

# GB-501 PG2

Wireless PowerG Two-way Glass-break Detector



# Visonic®

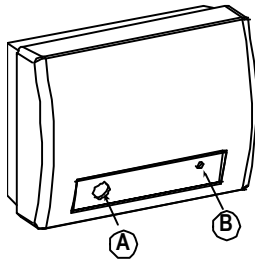
## Installation Instructions

## 1. INTRODUCTION

The GB-501 PG2 is a wireless PowerG Two-way Glass-break detector designed to detect the breaking of framed glass mounted in an outside wall.

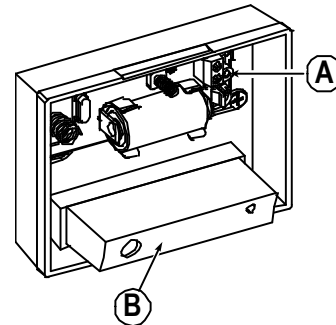
The GB-501 PG2 combines two modules:

- The Sentrol Inc. ShatterPro™ acoustic sensor with Pattern Recognition Technology™ (Protected under U.S. Patent 5,192,931)
- The Visonic Ltd. MC-302 PG2 transmitter



- A. Microphone  
B. Detection indicator

Figure 1. General View



- A. PowerG transmitter module  
B. Acoustic sensor module

Figure 2. Module Identification

### 1.1 Acoustic Sensor

The acoustic sensor module of the GB-501 PG2 is omni-directional, providing 360° coverage. Coverage is measured from the sensor to the point on the glass farthest from the sensor (see Fig. 3). The sensor can be mounted as close as 1 m (3.3 ft) from the glass.

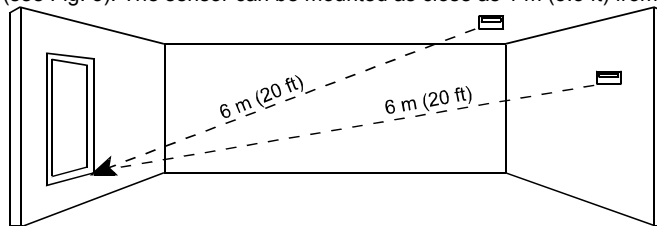


Figure 3. Typical Range Measurement

When mounted on opposite wall or adjoining walls, the range is 6 m (20 ft) for plate, tempered, laminated and wired glass.

When mounted on the ceiling, the maximum range is 6 m (20 ft) for plate, tempered, laminated and wired glass

For armor-coated glass, mount the sensor no more than 3.65 m (12 ft) from the glass.

### 1.2 PowerG Transmitter

The acoustic sensor shares its housing with a miniature transmitter using PowerG 2-way communications protocol.

Upon alarm (glass break detection), a digital message is transmitted, composed of the PowerG ID followed by various status and message-type markers. Alarm and other data are thus forwarded to the wireless alarm control panel.

The GB-501 PG2 is protected by a front tamper switch and back tamper switch that is activated when the cover is removed or when the base is forcibly detached from the wall. In a tamper situation, a message is transmitted with the "tamper alert" marker ON.

A periodic supervision message, distinguished by a specific marker, is transmitted automatically. The wireless control panel is thus informed, at regular intervals, of the sensor's active participation in the system.

A red LED mounted on the transmitter PCB (visible only when the cover is off) lights whenever alarm or tamper events are reported. The LED does not light while a supervision message is being transmitted.

## 2. INSTALLATION

### 2.1 Optimizing Detection and Avoiding False Alarms

For best detection, avoid installing in:

- Rooms with lined, insulating, or sound deadening drapes.
- Rooms with closed wooden window shutters inside.

For best false alarm immunity:

- Avoid 24-hour loop applications (perimeter loop OK).
- Don't use where white noise, such as air compressor noise, is present (a blast of compressed air may cause a false alarm).
- Avoid rooms smaller than 3 x 3 m (10 x 10 ft) and rooms with multiple noise sources such as small kitchens, glass booths noisy areas, garages, small bathrooms, etc.

