

INSTALLATION INSTRUCTIONS

GENERAL INFORMATION

The Quest 2235 Microwave/PIR motions offers next generation performance with technology advances in many areas, including optics and signal processing. Unmatched levels of operation are assured with the following advanced features:

- Microprocessor-based C³ signal processing (Cross-Channel Correlation) correlates data from both the PIR and microwave channel for decision-making rather than just requiring separate alarms on each channel.
- Split-Zone Optics technology improves discrimination between human and animal targets.
- Robust pet immunity to 100lbs over a range of mounting heights without sacrifice to detection of stooped or crawling human targets.
- Accu-Trak test feature allows the installer to determine precise coverage pattern of both PIR and microwave at the same time as well as check for environmental disturbances.
- Automatic adaption to environmental disturbances.
- Rejection (with a patented digital notch filter) of fluorescent light disturbance.
- Continuous supervision of both PIR and microwave.
- Advanced dual-slope temperature compensation assures detection at all temperatures.

This detector is shipped with its standard pet immune lens installed to provide coverage of 35ft x 45ft. If other coverage patterns are desired, please consider the following alternative products:

- Quest 2220: 20ft x 25ft with 100lb pet immunity
- Quest 2240: 40ft x 50ft
- Quest 2260: 60ft x 75ft

Optional swivel mounting brackets are available under part number 998SB and Quest-SB2, but are not recommended for installations with pets.

NOTE: To use the optional Look Down Zone, the masking material must be removed. Once the masking material has been removed, the Look Down Zone may be removed again by taking out the Look Down lens (see Figure 3 for location). **Do not remove the masking material for pet applications.**

COVERAGE & LOCATION CONSIDERATIONS

Combined protective patterns are shown in Figure 1 for a nominal mounting height of 7.5 ft (2.3m). The microwave detection pattern shown in Figure 1 represents coverage in open space. In practical applications, when the detector is bounded by ceiling, floor, and walls, reflections can occur.

SELECTING A MOUNTING LOCATION

The detector responds to changes in energy which occur when an intruder moves into the combined protection pattern. Best coverage will be obtained if the mounting site is selected so that the likely direction of intruder motion is generally across the pattern and angles slightly toward the detector.

SPECIFICATIONS

- Detection Method:** Dual technology Microwave/PIR
- Coverage:** Standard Pet Immune Lens
35' x 45' (10.6m x 13.7m)
- Detection Zones:** Pet Immune Lens - 31 zones
(8 long range, 7 over 7 intermediate, 4 over 4 short range, 1 optional look down zone)
- Pulse Processing:** Standard or Intermediate, selectable via DIP switch
- Detectable Walk Rate:** 0.5-10ft/sec (.15-3m/sec)
- Mounting Height:** 7-8ft (2.1-2.4m), 7.5 ft (2.3m)
recommended for pet installations
- Indicator:** Red and Green LED
(see LED INDICATIONS);
enabled/disabled via DIP Switch
- Alarm Relay:** Form A, N.C., 28VDC, 90ma max. with 15-ohm protective resistor
- Input Voltage:** 10-16 VDC with reverse polarity protection
- Current @ 12V:** 25 ma nominal (non-alarm)
13 ma nom. (alarm, LED disabled)
20 ma nom. (alarm, LED enabled)
40 ma nom. during warm-up
- Standby:** Power source should be capable of at least 4 hours of battery standby
- Operating Temp.:** -20°F to 122°F (-29°C to +50°C)
[0°C to +50°C for UL installations]
- Operating Humidity:** Up to 95% RH (max.), non-condensing
- Dimensions:** 2.8"W x 5.2"H x 2.2"D
(71mm x 132m x 56m)

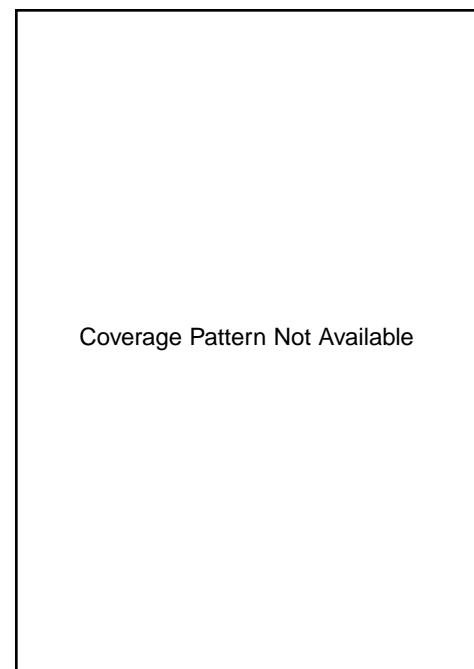


Figure 1. COVERAGE PATTERN

INSTALLATION HINTS

The detector is remarkably resistant to false alarm hazards, but the following recommendation should be observed.

