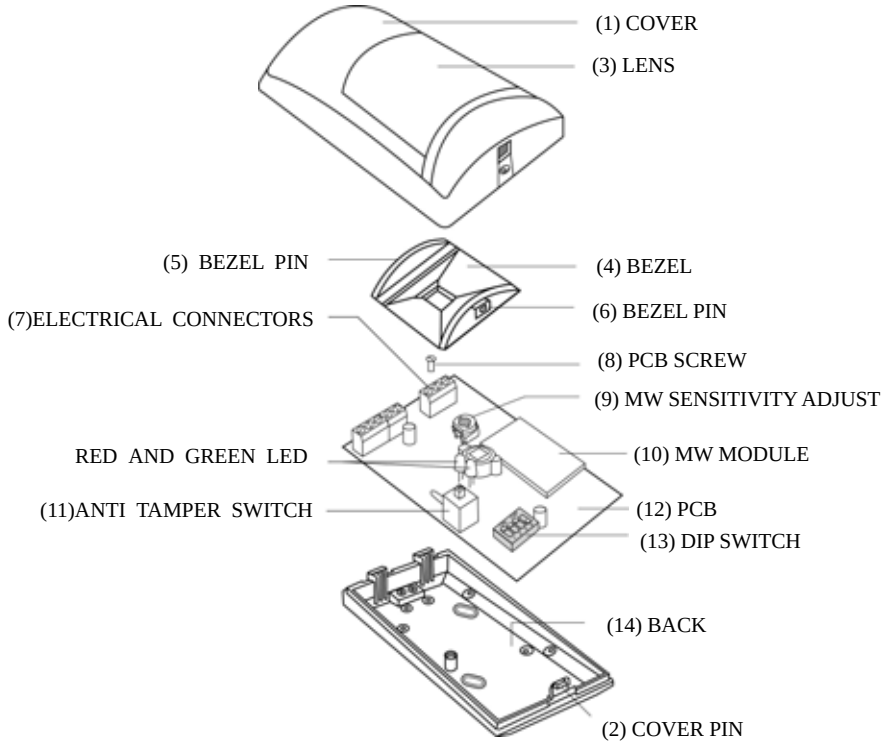
MW-2200 Dual Technology Microwave/PIR Motion Detector
Installation Manual

INTRODUCTION

The **MW-2200** (MW/PIR) is state-of-the-art, microcomputer controlled dual technology intrusion detectors. The PIR and MW technologies, when combined in a single detector, complement each other to assure the most reliable detection and immunity to false alarms. The superiority of the **MW-2200** series over other dual detectors has been achieved by the advent of the **True Motion Detection Technology** algorithm. This advanced motion analysis method provides the **MW-2200** with the ability to distinguish between the true motion of a human body and any other disturbances which invariably cause false alarms. Another unique feature of the **MW-2200** is the **MW Motion Simulator** circuit, that simulates the effect created by a human body moving in the MW field. The simulation routine is carried out periodically for self-testing, supervision and assurance that the MW detector operates properly. In addition, the pyroelectric sensor and its circuitry are tested at regular intervals by application of a short-duration heat pulse. If they do not react properly, a trouble alert is initiated.

Fig-1
EXPLODED VIEW



INSTALLATION

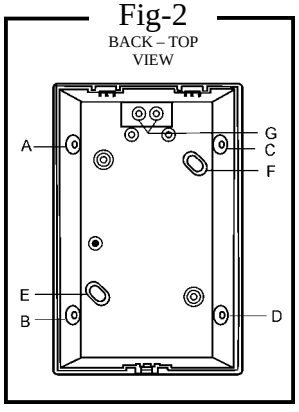
1. Location

Installation locations should be carefully selected to avoid proximity to any of the following: reflective surfaces, direct air flow from vents, fans and windows, sources of steam/oil vapor, objects causing temperature changes such as heaters, refrigerators and ovens, and infrared light sources.