### Areas to avoid:

- Glass airlocks and glass vestibule areas
- Noisy kitchens
- Residential car garages
- Small utility rooms
- Stairwells
- Small bathrooms
- Other small acoustically live rooms. For glass break protection in such applications, use shock sensors on the windows or window frames.

**Do Not Install In Humid Rooms** The Wireless GB-501 PG2 is not hermetically sealed. Excess moisture on the circuit board can eventually cause a short and a false alarm.

**Avoid 24-Hour Loop Applications** The GB-501 PG2 is recommended for perimeter loops and is designed to function in occupied area. In 24-hour loop applications, where the sensor is armed all day and all night, the false alarm prevention technology will be pushed to its limit. Some sounds can duplicate the glass break pattern the acoustic sensor detects.

Install the GB-501 PG2 on a perimeter loop which is armed whenever the door and window contacts are armed.

### Protecting Occupied Areas

The false alarm immunity is best in rooms with only moderate noise. For 24-hour occupied area protection, use shock sensors.

### Proper Testing

The GB-501 PG2 is designed to detect the breaking of framed glass mounted in an outside wall. Testing the sensor with unframed glass, broken bottles, etc., may not trip the sensor. The sensor typically does not trip to glass breaking in the middle of the room. No burglar breaks glass in the middle of a room, so such "breaks" are false alarms.

**NOTE:** GB-501 PG2 may not consistently detect cracks in glass, or bullets which break through the glass. Glass-break sensors should always be backed up by interior protection.

For best false alarm immunity the sensor should be located at least 1.2 m (4 ft) away from noise sources (televisions, speakers, sinks, doors, etc.). The sensor must always be in direct line of sight of all protected windows. It cannot consistently detect glass breaking around corners, in other rooms, etc. Front or back, up or down orientation is not necessary.

## 2.2 Sound Travel Considerations

Since the sound of breaking glass travels directionally out from the broken window, the best location for mounting the sensor is on the opposite wall - assuming the glass to be protected is within the sensor's range and line of sight. The ceiling and adjoining (side) walls are also good sensor locations. A ceiling mounted sensor will have better detection if positioned 2 - 3 m (6 - 10 ft) away from the protected glass into the room.

As with all glass-break sensors, detection is reduced with same-wall mounting, since such detection is partially dependent on glass break sound reflecting off the opposite wall. Test the range with a Sentrol 5709C unit held flat against the glass. There may be a reduction in range, depending on room acoustics.

## 2.3 Preparing the Unit

1. Use a screwdriver to separate the cover from the base, as shown in Figure 4.

You will find inside a nylon bag with the battery, two masonry anchors (wall plugs) and two mounting screws.

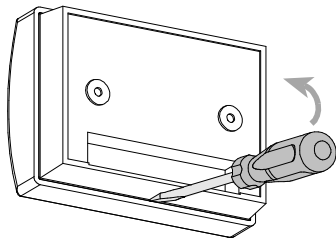
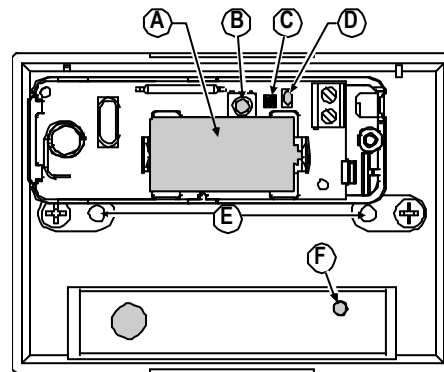


Figure 4. Opening the Unit

2. Get to know the items indicated in Fig. 5 - they are all relevant to the steps you will have to take in the course of installation.



