A through D):				mA	mA
E	Total current ratings converted to amperes (x .001):				A	A

*Note: If you are using door holders, you do not need to consider door holder current for alarm/battery standby, because power is removed during that time. However, during normal operation, door holders draw current and must be included in the total current that can be drawn from the panel.

3.8.3   Worksheet Requirements

The following steps must be taken when determining SK-2224 current draw and standby battery requirements.

Filling in the Current Draw Worksheet, Table 3-5 (Section 3.8.2)

1. For the SK-2224, the worst case current draw is listed for the panel and is recorded in the table at Line A.

2. Add up the current draw for all smoke detectors and record in the table at Line B.

3. Add up all notification appliance loads and record in the table at Line C.

4. Any additional devices should be recorded at Line D.

5. Make sure that the alarm current without the panel (Lines B-D) does not exceed 2.5 A. The total alarm current (including the panel, Lines A-D) should not exceed 2.75 A.

6. Complete the remaining instructions in Table 2 for determining battery size requirements.

Section 4
Hardware Installation

4.1   AC Power

At installation, connect the transformer AC inputs to the AC power source as shown in Figure 4-1. It may be necessary for a professional electrician to make this connection.

The AC inputs are rated as 120 VAC, 60 Hz (for transformer P/N 115061) or 230 VAC,50 Hz (for transformer P/N 115031). See Table 3-1 for more information.
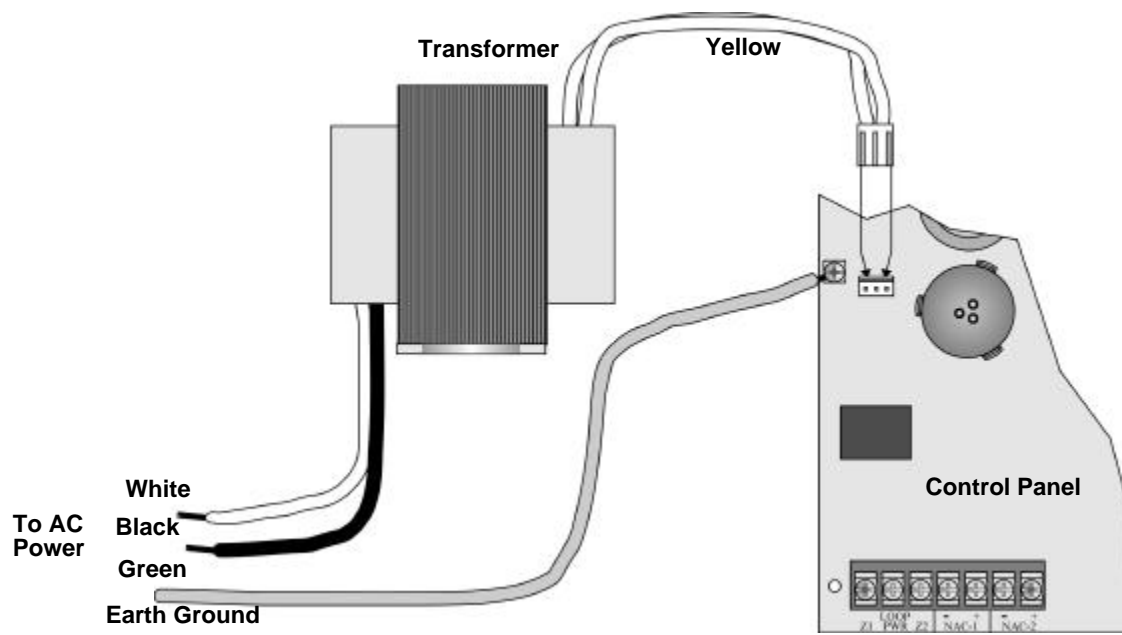
Figure 4-1 AC Power Connection

4.2   Battery Connection

The SK-2224 battery charge capacity is 7.0 AH. Use 12V batteries of the same AH rating. Determine the correct AH rating as per your current load calculation (see Table 3-5).

Wire batteries in series to produce a 24-volt equivalent. Do not parallel batteries to increase the AH rating.

Note: The SK-2224 cabinet supports two 7.0 AH batteries.
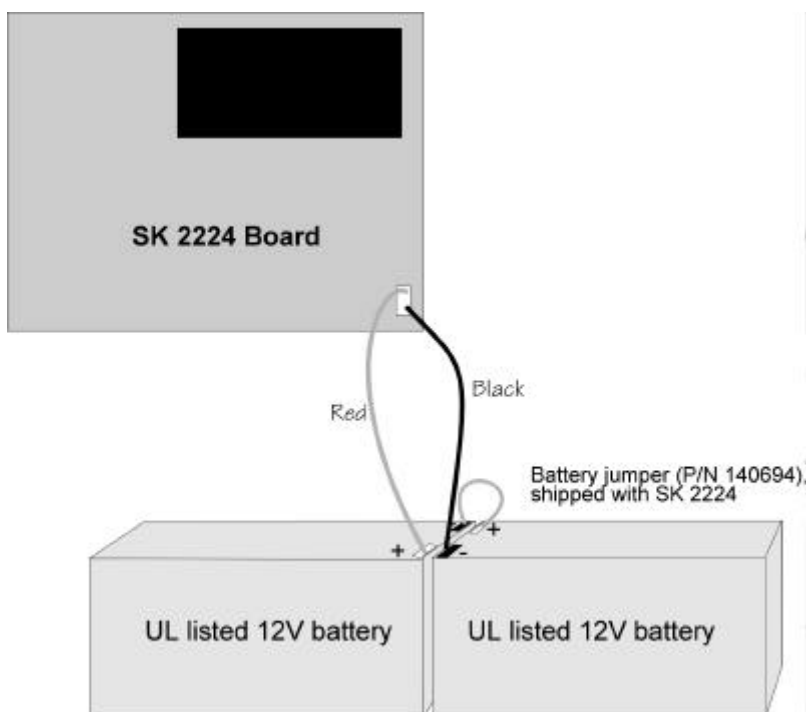
Figure 4-2 Battery Connection

