1. INTRODUCTION

1.1 Applications
The SRN-2000 is the only universal PIR you can truly standardize on without compromising. It combines several different design techniques to master the industry’s biggest problem - false alarms. An outstanding variety of 45 easy-to-change lenses is available for the SRN-2000 from the “Super Red Lens Library”:
- 9 wide-angle lenses up to 140°
- 3 long-range corridors up to 36 m (120 ft)
- 6 pet alleys
- 3 finger curtains
- 8 lenses for combined ceiling and room coverage
- 10 unique lenses for multiple 2-3 room and corridor coverage
- 6 solid curtains.
The “Super Red Lens Library” provides the most extensive selection of coverages and saves you time and money in every installation.

1.2 Features
Incomparable Flexibility:
- 30° Vertical and Horizontal Adjustments
- 0-5 m (0-17 ft) Installation Height
- Visible Pattern Locator
- Surface, Corner and Flush Mounting
- Switchable Walk-Test Indicator
- N.C. Silent Relay
- Tamper Switch
- Low Current Drain: 17 mA
- 9-16 VDC Supply Voltage

False Alarm Immunity:
- Programmable Pulse Counter - to virtually eliminate environmental disturbances
- Adjustable Coverage Range - to adjust coverage range to room size
- Unprecedented RF Immunity - rejects RF interference up to 1000 MHz
- Light Rejection Filter - rejects visible light variations
- Maskable Lens Patterns - to block thermal disturbances
- Test-Point - to identify and eliminate background disturbances
- Dual-Element Low-Noise Pyroelectric Detector - rejects thermal variations with maximum signal-to-noise ratio.

Additional features are available with other models (see Para. 3.1).

2. SPECIFICATIONS

OPTICAL
Standard Lenses:  SRN-2000 Lens No. 100
SRN-2000H Lens No. 52
SRN-2000R Lens No. 55
Interchangeable Lenses: See SUPER-RED Lens Library
Adjustment: Vertical: +10° to -20° calibrated scale.
Horizontal: up to 30°

ELECTRICAL
Voltage: 9 to 16 VDC
Current: 20 mA
Relay output: Normally Closed (fail safe) contacts. 18 ohm resistor in series with contacts. Rating - 0.1 A resistive/30 VDC.
Alarm period: 2-3 seconds
Tamper contacts: Normally Closed, 0.5 A resistive/30 VDC
LED: Walk Test - (switchable)
Testing: Background noise test point
Detector: Dual-element low-noise pyroelectric detector

PHYSICAL
Dimensions: 70 x 120 x 48 mm (2.7 x 4.7 x 1.9 in.)
Weight: 140 g (4.5 oz).
Colors: white.

3. MODELS AND LENSES

3.1 Super Red SRN-2000 Models
SRN-2000: Standard model, with pulse counter.
SRN-2000H: Horizontally mounted PIR provides the largest solid curtain coverage 18 x 18 m (60 x 60 ft) and five interchangeable lenses (see Lens Library).
SRN-2000R: Ceiling mounted PIR provides maximum 6 x 18m (20 x 60 ft) floor coverage when mounted at 6 m (20 ft) height.
SRN-2000M: Similar to SRN-2000, but with additional alarm latching memory for multiple PIR installation on a single zone.
SRN-2000C/PC: 9 Volt battery-operated PIR, providing the lowest standby current drain - 0.004 mA. Has a pulse counter and is designed to operate with virtually all wireless transmitters on the market.
SRN-2000CH: Horizontally mounted, battery-operated PIR, providing same solid curtain patterns as SRN-2000H.
SRN-2000CR: Ceiling mounted, battery-operated PIR, with the same coverage pattern as SRN-2000R.

3.2 Lens Selection
Coverage: Lens # 100 is the standard pattern supplied with SRN-2000 sensors (not applicable to models SRN-2000H, R, CH, CR). Printed circuit board elevation scale is factory preset at -5°. For application of PCB elevation scale, see Table 1.

Lens No. 100 Specifications
Total Number of Beams: 38
Intermediate Layer - 5 twin beams (split), angled 10° below upper layer
Downward Layer - 5 twin beams (split), angled 25° below upper layer.
Angle span: 90° Wide Angle.
Coverage: Max. 18 x 18 m (60 x 60 ft).

