PRELIMINARY 10/1/03

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Product Summary

The Learn Mode Shock Sensor has the following three main functions:

- To detect the vibrations made by an intruder trying to break a window or door.
- To detect a window or door opening.
- To detect tamper situations, such as an intruder removing the sensor cover or the sensor from the wall.

Vibrations cause a momentary open circuit in the shock element of the sensor. The circuit closes again when the vibration stops. The sensor microcontroller "sees" the open/close action as a pulse, causing the sensor to transmit an alarm signal. The sensor has two different detection modes:

- Gross Attack - detect a violent blow sufficient in length to trip sensor.
- Pulse Count - detect a sufficient number of less violent blows (rapping or tapping).

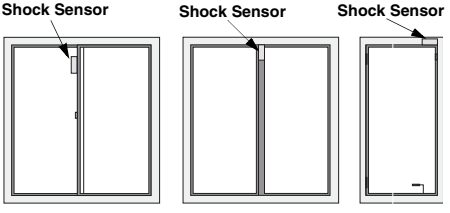
The sensor includes an internal magnetic reed switch that must be disabled if it is not used.

Extend the battery life of the sensor by adding a second 3-volt lithium battery.

Installation Guidelines

- Learn the sensor before adjusting the shock sensitivity. The sensor is shipped with the reed switch enabled and open, and this is how it must be learned.
- Before permanently mounting the sensor, test it at the intended location to make sure that the panel can receive sensor signal transmissions. The sensor is an RF device and there may be blind or non-operational locations within the installation. Normally, these can be overcome by moving the sensor or receiver.
- Always mount the shock sensor so that the detector is on the frame and not on the glass. See Figure 2 for mounting locations.
- Mount the sensor in a location where the structure can transmit vibrations to the sensor.
- The sensor can be mounted on a vertical surface or on a horizontal (flat) surface.
- Make sure the window fits snugly in the frame and doesn't move or rattle.
- Hold the sensor against the frame to make sure the sensor base fits on the surface area of the frame and doesn't extend over the surface edges.

Vertical (Wall) Surface Mounting



Horizontal (Ledge) Surface Mounting

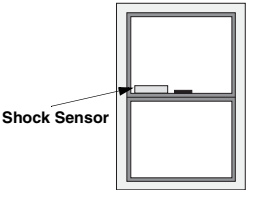


Figure 1. Mounting Options for Door/Window Sensor

Tools and Supplies

- Control panel installation instructions
- Phillips screwdriver
- Slotted screwdriver (to pry off the cover)
- Two #6 x 2 cm flathead screws for mounting the sensor (included)
- Two #6 x 1.5 cm screws for mounting the magnet (included)

Installation

Caution!
You must be free of all static electricity when handling electronic components. Touch a grounded, bare metal surface before touching a circuit board or wear a grounded wrist strap.

1. Insert a slotted screwdriver into the slot at the top end of the unit and remove the cover by lifting it up (see Figure 2).

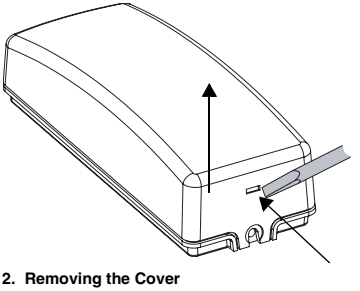


Figure 2. Removing the Cover

2. Using the flathead mounting screws, secure the base to the mounting surface either vertically or horizontally as required (see Figure 3).