4.3 Initiation Circuit Installation

4.3.1 Contact Wiring

Wire normally open contacts as shown in Figure 4-3. This is the type of wiring that would typically be used for water flow switches, heat detectors and other normally open devices.
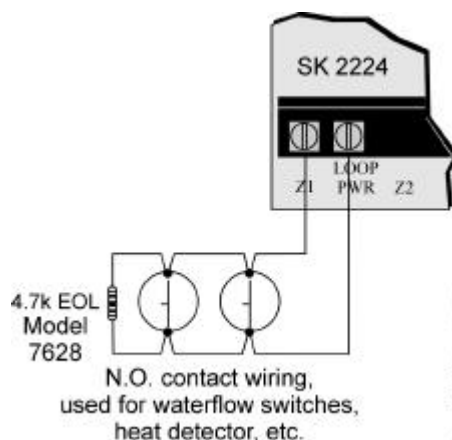
Figure 4-3 N.O. Contact Wiring

4.3.2 Two-Wire Smoke Detector Wiring

Figure 4-4 shows how to connect two-wire smoke detectors to the SK-2224 loops. The figure uses Silent Knight's SLK-24F with HSB-224 base as an example. You can use any detector that has been UL listed for compatibility with the SK-2224. Refer to the Appendix for a list of compatible devices. Refer to Section 5 for configuration options.
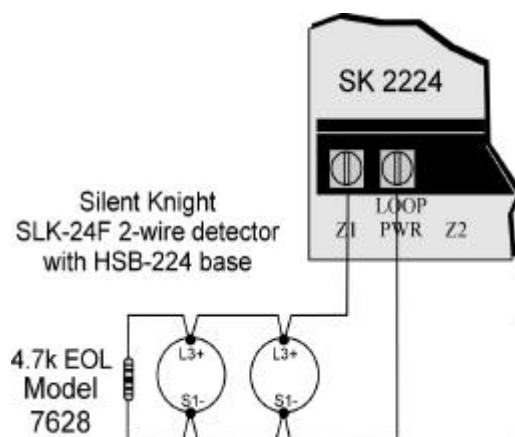
Figure 4-4 Two-Wire Smoke Detector Wiring

4.3.3 Four-Wire Smoke Detector

Figure 4-5 shows how to connect four-wire smoke detectors to the SK-2224 loops. The figure uses Silent Knight's SLK-24F with HSC-4R base as an example. You can use any UL listed device. Refer to the Appendix for a list of compatible devices. Information on selecting zone configuration options is in Section 5.
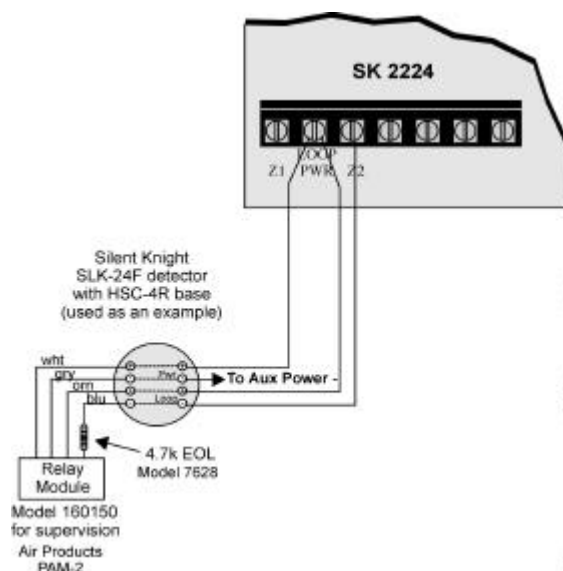
Figure 4-5 Four-Wire Smoke Detector Wiring

4.3.4 Notification Circuit Installation

Notification appliances used with the SK-2224 must be UL listed for compatibility with the SK-2224. Refer to the list in the Appendix at the end of this manual for a list of compatible devices.

For proper operation, you must use polarized notification devices with a model 7628 4.7k ohm end-of-line (EOL) resistor on each loop. Select ANSI output pattern, if desired. Output is configured as steady (continuous sound) at the factory. See Section 5 for information on changing the pattern.
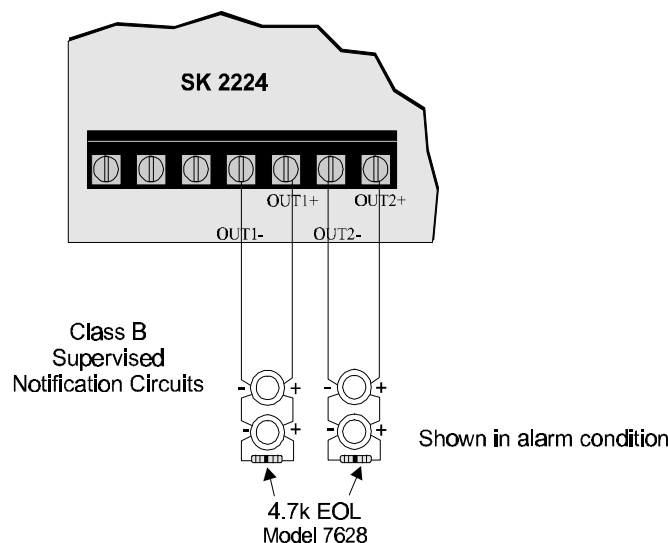
Figure 4-6 Notification Circuit Installation

4.4 Alarm and Trouble Relays

The SK-2224 has built-in relays for alarm and trouble. The alarm relay is energized during any alarm condition. The trouble relay is energized during any trouble or supervisory trouble condition. Each relay has three terminals (N.O., Common, and N.C.). Refer to Figure 3-1 for location of these terminals.

