Terminus™

SHOCK DETECTION PRODUCTS

Install Manual
11/30/06

Security Systems
SP3268 Single Zone Processor

STLIT02073E

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SECURITY UL 528R LISTED

This Product is Listed by
UNDERWRITERS LABORATORY INC.

FCC Notice

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 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 and 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 separation between the equipment and the receiver.
- Connect the equipment into an outlet or circuit different from the one in which the receiver is connected.
- Consult the dealer or an experienced radio - TV technician.

Notice

This digital apparatus does not exceed the class B limits for Radio Noise Emissions from digital apparatus set out in the Radio Frequency Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectricques depassant les limites applicables aux appareils numeriques de la class B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communication du Canada.

Contents

Introduction

The Terminus SP3268 processor is designed to allow the security specialist to monitor Terminus shock sensors in a variety of installations and conditions. Plate glass, multi-pane windows, fences, masonry or wallboard all have different types of responses to shock disturbances that may indicate intrusions into a secured area. This processor allows the installer to tailor its responses to the shock characteristics of any of these materials. The SP3268 processor can be used to monitor up to fifty sensors on a single zone.

Specifications

Cabinet Dimensions: 13.5" High x 9.60" Wide x 3.25" Deep

Power Requirements: Primary: 16.5 VAC, 50 VA - - 60 Hz Transformer (supplied)
Secondary: 12 VDC, 5.0 AH minimum Gel-Cell Battery (supplied)

Current Drain: 113 mA (Armed)
140 mA (Alarm)

End-Of-Line Terminating Resistor: 4700 Ohms 1/4 Watt (supplied)

Environmental: Temperature: 0º to 120º F
Humidity: Less than 95%, non-condensing

Relay Contacts Rating: 2 Amp at 30 V AC/DC Fail-safe ** SPDT relay

Cabinet Tamper Switch: Normally Open (NO) & Normally Closed (NC) Uncommited. Usually wired NC into the supervised Sensor Loop.

* * Relay will open on loss of power or low battery.

Terminus intrusion detection devices that can be used with the SP3268 include:

SP3223
SP2539
SP2549
SP3227
SP3237 Suffixes: None, D, JB, JBT, DJBT

Part Number Suffixes Legend:

None: Undamped
D: Damped
JB: Junction Box
T: Tamper Switch (included)

Installation

Cabinet Installation

The SP3268 cabinet shown below, is a hinged metal enclosure designed for wall mounting in a secure indoor location. As viewed from the front, a hinge on the left side allows the door to swing through 180 degrees when opened. This provides easy access to the board and connections. The chamfered box allows the cabinet to be mounted close to other control boxes. The cabinet is equipped with a key lock and a tamper switch. The SP3268 is also equipped with a slide switch on the front panel.

When choosing a location for your processor, the following points should be kept in mind. The cabinet must be electrically connected to a good cold water ground (CWG). Do not mount the cabinet in an outdoor environment. Do not mount the cabinet near AC power mains, transformers, air conditions or other heavy electrical equipment. Carefully plan access to wiring runs before mounting the cabinet. These steps will help eliminate future problems and assure professional installation.