- Never install the detector in an environment that causes an alarm condition in one technology. Good installations start with both LEDs OFF when in the Accu-Trak test mode and there is no target motion.
- Do not mount on an unstable surface. Locate the unit on a sturdy inside wall whenever possible. Avoid sources of vibration such as loose fitting doors and walls that shake when heavy traffic exists.
- Do not install on or close to metal structures such as metal door frames, shelves, etc.
- Do not include space heaters in the protective pattern whenever possible, to avoid rapid temperature changes and vibrations from fans.
- ALL microwave transmission penetrates most building materials (except metal, which reflects transmission). Moving objects outside of the protected area may be detected unless the microwave sensitivity control is kept at as low a setting as possible, to minimize penetration.
- Make sure the detection area does not have obstructions (curtains, screens, large pieces of furniture, plants, etc.) which may block the PIR portion of the coverage pattern.

MOUNTING

Mount the unit to a firm vertical surface. The wall wiring hole should be no more than 5/16" (8mm) diameter.

1. Remove the front cover by twisting a screwdriver blade in the groove between cover and base at the bottom edge of the case and then lifting the cover off.
2. Remove the circuit board from the base. Loosen the vertical adjustment screw, slide the circuit board up and spread PCB holding tabs as shown in Figure 3.
3. Breakout desired mounting & entry holes. Refer to Figure 2. Knockout holes "A" in the base are for normal surface mounting on a wall. Knockout holes "B" are for corner mounting. Also break out the wire entry hole at this time marked X in Figure 2.
4. Feed wiring (unpowered) coming from the wall through the wire access hole near the top of the detector base. Use the wiring channel on the back to assist with routing.
5. Mount the base & reinstall the PC board.
6. Vertically align PCB before tightening screw.
7. Refer to WIRING CONNECTIONS section before replacing the cover.

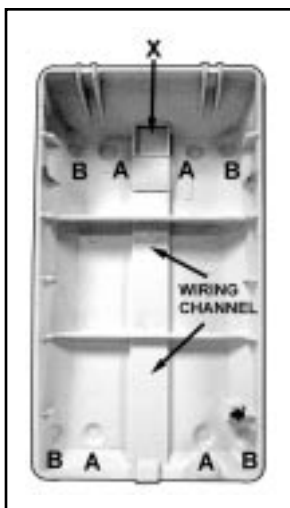


Figure 2. CASE BACK

Special Instructions for Installations Containing Pets

The QUEST 2235 will provide reasonable protection from nuisance alarms caused by the following sources:

- A dog up to 100 pounds.
- Two dogs, up to 60 pounds each.
- Up to 10 cats.
- Multiple small rodents, such as rats.
- Random flying birds.

To take full advantage of the QUEST 2235's next generation performance for pet immunity, the following guidelines should be followed:

- Mount the center of the detector 7.5 feet high & adjust the PCB to POSITION TWO.
- Set the sensor sensitivity for standard (STD).
- Mount where animals cannot come within six feet of the detector by climbing on furniture, boxes, or other objects.
- Do not aim the detector at stairways that can be climbed by an animal.
- Adjust the microwave range for the minimum acceptable coverage for the room in which the detector is installed. Never install with the microwave range exceeding 35 feet.