4.5 Auxiliary Power Circuit

The SK-2224 has a power limited auxiliary power circuit which can source up to .5A. The terminal is labeled "AUX PWR". Refer to Figure 3-1 for location of this terminal.

4.6   Door Release Wiring

Figure 4-7 shows how to configure a door release using an ESL DHX 1224 door holder.
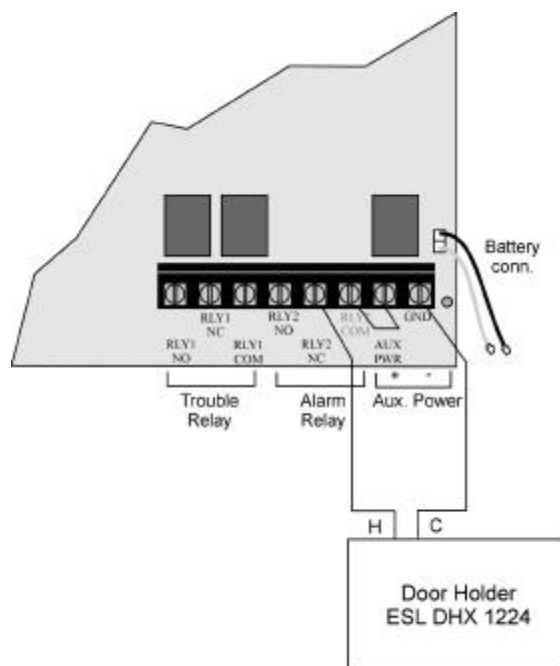
Figure 4-7 Door Release Wiring

Section 5
System Configuration

SK-2224 system configuration is simple. Just set the dipswitch that controls the option you want to select. The following chart shows how to program the dipswitches that control system, zone, and notification appliance operation. Refer to Figure 3-1 for location of the dipswitches.

Important!

When you change a dipswitch, be sure to perform a system reset (press [RESET]) or power down the panel. Dipswitch changes will have no effect until after the system has been reset. Some switches are unused and are not referred to in this chart. Leave all unused switches in their factory-programmed OFF position.

Table 5-1: System Configuration

To Enable		For Zone 1 (DIP 1)	For Zone 2 (DIP 1)	DIP Position
Enhanced mode (dipswitch ON). Use when both pull stations and detectors will be used in the same zone. Normal mode (dipswitch OFF). Use when 4-wire smoke detectors and smoke verification are used in the same zone.		SW1	SW6	ON = Enhanced OFF = Normal
Alarm verification **Note:** Can not be used with smoke detectors that have verification built-in.		SW 2	SW 7	ON = Verification zone OFF = No verification
Zone Type	Fire alarm	SW 3	SW8	OFF
	Supervisory	SW 3	SW8	ON
Alarm delay options **Note:** Alarm delay options is to be used with water flow devices only. If the device has a built-in delay time the total delay time (device delay + programmed delay) can not exceed 120 seconds.	No delay	SW4	SW9	OFF
		SW5	SW10	OFF
	30 second delay	SW4	SW9	ON
		SW5	SW10	OFF
	60 second delay	SW4	SW9	OFF
		SW5	SW10	ON
	90 second delay	SW4	SW9	ON
		SW5	SW10	ON
To Enable		**For NAC 1 (DIP 2)**	**For NAC 2 (DIP 2)**	**DIP Position**
Silencing		SW 1	SW 3	ON = Can be silenced OFF = No silence
ANSI pattern		SW 2	SW 4	ON = ANSI Off = Steady

Table 5-1: System Configuration

To Enable	For Entire Panel (DIP 2)	DIP Position
*Serial Accessory Devices	SW5	ON = Serial Annunciator connected to the control panel. OFF = No Serial Annunciator connected to the control panel.
	SW6	ON = Serial Dialer connected to the control panel OFF = No Serial Dialer connected to the control panel.
AC loss report delay	SW7	ON = 6 hour delay on AC loss report. OFF = No delay on AC (for dialer testing only). **Note:** If there is not a serial dialer connected to the control panel this should be set to the OFF position.
	SW8	Not Used.

*   *Not available at this time.*

Section 6
System Operation

The annunciator on the SK-2224 board is used for all system operation. It contains the switches for enabling silencing, resetting, and so on. The LEDs that indicate system status are also located on the annunciator.
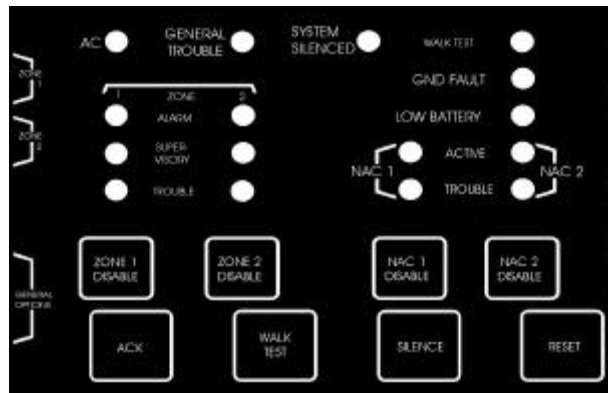
Figure 6-1 On-Board Annunciator

6.1   Meaning of LEDs

The chart below explains the meaning of LEDs on the system board.

