SA-20

Wireless Vibration Detector

Installation Manual

March 2013

1. Introduction

The SA-20 is an advanced, wireless, intrusion detector, operating on the basis of pre-event detection. This unit operates with Rosslare's wireless control panels, such as: AuraSys™ and HomeLogix™.

The SA-20 vibration detector combines, in a compact package, 3 types of sensors: magnetic, vibration and movement, to provide the user a high level of security.

It is ideal for residences, stores and warehouses, as well as paintings and art objects. With its small size, the SA-20 can be secured at any location, remaining inconspicuous.

The vibration detector uses a special algorithm, to monitor the area at all times, while preventing false alarms or random events. By performing self-calibration, the user is assured of reliable and precise operation at all times. Other features include: battery check, Walk Test and tamper-event reporting. The following pages outline the installation and test instructions for your new SA-20 detector.

Figure 1: SA-20

2. Technical Specifications

2.1 Electrical Characteristics

Battery Type	CR2477; 3 V, 1000 mAh
Input Current	Standby 20 µA; maximum 14 mA
Battery Life Expectancy	3 years (typical usage)
Signaling Type	Green, red, yellow LED indicators
Signaling Events	Alarm, tamper, calibration, trouble, battery
Sensors	Vibration – Ceramic piezoelectric element Movement – Non-position ball actuator motion Magnetic – Reed switch
Sensitivity (max.)	Vibration –10 to 50 gram force (300 to 3000 Hz) (depends on the distance and surface material) Movement – 0.0003 g (average) Magnetic – Operates up to 3 cm
Sensitivity levels	Low, medium and high
Alarms	Vibration only; movement only; vibration or movement; magnetic (enable/disable)
Arming Types	Normal – 2 minutes following last alarm Dynamic – 2 minutes following last movement (retriggered)

2.2 RF Transmission Characteristics

Frequency	Model H = 868.35 MHz; model G = 433.92 MHz
Range	180 meters (590 ft) open field conditions
Family Types	Glass break (vibration/movement) window (magnetic)
Supervision Transmission	Automatic, at 20-minute intervals
Self Check	20 minutes from last alarm (retriggered)

2.3 Environmental Characteristics

Operating environment	Indoor use
Operating Temperature	-10°C to 60°C (14°F to 140°F)
Relative Humidity	0 to 95% (non-condensing)
RFI Protection	>20 V/m up to 1000 MHz

2.4 Physical Characteristics

Dimensions	35 x 110 x 28 mm (1.37 x 4.33 x 1.10 in.)
Weight	48 g (1.69 oz)

3. Installation

3.1 General

The SA-20 must be mounted on a flat surface, with the indicators top side. For applications involving the magnetic feature, the device must be located close to the magnet. Prior to installation, the required features and applications must be established, so as to set internal jumpers.

3.2 Opening the SA-20

The SA-20 cover is removed by loosening the screw and prying the cover off. Locate the various jumpers to be set, according to the application requirements, as defined in Section 7.

3.3 Mounting the SA-20

The detector can be installed using the provided screws and wall plugs or it can be mounted using the two stickers on its back side (once glued in place, the sensor cannot be moved).

It is essential to have the device on a flat surface to ensure optimum contact with the piezoelectric sensor and with the tamper switch, both on the back of the SA-20. In addition, the side with the LEDs should be on top to provide ideal movement detection. For magnetic switch applications, position the SA-20, no farther than 3 cm from the activating magnet, with 1 cm being optimum. The recessed slot on the left side of the cover indicates the location of the magnetic switch.

The SA-20 sensor can be used to transmit alarms from other nearby sensors that are equipped with dry contacts (see Section 7.5).

3.4 Setting the Jumpers

Set the jumpers as described in Section 7.

3.5 Inserting the Battery

Once the device is installed, insert the battery. The 3 LEDs blink 3 times. The red LED then comes on and remains lit until the cover is closed.

3.6 Closing the SA-20

Close the SA-20 by replacing and snapping the cover until it clicks. An automatic calibration is performed (see Section 4). If the cover is not close properly, the calibration process begins after 30 seconds. As part of the calibration, a Walk Test is performed automatically to verify correct operation of the device and its integration in the alarm system (see Section 5). Upon successful testing, replace the screw previously removed.

4. Calibration

During the calibration process, do not touch the sensor or nearby objects. To do so, may lead to erroneous values or may stop the process. During the calibration process, the sensor should be in a vertical position (LEDs on upper part of the unit), attached to its intended location with good contact between the Piezo sensor and the surface.