If the standard No. 100 lens does not meet your coverage needs, select the desired pattern from the SUPER RED LENS LIBRARY. Your nearest distributor will be glad to supply you with any lens you choose.
LENSES LIBRARY
SUPER-RED offers a selection of more than 45 lenses to provide the best coverage pattern for any installation. The SUPER-RED LENS LIBRARY is divided into the following nine sections:

Section 1: Corner Mounting Wide-Angle 90° - 100°.
This section comprises 6 lenses which provide the maximum room coverage, when the PIR is installed in the corner.

Section 2: Ultra-Wide-Angle 120° - 140°.
This section comprises 3 lenses which provide the largest and widest room coverage in applications where the PIR is wall mounted or flush mounted.

Section 3: Pet-Alleys.
This section comprises 6 lenses with a single horizontal beam layer which allows pets to move under the coverage pattern, undetected.

Section 4: Long-Range Corridors up to 36 m (120 ft).
This section comprises 3 lenses specially designed for long range and narrow areas such as corridors, aisles and long walls.

Section 5: Multiple Room and Corridor Coverage.
This section comprises 10 lenses, each providing a combination coverage of one or two Long-Range corridors and one or two Wide-Angle rooms simultaneously, using a single PIR.

Section 6: Combined Ceiling, Stair and Room Coverage.
This section comprises 8 lenses providing multiple coverage of ceiling and stairs in addition to the normal room area coverage.

Section 7: Finger Curtains.
This section comprises 3 lenses providing coverage of multiple vertical finger curtains which may be used to prevent access from two walls simultaneously and detect movement through curtains located in the area between the walls.

Section 8: Lenses for Energy Management PIRs.
This section comprises 4 high density lenses specially designed for use with models SRN-2000E, ET and EF in Energy Management applications.

Section 9: Solid Curtain PIRs.
This section comprises 5 lenses specially designed for models SRN-2000H and SRN-2000CH, providing various types of solid curtain coverage.

### 3.3. SRN-2000H Solid Curtain PIR

#### Description

The SRN-2000H is a horizontally mounted PIR which provides a variety of Solid-Curtain coverages. The unit may be used to provide wall and large show window coverage or as an internal invisible barrier to detect movement between two areas. Lens No. 52 is the standard lens supplied with SRN-2000H.

Fitted with lens No. 52 this unit produces a solid curtain coverage extending out from the mounting wall to the opposite wall - up to a maximum of 18 m (60 ft) and down to the floor (Fig. 3).

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**Figure 3. Curtain Coverage - Lens No. 52**

A Pet-Alley curtain is created by installing the SRN-2000H near the floor and angling it 45° towards the ceiling. The height of the curtain can be adjusted precisely by rotating the lens.

In addition to lens No. 52, several interchangeable lenses are offered, providing coverage combinations of solid curtains and beams. For more details refer to SUPER RED LENS LIBRARY.

#### Mounting

The SRN-2000H should be mounted horizontally on its angular shaped back, pointing to the floor at a declination of 45°.

The preferred location is at the wall-to-ceiling juncture. Wall or ceiling mounting is also possible as long as the 45° angle is maintained (Fig. 5).

The unit can be mounted at any height up to 18 m (60 ft), providing the largest curtain coverage on the market - 18 x 18 m (60 x 60 ft). All lenses, except for No. 52, require mounting the unit with the lens to the left (when facing the unit).

#### Adjustment

The curtain coverage can be adjusted 10° left or right by sliding the printed circuit board against the graduated scale. Vertical adjustment of ±15° is provided by rotating the lens (applicable for lens No. 52 and 56 only). In other regards, the SRN-2000H is virtually identical to the SRN-2020.

### 3.4 SRN-2000R Ceiling Mounted PIR

The SRN-2000R is a ceiling mounted PIR.

Fitted with lens No. 55, the unit produces four finger curtains projected from the ceiling, down to the floor.

When mounted at the height of 3 m (10 ft), the unit provides a pattern of 3 x 9 m (10 x 30 ft). The maximum recommended mounting height is 6 m (20 ft) providing a floor coverage area of 6 x 18 m (20 x 60 ft) maximum.

In all other regards, the SRN-2000R is virtually identical with the SRN-2000H.

### 3.5 Changing Lenses

To change or adjust a lens, release and remove lens retainers located on both sides of the lens by pushing them from the inner side of cover until it edges protrude equally at both sides. Holding the lens firmly in place, insert the lens retainers from the front holding the lens number in the upper right corner.

