Description

The 525DM is a microwave and infrared digital anti-mask motion detector. It features both a microwave sensor and a passive infrared sensor, and includes Paradox’s powerful signal processing algorithms for triggering an anti-mask alarm when certain conditions occur.

With the anti-mask feature, the 525DM will detect attempts to blind the detector by placing objects in its field of view or spraying it with paint, enhancing the level of your site’s security.

Installation

There are two mounting methods that can be used for the 525DM: corner mount and flat surface mount. To install the 525DM:

1) Select the detector’s location.
2) Remove the front cover screw holding the cover in place; open the cover.
3) Loosen the screw holding the PCB in place and gently slide and lift from back cover.
4) Drill or punch out the selected knockout holes from the 525DM back cover (as shown in Figure 2: Installation) and mount the back cover using the appropriate screws.
5) Wire the unit as shown in Figure 3: PCB Connection.
6) Perform a walk-test to verify detector coverage (see Walk-testing).

WARNING: Do not touch the sensor surface as this could result in a detector malfunction. If necessary, clean the sensor surface using a soft cloth with pure alcohol.

Features

- Digital microwave/infrared detection
- Anti-mask feature allows for the detection of close proximity movements (less than 0.75m / 2.5ft) within the detector range
- Adjustable microwave range
- Two auto pulse settings; one for typical environment (normal), and one for high false alarm rejection (high)
- Installer Test Mode: test microwave and infrared detection individually
- 12m (40ft) X 12m (40ft); 90° viewing angle

Figure 1: Beam Pattern

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Turning on the 525DM

Turning on the detector initiates a self-testing program for the signal processor and memory. The LEDs will flash for 16 seconds. When the LEDs are no longer flashing, the detector is ready and fully operational.

Walk-testing

At 20°C (68°F), at the highest sensitivity level, with APS set to normal, and in dual-edge processing mode, you should be detected crossing at least one complete zone (consisting of 2 beams, left and right sensor detecting elements) in the coverage area with any kind of movement; slow/normal walking or running.

With APS set to high, the amount of movement required to generate an alarm is doubled, and you should be detected within crossing 2 complete zones. The approximate width of a full beam at 12m (40ft) from the detector is 1.8m (6ft). To walk-test, move across the detection path, not toward the detector.

Anti-mask Detection Details

Anti-masking is active only if a valid movement detection occurred during the 10 minutes prior to the anti-mask detection. When a moving object gets near the detector, the blue LED starts flashing for 90 seconds (AM relay not activated yet). If an alarm occurs during that period, the LED stops flashing and no anti-mask trouble occurs. If no alarm occurs within that 90 seconds, anti-mask trouble occurs – AM relay is activated and the LED turns steady blue ON. The anti-mask trouble is cleared by an alarm event.

Relay Operation Details

When anti-masking is enabled, both the alarm and anti-mask relay are independent. When anti-masking is disabled, both relays are activated by an alarm, where the anti-mask relay functions as N.O., and the alarm relay functions as N.C. In Installer Test Mode (see reverse page), the alarm relay is continuously activated, and the anti-mask relay is activated upon an alarm. For connection details, see Figure 4: AM Relay Output Connection.

LED Indicator (Normal Operation)

<table>
<thead>
<tr>
<th>LED State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>4 seconds Alarm (movement detection)</td>
</tr>
<tr>
<td>Blue</td>
<td>Flashing 90 sec. Anti-mask detection pending*</td>
</tr>
<tr>
<td>Blue</td>
<td>ON Anti-mask detection*</td>
</tr>
<tr>
<td>Green</td>
<td>0.5 seconds Microwave detection</td>
</tr>
<tr>
<td>Yellow</td>
<td>0.5 seconds Infrared detection</td>
</tr>
</tbody>
</table>

*See Anti-mask Detection Details for more information.

LED Indicator (Installer Test Mode)

<table>
<thead>
<tr>
<th>LED State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>4 seconds Infrared detection</td>
</tr>
<tr>
<td>Green</td>
<td>4 seconds Microwave detection</td>
</tr>
</tbody>
</table>
Detector Settings

The following detector settings can be modified using the unit's DIP switches (see Figure 5: Overview). Any changes that are made to DIP switch settings are ignored during a movement alarm or an anti-mask detection. To ensure that new DIP switch settings have been registered, ensure that the unit is not in anti-mask alarm, then move out of the unit's detection path and wait for the LED to turn OFF.