Table 6-1: Meaning of LEDs

LED (Color)	Function	Comments
AC (green)	ON = Good AC OFF = Low AC trouble condition and it was acknowledged FLASHING = Unacknowledged AC Low trouble condition	If flashing press the ACK button to acknowledged the condition.
GENERAL TROUBLE (yellow)	ON = System trouble OFF = System OK FLASHING = At least one serial device is in trouble DOUBLE FLASHING = Two types of serial devices are in trouble.	
WALK TEST (yellow)	ON = Walk test is in progress OFF = Walk test is off. FLASHING = Walk test is on and at least one zone is not ready	Allow approximately 47 seconds between detector tests. In walk test when a detector is tripped it will cause an alarm for two seconds, then the control panel will drop power to the loop for seven seconds to reset the detector. Then an additional 38 seconds is needed to restore the detector. If verification is used the time between detector test will be about 1 minute and 30 seconds.

Table 6-1: Meaning of LEDs

LED (Color)		Function	Comments
GND FAULT (yellow)		ON = Ground fault condition exists and was acknowledged OFF = No fault FLASHING = A ground fault condition detected	If flashing press the ACK button to acknowledged the condition.
LOW BATTERY (yellow)		ON = Battery low condition that has been acknowledged OFF = Good battery condition FLASHING = Battery low condition	If flashing press the ACK button to acknowledged the condition.
ZONE 1 and ZONE 2	ALARM (red)	ON = Zone in alarm which has been acknowledged OFF = No Alarm FLASHING = Zone in alarm has not yet been acknowledged.	If flashing press the ACK button to acknowledged the condition.
	SUPERVISORY (yellow)	ON = Zone has a supervisory condition (self-restoring condition) OFF = No supervisory condition exists. FLASHING = supervisory trouble detected on that zone.	
	TROUBLE (yellow)	ON = Zone has a trouble condition which has been acknowledged OFF = No zone trouble FLASHING = Zone has a trouble condition DOUBLE FLASHING = Zone was disabled	If flashing press the ACK button to acknowledged the condition.
NAC 1 and NAC 2	ACTIVE (yellow)	ON = NAC is active during an alarm OFF = NAC is not active during alarm	
	TROUBLE (yellow)	ON = NAC has a trouble condition and was acknowledged OFF = No trouble condition FLASHING = NAC is in trouble DOUBLE FLASHING = Circuit was disabled	If flashing press the ACK button to acknowledged the condition.
SYSTEM SILENCED (yellow)		ON = System audio output has been silenced OFF = Nothing silenced FLASHING = Partially silenced	When condition that caused audio activation clears, this condition will clear automatically. *Note:* Silencing an alarm will cause a general trouble condition.

6.2 Operation Keys (Switches)

All system operation are performed from the on-board keys (switches) as described in the chart below.

Table 6-2: Operations and Instructions

Operation	Keystrokes
Disable notification appliance circuit. To re-enable the circuit, press [NAC DISABLE] again.	Press the appropriate [NAC DISABLE] key. The NAC circuit will be disabled and the corresponding TROUBLE LED will Double Flash. This function is not available during an alarm condition.
Disable a zone To re-enable the circuit, press [ZONE DISABLE] again.	Press the appropriate [ZONE DISABLE] key. The zone will be disabled and the corresponding TROUBLE LED will Double Flash. This function is not available during an alarm or supervisory condition.
Begin Walk Test	Press [WALK TEST]. Walk Test LED turns on. *Note:* Walk test will not activate if the control panel has a trouble, alarm, or supervisory condition.
End Walk Test (The test ends automatically after 10 minutes of no system activity.)	Press [WALK TEST]. NOTE: The Walk Test feature is not operational during an alarm, supervisory or any system trouble condition.
Acknowledge condition (alarm, supervisory, trouble)	Press [ACK]. The corresponding LED will change from blinking to steady for the duration of the condition.
Silence Panel	Press [SILENCE]. This will silence the on-board PZT and all active NAC circuits that have been configured as "silenceable".
Perform system reset	Press [RESET]. Resets alarms, supervisories, troubles and all LEDs.

Appendix A
Compatible Devices

This section of the manual lists devices (smoke detectors and notification appliances) that are compatible with the SK-2224. Contact Silent Knight if you have a question about whether a device not listed here is compatible.

A.1   Smoke Detectors

This section of the manual contains information about smoke detectors that are compatible with the SK-2224.

	SK-2224
Identifier	24F
Voltage Range	17.3-28 VDC

Note: The maximum number of smoke detectors per zone is determined by both the current draw and the imped-ance of the smoke detector. If too many smoke detectors are used on any zone, false alarms could occur.

Do not mix different models of detectors on any zone; false alarms could occur.

A.1.1   Enhanced Mode

Enhanced mode allows the installer to use pull stations on a loop that has been programmed for Enhanced Alarm Verification. If a single detector goes into alarm it will start the alarm verification cycle. If a pull station is activated any time during the alarm verification cycle and after the control panel re-applies loop power (power will drop for seven seconds to restore detector during verification), the panel will go into immediate alarm and discontinue the verification cycle.

Warning! *Do not mix different models or manufacturers of smoke detectors on the input loops.*

A.1.2   Two-Wire Smoke Detectors

The table below lists two-wire smoke detectors that are compatible with the SK-2224. The table is organized by manufacturer. The columns show the number of detectors per loop that can be used.