WIRING CONNECTIONS

Bring all wires through the wire access slot at the top of the detector base near the terminal block and connect to the screw terminal. See Figure 3 for wiring details. Seal any openings in the base with foam or RTV (not supplied) to prevent drafts and insects from entering the unit. Apply power only after all connections have been made and are inspected.

| TERM | FUNCTION |
|------|--|
| 1 | +12 Input Supply. Power must be provided from a 12VDC filtered source with 25ma capability and at least 4 hours of standby battery capacity. |
| 2 | (-) Input Supply (ground). |
| 3 | Relay Contact, N.C. (Open on Alarm) |
| 4 | Relay Common Contact |
| 5 | SPARE |
| 6,7 | Tamper Switch, N.C. (Open on Tamper) |
| 8 | Trouble Output. Upon supervision failure, this open collector output will go low (requires 1000-ohm pull-up resistor.) Use shielded wire for UL installations. |

REMOTE LED DISABLE

A separate terminal pin is provided on the PCB that can be used to remotely control the LED. (See Figure 3.) If a 7-16VDC signal is applied to the terminal, all LED functions will be disabled, including alarm, Accu-Trak test mode, and supervision failures. To remotely enable the LED by removing the 7-16VDC signal, DIP Switch #3 must be set to OFF (LED enable).

ADJUSTMENTS AND SELECTIONS

MICROWAVE SENSITIVITY CONTROL:

Turn the potentiometer clockwise to increase sensitivity.

DIP SWITCH SETTINGS:

- #1: **ON** Accu-Trak test mode (relay remains open when selected)
- OFF** Normal operation
- #2: **ON** Intermediate signal processing.
- OFF** Standard signal processing (recommended for installations with pets)
- #3: **ON** LED disable
- OFF** LED enable

LED INDICATIONS

| MODE | LED INDICATIONS |
|---------------------|--|
| Power Up | Red & Green LEDs ON for ~50 secs. |
| Alarm | Red LED ON. |
| Accu-Trak Test Mode | Green LED FLASHES for microwave Red LED flashes for PIR |
| Supervision Failure | Red LED flashes for PIR failure; Green LED flashes for microwave failure. |

Note: When Accu-Trak test mode is selected, alarm relay is constantly held open to prevent leaving the detector in the test mode.

SIGNAL PROCESSING OPTION

For Standard Signal Processing, set DIP Switch #2 OFF. For Intermediate Signal Processing, set DIP Switch #2 ON. Use a small pointed tool to move the switch handle.

Standard Signal Processing: This is the recommended setting for maximum false alarm immunity. It tolerates environmental extremes on this setting.

Note: Standard Signal Processing is recommended for installations with pets.

Intermediate Signal Processing: This is the recommended setting for any location where an intruder is expected to cover only a small portion of the protected area. It tolerates normal environments on this setting.

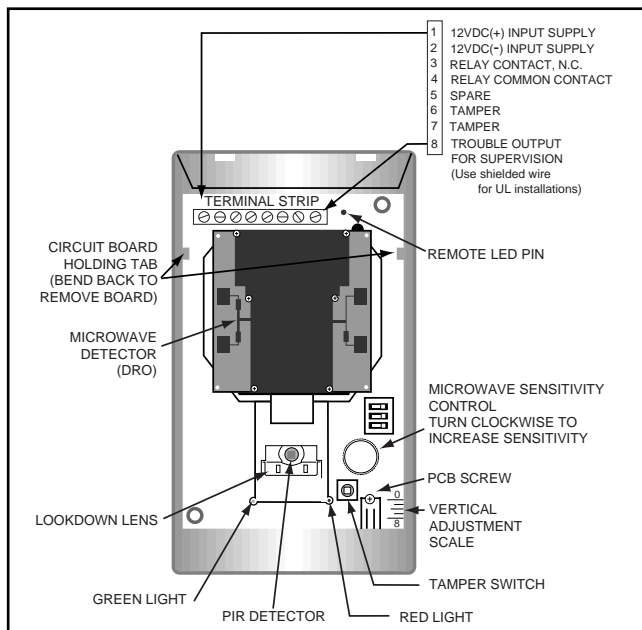


Figure 3. INTERIOR OF DETECTOR

LED ENABLE/DISABLE OPTION

To enable the LED, set the DIP Switch #3 OFF. To disable the LED, set DIP Switch #3 ON. Use a small pointed tool to move the switch handle.

TEST PROCEDURES

On power-up, testing must not begin until the LED extinguishes after first applying power to signify warm-up is complete, about 50 seconds. If the LED begins to flash at a constant rate, refer to the section on SUPERVISION.

Note: During this warm-up period the relay will be held CLOSED.

