

# Installation Instructions for the OD850 Outdoor PIR/Microwave Intrusion Detector

## 1.0 Description

The OD850 is a 50 ft. by 50 ft. (15 m by 15 m) PIR/Microwave intrusion detector that can be mounted outdoors. It provides reasonable levels of false alarm immunity and catch performance in a wide range of weather conditions.

## 2.0 Specifications

- **Dimensions (HxWxD):** 6.5 in. x 3.25 in. x 2.25 in. (16.5 cm x 8.25 cm x 5.7 cm)
  - **Input Power:** 10-15 VDC @ 22 mA standby. Use only an Approved Limited Power Source.
  - **Standby Power:** No internal standby battery. Standby power **must** be provided by an Approved Limited Power Source. *For UL Certificated installations, four hours (88 mAh) standby power must be provided by the control unit or by a Listed burglary power supply.*
  - **Alarm Relays:**
    - Form "A":** Normally closed, supervised alarm contact opens on alarm.
    - Form "C":** Unsupervised, timed relay contact transfers on alarm and follows an installer programmable timer.
  - **Contact Ratings:** 3 W, 125 mA @ 12 VDC maximum for DC resistive loads; and protected by a 4.7  $\Omega$ , 1/2 W resistor in the common "C" leg of the relay. To be connected to a SELV (Safety Extra-Low Voltage) circuit only.
- NOTE:** Do not use with capacitive or inductive loads.
- **Temperature Range:** The temperature range is -40°F to +130°F (-40°C to +54°C). *For UL Certificated installations, the range is +32°F to +120°F (0°C to +49°C).*
  - **Microwave Frequency:** 10.525 GHz (UL Listed)
  - **Coverage:** 50 ft. by 50 ft. (15 m by 15 m)
  - **Tamper:** Normally Closed (with cover on). Contacts rated 125 mA @ 12 VDC, max. To be connected to a SELV (Safety Extra-Low Voltage) circuit only. Connect tamper circuit to a 24-hour protection circuit.
  - **Options:** B335 Low Profile Swivel Mount Bracket (supplied), B328 Swivel Mount Bracket, B338 Ceiling Mount Bracket, Pole Mount Bracket (supplied).

**NOTE:** The use of brackets may reduce range and increase dead zone areas.

- **Patents:** This product is covered by one or more of the following U.S. patents: #4,660,024, #4,764,755, #5,077,548, #5,208,567, #5,262,783, #5,450,062, and #5,670,943. Other patents pending.

- **Compliance:** This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry and Science Canada. Operation is subject to the following two conditions:
  - (1) this device may not cause harmful interference, and
  - (2) this device must accept any interference received, including interference that may cause undesirable operation.

Changes or modifications not expressly approved by Detection Systems, Inc. can void the user's authority to operate the equipment.

## 3.0 Installation Considerations

- **Never** install the detector in an environment that causes an alarm condition in one technology. Good installations start with the LED **OFF** when there is no target motion. It should never be left to operate with the tri-color LED in a constant or intermittent green, yellow, or red condition.
- Point the unit away from traffic (roads/alleys).
- Avoid installations where rotating machines are normally in operation within the coverage pattern.
- Point the unit away from objects that may change temperature rapidly.

**NOTE:** The PIR detector will react to objects rapidly changing temperature within its field-of-view.

- Eliminate interference from nearby sources.

**NOTE:** Microwave energy will pass through glass and most common non-metallic construction walls.

## 4.0 Mounting

**WARNING: All wires should remain disconnected from the power supply until all detector mounting and wiring procedures are completed.**

- Select a location likely to intercept an intruder moving **across** the coverage pattern.

**NOTE:** This detector features a Fresnel lens to focus infrared energy onto a sensor and an offset Look Down lens that adds a Look Down Zone. The coverage pattern of these lenses is shown in **Figure 1**.

- The surface should be solid and vibration-free.
- Mounting height range is 7 to 9 feet (2.1 to 2.7 m). Recommended mounting height is 8 feet (2.4 m).
- Choose from the available mounting methods:
  - surface mount using a single-gang electrical box
  - surface mount without an electrical box
  - pole mount
  - bracket mount using an optional bracket

### 4.1 Surface Mount Using a Single-Gang Electrical Box

- Install a single-gang electrical box at the desired detector location.
- Knock out mounting holes (see **Figure 2f**).
- Attach the mounting plate (see **Figure 2i**) to the single-gang box with appropriate screws.