Note: The check mark by manufacturers name indicates that this device can be used in enhanced mode.

Table A-1: Compatible Two-Wire Smoke Detectors

Enhance Mode Compatible	Manufacturer	Model Name or Number *(Base model name or number in parentheses.)*	Compatibility ID		# per Loop
			Head	Base	
	Apollo	55000-350 (45681-200)	55000-350	45681-200	24 / loop
		55000-250 (45681-200)	55000-250	45681-200	24 / loop
	Detection Systems	DS200 (MB200-2W)	A	B	24 / loop
		DS200HD (MB200-2W)	A	B	24 / loop
		DS250 (MB2W or MB2WL)	B	A	18 / loop
		DS250HD (MB2W or MB2WL)	B	A	18 / loop
		DS250TH (MB2W or MB2WL)	B	A	18 / loop
	ESL	425	S10	N/A	40 / loop
		425C	S10	N/A	40 / loop
		425CR	S10	N/A	40 / loop
		425CRT	S10	N/A	40 / loop
		425CT	S10	N/A	40 / loop
✔		429C (S10A)	N/A	S10A	30 / loop
✔		429CRT (S11A)	N/A	S11A	30 / loop
✔		429CST (S11A)	N/A	S11A	30 / loop
✔		429CT (S10A)	N/A	S10A	30 / loop
✔		609U01-11	S10	S00	40 / loop
✔		609U02-11	S10	S00/S03	40 / loop
✔		611U (601U or 602U)	S10	S00/S03	40 / loop
✔		611UD (601U or 602U)	S10	S00/S03	40 / loop
✔		611UT (601U or 602U)	S10	S00/S03	40 / loop
✔		612U (601U or 602U)	S10	S00/S03	40 / loop
✔		612UD (601U or 602U)	S10	S00/S03	40 / loop
✔		711U (701E or 701U)	N/A	S10A	25 / loop
✔		712U (701E or 701U)	N/A	S10A	25 / loop
✔		713-5U (702E or 701U)	N/A	S10A	25 / loop
✔		713-6U (702E or 701U)	N/A	S10A	25 / loop
✔		721-U (S10A)	N/A	S10A	30 / loop
✔		721-UT (S10A)	N/A	S10A	30 / loop

Compatible Devices

Table A-1: Compatible Two-Wire Smoke Detectors

Enhance Mode Compatible	Manufacturer	Model Name or Number *(Base model name or number in parentheses.)*	Compatibility ID		# per Loop
			Head	**Base**	
✔	Falcon	525	FDT1	N/A	17 / loop
✔		525T	FDT1	N/A	17 / loop
✔	Hochiki	SIH-24F (HS-224D or HSB-224)	HD-3	HB-5	25 / loop
✔		SLK-24F (HS-224D)	HD-3	HB-5	25 / loop
✔		SLK-24FH (HS-224D)	HD-3	HB-5	25 / loop
✔	System Sensor	1100	A	N/A	20 / loop
✔		1100T	A	N/A	20 / loop
✔		1100TB	A	N/A	20 / loop
		1151 (110LP)	A	A	20 / loop
		1400	A	N/A	20 / loop
✔		1451 (B401B)	A	A	20 / loop
		1800	A	N/A	20 / loop
		1851B (B101B)	A	N/A	20 / loop
		1851DH (DH1851DC)	A	N/A	20 / loop
✔		2100	A	N/A	20 / loop
✔		2100T	A	N/A	20 / loop
✔		2100TB	A	N/A	20 / loop
		2151 (B110LP or B110LRP)	A	A	20 / loop
✔		2300T	A	N/A	20 / loop
✔		2300	A	N/A	20 / loop
✔		2300TB	A	N/A	20 / loop
✔		2400	A	N/A	20 / loop
✔		2400 (DH400)	A	N/A	20 / loop
✔		2400AIT	A	N/A	20 / loop
✔		2400AT	A	N/A	20 / loop
✔		2400TH	A	N/A	20 / loop
✔		2451 (B401B)	A	N/A	20 / loop
✔		2451DH (DH 400)	A	N/A	20 / loop
✔		2451TH (B401B)	A	N/A	20 / loop
		2800	A	N/A	20 / loop
		2800TH	A	N/A	20 / loop
		2851B (B101B)	A	A	20 / loop
		2851BTH (B101B)	A	A	20 / loop
		2851DH	A	A	20 / loop
		2851TH (B101B)	A	A	20 / loop

Four-Wire Smoke Detectors

Table A-2: Compatible Four-Wire Smoke Detectors

Manufacturer	Model
Silent Knight	SD-P24F with SD-B4@ base
Detection Systems	DS200/DS200HD MB200
ESL	445 Series 449 Series
Gentex	624 824 2040-24 Power Supervision Unit
System Sensor	1851B 2851/2851BTH DH200ADCD

A.2   Notification Appliances

The chart below lists notification appliances compatible with the SK-2224.