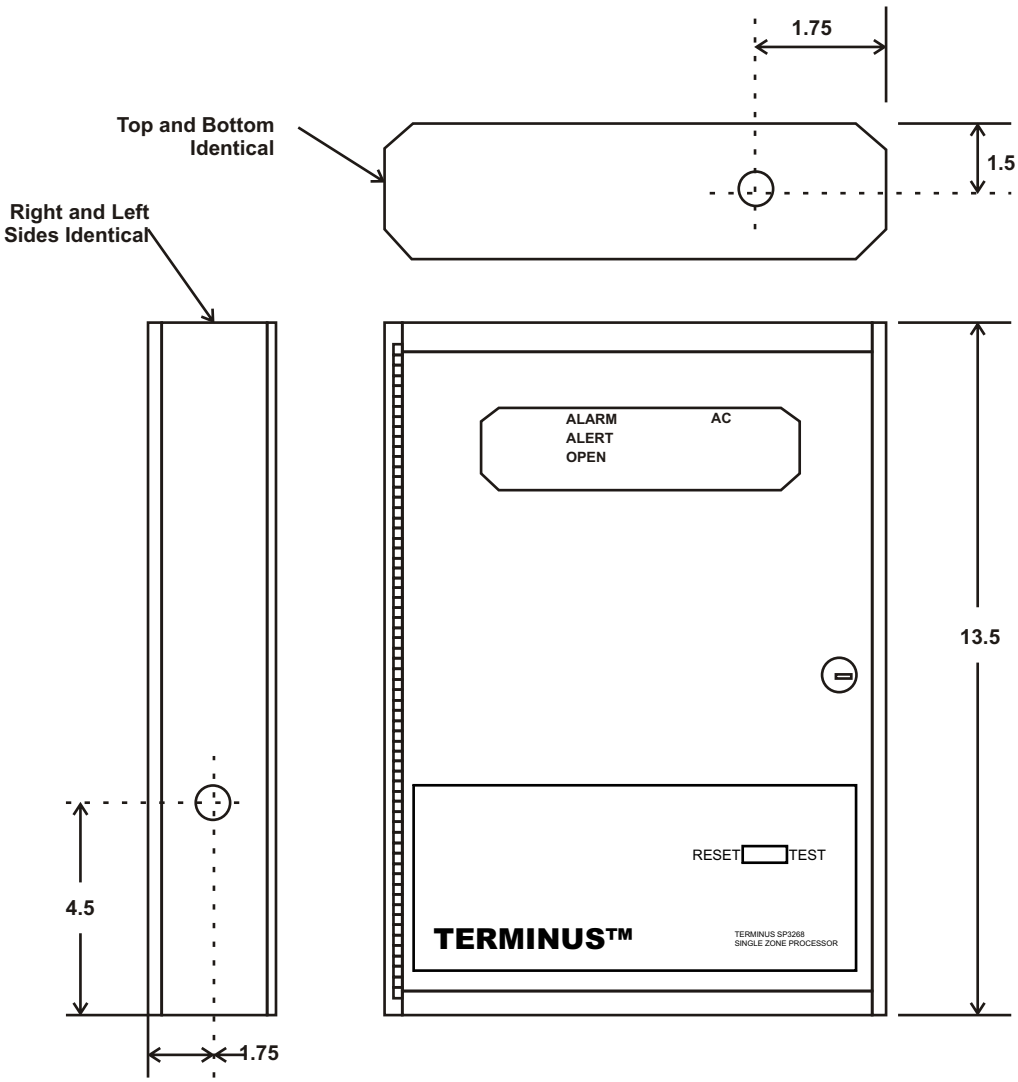

Figure 1

1. Unpack the unit. Included in the shipping container with the SP3268 are the following:

1 - 12V, 5.0 Amp-hour minimum Gel-Cell Battery
1 - Pre-mounted Normally Open Tamper Switch
1 - 16.5 VAC, 50VA Transformer
1 - 4700 Ohm, 1/4 Watt Resistor
1 - Battery Cable

2. Remove the circuit board. The SP3268 comes shipped with its circuit board installed on stand-offs. *You will need to remove the circuit board prior to mounting the cabinet on the wall.* Care should be taken when removing the nuts from the circuit board so as not to damage the electronics on this board. Retain the hex nuts that will be required to replace the board.