- |                  |                       |                        |
|------------------|-----------------------|------------------------|
| A. Battery       | C. Transmit Indicator | E. Mounting holes      |
| B. Tamper switch | D. Enroll button      | F. Detection indicator |

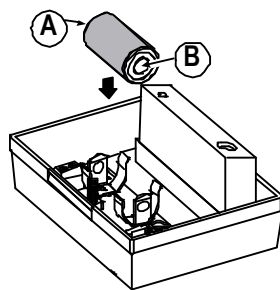
Figure 5. Inside View

3. Insert the battery into the battery clips, as shown in Figures 6 and 7.

**Observe Polarity!**

### Caution!

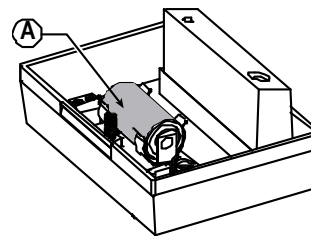
Risk of explosion if battery is replaced by an incorrect type. Dispose of used battery according to manufacturer's instructions.



- A. Negative terminal  
B. Positive terminal

Figure 6. Battery Insertion

Use only Lithium CR-123 type battery, Panasonic, Sanyo or GP.



- A. Properly seated battery

Figure 7. Battery in Place

- Click the front tamper switch once and release it to reset the transmitter at power up.

**Note:** Since the cover is removed and power is applied, a tamper situation exists.

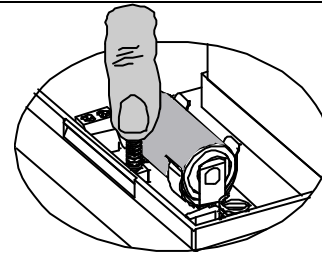
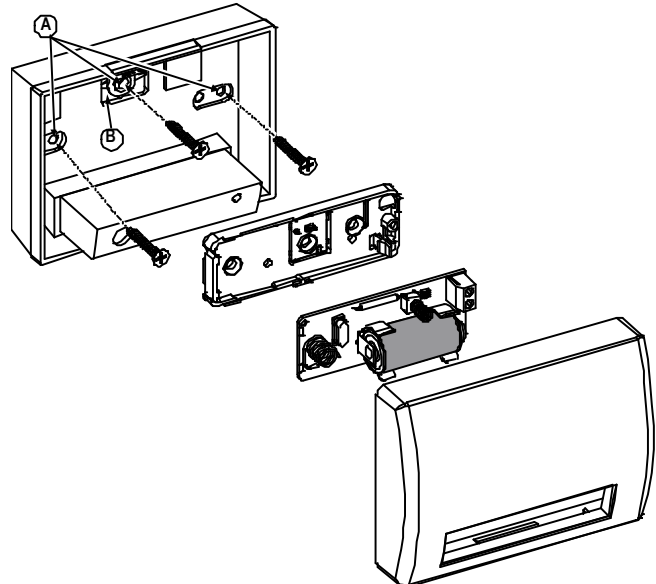


Figure 8. Resetting the Unit

**Attention!** The GB-501 PG2 has a back tamper switch under the PCB. As long as the PCB is seated firmly within the base, the switch lever will be pressed against a special break-away base segment that is loosely connected to the base (Figure 9). Be sure to fasten the break-away segment to the wall. If the detector unit is forcibly removed from the wall, this segment will break away from the base, causing the tamper switch to open!



A. Mounting holes B. Break-away base segment

Figure 9. GB-501 PG2 Internal View

## 2.4. ENROLLMENT

Refer to the PowerMaster panel's Installer Guide and follow the procedure under the "02:ZONES/DEVICES" option of the Installer Menu. A general description of the procedure is provided in the following flow chart.

Step 1	Step 2	Step 3	Step 4	Step 5
Enter the Installer menu and select "02:ZONES/DEVICES"	Select "ADD NEW DEVICE" Option See Note	Enroll the device or Enter the device ID	Select the desired Zone Number	Configure Location & Zone Type Parameters
02.ZONES/DEVICES	⇒ ADD NEW DEVICES	⇒ ENROLL NOW or ENTR ID:XXX-XXXX	⇒ Z04:Glass Break ID No. 160-XXXX	⇒ Z06.LOCATION Z06.ZONE TYPE
⇒ means scroll → and select OK				

## 3. LOCAL DIAGNOSTICS TEST

Before testing, separate the base from the cover (see Figure 4).