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Faraday	446X 12/24VDC	Vibrating Bell
Faraday	476X 12/24VDC	Vibrating Bell
Faraday	477X 12/24VDC	Single Stroke Bell
Faraday	5303B-0-14-( )-DC	Chime (flush)
Faraday	5304B-0-14-( )-DC	Chime (surface)
Faraday	5305B-0-4-( )-DC	Chime (ceiling)
Faraday	5306B-0-14-( )-24-DC	Chime/Strobe (flush)
Faraday	5307B-0-14-( )-24-DC	Chime/Strobe (surface)
Faraday	5308B-0-4-( )-24-DC	Chime/Strobe (ceiling)
Faraday	5333B-0-14-24-DC	Multi-Tone Horn (flush)
Faraday	5334B-0-14-24-DC	Multi-Tone Horn (surface)
Faraday	5336B-( )-14-24-DC	Multi-Tone Horn/Strobe (flush)
Faraday	5337B-( )-14-24-DC	Multi-Tone Horn/Strobe (surface)
Faraday	5338B-( )-4-24-DC	Multi-Tone Horn/Strobe (ceiling)
Faraday	5343B-0-14-24-DC	Single Tone Horn/Strobe (flush)
Faraday	5344B-0-14-24-DC	Single Tone Horn/Strobe (surface)

Compatible Devices

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Faraday	5345B-0-4-24-DC	Single Tone Horn/Strobe (ceiling)
Faraday	5348B-( )-4-24-DC	Single Tone Horn/Strobe (ceiling)
Faraday	5373B-0-14-24-DC	8-Tone Horn/Strobe (flush)
Faraday	5374B-0-14-24-DC	8-Tone Horn/Strobe (surface)
Faraday	5375B-0-4-24-DC	8-Tone Horn/Strobe (ceiling)
Faraday	5376B-0-14-24-DC	8-Tone Horn/Strobe (flush)
Faraday	5377B-0-14-24-DC	8-Tone Horn/Strobe (surface)
Faraday	5378B-0-4-24-DC	8-Tone Horn/Strobe (ceiling)
Faraday	5405B-0-14-24-DC	Sync Control Unit
Faraday	5508B-( )-14-24-DC	Single Gang Sync Strobe (flush)
Faraday	5521B-( )-14-24-DC	4" Square Sync Strobe (surface)
Faraday	5522B-( )-14-24-DC	4" Square Sync Strobe (flush)
Faraday	6126B-U-14-24 VDC	Horn/Strobe
Faraday	6223B-0-14-24-DC	Horn (flush)
Faraday	6224B-0-14-24-DC	Horn (surface)
Faraday	6225B-0-4-24-DC	Horn (ceiling)
Faraday	6226B-( )-14-24-DC	Horn/Strobe (flush)
Faraday	6227B-( )-14-24-DC	Horn/Strobe (surface)
Faraday	6228B-( )-4-24-DC	Horn/Strobe (ceiling)
Faraday	6243B-0-14-24-DC	Electron-Mechanical Horn (flush)
Faraday	6244B-0-14-24-DC	Electron-Mechanical Horn (surface)
Faraday	6245B-0-4-24-DC	Electron-Mechanical Horn (ceiling)
Faraday	6246B-( )-14-24-DC	Electron-Mechanical Horn/Strobe (flush)
Faraday	6247B-( )-14-24-DC	Electron-Mechanical Horn/Strobe (surface)
Faraday	6248B-( )-4-24-DC	Electron-Mechanical Horn/Strobe (ceiling)
Faraday	6300B-0-14-24-DC	Mini-Horn (flush)
Faraday	6301B-0-14-24-DC	Mini-Horn (surface)
Faraday	6302B-( )-4-24-DC	Mini-Horn (ceiling)
Faraday	6310B-0-14-24-DC	Mini-Horn/Strobe/Strobe (flush)
Faraday	6311B-0-14-24-DC	Mini-Horn/Strobe/Strobe (surface)
Faraday	6312B-( )-14-24-DC	Mini-Horn/Strobe/Strobe (ceiling)
Faraday	6320B-0-14-24-DC	Sync Mini Horn/Strobe (1 gang)

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Faraday	6321B-0-14-24-DC	Sync Mini Horn/Strobe (1,2 gang)
Faraday	6322B-( )-14-24-DC	Mini Horn/Sync Strobe (1,2 gang, 4SQ)
Federal Signal	450	Horn
Federal Signal	VALS	Horn/Strobe
Gentex	GX90-4	Horn
Gentex	GXS-4-15-1	Strobe
Gentex	GXS-4-1575	Strobe
Gentex	GX90S-4-15	Horn
Gentex	GX90S-4-1575	Horn
Gentex	HG124	Horn
Gentex	SHG24-1575	Horn/Strobe
Gentex	SHG24-15	Horn/Strobe
Gentex	GMH-24-X	Horn
Gentex	GMS-24-X	Horn/Strobe
Gentex	GMS-24-X	Horn/Strobe
Gentex	G0T24	Horn
Gentex	G0S24-X	Horn
Gentex	WGMS-24-X	Horn/Strobe
System Sensor	MASS241	Horn/Strobe
System Sensor	MASS24110ADA	Horn/Strobe
System Sensor	MASS2415ADA	Horn/Strobe
System Sensor	MASS2475ADA	Horn/Strobe
System Sensor	SS4110ADA	Strobe
System Sensor	SS2415ADA	Strobe
System Sensor	SS2475ADA	Strobe
System Sensor	PS2415ADA	Mini-Horn/Strobe
System Sensor	PS241575ADA	Mini-Horn/Strobe
System Sensor	PS24110ADA	Mini-Horn/Strobe
System Sensor	PS2475ADA	Mini-Horn/Strobe
Wheelock	46T-G4-24-R	Bell
Wheelock	46T-G6-24-R	Bell
Wheelock	46T-G10-24-R	Bell