Accu-Trak Test Mode: Ademco's unique Accu-Trak test feature is easy to use. It can be used to provide both pattern coverage and as an environmental check for potential false alarms. Simply set DIP Switch #1 to ON. Both microwave and PIR information is viewable simultaneously on the two LEDs, providing crisp, immediate feedback (see below).

| | LED COLOR | ACCU-TRAK LED INDICATIONS | |
|-----------|-----------|---|--|
| | | WALK TEST | ENVIRON TEST |
| PIR | RED | LED flashes when entering or exiting zone. | LED flashes when potential false alarm source is detected, such as fans or heating duct. |
| Microwave | GREEN | LED goes ON upon entering microwave coverage pattern. | LED is ON when potential false alarm source is detected, such as a fan or balloon. |

Note:

- 1) The alarm relay remains continuously open when test mode is selected to prevent leaving the detector in test mode.
- 2) Because of the advanced C³ signal processing, this test mode should only be used to verify limits of the coverage pattern of each technology and to check for potential environmental disturbances.

Testing in Normal Operating Mode: After testing with the unique Walk-Test mode, the detector should be tested in the Normal Operating Mode with the following steps:

1. Remove the front cover and ensure that DIP Switch #1 is set to OFF for Normal Operating Mode.
 2. Set DIP Switch #2 to the Pulse Processing Option that will be used for this installation.
 3. Enable the LED by setting DIP Switch #3 OFF.
 4. Replace the front cover and walk through the protective zones, observing that the detector's red LED lights whenever motion is detected. If necessary, re-adjust the microwave sensitivity to the minimum level required for satisfactory detection and repeat the walk test.
- Note:** The relay will open when the LED lights.
5. After walk-testing is complete, the LED may be disabled, if desired (DIP Switch #3 ON).

SUPERVISION

This motion sensor is equipped with advanced supervision of both the PIR and microwave channels. If a microwave channel failure occurs, the sensor will continue to operate as a dual element PIR sensor in Standard Signal Processing mode regardless of the processing option chosen. Even though some operation is

maintained, the unit should be replaced as soon as possible. If a PIR failure occurs, the unit becomes non-operational.

Supervision failure indications: If a supervision failure occurs, it will be indicated by the appropriate LED flashing 2 times per second, regardless of the LED enable/disable option chosen by DIP Switch. If a PIR failure occurs, the RED LED will flash; if a microwave failure occurs, the GREEN LED will flash. If the unit has defaulted to PIR-only operation as a result of a microwave failure, the RED LED will light when an alarm occurs if enable by DIP Switch while the GREEN LED continues to flash.

Upon supervision failure, the open collector TROUBLE output on the terminal block will also go low (requires 1000-ohm pull-up resistor). Use shielded wire for UL installations.

TO THE INSTALLER

Regular maintenance and inspection (at least annually) by the installer and frequent testing by the user are vital to continuous satisfactory operation of any alarm system.

The installer should assume the responsibility of developing and offering a regular maintenance program to the user, as well as acquainting the user with the proper operation and limitations of the alarm system and its component parts. Recommendations must be included for a specific program of frequent testing (at least weekly) to insure the system's operation at all times.

MAINTAINING PROPER OPERATION

In order to maintain the detector in proper working condition, it is important that the following be observed by the user:

1. Power should be provided at all times. Loss of power to the unit will result in the alarm contacts reverting to an alarm state. The unit's DC source should have standby power available for at least 4 hours of operation during emergencies.
2. Units should never be re-aimed or relocated without the advice or assistance of the alarm service company.
3. The physical surroundings of the protected area should not be changed. If furniture or stock is moved, or air conditioning or additional heating is installed, the system may have to be readjusted by the alarm service company.
4. Walk-tests should be conducted frequently (at least weekly) to confirm proper coverage by each detector.

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENT

The user shall not make any changes or modifications to the equipment unless authorized by the Installation Instructions or User's Manual. Unauthorized changes or modifications could void the user's authority to operate the equipment.