- Press the tamper switch once and release it.
- After 2 seconds the transmit indicator blinks 3 times.

The following table indicates received signal strength indication.

LED response	Reception
Green LED blinks	Strong
Orange LED blinks	Good
Red LED blinks	Poor
No blinks	No communication

**IMPORTANT!** Reliable reception must be assured. Therefore, "poor" signal strength is not acceptable. If you receive a "poor" signal from the device, re-locate it and re-test until a "good" or "strong" signal strength is received.

**Note:** For detailed Diagnostics Test instructions refer to the control panel Installer Guide.

## 4. TESTING PROCEDURES

### 4.1 How Does the Test Mode Works

The Pattern Recognition Technology™ of the GB-501 PG2, ignores most false alarm sounds, including glass-break testers. In order to test the GB-501 PG2, a test mode is used. With the sensor in the test mode, processing of the glass-break pattern in the upper and lower frequencies is disabled. The GB-501 PG2 is then sensitive only to the mid-range frequencies which the Sentrol 5709C hand-held tester reproduces. It's the mid-range frequencies that determine sensor coverage.

IN THE NORMAL MODE THE DETECTION LED FLASHES BRIEFLY UPON RECEIVING A LOUD SOUND. WHEN IN THE NORMAL MODE, THE GB-501 PG2 WILL NOT TRIP TO THE TESTER'S SIGNAL, UNLESS THE TESTER IS HELD NEXT TO THE SENSOR.

**NOTE:** Each time the sensor alarms it also goes into the TEST mode for one minute.

### 4.2 Switching the Sensor to the Test Mode

Use the Sentrol 5709C or the Intellisense FG701 hand-held tester to switch the sensor into the test mode. Set the tester to tempered glass, hold the tester speaker directly on top of the sensor and activate the tester. The sensor will alarm, then it will go into test mode for one minute. When in test mode the LED on the sensor will flash continuously. Prolong the test session by firing the tester at the sensor at least once a minute.

### 4.3 Testing the Sensor (see Figure 10).

- A. Holding the tester near the surface of the glass, aim the tester at the GB-501 PG2 and press the test button. If drapes or blinds are present, test with the hand-held tester behind the closed drapes or blinds (do not install the sensor where heavy or lined drapes are used). If the sensor is mounted on the same wall, point the tester at the opposite wall.

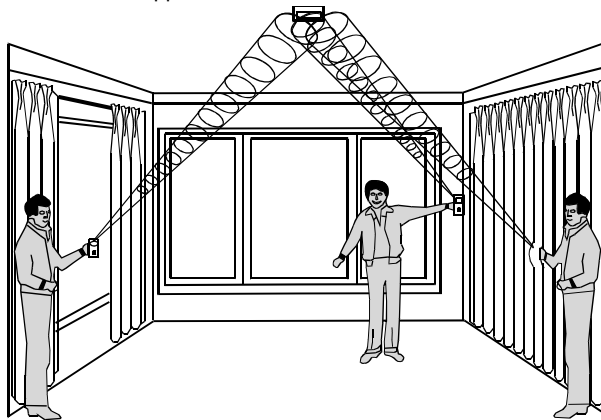


Figure 10. Testing the GB-501 PG2

- B. The tester has a different setting for each type of glass. It should always be set for tempered or laminated glass (either is correct and both have the same range) unless you are certain that all the protected glass is plate glass.
- C. When the LED on the sensor goes solid momentarily while the tester is triggered, the glass is within detection range.
- D. If the LED does not go solid, but continues flashing as before, re-position the sensor closer to the protected windows and retest. This may require adding sensors in order to achieve adequate coverage. It is very rare that the sensor will not activate within its stated range of coverage. Double check adequate battery strength in the hand-held tester. A new tester battery will likely **restore the range**.

**Note:** The sensor will automatically change from test mode to normal mode approximately one minute after the last signal received from the hand-held tester.