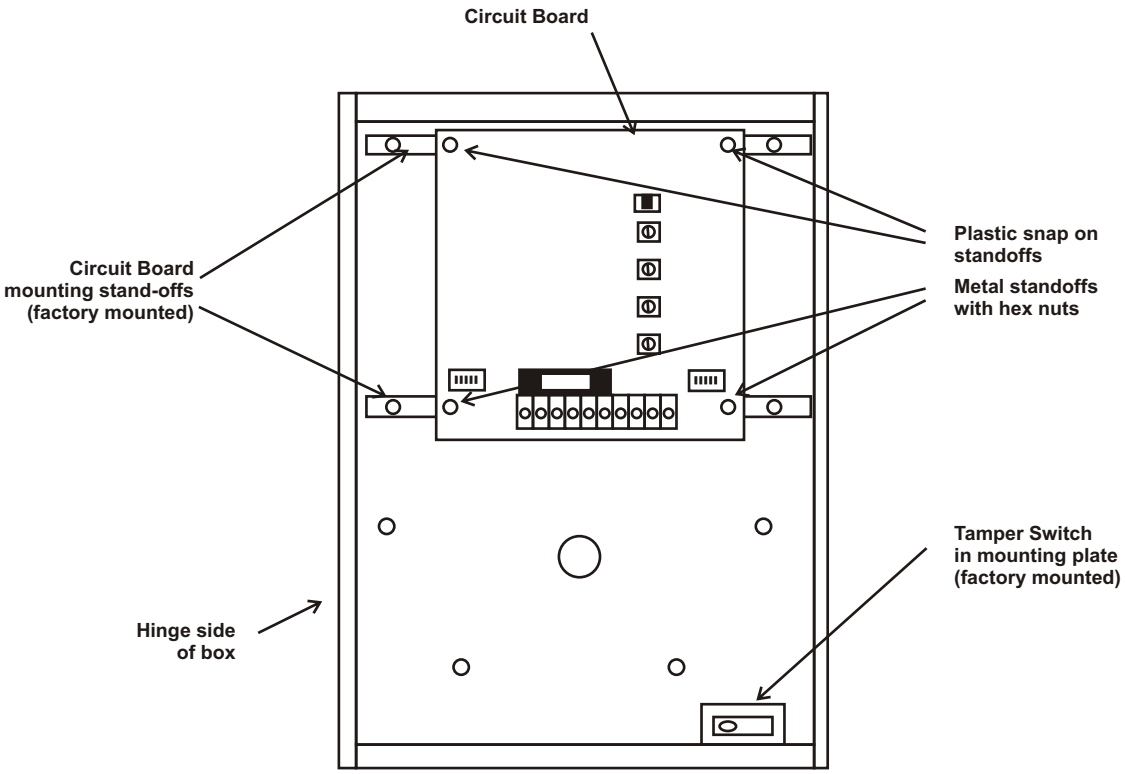

Figure 2

3. Remove the knockouts as needed using a screwdriver and hammer to provide wiring entrances into the cabinet. There is one knockout in each side and on the top, bottom, and rear of the enclosure. **Be sure to remove the circuit board prior to removing the knock outs.**

4. Mount the Cabinet using 4 #8 screws (not provided) and wall anchors of the appropriate length.

5. After the cabinet has been mounted, replace the circuit board on the stand offs and secure with the hex nuts.

Electrical Installation

1. Install AC power connections. AC power is provided by a 16.5 VAC, 50 VA class II transformer (Terminus P/N 2W00002100) connected to a 24 hour (un-switched) AC outlet. Wire the transformer to the two left most terminals on the terminal strip. Test AC power before proceeding.

2. Install the back-up power connections. Back-up power is supplied by a 12 volt, 5.0 Ah minimum Gel-Cell battery (Terminus Part # 2B0000400 (Power Sonic: PS1250)) connected to connector J1 on the circuit board. This connector is a 4 pin molded connector. Please pay attention to this connector when making this connection. The connector will only fit one direction and should seat with very little pressure. DO NOT FORCE. Depending on how the battery is used, it should have a life of 3 to 5 years. Test back-up power before proceeding.

3. Disconnect AC and backup battery power before proceeding.

4. Install the output relay connections. The processor is equipped with a fail-safe relay that is normally pulled in giving a closed circuit on the C-NC terminals and an open circuit on the C-NO terminals for all relays. On alarm, or if there is a loss of power or low battery, the relay drops out to a C-NO condition. (The relay is rated for 2 Amps @ 30V AC/DC.) For UL Listed installation the output relay must be connected to a 24-hour trouble loop.

5. Install the Terminus sensor loop connections. As many as 50 Terminus sensors may be connected in series to the sensor loop input terminals. A 4700 Ohm end-of-line resistor is provided and must be wired in series with the sensors. Referring to Figure 3, you will see that Normally-Open alarm devices should be wired in parallel with the loop for a given zone, while Normally-Closed devices should be wired in series. Please note the loop terminals are marked "-" and "+". Being aware of polarity is important for testing the loop voltage during troubleshooting procedures. However, when wiring in a loop, the polarity is not important unless you are using the SP3237D (damped) sensor.

