

PATROLⁱ - USM

COMBINED ULTRASONIC & MW INTRUSION DETECTOR

DETECTS BREAKAGE,
INTRUSION AND MOTION
WITHIN PROTECTED AREA

INSTRUCTION MANUALS



GSN Electronic Company Ltd.

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PATROL-USM combined ultrasonic & microwave detector determines destruction of walls, doors, all types of glass and intrusion into the protected area.

PATROL-USM with anti-mask technology detects any of the ultrasonic sensors' masking attempts.

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FEATURES

- UNPRECEDENTED PREMISES PROTECTION
- STABLE OPERATION IN A WIDE-RANGING TEMPERATURE ENVIRONMENT
- INNOVATIVE METHOD FOR DETECTING ULTRASONIC AND MW SIGNALS
- DIGITAL SPECTRAL ANALYSIS OF ULTRASONIC AND MW FREQUENCIES
- PULSE-COUNT SELECTION (1-5)
- SEPARATE ADJUSTMENT FOR BOTH ULTRASONIC AND MW CHANNEL SENSITIVITY
- BUILT-IN ANTI-MASK SYSTEM
- HIGH RFI/EMI PROTECTION
- TAMPER PROTECTION
- AUTOMATIC GAIN CONTROL . ADAPTATION TO ENVIRONMENTAL CHANGES

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ALGORITHM

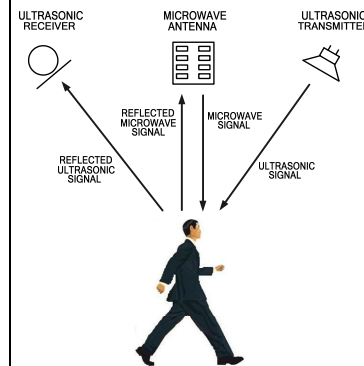
Dual-technology detector incorporates two physical means for determining destruction of walls, doors, all types of glass and intrusion into the protected area: registering the change in frequency of ultrasonic and microwave signals (Doppler Effect).

1. The Doppler Effect occurs when ultrasonic waves, emitted continuously by the detector, change their length and frequency when reflecting from different moving objects.
2. The Doppler Effect occurs when microwaves, emitted by the detector, change their length and frequency when reflecting from different moving objects.

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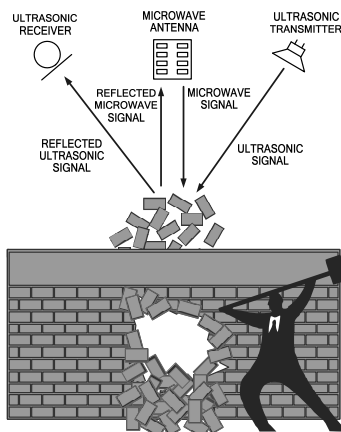
3. To activate the alarm, both ultrasonic and microwave signals must be successively sensed within a pre-determined time period.

Figure 1
Human Motion Detection



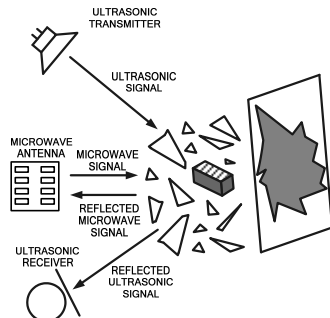
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Figure 2
Wall Breakage Detection



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Figure 3
Glass Breakage Detection



DETECTOR INSTALLATION

1. Fix the detector vertically on solid, flat wall surface.

The installation height is
2 . 2.5 meters.

For corner installation, use knockouts located on the sloping part of the detector base.

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For wiring, use the designated opening above the detector terminal block.

2. Connect the wires in accordance with the scheme.



NOTE!

Several detectors of this type can be installed within the protected area, at a distance of at least 3 meters from each other.

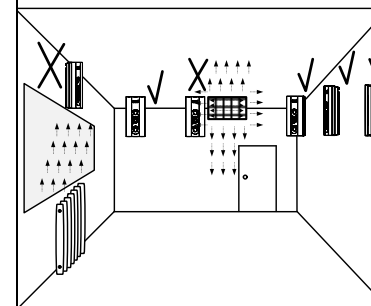
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INSTALLATION LIMITATIONS

- Do not install the detector on unstable or vibrating surfaces.
- Do not install the detector close to curtains, blinds or other items that vibrate with air movement.
- Do not install the detector close to air conditioners, air blast sources or above heat sources.
- Do not install the detector or route power wires and alarm loops next to high voltage cables
- Do not install the detector near bells, sirens or electronic sounders within the premises where sound-pressure level exceeds 75dB.

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DETECTOR INSTALLATION OPTIONS



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DETECTOR TESTING AND ADJUSTMENT

1. Remove the front cover.
2. Set jumper **W2** to "**US TEST**" position.
3. Connect the power.
4. Test the ultrasonic channel operation.
 - First of all, make sure there are no humans or animals within the protected area, windows are closed; air-conditioners, fans and other possible sources of air flow are switched off.
 - Walk into the detector field-of-view. The green LED should actively respond to your movement.