**IMPORTANT!** Room acoustics can artificially extend the range of a glass-break sensor. The specified range of the GB-501 PG2 has been established for worst-case conditions. While the sensor is likely to function at additional range, it may miss a "minimum output" break, or room acoustics may be changed at some future time, restoring sensor coverage back to the normal range of 6 m (20 ft). Do not exceed the rated range of the sensor, regardless of what the tester shows.

### 4.4 Hand Clap Test

The GB-501 PG2 can be checked by the installer or end user while in normal mode, simply by clapping hands loudly under the sensor. The LED will flash twice, but the sensor will not trip. This verifies visually that there is power to the sensor, and that the microphone and circuit board are functioning.

The hand clap activation is only momentary, so there is no appreciable effect on battery life.

#### INSTALLATION TIPS

- A. The GB-501 PG2 is designed to detect the shattering of framed glass mounted in an outside wall. "Testing" the sensor with unframed glass, broken bottles, etc. may not trip the sensor. The GB-501 PG2 typically does not trip to glass break tests in the middle of a room as such breaks are false alarms.
- B. False alarms are most likely to occur when installed on a 24-hour loop in glass airlocks and glass vestibule areas, when mounted above sinks, when used in residential car garages and in other small, acoustically live rooms and rooms where multiple sounds can reflect and eventually duplicate the glass break frequency pattern. For occupied area glass break protection in such applications, use shock sensors.
- C. Installing the GB-501 PG2 on 24-hour loops will increase false alarms. The GB-501 PG2 is recommended for perimeter loops and is designed to function without false alarms in occupied areas. On a 24-hour loop, which is armed all day/all night every day, the false alarm technology will be pushed to its limit since some sounds in some conditions can duplicate the points on the glass break pattern that the GB-501 PG2 detects. Install the GB-501 PG2 on a perimeter loop, which is armed whenever the door and window contacts are armed. For occupied area installations, GB-501 PG2 false alarm immunity is best in rooms with only moderate noise.
- D. GB-501 PG2 detects the shattering of glass. Like all glass-break sensors, it may not consistently detect cracks in glass, or bullets that break through the glass or break out the glass. Glass-break sensors should always be backed up by interior protection.

## 5. MISCELLANEOUS COMMENTS

Visonic Ltd. wireless systems are very reliable and are tested to high standards. However, due to low transmitting power and limited range (required by FCC and other regulatory authorities), there are some limitations to be considered:

- A. Receivers may be blocked by radio signals occurring on or near their operating frequencies, regardless of the digital code used.
- B. A receiver responds only to one transmitted signal at a time.
- C. Wireless devices should be tested regularly to determine whether there are sources of interference and to protect against faults.

**The user is cautioned that changes or modifications to the unit, not expressly approved by Visonic Ltd., could void the user's FCC or other authority to operate the equipment.**

The digital circuitry of this device 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 residential installations. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause such interference, which can be verified by turning the device off and on, the user is encouraged to eliminate the interference by one or more of the following measures:

- Re-orient or re-locate the receiving antenna.
- Increase the distance between the device and the receiver.
- Connect the device to an outlet on a circuit different from the one which supplies power to the receiver.
- Consult the dealer or an experienced radio/TV technician

### **IC statement:**

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### **WARNING!**

To comply with FCC and IC RF exposure compliance requirements, the device should be located at a distance of at least 20 cm from all persons during normal operation. The antennas used for this product must not be co-located or operated in conjunction with any other antenna or transmitter.