From inside the cover, carefully center the lens by sliding it right or left, until it edges protrude equally at both sides.

Holding the lens firmly in place, insert the lens retainers from the front (ridges pointed outward) and firmly push them into place until a click is heard (Fig. 8).

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**Figure 7. Lens Retainer Removal**

**Figure 8. Locking the Lens in Place**

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**Figure 9. Flush mounting bracket SRF-201**

#### 4. INSTALLATION

### 4.1. Selecting the Mounting Location

A SUPER RED passive infrared detector can be mounted directly onto the wall (surface mounted), or in a corner. It may also be flush mounted, using optional flush mounting bracket SRF-201 (Fig. 9). Always mount the unit on a firm and stable surface.

**A.** Select the mounting location so that the expected motion of an intruder will cross the beams of the coverage pattern provided by the lens in actual use.

It is recommended to aim the PIR detector toward the coolest place in the protected area, in order to obtain the maximum sensitivity where high ambient temperatures are expected.

**B.** Select the most convenient mounting height.

You may mount the unit anywhere from ground level up to 5 m (17 ft). An accurate adjustment table determines the recommended angle for any combination of range and mounting height (see Table 1). Take into account that installations at increased height result in larger blind areas close to the detector.
C. Where a single-layer pattern has been selected because pets are present, it is recommended that the detector be installed at the smallest possible height allowing the beams to be directed above the level of the pet's activity.

D. SUPER RED units are extremely immune to air turbulence and RF interference. However, to minimize false alarms, it is highly recommended to avoid aiming the detector at heaters, sources of bright light, or windows subjected to direct sunlight. Also avoid running wiring close to high power electrical cables.

4.2 Mounting
A. To remove the cover, insert a small screwdriver into the slot on top of the unit and press down lightly. The cover, equipped with the lens, hinges outward and removes easily (Fig. 10).

B. Mount the base (equipped with the printed circuit board) in the location and height selected for optimum coverage. For surface mounting use the two knockout holes at the back of the base; for corner mounting, use the knockouts on the angled sides. The unit must be fastened tightly to the mounting surface to avoid vibrations.

C. Insert the legs located at the bottom of the base into their respective slots in the bottom of the cover and close by exerting slight upward pressure (Fig. 11).

4.3 Wiring
A. For wiring the system use #22 AWG or larger wires. Maximum wiring length between the unit and its power source depends on the number of units connected in parallel and the wire gauge. The following table provides the maximum wiring length for a single unit, using different gauge wires.

<table>
<thead>
<tr>
<th>Wiring Gauge</th>
<th>22</th>
<th>20</th>
<th>18</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring length (ft)</td>
<td>750</td>
<td>1100</td>
<td>1800</td>
<td>3000</td>
</tr>
<tr>
<td>Wiring length (m)</td>
<td>230</td>
<td>330</td>
<td>550</td>
<td>900</td>
</tr>
</tbody>
</table>

If two or more units are connected in parallel, the maximum wiring length described in the table should be divided by the number of units.

B. To route the wires into the sensor use either the wiring knockouts or one of the lower mounting holes.

C. Make no splices within the unit and avoid contact between uninsulated conductors and the printed circuit board.

D. Connect wires to terminal block in the following order (Fig. 12):
   - Connect Tamper N.C. terminals to a normally closed 24-hour protection zone of the control panel. Tamper contact will open when cover is removed.
   - Connect the Relay N.C. terminals to a normally closed burglar protection zone of the control panel. Relay contacts will open upon detection of motion or during power loss. The relay contacts are rated at 100 mA, 30 VDC maximum (resistive load only). An 18-ohm resistor is internally connected in series with the relay contacts.
   - Connect the 12VDC (+) and (-) terminals to a 9 - 16 Volt DC power source and check for correct polarity. The power source should have a back-up battery that is capable of supplying power for at least four hours of operation, during power failure. Current drain of each sensor is approximately 17 mA.
   - Seal all openings in the base with tape or RTV to prevent insects from entering the unit.

4.4 Adjusting the Coverage Area
SUPER-RED provides you with the most powerful tools for quick, easy and accurate pattern adjustments.

The coverage-range control adjustment, LED selector, horizontal adjustment, vertical calibrated scale adjustment, vertical adjustment table and beam masking material are all unique features which enable precise pattern positioning, both vertically and horizontally.