### 4.2 Surface Mount Without an Electrical Box

- Select an appropriate location.
- Determine whether the tamper switch is to be used as a wall tamper or a cover tamper:
  - for a wall tamper, knock out and save the Tamper Section



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(see **Figure 2d**), complete the following mounting procedure. Then, using an appropriate screw, fasten the previously knocked out Tamper Section to the wall in the area of the Mounting Plate from which it was removed.

**NOTE:** With the Tamper section broken away from the Mounting Plate and fastened to the wall, the normally-closed Tamper Switch (see **Figure 2b**) will be activated (opened) when the unit is pulled away from the wall.

- for a cover tamper, do not knock out the Tamper section. Complete the mounting procedure.
- Knock out mounting holes (see **Figure 2f**).
- Using the Mounting Plate as a template, mark the location of the mounting screws and the wire run (see **5.0 Wiring**).
- Attach the Mounting Plate (see **Figure 2i**) to the wall with appropriate screws.

#### 4.3 Pole Mount Using the Supplied Bracket (see **Figure 3a**)

- Attach the supplied Pole Bracket to the Mounting Plate using appropriate screws and mounting holes.
- Use a hose clamp (not supplied) large enough to fit around the pole to fasten the detector mounting plate to the pole.

#### 4.4 Surface Mount Using the Supplied Bracket or an Optional Bracket

- Follow the instructions that come with the bracket to attach the bracket to the surface in an appropriate location.
- If using the B328 Swivel Mount Bracket, connect the bracket to the Mounting Plate as indicated in **Figure 3b**.
- If using the B335 Swivel Mount Bracket, connect the bracket to the Mounting Plate as indicated in **Figure 3c**.
- If using the B338 Ceiling Mount, connect the bracket to the Mounting Plate as indicated in **Figure 3d**.

### 5.0 Wiring

**Warning** *Only apply power after all connections have been made and inspected.*

- Connect wiring as shown in **Figure 2f**.

#### 5.1 Terminal Descriptions

- **1 (-) & 2 (+): Input Power (12 VDC).** Use no smaller than #22 AWG (0.8 mm) wire pair.
- **3 (NC), 4 (C): Alarm Relay Contacts.** Form "A" (Normally Closed, supervised) alarm contact opens on alarm. Contacts rated 125 mA at 12 VDC.
- **5 & 6:** Normally Closed Tamper Contacts, rated 125 mA at 12 VDC.
- **7 (NC), 8 (C) & 9 (NO): Timed Alarm Relay Contacts.** One Normally Closed and one Normally Open contact with a Common. Contacts rated 125 mA at 12 VDC.

### 6.0 Settings and Adjustments

#### 6.1 DIP Switches (Figure 2c)

The DIP Switches are used to specify a number of settings as follows:

##### LED Disable (SW0)

This switch setting determines whether or not the LED will light during alarm situations. This switch should be ON (LED enabled) during walk testing, but may be OFF (LED disabled) during normal detector operation to save power.

#### PIR Sensitivity (SW1)

The detector features two user-selectable PIR Sensitivity settings as follows:

- **Standard Sensitivity:** Recommended setting for maximum false alarm immunity. Tolerates environment extremes on this setting.
- **Intermediate Sensitivity:** Recommended setting for any location where an intruder is expected to cover only a small portion of the protected area. Tolerates normal environments on this setting. This setting will improve your intruder catch performance.

The appropriate switch settings for these sensitivities are:

SW1	PIR Sensitivity
OFF	Intermediate
ON	Standard

#### Timed Relay Outputs (SW2 & SW3)

The detector has a Form "C," unsupervised, timed relay contact that transfers on alarm and follows a user-selectable timer. The time will expire at the set time after the last alarm (it resets on each new alarm). For information on wiring this contact, see **5.0 Wiring**. To select the Relay Activation Time, set the switches as follows:

SW2	SW3	Relay Activation Time
OFF	OFF	3 seconds
ON	OFF	1 minute
OFF	ON	5 minutes
ON	ON	10 minutes

#### AND/OR Mode (SW4)

This setting specifies whether the detector alarms in the OR mode (when either the PIR or Microwave technology senses an alarm state) or in the AND mode (when both technologies sense an alarm condition). Setting the switch OFF and cutting the jumper (see **Figure 2e**) selects the OR mode; ON selects the AND mode.

#### Day/Night Mode (SW5)

This switch, in combination with a jumper (see **Figure 2e**), allows the user to specify whether or not the unit will alarm only during the night. Setting the switch to ON suppresses the alarm relay during daylight (the alarm relay is not triggered).