The SP3237 wiring section shows a diagram of sensor wiring for reference. Refer to the manual shipped with the sensor for complete instructions.

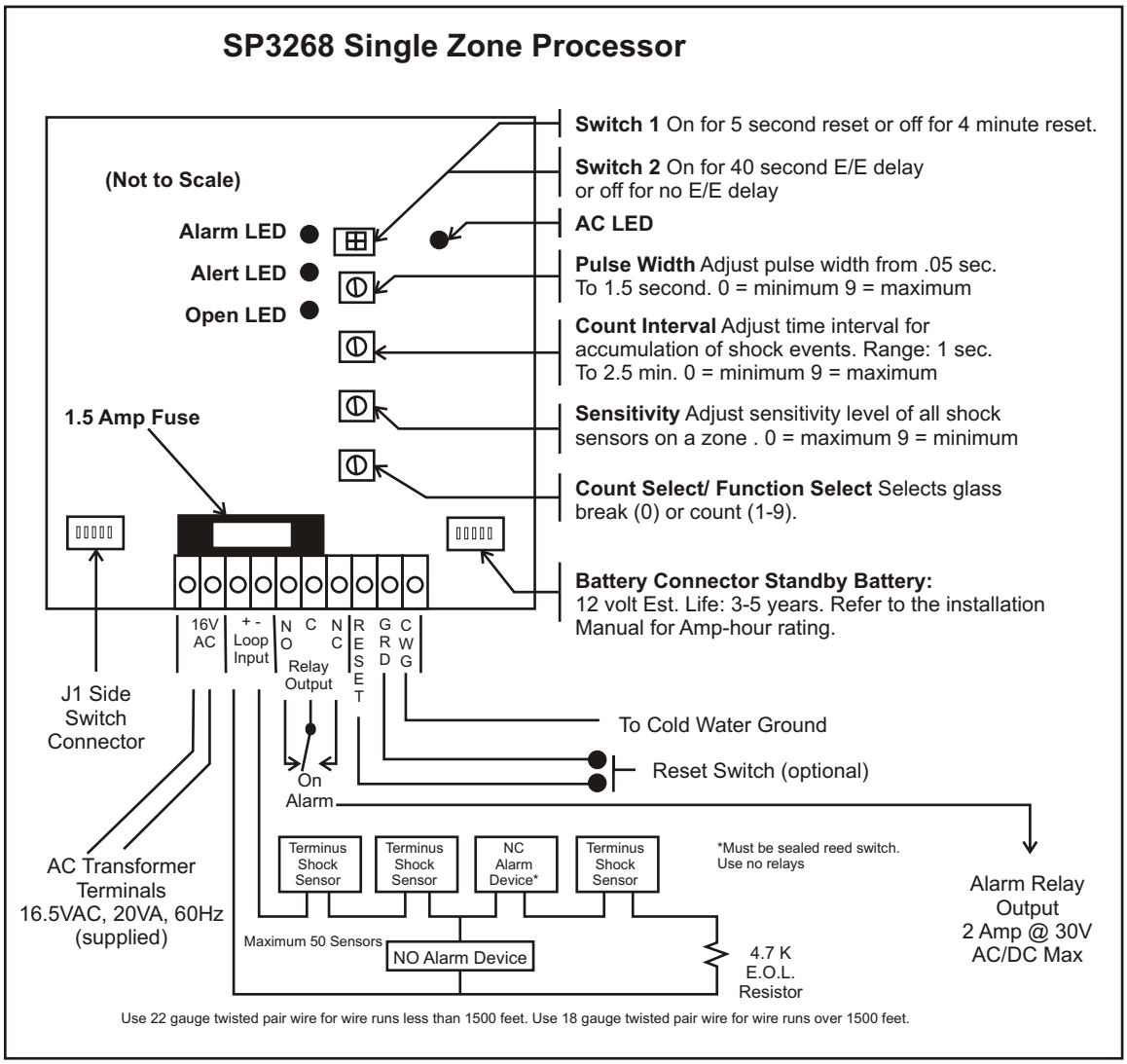

Figure 3

6. Install the remote reset connection if desired. These terminals may be connected to an external reset switch. This reset switch must be a Normally Open switch. A momentary closure across the reset terminals will reset the SP3268 processor just as if you moved the reset slide switch on the SP3268 cabinet from Armed to Reset. Wire length for this switch cannot exceed 1000 feet and wire gauge cannot be smaller than 22 AWG. The remote reset switch must not be used on UL Listed Installations.