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If needed, increase the detector ultrasonic channel sensitivity using **W4** jumper (**Ultrasonic Sensitivity**).

- Stay for a while to make sure the green LED stops blinking, which means the detector ultrasonic channel is configured correctly! If the green LED keeps blinking, check the premises without interferences, as described above.

If necessary, reduce the excessive ultrasonic channel sensitivity using **W4** jumper (**Ultrasonic Sensitivity**).

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5. Test the microwave (MW) channel operation.

- Set jumper **W2** to "**MW TEST**" position.
- Walk into the detector field-of-view. The yellow LED should actively respond to your movement. If necessary, increase the detector microwave channel sensitivity, using **R11** potentiometer (**Microwave Sensitivity**).
- Stay for a while to make sure the yellow LED stops blinking, which means the detector microwave (MW) channel is configured correctly! If the yellow LED keeps blinking, reduce the excessive MW channel sensitivity using the **R11** potentiometer (**Microwave Sensitivity**).

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6. Replace jumper **W2** to "**WORK**" position.
7. Select the required number of pulses (1-5).

Selectable pulse count 1, 2, 3, 4 or 5 provides users with the option of optimizing detector sensitivity to suit the environment, thus retaining reliable performance at all times.

To adjust pulse count for specific operating environments:

- A. Remove the **W3** jumper. The red LED blinks, indicating that pulse counting has begun.
- B. Replace jumper **W3** during pause between LED blinking.
 - To operate the detector without light indication, remove the **W1 (LED)** jumper.

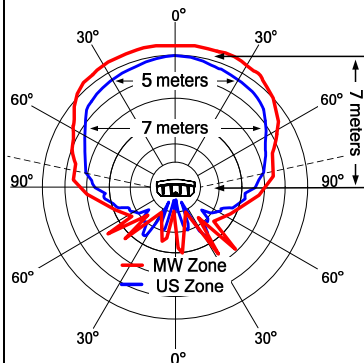
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8. Replace the cover - red LED will blink. At the same time, keep the detector field-of-view clear, until the LED stops blinking. The anti-masking function will then be correctly activated.

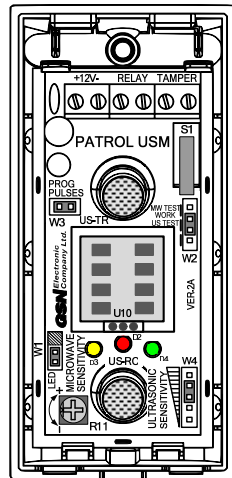
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PATROL-USM DETECTION ZONE

TOP VIEW



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- W2 . Operating mode setting
- W3 . Pulse programming jumper
- W4 . Ultrasonic channel sensitivity adjustment
- R11 . MW channel sensitivity adjustment

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TECHNICAL SPECIFICATIONS

- Input voltage:.....9 - 16Vdc
- Current consumption
 - In standby mode:ō ō ō .44m
 - In alarm mode:ō ō ō .95m
- Warm-up period:ō .ō ō ...2sec
- Anti-mask startup (boot) period:ō ō ō ō ō ō ...30±5sec
- Alarm period:ō ō ō ...ō ō ...3sec
- Anti-mask alarm activation delay:ō ō ō ō ō ō ō35sec
- Ultrasonic channel operating frequency:ō ō ō ō ō40kHz
- Microwave channel operating frequency:24GHz
- Installation height:ō ō 2 - 2.5m

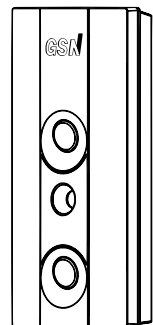
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- Detection range:ō ō ō ō ō ō 7m
- Maximum protected volume:ō ō ō ō 200m³
- Detection angle:ō ō170°
- Relay output:ō ō ō ō ō ō ō ō .. ō ō ō ..NC; 60V; 120mA; 16ō
- Tamper output:ō ō ō ō NC; 10ō
- Operating temperature range:ō ō ō ō ō ō ō 30°C to +70°C
- Storage temperature range:ō ō ō 50°C to +85°C
- RFI immunity:ō ō ō ō ...30V/m at a frequency range 10MHz . 2GHz
- EMI immunity:ō ō ō ō 50000V
- Dimensions:ō ō ō ō .ō ō ō ō105mm x 50mm x 22mm
- Weight:ō ō ō ō ō ō ō ō ō ...80g

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WARRANTY

GSN Electronic Company Ltd. warrants the product to be free from defects in materials and workmanship under condition of observance of service regulations and to be repaired or replaced under absence of mechanical damages for a limited period of five years from the date of sale.



P/N: USMOPATUSM_ENG_REV.A

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