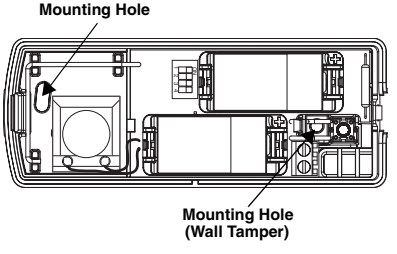


Figure 3. Sensor Mounting Holes

3. Position the shock element and press it firmly into its socket.

Note
*On a **vertical surface**, the shock sensor element must always be oriented with its screw terminals down, or the writing on the shock element horizontal.*

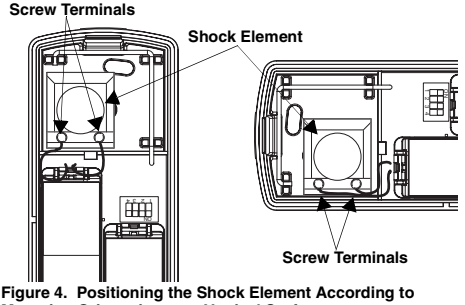


Figure 4. Positioning the Shock Element According to Mounting Orientation on a Vertical Surface

Note
*On a **horizontal surface (sill or ledge)**, any orientation is allowed, but certain sensor element orientations are better than others. The element is much better at detecting horizontal vibrations perpendicular to its writing than it is parallel vibrations (see Figure 5).*

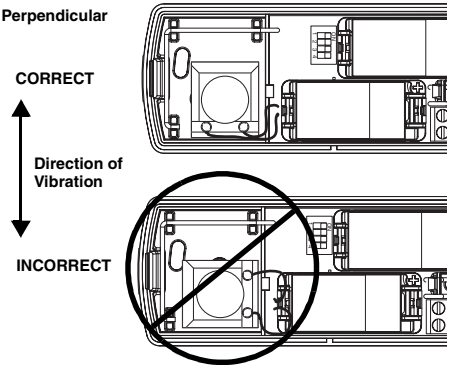


Figure 5. Positioning Shock Elements for Horizontal Surface Mounting

4. If using the reed switch, use the two remaining screws to mount the magnet so its arrow is aligned with the arrow on the sensor case (see Figure 7).

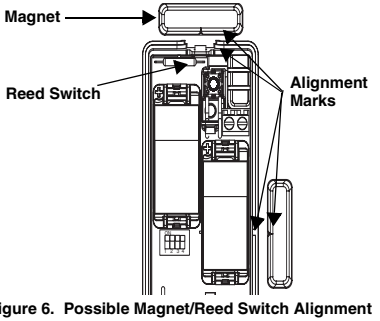


Figure 6. Possible Magnet/Reed Switch Alignment

Important!
You must disable the reed switch using the dip switches on the circuit board if you are not using it. If the reed switch is enabled but no magnet is installed, the sensor will be in a continuous alarm state. See the Sensor Settings section for more information.

5. Install the tamper switch as shown (see Figure 7).

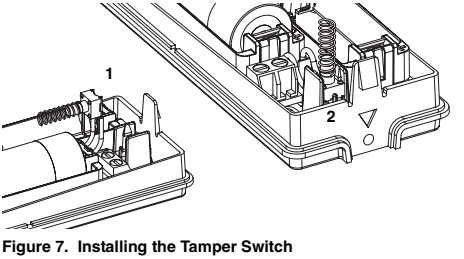


Figure 7. Installing the Tamper Switch

6. Install the 4.7 k Ohm EOL resistor across the terminals of the external switch block.

Setting the Detection Mode

The shock sensor has two detection modes:

- Gross Attack - detects a violent blow sufficient in length to trip sensor.
- Pulse Count - detects a sufficient number of less violent blows (rapping or tapping).
  Pulse Count signals are counted at 1-second intervals and stored in a 30-second digital memory. These small signals can detect an intruder gently prying open a window or door frame.

To set the shock sensor detection modes:

1. Hold in the tamper spring. Continue to hold in while moving the DIP switches to their desired settings.
2. Set the DIP switches to the desired pulse count (see Table 1). The LED will start blinking once a DIP switch is moved.