Microwave radiation can pass through glass and non-metallic walls. Be sure to adjust the MW range so that it does not exceed the room limits, or else a rotating ceiling fan in the next room, or moving traffic along the outer side of the wall will cause the MW detector to alarm. Large reflecting objects (especially metals) within the coverage area can distort the microwave detector's coverage pattern. Although the **MW-2200** is extremely immune to false alarms, it is recommended to avoid installation in a room with very strong air turbulence or close to high-power electrical cables. If two **MW-2200** units are installed in the same room or on opposite sides of a shared wall, they should not face each other and must be mounted at least 2 meters apart. For best performance at high ambient temperatures, aim the unit towards the coolest place in the protected area.

Always mount the unit on a firm and stable surface at a height that renders optimum coverage of the protected area. Increasing the vertical angle at a certain height will increase the coverage range.

Fig-2
BACK – TOP VIEW



2. Mounting

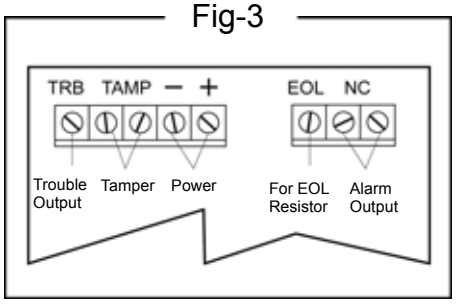
Select the detector installation site, based on the required coverage and recommended height of 2.1m (7 ft.) The detector comes equipped with the “no dead zone” standard lens. If another lens pattern is required, choose the desired lens and:

a) remove front cover of the detector (1) by gently pushing pin (2) in with a screwdriver.
b) pull out the bezel (4) by lightly pressing on bezel pins (5) and (6).
c) Remove the lens and replace it with the alternate lens. (Note that when the new lens is properly installed, the grooves should be inside the bezel.)
d) replace the bezel by lightly pressing it in place. Make sure that the lens is centered.

The unit can be installed directly on the wall or in a corner using the mounting knockouts. Optional swivel brackets permit greater flexibility when adjusting the coverage area.

After selecting the detector's location, drill holes for the screws as per figure #2. Holes A, B, C and D are to be used for corner mounts. For a corner mount, the PCB can be carefully removed by loosening the PCB screw. In the case of flat surface installation, utilize holes E and F. Run the wires through entry holes G and connect them according to the marking on the PCB or FIG-3, FIG-4 and FIG-5.

Fig-3



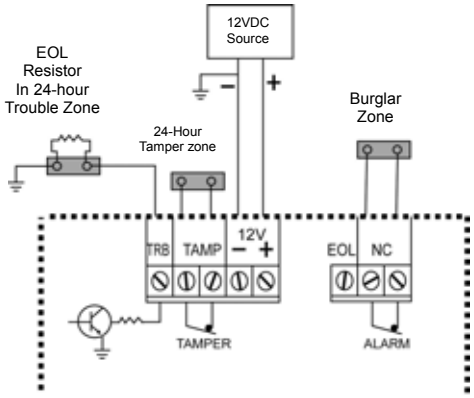
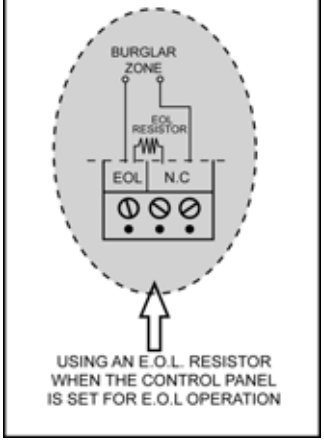


Fig-4. Terminal Block Wiring

Fig-5



3. Wiring

Connect wires to the terminal block in the following order (Fig. 3-5):

12 V (+) and (–)	Connect to a power source within the range of 9 to 16 VDC. Take care not to reverse the polarity.
N.C.	Alarm Output, Connect to normally closed burglar protection zones of the control panel.
TAMP	Tamper Switch, Connect to a normally closed 24-hour tamper zone of the control panel.
TRB	Trouble Output, Connect to a 24-hour trouble zone, parallel to an E.O.L. resistor (see Figure 4). The TRB open collector output will be grounded upon detector malfunction, causing disturbance in the trouble zone of the associated alarm system. Alternatively a buzzer or an interface relay may be connected across the **TRB** output and the **12 VDC (+)** terminals.

Note: Upon completion of installation, all openings in the detector should be sealed with silicone to prevent drafts or insets from entering the detector.