WARNING

THE LIMITATIONS OF YOUR MICROWAVE/PASSIVE INFRARED MOTION DETECTOR

While the Intrusion Detector is a highly reliable intrusion detection device, it does not offer guaranteed protection against burglary. Any Intrusion Detection device is subject to compromise or failure to warn for a variety of reasons:

- These Motion Detectors can only detect intrusion within the designed ranges as diagrammed in this installation manual.
- The passive infrared motion sensor in this Motion Detector do not provide volumetric area protection. It does create multiple beams of protection, and intrusion can only be detected in unobstructed areas covered by those beams.
- Passive Infrared Detectors cannot detect motion or intrusion that takes place behind walls, ceilings, floors, closed doors, glass partitions, glass doors, or windows.
- Metal objects (or other reflectors, such as foil faced insulation or water in bottles) can alter the microwave sensors protection pattern.
- Mechanical tampering, masking, painting or spraying of any material on the mirrors, windows or any part of the optical system can reduce the detection ability of the Passive Infrared Motion Detector.
- Passive Infrared Detectors sense changes in temperature; however, as the ambient temperature of the protected area approaches the temperature range of 90° to 105°F (32° to 40°C), the detection performance can decrease.
- This Passive Infrared Detector will not operate without appropriate DC power connected to it or if the DC power is improperly connected (i.e. reversed polarity connections).
- Passive Infrared Detectors, like other electrical devices, are subject to component failure. Even though they are designed to last as long as 10 years, the electronic components could fail at any time.

We have cited some of the most common reasons that a Passive Infrared Motion Detector can fail to catch intrusion. However, this does not imply that these are the only reasons and therefore, it is recommended that weekly testing of this type of unit, in conjunction with weekly testing of the entire alarm system, be performed to ensure that the detectors are working properly.

Installing an alarm system may make the owner eligible for a lower insurance rate, but an alarm system is not a substitute for insurance. Homeowners, property owners and renters should continue to act prudently in protecting themselves and continue to insure their lives and property.

We continue to develop new and improved protection devices. Users of alarm systems owe it to themselves and their loved ones to learn about these developments.

ADEMCO LIMITED WARRANTY

Alarm Device Manufacturing Company, a Division of Pittway Corporation, and its divisions, subsidiaries and affiliates ("Seller"), 165 Eileen Way, Syosset, New York 11791, warrants this detector to be in conformance with its own plans and specifications and to be free from defects in materials and workmanship under normal use and service for 72 months from the date stamp control on the product. Seller's obligation shall be limited to replacing, at its option, free of charge for materials or labor, a detector which is proved not in compliance with Seller's specifications or proves defective in materials or workmanship under normal use and service. Seller shall have no obligation under this Limited Warranty or otherwise if the detector is altered or improperly repaired or serviced by anyone other than Ademco factory service. In case of defect, return the detector to ADI or an authorized distributor for an immediate replacement.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO CASE SHALL SELLER BE LIABLE TO ANYONE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, OR UPON ANY OTHER BASIS OF LIABILITY WHATSOEVER, EVEN IF THE LOSS OR DAMAGE IS CAUSED BY THE SELLER'S OWN NEGLIGENCE OR FAULT.

Seller does not represent that its detector may not be compromised or circumvented; that the detector will prevent any personal injury or property loss by burglary, robbery, fire or otherwise; or that the detector will in all cases provide adequate warning or protection. Buyer understands that a properly installed and maintained alarm may only reduce the risk of a burglary, robbery, fire or other events occurring without providing an alarm, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss as a result. CONSEQUENTLY, SELLER SHALL HAVE NO LIABILITY FOR ANY PERSONAL INJURY, PROPERTY DAMAGE OR OTHER LOSS BASED ON A CLAIM THE DETECTOR FAILED TO GIVE WARNING. HOWEVER, IF SELLER IS HELD LIABLE, WHETHER DIRECTLY OR INDIRECTLY, FOR ANY LOSS OR DAMAGE ARISING UNDER THIS LIMITED WARRANTY OR OTHERWISE, REGARDLESS OF CAUSE OR ORIGIN, SELLER'S MAXIMUM LIABILITY SHALL NOT IN ANY CASE EXCEED THE PURCHASE PRICE OF THE DETECTOR, WHICH SHALL BE THE COMPLETE AND EXCLUSIVE REMEDY AGAINST SELLER. This warranty replaces any previous warranties and is the only warranty made by Seller on this detector. No increase or alteration, written or verbal, of the obligations of this Limited Warranty is authorized.



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