

Installation Instructions

DS825, DS825T, DS840, DS840T

TriTech PIR/Microwave Intrusion Detectors

1.0 General Information

The DS825 Series and DS840 Series are microprocessor-based TriTech Passive Infrared/Microwave Intrusion Detectors that provide immunity to false alarms caused by pets [a dog up to 100 lbs. (27 kg) or up to 10 cats, and other small animals such as birds and rodents]. Patented Passive Infrared and Microwave signal processing provides excellent catch performance with freedom from false alarms.

2.0 Specifications

- **Input Power:** 6 to 15 VDC, 15 mA DC nominal (up to 35 mA DC during walk testing).
- **Standby Power:** No internal standby battery. Connect to DC power sources capable of supplying standby power. For each hour of standbytime needed, 15 mAh are required. *For UL Listed Requirements, four hours (60 mAh) are required.*
- **Alarm Relay:** Silent operating Normally Closed reed relay. Contacts rated 3 W, 125 mA, 28 VDC maximum for DC resistive loads; and protected by a 4.7 Ω , 1/2 W resistor in the common "C" leg of the relay. Do **not** use with capacitive or inductive loads.
- **Temperature:** -40°F to +120°F (-40°C to +49°C). *For UL Certificated Installations, the temperature range is +32°F to +120°F (0°C to +49°C).*
- **Microwave Frequency:**
 - DS825(T)/DS840(T): 10.525 GHz (UL Listed)
 - DS825TA/DS840TA: 10.687 GHz (Export only, not UL Listed)
 - DS825TB/DS840TB: 9.9 GHz (Export only, not UL Listed)
- **Coverage:**
 - DS825 Series: 25 ft. x 25 ft. (8 m x 8 m)
 - DS840 Series: 40 ft. x 40 ft. (12 m x 12 m)
- **Internal Pointability:** +1° to -18° Vertical.
- **Optional Tamper:** The DS825T, DS825TA, DS825TB, DS840T, DS840TA, and DS840TB have a Normally Closed (with cover on) tamper switch. Contacts rated at 28 VDC, 125 mA max. Connect the tamper circuit to a 24-hour protection circuit.
- **Options:** B335 Low Profile Swivel Mount Bracket and B338 Ceiling Mount Bracket. (The use of brackets may reduce range and increase dead zone areas.)
- **Patents:** These detectors are covered under 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 Mounting

3.1 Mounting Considerations

- **Never** install the detector in an environment that causes a constant alarm in one technology; it should never be left to operate with the tri-color LED in a constant green, yellow, or red condition. A detector with one technology in constant alarm, will cause an alarm output whenever the other technology alarms. Good installations start with the LED **OFF** when there is no target motion. The best installations will have background noise voltages below recommended limits.
- Point the unit away from outside traffic (e.g. roads, alleys, and parking lots).

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

- Avoid direct or indirect sunlight.
- Point the unit away from glass exposed to the outdoors and 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 outside sources.
- Avoid installations where rotating machines (e.g. ceiling fans) are normally in operation within the coverage pattern.
- Select a location likely to intercept an intruder moving **across** the coverage pattern.
- The surface should be solid and vibration-free.
- Mounting height range is 6 to 8 ft. (1.8 to 2.4 m). The recommended height is 7.5 ft. (2.3 m). Mounting height for Pet Applications is 6.5 ft. (2 meters).

3.2 Mounting the Detector

- Remove the cover by inserting a thin flathead screwdriver into the locking tab hole at the bottom front of the detector, pressing in, and pulling the cover up and forward.

NOTE: Mount the unit with the terminal block up.

- Remove the circuit board from the base by pulling outward slightly on one of the Circuit Board Locking Tabs (see Figure A).

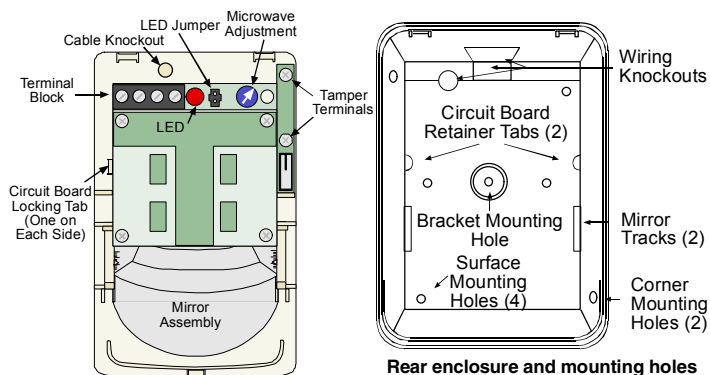


Figure A - Location of Features

- Remove the mirror.



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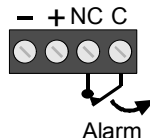
- Break away the Cable Knockout wire entrance.
- Open two holes for surface or corner mounting (See Figure A).
- Mark the location for the mounting screws.
 - Use the enclosure as a template.
 - Pre-start the mounting screws.
- Route wiring as necessary. Route to the rear of the base and through the wire entrance. **Make sure all wiring is unpowered before routing.**
- Securely attach the base to the mounting surface.
- Return the circuit board to the base.
- Install the mirror.

4.0 Wiring

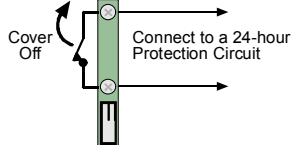


Apply power **ONLY** after all connections have been made and inspected. Do **NOT** coil excess wiring inside the detector.

- Terminals (–) & (+): Power limits are 6 to 15 VDC. Use no smaller than #22 AWG (0.8 mm) wire pair between the detector and the power source.
- Terminals C & NC: Alarm relay (reed) contacts. **Do not use with capacitive or inductive loads.**



- Tamper contacts: "T" Models only.