LED selector
The LED selector consists of a pin header and jumper to switch the walk-test LED either ON or OFF.

Horizontal Adjustment
The SUPER-RED coverage pattern can be adjusted horizontally approximately ± 15° by rotating the lens to the left or right. To adjust the lens, remove the lens-retainers, rotate the lens carefully to the desired position and lock the lens.

Vertical Adjusting Scale
The vertical adjustment scale (printed on left side of the P.C. board) and the plastic pointer on the base indicate (in degrees) the vertical angle between the upper layer of the coverage pattern and the horizontal line of the unit.

Table 1 gives the optimum scale adjustment for various combinations of mounting height and coverage range (indicated in feet and meters). The scale enables pattern adjustment from +10° upward to -20° downward, according to the installation height and the required coverage range. All SUPER-RED sensors are shipped from our factory pre-set to -5° (downward). To change the vertical-pattern adjustment, loosen the screw which fastens the printed circuit board to the base, slide the P.C. board up/down to the desired angle and tighten the screw.

Table 1 - Vertical Adjustment Scale

<table>
<thead>
<tr>
<th>Mounting Height (m)</th>
<th>Coverage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Coverage</td>
</tr>
<tr>
<td></td>
<td>Range</td>
</tr>
<tr>
<td>2</td>
<td>± 20°</td>
</tr>
<tr>
<td>3</td>
<td>± 15°</td>
</tr>
<tr>
<td>4</td>
<td>± 10°</td>
</tr>
<tr>
<td>5</td>
<td>± 5°</td>
</tr>
</tbody>
</table>

Example: If you require coverage range of 43 ft (13 m) and wish to install the sensor at a height of 6 ft (1.8 m) from the ground, set the Vertical Adjustment Scale to -5°.

Coverage-Range Control Adjustment
The potentiometer - marked "RANGE" on the P.C. board - should be set according to the actual room size, relative to the lens's range coverage specification.

For example, if you are using lens No. 100, which is specified for 18 m (60 ft) in a 9 m (30 ft) room, set the range control to 1/2 (9/18 = 1/2). In installations requiring maximum detection sensitivity or when hot ambient temperatures are expected, it is recommended that the range control potentiometer be set to maximum.

Beam Masking Material
A special beam-masking material supplied with each SUPER-RED sensor can be used to mask individual segments in the lens array which are exposed to potential sources of false alarm (heaters, blowers, pets, etc).
The material is transparent to visible light but blocks any infrared energy. To block individual beam(s), locate the corresponding segment(s) in the array. Cut the masking material to the exact dimensions of the segment(s) to be blocked, remove the backing paper and apply the masking material accurately to the inside (smooth) surface of the appropriate segment(s). In some cases, more than one layer of the lens masking material may be required to completely block the infrared energy.

4.5 Setting the Pulse Counter

Several models of the SRN-2000 series are equipped with a programmable pulse counter which can be set to count 1, 2, or 3 pulses, before activating the alarm relay. To set the pulse counter, set the jumpers as desired (1, 2 or 3).

3 Pulses: This setting provides the maximum protection against false alarms caused by all types of environmental disturbances. Three pulses may be selected for all applications where wide-angle, multi-beam lenses are used - such as illustrated in Sections 1, 2, 3, 6 and 7 of the SUPER-RED Lens Library (except lens No. 53). When the pulse counter is set to 3, no alarm will be triggered unless the unit registers three pulses consecutively. In this case, the alarm will activate an immediate alarm. This feature enables convenient walk-testing of each beam in the coverage pattern - exactly as for a unit without a pulse counter. Two minutes after the end of walk-testing, the pulse counter returns automatically to its original setting and is ready for a new counting sequence.

4.6 Final Testing

A. Apply 12 VDC power and allow five minutes for the unit to stabilize before testing.
B. Adjust the vertical-pattern angle according to Table 1.
C. Set the LED selector to ON and replace the cover.
D. Set the pulse counter (SRN-2000) according to Section 4.5.
E. Walk-test the entire protected area by walking slowly across the coverage-pattern beam(s) while observing the LED. The LED lights up whenever you cross a protective beam. Allow two seconds between each test for the unit to re-stabilize.
F. MASK beams which face potential sources of false alarms (see Section 4.4).
G. If desired, disable the LED by setting LED selector to OFF.