### 7.0 Closing the Detector Housing

- When all wiring has been connected to the detector (but not to the power supply) and all the settings have been made, slide the Housing Cover/PC Board Assembly onto the Mounting Plate and down until it is firmly seated. Avoid pinching the wires.
- With a small screwdriver, lock the Housing Cover/PC Board Assembly to the Mounting Plate by turning the Locking Cam (see **Figure 2j**) clockwise.

### 8.0 Testing the Detector

**NOTE:** The cover should be in place before testing the unit.

- Place the LED Disable (**SW0**) in the ON position.
- Connect the wires to the power supply and apply power.

**NOTE:** Wait at least two minutes, after applying power, to start

walk tests. During the warm-up period, the tricolor LED will flash red until the unit has stabilized (approximately one to two minutes) and has seen no movement for two seconds. When the LED stops flashing, the detector is ready to be tested. With no motion in the protection area, the LED should be OFF. If the LED is on, recheck the protection area for disturbances affecting the microwave (yellow) or PIR (green) technologies.

#### Establishing PIR Pattern Coverage

- Turn the Microwave Range Adjust (see **Figure 2a**) to minimum and replace the cover.

**CAUTION:** *Do not use excessive force when adjusting the microwave pot.*

- Walk test **across** the pattern at its farthest edge, then several times closer to the detector. Start walking from outside of the intended protection area, and observe the tricolor LED. The edge of the pattern is determined by the first green, PIR activation of the LED (or the first red activation if the yellow microwave LED activates first).
- Walk test from the opposite direction to determine both boundaries.

**NOTE:** The center of the pattern should be pointed toward the center of the intended protection area.

- While standing 10 to 20 ft. (3 to 6 m) from the detector, slowly bring your arm up and into the pattern to mark the lower boundary on PIR alarm. Repeat from above for the upper boundary.

**NOTE:** The center of the pattern should **not** be tilted upward.

If the desired coverage cannot be achieved, try angling the coverage pattern up or down using a swivel bracket to assure the pattern is not aimed too high or low.

#### Establishing Microwave Coverage

**NOTE:** Wait one minute after removing/replacing the cover so the microwave portion of the detector can settle. Wait at least ten seconds between the following walk testing procedures.

- The tricolor LED should be OFF before walk testing.
- Walk test **across** the pattern at the intended coverage's **farthest** end. Start walking from outside the intended protection area and observe the tricolor LED. The edge of the microwave pattern is determined by the first yellow, microwave activation of the LED (or the first red activation if the green PIR LED activates first).
- If adequate range can not be reached, increase the Microwave Range Adjust **slightly**. Continue walk testing (waiting one minute after removing/replacing the cover) and adjusting the range until the farthest edge of desired coverage has been accurately placed.

**NOTE:** If you adjust the range, set the adjustment as low as possible for proper catch performance. Be sure to walk test throughout the coverage pattern after any adjustment.

- When all walk testing is completed, the LED Disable switch can be set to disable the LED if so desired.