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Wheelock	46T-G6-24-WS-24-HF-R	Strobe/Bell
Wheelock	46T-G10-24-WS-24-HF-R	Strobe/Bell
Wheelock	46T-G6-24-WH-24-HF-R	Strobe/Bell
Wheelock	46T-G10-24-WH-24-HF-R	Strobe/Bell
Wheelock	7001T-12\24-W-FR	Strobe Horn
Wheelock	7002T-12\24-W-FR	Strobe Horn
Wheelock	AES-DL1-R	Multitone Horn
Wheelock	AES-EL1-R	Multitone Horn
Wheelock	AES-DL1-WS-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WS-24-VF-R	Multitone Horn
Wheelock	AES-DL1-WH-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WH-24-VF-R	Multitone Horn
Wheelock	AES-DL1-WM-24-VF-R	Multitone Horn
Wheelock	AES-EL1-WM-24-VF-R	Multitone Horn
Wheelock	AH-24-R	Horn
Wheelock	AMT-12\24-R	Strobe Horn
Wheelock	AMT-24-LS-VFR	Strobe Horn
Wheelock	AMT-24-LSM-VFR	Strobe Horn
Wheelock	AMT-24-IS-VFR	Strobe Horn
Wheelock	AS-2415-VFR	Strobe Horn
Wheelock	AS-241575-VFR	Strobe Horn
Wheelock	AS-2430-VFR	Strobe Horn
Wheelock	AS-2475-VFR	Strobe Horn
Wheelock	AS-24110-HFR	Strobe Horn
Wheelock	SM-12\24-R	Strobe Horn Controller
Wheelock	DSM-12\24-R	Strobe Horn Controller
Wheelock	CF-BF1	Chime
Wheelock	CF-BF1-R	Chime
Wheelock	CH-CF1	Chime
Wheelock	CH-CF1-R	Chime
Wheelock	CH-CF1-W	Chime
Wheelock	CH-DF1	Chime

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Wheelock	CH-DF1-R	Chime
Wheelock	CH-BF1-WS-24-HF-R	Strobe Chime
Wheelock	CH-CF1-LS-24	Strobe Chime
Wheelock	CH-CF1-MS-24	Strobe Chime
Wheelock	CH-CF1-IS-24	Strobe Chime
Wheelock	CH-CF1-LS-24-CFW	Strobe Chime
Wheelock	CH-CF1-MS-24-CFW	Strobe Chime
Wheelock	CH-CF1-IS-24-CFW	Strobe Chime
Wheelock	CH-CF1-WS-24-CF-W	Strobe Chime
Wheelock	CH-DF1-LS-24	Strobe Chime
Wheelock	CH-DF1-MS-24	Strobe Chime
Wheelock	CH-DF1-IS-24	Strobe Chime
Wheelock	CH-DF1-LS-24-VFR	Strobe Chime
Wheelock	CH-DF1-LSM-24-VFR	Strobe Chime
Wheelock	CH-DF1-MS-24-VFR	Strobe Chime
Wheelock	CH-DF1-IS-24-VFR	Strobe Chime
Wheelock	CH-DF1-WM-24-VFR	Strobe Chime
Wheelock	CH-DF1-WS-24-VF-R	Strobe Chime
Wheelock	DSM-12/24	Sync Module
Wheelock	EH-DL1-R	Electronic Horn
Wheelock	EH-EL1-R Electronic Horn	Electronic Horn
Wheelock	EHS-DL1-W-VF-R	Strobe Horn (single input)
Wheelock	EHS-EL1-W-VF-R	Strobe Horn (single input)
Wheelock	EH-DL1-WS-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WS-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-DL1-WH-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WH-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-DL1-WM-24-VF-R	Strobe Horn (dual input)
Wheelock	EH-EL1-WM-24-VF-R	Strobe Horn (dual input)
Wheelock	HSW-24-HFR	Remote Strobe
Wheelock	HS2W-24-HFR	Remote Strobe
Wheelock	HSPW-24-HFR	Remote Strobe

Compatible Devices

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Wheelock	IS-24-VFR	Remote Strobe
Wheelock	IS1-24-VFR	Remote Strobe
Wheelock	IS3-24-VFR	Remote Strobe
Wheelock	ISP-24-HFR	Remote Strobe
Wheelock	LS-24-VFR	Remote Strobe
Wheelock	LS1-24-VFR	Remote Strobe
Wheelock	LS3-24-VFR	Remote Strobe
Wheelock	LSP-24-HFR	Remote Strobe
Wheelock	LSM-24-VFR	Remote Strobe
Wheelock	LS1M-24-VFR	Remote Strobe
Wheelock	LS3M-24-VFR	Remote Strobe
Wheelock	LSPM-24-VFR	Remote Strobe
Wheelock	MS-24-VFR	Remote Strobe
Wheelock	MS1-24-VFR	Remote Strobe
Wheelock	MS3-24-VFR	Remote Strobe
Wheelock	MSP-24-HFR	Remote Strobe
Wheelock	MB-G6-24-R	Motor Bell
Wheelock	MB-G10-24-R	Motor Bell
Wheelock	MBS-G6-24-W-HF-R	Motor Bell with Strobe
Wheelock	MBS-G10-24-W-HF-R	Motor Bell with Strobe
Wheelock	MIZ-24-R	Mini-Horn
Wheelock	MIZ-24-W	Mini-Horn
Wheelock	MIZ-24-LS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-LSM-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-MS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-HSW-HFR	Mini-Horn/Strobe
Wheelock	MIZ-24-IS-VFR	Mini-Horn/Strobe
Wheelock	MIZ-24-WS-VF-R	Mini-Horn/Strobe
Wheelock	MIZ-24-WS-VF-W	Mini-Horn/Strobe
Wheelock	MIZ-24-WH-VF-W	Mini-Horn/Strobe
Wheelock	MIZ-24-WM-VF-W	Mini-Horn/Strobe
Wheelock	MT-12/24-R	Strobe Horn