7. Install the Cold Water Ground (CWG) connections. Use this terminal for wiring the unit to a GOOD EARTH GROUND -- usually through a cold water pipe.

8. Install the reset switch connections. Supplied with the SP3268 processor is a 2 position slide switch. This switch connects to the SP3268 circuit board at connector J1 (on the left end of the terminal strip). This should have come to you installed, but was removed with the circuit board while installing the cabinet. Make sure the slide switch is connected to the circuit board properly. This connector is a 4 pin molded connector. Please pay attention to the position of this connector when making the connection. The connector will only fit one way and should seat with very little pressure. **DO NOT FORCE.**

Setup

General Explanation of Shock Sensing Process

Shock sensors produce short electrical pulses on a protective loop in response to disturbances. The number of pulses is proportional to the amount of activity in an attempted intrusion; the size (length) of the pulses is proportional to the vigor of the attack (See Figure 5).

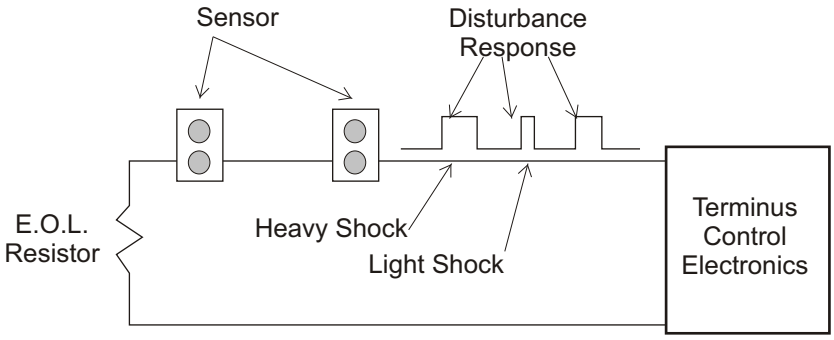

Figure 5

The sensitivity circuit filters sensor pulses according to length (how vigorous the attack is). For a given sensitivity setting only pulses that are long enough are passed on to the other processing circuits. Terminus electronic controls can detect pulses as short as 100 microseconds when set on most sensitive. (See Figure 6.)

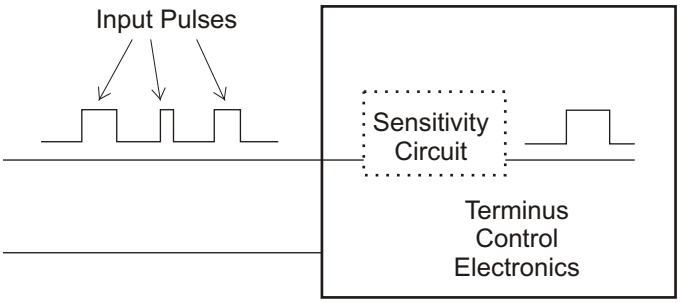

Figure 6

After passing through the sensitivity circuit, pulses go to the pulse width circuit. The pulse width circuit permits the pulses to pass through it only at predetermined intervals. (See Figure 7.)

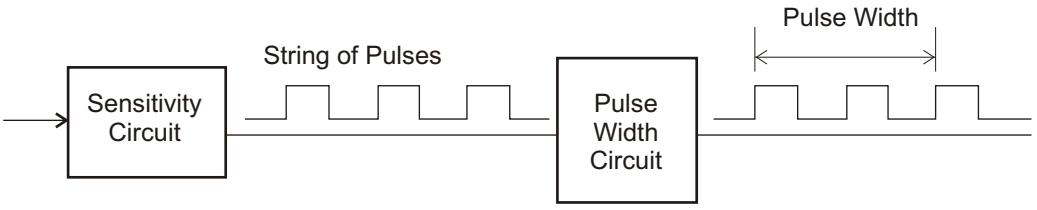

Figure 7

Once the preset counter setting has been reached, the alarm circuit is tripped. However, there is still one more important timing circuit not mentioned yet. If it was not for the count interval circuit, the counter would continuously accumulate pulses over hours or even days. With random disturbances (birds, sleet, hail, wind, etc.) continuous counting could lead to false alarms.