4.7 Test Point (T.P.)

The test point T.P. terminal provides a good means for analyzing the sensor in the event of an environmental problem or suspicion of a faulty sensor. Using a DC voltmeter (20k ohms per Volt), connect its positive lead to the T.P. terminal and the negative lead to the (--) VDC terminal. See Figure 12.

For easy testing, temporarily connect two wires to these terminals and route them out of the unit. The meter can then be connected to the wires. Set the meter to 5 VDC range and completely cover the lens area using a piece of cardboard so that motion cannot be detected. The meter should indicate approximately 2.0 VDC. If the meter indicates more than 2.3 VDC or less than 1.7 VDC, the unit should be replaced.

Uncover the lens and allow the meter to stabilize; do not move. Any motion into or out of a detection beam or an environmental disturbance which affects the PIR will cause the meter to deflect above or below the 2.0 volt level. Meter variations of more than ±1 volt (i.e. above 3.0 volt or below 1.0 volt), will trigger an alarm.

4.8 Maintenance

The proper operation, range and the coverage pattern of the unit should be checked at least once a year according to Section 4.6 “Final Testing.” To assure proper continuous operation, the end user should be instructed to walk through the entire coverage pattern and to assure an alarm output, each time before the alarm system is armed.

WARRANTY

Visonic Ltd. (the “Manufacturer”) warrants this product only to the person who purchases it as the original Purchaser (the “Purchaser”) against defective workmanship and materials under normal use of the Product for a period of twelve (12) months from the date of shipment by the Manufacturer. This Warranty is absolutely conditional upon the Product having been properly installed, maintained and operated under conditions of normal use in accordance with the Manufacturers recommended installation and operating instructions, each of which have become a part of this Warranty by any other reason, according to the Manufacturers discretion, such as improper installation, failure to follow recommended installation and operating instructions, defects, willful damage, misuse or vandalism, accidental damage, alteration or tempering, or repair by anyone other than the manufacturer, are not covered by this Warranty.

The Manufacturer does not represent that this Product may not be compromised and/or circumvented or that the Product will prevent any death and/or personal injury and/or damage to property resulting from burglary, robbery, fire, or vandalism, or that the Product will in all cases provide adequate warning or protection. The Product, properly installed and maintained, only reduces the risk of such events without warning and it is not a guarantee or insurance that such events will not occur.

This Warranty is EXCLUSIVE AND EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS OR LIABILITIES. WHETHER WRITTEN, ORAL, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE.

In no case shall the Manufacturer be liable to any person for any consequential or incidental damages for breach of this Warranty or any other warranties whatsoever, as aforesaid.

The Manufacturer shall, in no event be liable for any special, indirect, incidental, consequential or punitive damages or for loss, damage, or expense, including loss of use, profits, revenue, or goodwill, directly or indirectly arising from purchase, installation or use of the Product, or to use the Product, or to loss or destruction of other property or from any other cause, even if Manufacturer has been advised of the possibility of such damages.

The Manufacturer shall have no liability for any death, personal and/or bodily injury, loss of property or other loss whether direct, indirect, incidental, consequential or otherwise. Based on a claim that the Product failed to function.

However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty, the Manufacturer’s maximum liability (if any) shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.

When accepting the delivery of the Product, the Purchaser agrees to the said conditions of sale and warranty and acknowledges having been informed of.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so these limitations may not apply under certain circumstances.

The Manufacturer shall be under no liability whatsoever arising out of the corruption and/or malfunctioning of any telecommunication or electronic equipment or any programs.

The Manufacturers obligations under this Warranty are limited solely to repair and/or replace at the Manufacturer’s discretion any Part or part thereof that may prove defective. Any repair and/or replacement shall not extend the original Warranty period. The Manufacturer shall not be responsible for dismantling and/or reinstallation costs. To exercise this Warranty the Product must be returned to the Manufacturer freight pre-paid and insured. All freight and insurance costs are the responsibility of the Purchaser and are not included in this Warranty.

This Warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by the warranty of the Manufacturer of said products, and the Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to problems with said products, or attachments of others, including batteries, used in conjunction with the Products. This Warranty is exclusive to the original Purchaser and is not assignable.

This Warranty is in addition to and does not affect your legal rights. Any provision in this warranty which is contrary to the Law in the state or country where the Product is supplied shall not apply.

Warning: The user must follow the Manufacturer’s installation and operational instructions including testing the Product and its wiring system at least once a week and to take all necessary precautions for his/her safety and the protection of his/her property.