## APPENDIX: SPECIFICATIONS

### **POWERG TRANSMITTER SECTION**

**Frequency Band (MHz)**  
**Communication Protocol**  
**Supervision**  
**Tamper Alert**

**Europe and rest of world:** 433-434, 868-869 **USA:** 912-919

PowerG  
Signaling at 4-min. intervals  
Reported when a tamper event occurs

### **POWER SUPPLY**

**Power Supply**  
**Nominal Battery Capacity**  
**Battery Life Expectancy**  
**Battery Supervision**

3 V Lithium CR-123 type battery, Panasonic, Sanyo or GP only.  
1.45 Ah  
4 years (for typical use)  
Automatic transmission of battery condition data as part of periodic status report

### **ACOUSTIC SENSOR SECTION**

**Microphone**  
**Alarm Duration**  
**RF Immunity**  
**Temperature Range**  
**Recommended Glass Size:**

Omni-directional electret  
4 seconds  
20 V/m, 1 MHz to 1000 MHz  
-10°C to 50°C (14°F to 120°F)

### **Operating Temperature**

Minimum – 0.3 x 0.6 m (1 x 2') or larger glass thickness  
Plate – 2.4 to 6.4 mm (3/32" to 1/4")  
Tempered – 3.2 to 6.4 mm (1/8" to 1/4")  
Wired – 6.4 mm (1/4")  
Laminated – 3.2 to 6.4 mm (1/8" to 1/4")  
0°C to 49°C (32°F to 120°F)

### **PHYSICAL**

**Dimensions**  
**Weight (not including battery)**  
**Housing Material and Color**  
**Compliance with Standards**

80 x 108 x 43 mm (3.13 x 4.24 x 1.70 in.).  
130 g (4.6 oz)  
Flame retardant ABS, white  
**Europe (CE):** EN 300220, EN 301489, EN 60950, EN50130-4, EN50130-5, EN 50131-2-2, EN 50131-6, EN 50131-1 Grade 2 Class 2  
**USA:** CFR 47 Part 15 (FCC)  
**Canada:** RSS 210

## WARRANTY

Visonic Limited (the "Manufacturer") warrants this product only (the "Product") to the original purchaser only (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 operation instructions. Products which have become defective for any other reason, according to the Manufacturers discretion, such as improper installation, failure to follow recommended installation and operational instructions, neglect, willful damage, misuse or vandalism, accidental damage, alteration or tampering, 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 otherwise, 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 ANYONE 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 PURCHASER'S USE OR INABILITY TO USE THE PRODUCT, OR FOR LOSS OR DESTRUCTION OF OTHER PROPERTY OR FROM ANY OTHER CAUSE, EVEN IF MANUFACTURER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.**

**THE MANUFACTURER SHALL HAVE NO LIABILITY FOR ANY DEATH, PERSONAL AND/OR BODILY INJURY AND/OR DAMAGE TO 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 he recognizes 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 Product 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 their own warranty, if any. 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 products, accessories, 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 whole system at least once a week and to take all necessary precautions for his/her safety and the protection of his/her property.

1/08

The technical documentation as required by the European Conformity Assessment procedure is kept at:

UNIT 6 MADINGLEY COURT CHIPPENHAM DRIVE KINGSTON MILTON KEYNES MK10 0BZ. Telephone number: 0870 7300800, Fax number: 0870 7300801



### W.E.E.E. Product Recycling Declaration

For information regarding the recycling of this product you must contact the company from which you originally purchased it. If you are discarding this product and not returning it for repair then you must ensure that it is returned as identified by your supplier. This product is not to be thrown away with everyday waste. Directive 2002/96/EC Waste Electrical and Electronic Equipment.



VISONIC LTD. (ISRAEL): P.O.B 22020 TEL-AVIV 61220 ISRAEL. PHONE: (972-3) 645-6789, FAX: (972-3) 645-6788  
VISONIC INC. (U.S.A.): 65 WEST DUDLEY TOWN ROAD, BLOOMFIELD CT. 06002-1376. PHONE: (860) 243-0833, (800) 223-0020.  
FAX: (860) 242-8094

VISONIC LTD. (UK): UNIT 6 MADINGLEY COURT CHIPPENHAM DRIVE KINGSTON MILTON KEYNES MK10 0BZ. TEL: (0870) 7300800  
FAX: (0870) 7300801. TEL: (0870) 7300800 FAX: (0870) 7300801 **PRODUCT SUPPORT: (0870) 7300830**

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