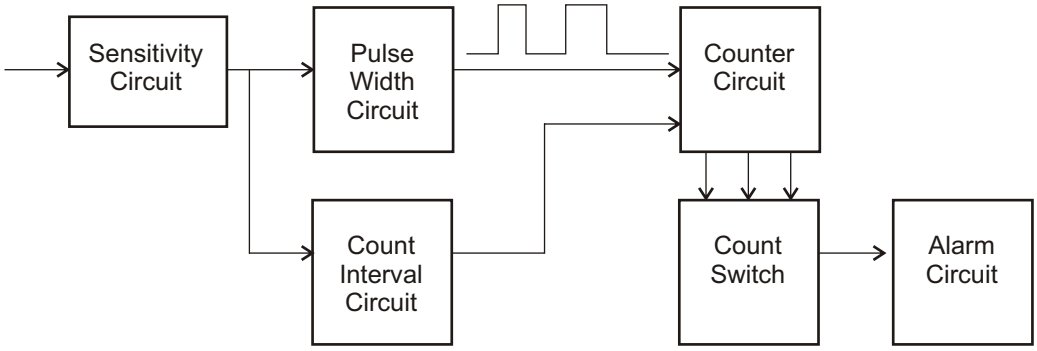

Figure 8

The count interval circuit limits how long the counter remembers. For best performance this time is typically between 15 seconds and 2 minutes depending on the application and the Terminus processor used.

Processor Control Adjustments

Sensitivity

The ten position sensitivity control sets pulse intensity registered as disturbances. Position 0 is the maximum setting and sets for approximately 1 millisecond. The minimum setting is position 9 and sets for disturbances of approximately 60 milliseconds. This control should be adjusted to the least sensitive point where effective detection occurs.

Count Interval

The ten position count interval switch sets the time in which a preset count must occur to cause an alarm. The following table gives the interval for each switch setting.

Switch Setting	0	1	2	3	4	5	6	7	8	9
Time (seconds)	1	1.5	3	5	10	15	30	50	90	150

Pulse Width

The ten position pulse width switch sets the required interval between sensed pulses. The table below shows the pulse width for each switch setting.

Switch Setting	0	1	2	3	4	5	6	7	8	9
Time (seconds)	0.050	0.075	0.100	0.150	0.200	0.300	0.500	0.750	1.000	1.500

This control is used to eliminate the effects of ringing in a live structure such as a metal building. With the circuit set correctly only the blow is detected, not the reverberations. This control should be adjusted for the shortest time which will give good protection.

Warning: It is possible to set the pulse width and the count interval too low relative to each other for all signals to be detected. If this occurs, the unit will detect the error and cause all three LEDs for that zone to blink at a ½ second interval.

Count/Function Select

A 10 position switch for each zone allows selection of count or glass break mode. The same switch allows the installer to set for any count from 1 to 9 while in count mode. Set in coordination with other adjustment options, various switch settings allow you to tailor each shock detection zone to different kinds of materials or sensor environments.

Mode Select -Setting this switch to position 0 selects the glass break mode. Any other setting selects the count mode as described below.

Count Select -Position 1 through 9 place the zone in the count mode. Each of these settings corresponds to the number of shock events that must occur within a count interval selected to cause an alarm.

Automatic Reset Time Switch

SW1 Position 1. If this switch is On, the alarm relay will reset after 5 seconds. If this switch is Off, the alarm relay will reset after 4 minutes. If the loop remains faulted after this period, the relay will not reset until the condition clears. The LED latches on until the unit is reset.

Entry-Exit Delay Time Switch

SW1 Position 2. If this switch is On, all activity on the sensor loop will be ignored for a period of 40 seconds after the zone is armed to give the user time to exit the premises. Similarly, the unit will delay alarming on entry to allow the user time to reset it and abort the alarm.