**Figure 1 - Coverage Patterns**

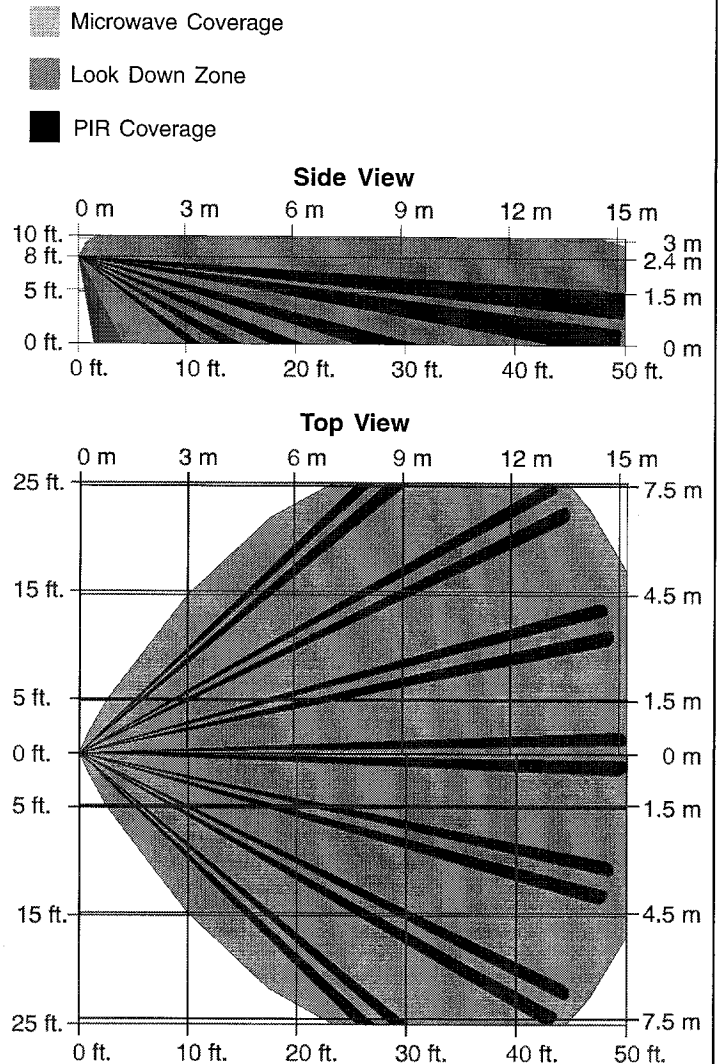


Figure 2 - Assembly

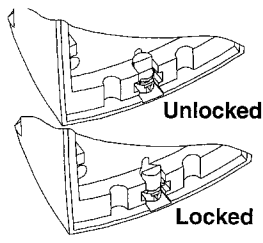
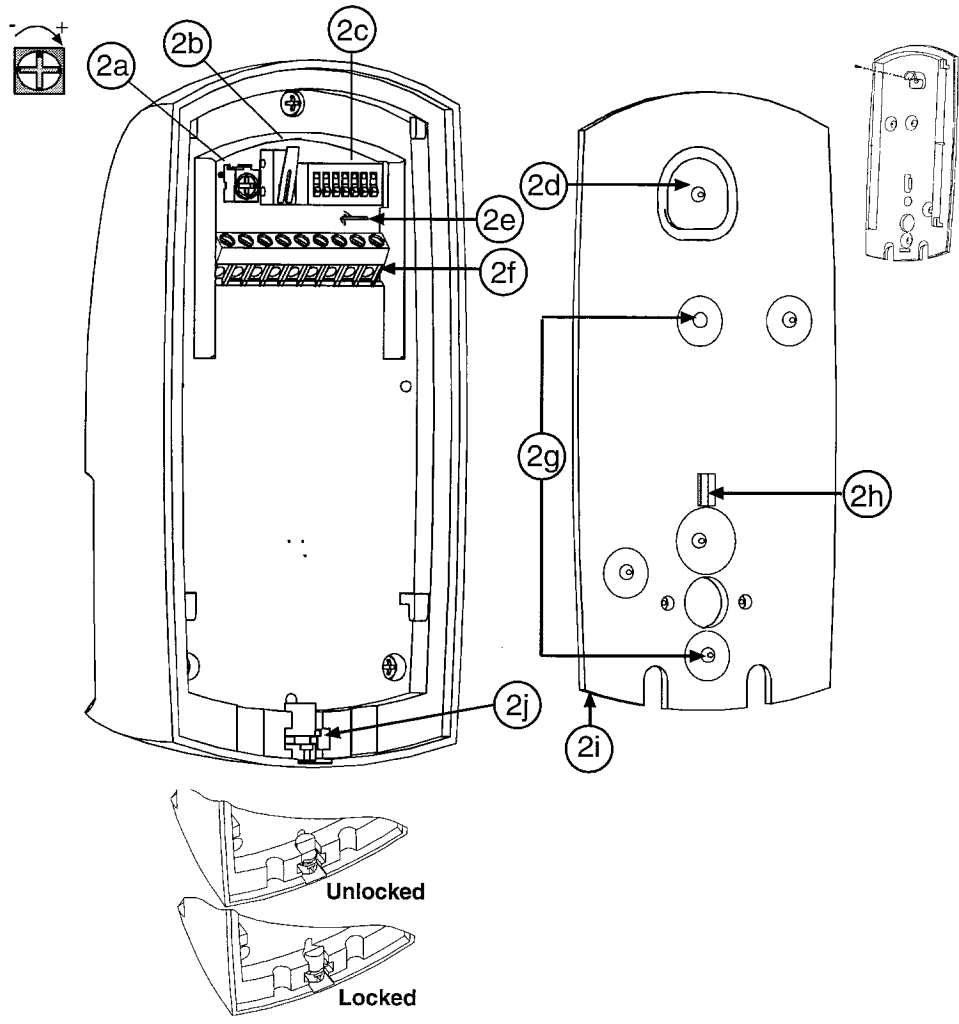


Figure 3a - Pole Mounting

Figure 3b - B328 Bracket Mounting

Figure 3c - B335 Bracket Mounting

Figure 3d - B338 Bracket Mounting