The calibration process starts about 8 seconds after closing the cover, as indicated by the greed LED flashing on and off around 24 times.

After the green LED stops flashing, the yellow LED blinks on and off around 6 times.

After the yellow LED stops flashing, the unit automatically enters into Walk Test mode (see Section 5) after which the 3 LEDs turn off to indicate Standby mode after the calibration process is successful.

If, for some reason, there is an interruption, the process ceases and starts over. If the SA-20 cannot calibrate itself as indicated by the flashing of the red indicator together with the relevant sensor indicator, the source of the problem must be located and fixed prior to continuing (see Section 10). Once fixed, remove the battery, replace it and restart the process.

If the problematic sensor is not in use, it can be disregarded by setting the Mode selector (JP4) to vibration only or movement only.

5. Testing the Detector

As part of a successful calibration, there is a minimum 1-minute Walk Test. During that period, the SA-20 responses can be evaluated by gently knocking in different places around the protected area (vibration check). The sensitivity of the device to movement can also be checked by gently moving the object which is attached to it. A triggering of the alarm causes the red indicator and the relevant sensor indicator to be illuminated simultaneously.

The magnetic sensor functions all the time. It can be tested by opening and closing the magnet near the SA-20. The open/close event is signaled by all 3 indicators being illuminated simultaneously. Be certain to close the magnetic circuit to avoid a permanent open zone. The test mode can be entered for a one-minute period, by opening the cover and depressing pushbutton S6 for about one second.

6. Enrolling the Detector

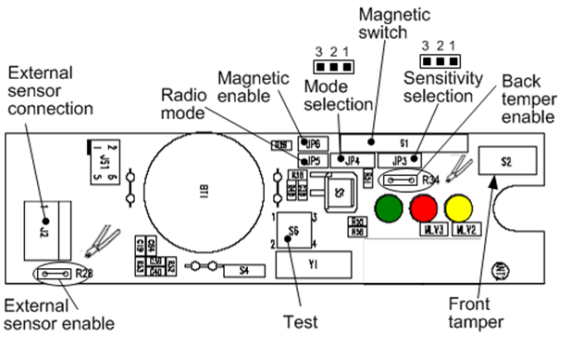
The SA-20 includes a glass break detector. The easiest way to register the device is by opening/closing the tamper.

For specific steps to be followed for enrollment, refer to the manual supplied with the alarm panel.

7. Jumpers and Back Tamper Setting

The SA-20 has 4 internal jumpers that can be connected to enable various features, allowing the unit to be versatile for any situation (Figure 2). In addition to the jumpers, a pushbutton is provided for test purposes.

Figure 2: SA-20 Controls and Indicators Layout



7.1 Back Tamper (R34)

The SA-20 has both front and back tamper detection. Front tamper detection is on by default it is activated when the cover is opened cannot be changed. The back tamper detection is activated when the detector is pulled off the wall and is disabled by default, to enable the back tamper detection cut the back tamper wire (R34).

The cover must be closed at all times; otherwise the red LED flashes to alert the tamper activation.

7.2 Detection Sensitivity Jumper (JP3)

In harsh environment conditions, the sensor may detect false alarms. To prevent these false alarms, three sensitivity modes are available. As a starting point, use the medium setting (default) and after the calibration process, perform a Walk Test to decide which setting is best. Use **High** for maximum sensitivity and **Low** when for false alarms occur.

Jumper JP3 changes the detection sensitivity between three settings:

Low – Pins 1-2; **Medium** – no jumper; **High** – Pins 2-3

> Note: When using a low sensitivity setting, Vibration Only mode for the sensor is recommended (see Section 7.3).

7.3 Mode Jumper (JP4)

There are 3 types of sensor modes, all of type glass break:

- **Movement only** (Pins 1-2) – Only the movement sensor can trigger an alarm.
- **Vibration only** (Pins 2-3) – Only the vibration sensor can trigger an alarm.
- **Movement or vibration** (no jumper) – When using this setting, either the movement or the vibration sensor triggers an alarm.

7.4 Magnetic Enable Jumper (JP6)

This jumper enables the internal magnetic sensor. Even if disabled, external sensors can still use the SA-20's transmission capabilities.

Enabled – no jumper; Disabled – jumper on

7.5 Adding an External Sensor

Sensors with normally-closed (N.C.) dry contacts can be connected in series with or without the SA-20 magnetic switch. This application is intended for open/close sensors (magnetic or tamper) that are not far away from the SA-20, so as to make use of its transmitter.