Starting Points for Installers

To help you get your system ready for operation we recommend you set your SP3268 processor adjustments to these starting points:

For Walls:

Count Interval --4
Pulse Width --5
Sensitivity --1 (see below)
Count Switch --3

For Fences:

Count Interval --5
Pulse Width --5
Sensitivity --1 (see below)
Count Switch --3

For Glass:

Count Interval --0 (ignored)
Pulse Width --0 (ignored)
Sensitivity --0 (see below)
Count Switch --position 0

Verify that each sensor in a loop will respond to a shock administered at a point on the glass that is most remote from the sensor. Having done that, adjust the Sensitivity Control --toward decreasing sensitivity -- to get the kind of response you should be getting from the processor. Processor sensitivity should allow a sensor to register a shock on glass that is on the edge of its area of coverage.

Adjusting the sensitivity of your system is a matter of finding a level that will ignore most ambient shocks. You want the system to be insensitive to rain, wind, thunder, passing trucks, and so on. On the other hand you want it sensitive enough to register shocks that may signal an intrusion. To find the right level of sensitivity, make sure sensors are registering shocks. Refer to the installation manual for the sensor that you are using for testing procedure.

Operation

The SP3268 Single Zone Processor includes a three-position, slide operated system function switch. The switch selects the operating mode for your SP3268 and the switch positions are: ARMED, RESET and TEST. It is spring loaded so it will return to the armed (center) position when pressure is released.

Test Mode

This position of the slide switch is used for testing the processor and the security system that it monitors. When this position is selected, the processor will go into alarm condition, the alarm LEDs will turn on and the open LED will blink. TO MEET U.L. REQUIREMENTS, THE ENTIRE SECURITY SYSTEM MUST BE TESTED AT LEAST ONCE A YEAR.

Reset Mode

In this mode the processor acts to reset any past or present alarm conditions. When the slide switch is in this position the ALARM LEDs and the zone relays will not operate. However, the OPEN and the ALERT LEDs will operate to let you see the status of each processor.

Armed Mode

This is the normal position for the key switch when your security system is in operation. Set to Armed, the system is watching for sensor pulses that indicate activity.

Glass Break Mode

When operating the processor in the Glass-Break mode, one initial shock, and a shock of any magnitude that follows within .6 seconds will cause alarm. The Pulse Width switch is ignored in glass break mode.

Count Mode

When a zone is operating in the count mode, the number of individual shock events required to cause an alarm is set by the count select/function switch. To qualify as an event, each shock must meet the qualifications set by the sensitivity and pulse width switches. To cause an alarm, the number of events indicated by the count select must occur within the interval selected by the count interval switch. If the number selected is not reached within this period, the timer and counter will automatically reset.

Alarm LED

The alarm LED will light on alarm and latch until reset. Reset will not occur if the loop is faulted after the expiration of the reset delay. The LED will blink every ½ second during an entry or exit delay. The LED will blink every ½ second in synchronism with the alert and open LED if an illegal configuration of the pulse width and count interval switches.

Alert LED

The alert LED will light during the count interval timeout and during the glass break timeout. The LED will blink every ½ second in synchronism with the alarm and open LEDs if an illegal configuration of the pulse width and count interval switches is detected.

Open LED

The open LED will be on steady if an open circuit is detected on the sensor loop. The LED will blink at a ½ second rate if a short circuit is detected on the sensor loop. The LED will be on while the pulse width timer is running which means that it will blink with each pulse detected on the sensor loop. The LED will blink every ½ second in synchronism with the alarm and alert LEDs if an illegal configuration of the pulse width and count interval switches.

Relay

The relay will trip on alarm for the interval selected by the Automatic Reset Select Switch and then reset. Reset will not occur if the loop is still faulted after the expiration of the reset delay.