Model SK-2224 Fire Control Panel Installation/Operation Manual

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Wheelock	MT-24-LS-VFR	Strobe Horn
Wheelock	MT-24-LSM-VFR	Strobe Horn
Wheelock	MT-24-MS-VFR	Strobe Horn
Wheelock	MT-24-IS-VFR	Strobe Horn
Wheelock	MT-24-SL-VFR	Strobe Horn
Wheelock	MT-24-SLM-VFR	Synch. Multitone Strobe
Wheelock	MT-24-WM	Strobe
Wheelock	MT-24-WM-VF-R	Horn
Wheelock	MT-24-WM-VFR	Horn
Wheelock	RS-2415-HFR	Strobe
Wheelock	RSP-2415-VFR	Strobe
Wheelock	RS-241575-VFR	Strobe
Wheelock	RSP-241575-VFR	Strobe
Wheelock	RS-2430-VFR	Strobe
Wheelock	RS-2430-HFR	Strobe
Wheelock	RS-2475-VFR	Strobe
Wheelock	RSP-2475-HFR	Strobe
Wheelock	RS-24110-HFR	Strobe
Wheelock	RSP-24110-HFR	Strobe
Wheelock	SL-24-VFR	Synchronized Remote Strobe
Wheelock	SL1-24-VFR	Synchronized Remote Strobe
Wheelock	SL3-24-VFR	Synchronized Remote Strobe
Wheelock	SLP-24-VFR	Synchronized Remote Strobe
Wheelock	SLM-24-VFR	Synchronized Remote Strobe
Wheelock	SL1M-24-VFR	Synchronized Remote Strobe
Wheelock	SL3M-24-VFR	Synchronized Remote Strobe
Wheelock	SLPM-24-VFR	Synchronized Remote Strobe
Wheelock	SHW-24-VFR	Synchronized Remote Strobe
Wheelock	SH2W-24-VFR	Synchronized Remote Strobe
Wheelock	SHPW-24-VFR	Synchronized Remote Strobe
Wheelock	SCM-24-R	Controller for Synchronized Strobes
Wheelock	SM-12/24-R	Sync Module

Compatible Devices

Table A-3: Compatible Notification Devices

Manufacturer	Model	Type
Wheelock	SR-2415-VFR	Sync Strobe
Wheelock	SRP-2415-HFR	Sync Strobe
Wheelock	SR-241575-VFR	Sync Strobe
Wheelock	SRP-241575-VFR	Sync Strobe
Wheelock	SR-2475-VFR	Sync Strobe
Wheelock	SR-2475-HFR	Sync Strobe
Wheelock	SR-24110-HFR	Sync Strobe
Wheelock	SRP-24110-HFR	Sync Strobe
Wheelock	V7001T-12\24-W-FR	Strobe Horn
Wheelock	WM3T-24-FR	Remote Strobe
Wheelock	WM3T-24-VFR	Remote Strobe
Wheelock	WS1T-24-FR	Strobe
Wheelock	WS3T-24-FR	Strobe
Wheelock	WST-24-FR	Strobe

IMPORTANT: Silent Knight products should be tested weekly to insure complete and proper operation and proper input and output connections.

LIMITED WARRANTY

Silent Knight warrants that the products of its manufacture shall be free from defects in materials or workmanship for one year from the date stamped on the printed circuit board if such goods have been properly installed, are subject to normal proper use, and have not been modified in any manner whatsoever. Upon return of the defective product to the nearest Silent Knight dealer, Silent Knight will, at its sole discretion, either repair or replace, at no cost to the customer, such goods as may be of defective material or workmanship. Customers outside the United States are to return products to their distributor for repair.

SILENT KNIGHT SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM LOSS OF PROPERTY OR OTHER DAMAGE OR LOSSES OWING TO THE FAILURE OF SILENT KNIGHT SECURITY SYSTEMS PRODUCTS BEYOND THE COST OF REPAIR OR REPLACEMENT OF ANY DEFECTIVE PRODUCTS.

SILENT KNIGHT MAKES NO WARRANTY OF FITNESS OR MERCHANTABILITY AND NO OTHER WARRANTY, ORAL OR WRITTEN, EXPRESS OR IMPLIED, BEYOND THE ONE YEAR WARRANTY EXPRESSLY SPECIFIED HEREIN.

WARRANTY EXCHANGE

1. Silent Knight offers an exchange program for defective products with a date stamp less than 60 days old. A new product will be shipped to replace the defective unit, with credit to your account when the defective product is returned.

2. Warranty exchange units will be shipped to the customer via normal U.P.S., free of charge to customers who have an account with Silent Knight. Alternative shipping methods are available at the customer's expense.

3. To expedite processing for customers who do not have an account with Silent Knight, warranty exchange products will be shipped C.O.D. Upon receipt of the defective product, Silent Knight will issue an immediate refund.

4. Products with a date stamp over 60 days old will be repaired and returned promptly.

5. To expedite your credit or product return, be sure the RA (return authorization) number is clearly marked on the box when you ship the defective unit. To obtain the RA number, call Silent Knight Technical Support Services at 1-800-328-0103. If no RA number is shown on the box, the product will be repaired and returned promptly.

6. To avoid restocking fees or the possibility of paying the full invoice price for the product, please return the defective unit within 15 days after receiving the replacement equipment.

7. To avoid additional charges, be sure the equipment being returned is free of modifications and not missing any parts.

8. To minimize freight charges, please return the PC boards without the metal cabinet whenever possible.