To add an external sensor:

1. Connect their dry contacts to J2 and cut wire R28 (Figure 2).
1. Set the jumper JP6 in to the "magnetic disable" position to activate the external sensor.

7.6 Radio Mode Jumper (JP5)

To save power, the SA-20 goes into Sleep mode after sending an alarm. The time the device is latent is set by the radio mode jumper, JP5.

- Normal (always 2 minutes between alarms) – no jumper
- Dynamic (2 minutes retriggered between alarms) – jumper on

When the Dynamic mode is set, an alarm event is sent only if there were 2 minutes of silence prior to the current alarm. This setting is useful for places with a high level of noise, such as factories.

7.7 Test Mode (S6)

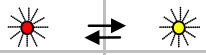
This pushbutton is used for Walk Test or radio test, as follows:

- Walk Test – Press S6 and release as soon as the red LED goes on. At this point, sensor functionality is evaluated for a 1-minute period, indicated by the flashing red LED.
- Radio Test – Press for more than 3 seconds. 10 glass break type events are transmitted at intervals of 4 seconds – the green and yellow indicators illuminate for each transmission.

8. Low Battery Supervision

Prior to each RF transmission, the battery voltage is sampled. If the voltage is low for 3 sequential samples, a special message is sent. Once the battery level returns to the minimum preset value, fault transmissions cease.

9. Indicator Status Guide

Event	Indications			Sequence
	Green	Red	Yellow	
Vibration calibration				Green LED flashes
Movement calibration				Yellow LED flashes
Vibration calibration problem				1 second green, then 1 second red Alternatively*
Movement calibration problem				1 second yellow, then 1 second red alternatively *
Radio test				Green & yellow LEDs light during each transmission
Vibration event				Green & red LEDs light during event transmission
Movement event				Yellow & red LEDs light during event transmission
Magnetic event (open/close)				Green, yellow & red LEDs light during event transmission
Low battery event				Red LED blinks during regular event transmission;  = don't care
Tamper event/case open				Red LED flashes when the tamper is opened or during Walk Test period. If the case is open after power up, the red LED lights for 30 seconds or until the case is closed.
Front/back cover open Walk Test				Red LED flashes

*If there is a problem in both vibration and movement calibrations, then all 3 lights are on.

10. Troubleshooting

Problem	Cause	Solution
No indicator illuminated after power up	Battery inserted in the wrong direction or has very low voltage	Take the battery out and rotate it (the + is up) or replace the battery
After power up, red indicator stays on	Tamper is open	Check that cover is properly closed
After calibration, green and red lights flash in sequence	Vibration calibration problem due to noisy environment	Remove/replace battery and perform the calibration during quiet period
After calibration yellow and red lights flash in sequence	Movement calibration problem	Indicators are positioned on top section and device is not moving. Remove/replace battery.
Red indicator flashes during transmission of event	Battery is low	Replace battery
No magnetic sensor event transmission	External contact enabled and open; JP6 is set	Close external contact or remove JP6
No tamper event when opening/closing case	Back tamper is enabled and the device is not secured to its mounting surface	Secure the device to its surface and check again
No alarm from the device, even when hit	"Walk Test" period has elapsed	Wait 2 minutes or open the case; press the pushbutton for less than 3 seconds and close again
Walk Test continues for more than 2 minutes	Time during alarms is not included	Maintain silence after completion of Walk Test

Limited Warranty

ROSSLARE ENTERPRISES LIMITED (ROSSLARE) TWO-YEAR LIMITED WARRANTY is applicable worldwide. This warranty supersedes any other warranty. ROSSLARE'S TWO-YEAR LIMITED WARRANTY is subject to the following conditions:

WARRANTY

Warranty of ROSSLARE'S products extends to the original purchaser (Customer) of the ROSSLARE product and is not transferable.

PRODUCTS COVERED BY THIS WARRANTY AND DURATION

ROSSLARE ENTERPRISES LTD. AND/OR SUBSIDIARIES (ROSSLARE) warrants that the SA-20 Wireless Vibration Detector to be free from defects in materials and assembly in the course of normal use and service. The warranty period commences with the date of shipment to the original purchaser and extends for a period of 2 years (24 months).