Troubleshooting the SP3268

PROBLEM	PROBABLE CAUSE
Unit completely inoperative	1. No 16.5 VAC power (must come from a 24 hour, unswitched line). 2. Battery or batteries dead. 3. Fuse blown.
Unit operates from AC but not from battery.	1. Battery discharged. (allow battery to charge for 12-16 hours.) 2. Defective battery. 3. Battery disconnected.
Unit in alarm, will not reset.	1. Sensor loop open or shorted -loop resistance should read 4700 - 5200 Ohms when disconnected from panel. 2. Terminating resistor not installed in series in sensor loop.
Unit will not go into alarm with loop open.	1. Loop not wired correctly.
All LEDs for a zone are blinking	1. Illegal setup of sensitivity count pulse and count interval switches for selected Count.
Alert LED on steady	1. Loop Open. 2. EOL not 4.7 K.
Alert LED blinking	1. Loop Shorted. 2. EOL Resistor not 4.7K.

SP3237 Sensor Wiring

The Terminus SP3237 Shock Sensor has a jacketed four wire lead. The damped versions are polarized and the undamped versions are not. It is good practice to maintain polarity in both versions to make wiring easier and more understandable. The sensors must be wired to a Terminus processor as shown in Figure 1. The SP3237 can be used with the SP3219, SP3268, SP3274 and SP3273 processors. Each processor can handle up to 50 sensors per zone. An end-of-line (EOL) resistor of 4.7K ohms is installed at the last sensor in the loop. All splices should be soldered and taped. Normally-open and normally-closed alarm devices can be used in the alarm loop as shown.

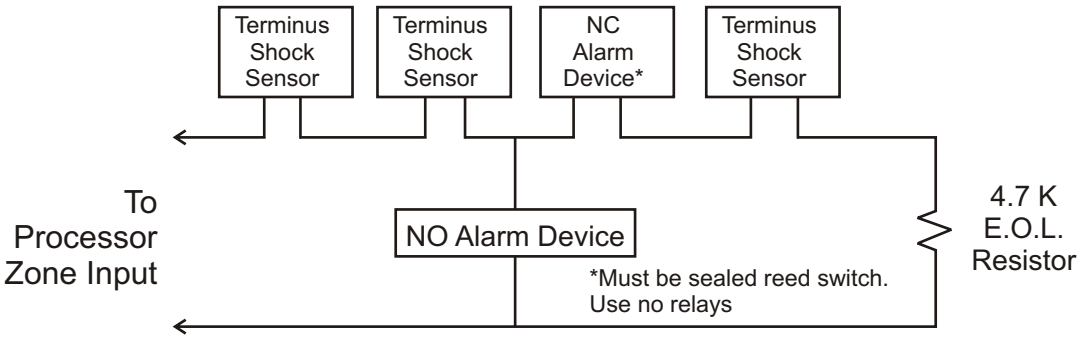

Figure 14 Typical Loop

For sensor loops less than 1500 feet in length, use 22 gauge or larger stranded twisted pair cable. For longer loops, use 18 gauge or larger stranded twisted pair. Shielded cable is not required except in rare cases.

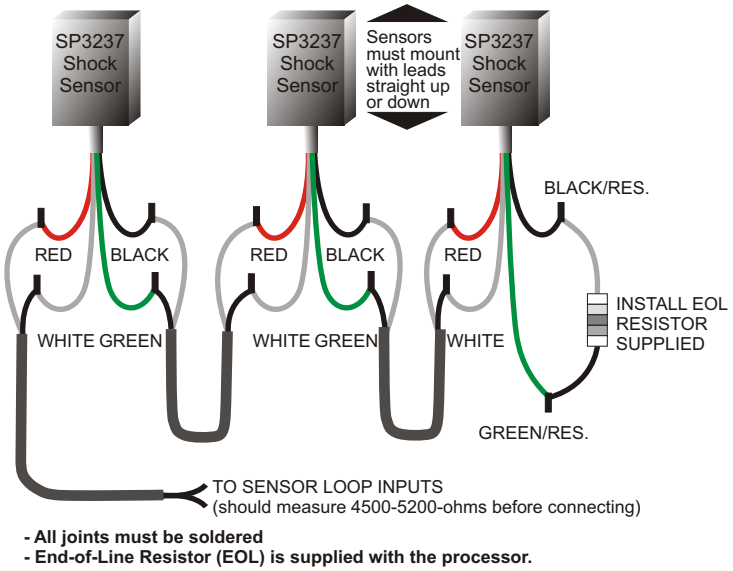

Figure 15 Sensor Wiring

Refer to the manual shipped with the sensor for placement, mounting and testing details.

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