Plug the wire entrance hole with the foam plug provided after all wiring connections have been made.

6.0 LED Operation

The detector uses a tricolor LED to indicate the various alarm and supervision trouble conditions that may exist. See the following chart:

LED	Cause
Steady red	Unit alarm
Steady yellow	Microwave activation (walk test)
Steady green	PIR activation (walk test)
Flashing red	Warmup period after power-up
Flashing red (4 pulse sequence)	Microwave or PIR failure - Replace Unit

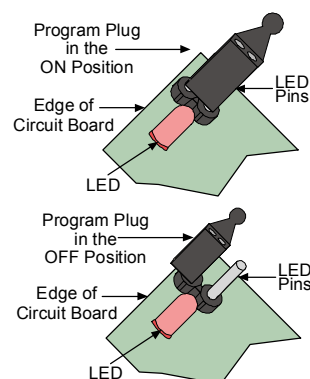
If the detector experiences a Microwave or PIR self-test failure, it is in need of replacement.

During walk testing, the LED will light for the first technology (microwave or PIR) and then light red to indicate a detector alarm. The LED will not indicate activation of the second technology by lighting its color.

7.0 Feature Selection

- **LED On/Off Pins:** Placing the jumper across the LED selection pins allows operation of the tricolor LED. If the tricolor LED indication is not desired after setup and walk tests are completed, move the jumper from across the LED selection pins. Moving the jumper to the OFF position does not prevent the tricolor LED from indicating a supervision trouble condition.

LED ON/OFF JUMPER PLACEMENTS



8.0 Setup and Walk Tests

- Select the vertical starting angle from the chart.

Broad Coverage Mirror

Mounting Height	DS825 25 (7.5)	DS840 40 (12)	Required Settings for Pet Applications
6.5 (2.0)	-6°	-4°	
7.5 (2.3)	-10°	-8°	
8.5 (2.6)	-12°	-8°	

Height and desired Range listed in feet (meters)

- The angle adjust markings are on the mirror. Slide the mirror forward or back until the angle hash marks are in-line with the markers on each side of the frame.

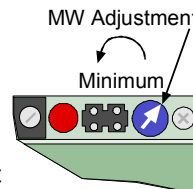
NOTE: See Section 11.0 for Pet Applications.

- Place the LED Jumper in the ON position.
- **Wait at least two minutes**, after applying power, to start walk tests.

NOTE: 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 to minimum and replace the cover.
- 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 to assure the pattern is not aimed too high or low.

Establishing Microwave Coverage



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.



Do not adjust the microwave range higher than required. Doing so will enable the detector to catch movement outside of the intended coverage pattern.

- Walk test the unit from all directions to determine all the pattern boundaries.

Establishing Detector Coverage

- The tricolor LED should be OFF before walk testing.
- Walk test the unit from all directions to determine the detection boundaries. A detector alarm is signaled by the first red activation of the tricolor LED after an initial green or yellow activation.

9.0 Supervision Features

The supervision features function as follows:

- **PIR/Microwave:** The complete circuit operation of these subsystems is checked approximately every six hours. If the PIR or microwave subsystem fails, the tricolor LED will flash red four times per cycle and the unit should be replaced.
- **Default:** The detector will default to PIR technology protection if the microwave subsystem fails.

10.0 Other Information

Maintenance: At least once a year, the range and coverage should be verified. To ensure continual daily operation, the end user should be instructed to walk through the far end of the coverage pattern. This ensures an alarm output prior to arming the system.

Pattern Masking: The PIR coverage pattern may be masked using masking tape or electrical tape on the inside of the mirror.



Many adhesives will either destroy the mirror surface or leave enough residue behind to reduce coverage performance. Be sure to clean the mirror surface with a mild window cleaning solution after masking removal.

NOTE: Masking only eliminates the PIR portion of the coverage and has no effect on the microwave pattern.

11.0 Special Instructions for Installations Containing Pets

The DS825, DS825T, DS840 and DS840T detectors will provide reasonable protection from nuisance alarms caused by the following sources:

- One dog up to 100 pounds (27 kg)
- Up to 10 cats
- Multiple small rodents, such as rats
- Random flying birds

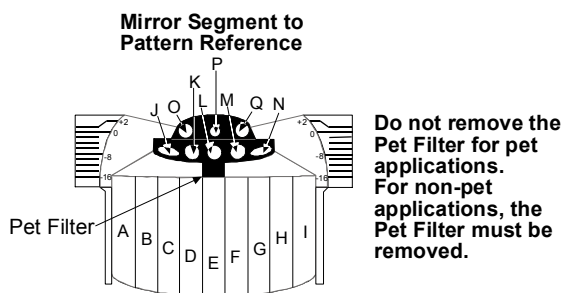
To take full advantage of the detector's Signature Recognition Technology, the following guidelines should be followed:

- Do not remove the Pet Filter from the mirror.

NOTE: The Pet Filter is not a mirror mask. Use only the supplied filter for pet applications.

- Mount the detector 6.5 ft. (2 m) high and adjust the Mirror angle as shown in the chart in Section 8.0.
- Mount where the animals can not come within 6 ft. (1.8 m) of the detector by climbing on furniture or other objects.
- Adjust the microwave range for the minimum acceptable coverage for the room in which the detector is installed.

NOTE: Pet avoidance is only available when using the lens provided with the detector. This pet nuisance protection has not been verified by Underwriters Laboratories, Inc.



12.0 Coverage Patterns

The protected coverage area is where the microwave and PIR patterns overlap.