WARRANTY REMEDY COVERAGE

In the event of a breach of warranty, ROSSLARE will credit Customer with the price of the Product paid by Customer, provided that the warranty claim is delivered to ROSSLARE by the Customer during the warranty period in accordance with the terms of this warranty. Unless otherwise requested by a ROSSLARE representative, return of the failed product(s) is not immediately required.

If ROSSLARE has not contacted the Customer within a sixty (60) day holding period following the delivery of the warranty claim, Customer will not be required to return the failed product(s). All returned Product(s), as may be requested at ROSSLARE'S sole discretion, shall become the property of ROSSLARE.

To exercise the warranty, the user must contact ROSSLARE Enterprises Ltd. to obtain an RMA number after which, the product must be returned to the Manufacturer freight prepaid and insured.

In the event ROSSLARE chooses to perform a product evaluation within the sixty (60) day holding period and no defect is found, a minimum US$ 50.00 or equivalent charge will be applied to each Product for labor required in the evaluation.

ROSSLARE will repair or replace, at its discretion, any product that under normal conditions of use and service proves to be defective in material or workmanship. No charge will be applied for labor or parts with respect to defects covered by this warranty, provided that the work is done by ROSSLARE or a ROSSLARE authorized service center.

EXCLUSIONS AND LIMITATIONS

ROSSLARE shall not be responsible or liable for any damage or loss resulting from the operation or performance of any Product or any systems in which a Product is incorporated. This warranty shall not extend to any ancillary equipment not furnished by ROSSLARE, which is attached to or used in conjunction with a Product, nor to any Product that is used with any ancillary equipment, which is not furnished by ROSSLARE.

This warranty does not cover expenses incurred in the transportation, freight cost to the repair center, removal or reinstallation of the product, whether or not proven defective.

Specifically excluded from this warranty are any failures resulting from Customer's improper testing, operation, installation, or damage resulting from use of the Product in other than its normal and customary manner, or any maintenance, modification, alteration, or adjustment or any type of abuse, neglect, accident, misuse, improper operation, normal wear, defects or damage due to lightning or other electrical discharge. This warranty does not cover repair or replacement where normal use has exhausted the life of a part or instrument, or any modification or abuse of, or tampering with, the Product if Product disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.

ROSSLARE does not warrant the installation, maintenance, or service of the Product. Service life of the product is dependent upon the care it receives and the conditions under which it has to operate.

In no event shall ROSSLARE be liable for incidental or consequential damages.

LIMITED WARRANTY TERMS

THIS WARRANTY SETS FORTH THE FULL EXTENT OF ROSSLARE'S WARRANTY.

THE TERMS OF THIS WARRANTY MAY NOT BE VARIED BY ANY PERSON, WHETHER OR NOT PURPORTING TO REPRESENT OR ACT ON BEHALF OF ROSSLARE.

THIS LIMITED WARRANTY IS PROVIDED IN LIEU OF ALL OTHER WARRANTIES. ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED.

IN NO EVENT SHALL ROSSLARE BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, OR FOR ANY OTHER INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF TIME, COMMERCIAL LOSS, INCONVENIENCE, AND LOSS OF PROFITS, ARISING OUT OF THE INSTALLATION, USE, OR INABILITY TO USE SUCH PRODUCT, TO THE FULLEST EXTENT THAT ANY SUCH LOSS OR DAMAGE MAY BE DISCLAIMED BY LAW.

THIS WARRANTY SHALL BECOME NULL AND VOID IN THE EVENT OF A VIOLATION OF THE PROVISIONS OF THIS LIMITED WARRANTY.

Contact Information

Asia Pacific, Middle East, Africa
Rosslare Enterprises Ltd.
Kowloon Bay, Hong Kong
Tel: +852 2795-5630
Fax: +852 2795-1508
support.apac@rosslaresecurity.com

United States and Canada
Rosslare Security Products, Inc.
Southlake, TX, USA 76092
Toll Free: +1-866-632-1101
Local: +1-817-305-0006
Fax: +1-817-305-0069
support.na@rosslaresecurity.com

Europe
Rosslare Israel Ltd.
Rosh HaAyin, Israel 48091
Tel: +972 3 938-6838
Fax: +972 3 938-6830
support.eu@rosslaresecurity.com

Latin America
Rosslare Latin America
Buenos Aires, Argentina 1642
support.la@rosslaresecurity.com

China
Rosslare Electronics (Shenzhen) Ltd.
Shenzhen, China
Tel: +86 755 8610 6842
Fax: +86 755 8610 6101
support.cn@rosslaresecurity.com

0706-0960223+01

www.rosslaresecurity.com