Table 1: Pulse Count Adjustment

DIP Switch 1	DIP Switch 2	30-second Pulse Count
OFF	OFF	4
ON	OFF	6
OFF	ON	8
ON	ON	Disabled

3. Set the DIP Switches to the desired Gross Attack sensitivity (See Table 2).

Table 2: Gross Attack Sensitivity Settings

DIP Switch 3	DIP Switch 4	Sensitivity
OFF	OFF	1 (most sensitive)
ON	OFF	2
OFF	ON	3
ON	ON	4 (least sensitive)

4. Release the tamper spring. The LED will flash quickly 3 times to indicate the settings have been programmed.
5. Repeat steps 1-4 each time you make a sensitivity change. It may then be necessary to reset the DIP switches to their proper device settings (See Sensor Settings).

Testing the Detection Modes

To test the Pulse Count setting:

- Generate small shocks on the mounting structure. Each time a shock is detected, a pulse is registered in memory and the LED will blink for one second. If the programmed pulse count is reached within the most recent 30 seconds, the alarm will trip and the LED will light for approximately 4 seconds. If the alarm trips for any reason, the stored pulses are cancelled.

To test the Gross Attack setting:

- Apply high level shocks to the mounting structure, using the LED as a guide to when the alarm trips (LED on for 4 seconds).

  The LED will blink for 1 second every time the sensor detects a pulse. A shock that is severe enough to cause an alarm will cause the LED to light for approximately 4 seconds.

Sensor Settings

After programming the Detection Mode, the DIP switches are used to set up the sensors use of the reed switches and/or external contacts. If the external contact is not used the 4.7 k Ohm EOL resistor must be installed across the terminals of the external switch block.

With the tamper spring in the up position, set the DIP switches to the desired settings (See Table 3).

Important!
DO NOT remove the reed switches from the circuit board! The Shock Sensor will not function properly. If you don't need to use the reed switches, disable them with the DIP switches as described in Table 3.

Table 3: Sensor Settings

Switch Number	OFF	ON
1	Unused	Unused
2	Disable Reed Switches	Enable Reed Switches
3	Disable External Contact	Enable External Contact
4	External Contact is Normally Open	External Contact is Normally Closed

System Programming

This section describes the basic steps for adding the sensor to panel memory. Refer to the specific panel installation instructions for complete programming details.

The reed switch must be enabled and open when learning the sensor.

1. With the cover on the sensor, set the panel to Program mode.
2. Proceed to the LEARN SENSORS menu.
3. Select the appropriate sensor group and sensor number assignments.
4. When prompted by the panel to trip the sensor, remove the sensor cover to activate the tamper switch.
5. Exit program mode.

RF Testing

This section describes the basic steps for testing the sensor. Refer to the specific panel or receiver installation instructions for complete testing details.

1. Set the panel to Sensor Test.
2. Trip the sensor.
3. Listen for appropriate response from system sirens.
4. Exit Sensor Test.

- Use an RF Sniffer to help diagnose sensor problems.

Battery Replacement

When the system indicates that the sensor has a low battery, remove the old battery and install a new battery (Duracell DL123A or a Sanyo CR123A) into the battery holder, observing proper polarity.

Caution!
Replace only with a Duracell DL123A battery or a Sanyo CR123A battery. Observe polarity when installing a new battery. Installing the battery backwards may cause damage to the sensor.

Dispose of used batteries according to the manufacturer's instructions and/or local government authorities.

Specifications

Model No.: 60-975-95R and 60-975-11-95R
RF Frequency: 319.5 MHz
Compatibility: All GE Interlogix 319.5 MHz Control Panels and Receivers
Battery Type: 3.0 VDC Lithium
Recommended Battery: GE CR123A
Typical Standby Current (µA): 10
Estimated Battery Life: 5 years (one battery); 10 years (two batteries)
Typical RF Power Output (mW): 10
Operating Temperature Range (C°): 0 to 49
Storage Temperature Range (C°): -34 to 60
Relative Humidity: 0 - 90% non-condensing
Dimensions (mm): 45 x 115 x 31 (L x W x D)
Weight: 88

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