<table>
<thead>
<tr>
<th>Step</th>
<th>DIP / Trimpot</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operational Mode</td>
<td>The 525DM uses both infrared and microwave detection. Setting DIP switch 1 to OFF will allow you to test each detection method individually. This feature is used in conjunction with DIP switch 3 Installer Test Mode.</td>
</tr>
</tbody>
</table>
| | DIP Switch 1 | DIP switch 1 OFF = installer test mode (see step 3)  
DIP switch 1 ON = operational mode |
| 2 | LED Settings | If DIP switch 2 is turned ON, the LED will indicate detections as per the LED Indicator table. |
| | DIP Switch 2 | DIP switch 2 OFF = LED disabled  
DIP switch 2 ON = LED enabled |
| 3 | Anti-Mask | When DIP switch 3 is turned ON, the anti-mask feature will detect close proximity movements (less than 0.75m / 2.5ft) within the detector range. |
| | DIP Switch 3 | DIP switch 3 OFF = anti-mask disabled  
DIP switch 3 ON = anti-mask enabled |
| 4 | Installer Test Mode | DIP Switch 3 (with DIP1 OFF) | DIP switch 3 OFF = test infrared only  
DIP switch 3 ON = test microwave only  
For test mode LED feedback, see LED Indicator (Installer Test Mode).  
NOTE: In installer test mode, relay functions and anti-mask are deactivated or altered. |
| 5 | Edge Processing Mode | Preferably, dual edge processing should be used at all times. Dual edge processing requires balanced detection from both sensor's elements and requires that a beam must be fully crossed even at close range. This setting provides better false alarm rejection. Single edge setting allows for faster detection of close range movements. Use this setting only in normal environments with minimal sources of interference. Never use single edge setting if the detector is placed near sources of interference that could adversely affect it. |
| | DIP Switch 4 | DIP switch 4 OFF = single edge  
DIP switch 4 ON = dual edge |
| 6 | Auto Pulse Signal Processing Level | APSF measures the energy from each detected signal and stores it in memory. To generate an alarm, the memory must reach a required minimum level. APSF can be set to normal level or high level. When APSF is set to normal level, the unit is calibrated to detect the energy level which is typical to crossing one full single beam at the maximum detection distance. When APSF is set to high level, the unit is calibrated to detect the energy level which is typical to crossing two full beams at the maximum detection distance. Set APSF to high level when the detector is installed in high-risk environments (potential interference) and to provide greatly increased false alarm immunity. |
| | DIP Switch 5 | DIP switch 5 OFF = APSF - normal level  
DIP switch 5 ON = APSF - high level |
| 7 | Microwave Range Trimpot | Microwaves generated by the unit can pass through walls and have the potential to interfere with the performance of other 525DM units. The range of the microwaves emitted by the detector can be adjusted using the trimpot (see Figure 5: Overview). Microwave range trimpot adjustment can be verified using microwave only test mode. |
| | Trimpot | Turn clockwise = increase microwave range  
Turn counterclockwise = decrease microwave range |

△ = default settings

WARNING: The trimpot is fragile. Do not overtorque.

Microwave range trimpot adjustment

Technical Specifications

- Motion detector type: PIR + Microwave
- PIR sensor element type: Dual elements
- PIR sensor geometry: Rectangular
- Range (90° standard lens): 12m x 12m (40ft x 40ft)
- Microwave antenna type: Flat strip microwave antenna with FET oscillator
- Frequency: FCC & DOC - 10.525GHZ (other frequencies available)
- Operating temperature: -20° to +50°C (-4° to +122°F)
- Voltage: 10 - 16Vdc
- Current consumption: 30mA (approximately)
- Alarm form A output: Standard 100mA, 28Vdc
- Alarm solid-state output: N.C. 150mA, 28Vdc (optional)
- Tamper form C output: N.C. 150mA, 28Vdc (optional)
- Alarm period: 4 seconds
- Detection speed: 0.2m to 3.5m/s (0.6ft to 11.5ft/s)

Warranty

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