4. COVERAGE ADJUSTMENT

Using the lens at the recommended installation height of 2.1m (7 ft) ±10%, the **MW-2200** will provide full coverage from 1.2m (4 ft) to 12m (40 ft), without any dead zones. Please ensure that the PCB is fixed at the 2.1m (7 ft) mark. (A small vertical adjustment of the PCB (± 0.5mm) may be required.)

Your unit is equipped with "automatic temperature compensation", which adjusts amplifier gain to maintain coverage levels across a wide range of temperatures.

For any of the other lenses, please refer to pattern drawings for each lens. If another installation height is called for, move the PCB to the proper installation height indicated on the left side of the PCB. A small adjustment may be required, depending on the protected area.

To create a pet "alley" using the pet alley lens, the recommended installation height is slightly above the maximum area occupied by the pet. The PCB should be set at the 2.1m (7 ft) mark, regardless of the installation height for this lens.

Any PCB adjustment should be followed by a walk-test of the protected area. Walk-testing verifies that the required coverage is in place, as per the lens pattern being used. With standard lens, there should be no dead zones in the protected area. When walk-testing, always move across the path of detection, not toward the detector.

5. Power on

After connecting the power source, the MW-2200 starts a 60-second warm-up period, indicated by alternate flashing of both red and green LEDs. If the alternate flashing of the LEDs do not stop within 60 seconds, a failure has been detected by the self-test circuit.

INDICATION AND SETTING

1. LED Indications

The two LEDs (Fig. 1) are used to signal various alarm and trouble messages as shown in Table 1 below:

Table 1. LED Indications

Status of LEDs		Meaning
GREEN	RED	
Off	Off	No detection
On	Off	MW walk-test detection
Flashes	Off	PIR walk-test detection
Off	On	Alarm: MW+PIR detection
Flashes	Flashes	Trouble is being detected by the self test circuitry, or initial warm-up self test (stops 60 seconds after power up)

Notes: *1. During walk testing, the first LED to respond is the green one. It illuminates steadily (MW detection) or flashes (PIR detection), depending on which one of the two detectors discovered the motion first. Upon subsequent discovery of the motion by the other detector, the green LED will go off and the red LED will illuminate (alarm).*

2. If the green and red LEDs continue to flash beyond the warm-up period, a malfunction or masking has been diagnosed. Replace the unit without delay.

2. Mode Setting

The mode setting DIP Switch is mounted on the detector's PCB board (see Fig. 1). It controls four functions as demonstrated in Fig. 6 and as detailed in Table 2.

Table 2. Mode Setting DIP Switch

Switch	Setting	Function	Default Setting
SW-1	ON	Two PIR pulse count triggers the detector(false alarm prevention)	ON
	OFF	One PIR pulse count triggers the detector(high sensitivity)	
SW-2	ON	Alarm walk test LED is enabled*	ON
	OFF	Alarm walk test LED is disable	
SW-3	ON	MW/PIR walk test LED is enabled	ON
	OFF	MW/PIR walk test LED is disable	
SW-4	ON	Output relay opens upon alarm And/or when trouble is detected	OFF
	OFF	Output relay opens upon alarm	

Fig-6. DIP Switch Mode Selector

*Setting SW-2 and SW-3 to OFF does not disable the trouble indication (flash/flash)

ADJUSTMENT AND TEST

1. Setting the PIR Pulse Count

If you wish to set the PIR detector for maximum false alarm immunity, shift DIP switch 1 (SW-1) to ON. In this position, two consecutive motion pulses are required to trigger the PIR detection. For faster catch performance, shift SW-1 to OFF. In this position, only one motion pulse is required to trigger the PIR detection.

2. PIR Walk Test

A. Rotate the MW sensitivity adjust all the way towards minimum (turn the adjust anti-clockwise).
B. Verify that DIP switch SW-3 is set to ON (the green walk-test LED is enabled).
C. Mount the front cover in place.
D. Walk into the detector's field of view at the expected far edge of the coverage area. The green LED should flash for up to 5 seconds each time your motion is detected.
Note: *If the green LED illuminates steadily, your motion has been detected by the MW detector.*
E. If PIR detection is not obtained at the far end of the coverage area, remove the front cover and re-adjust the vertical angle. Replace the cover and retest.

3. MW Walk Test

A. Remove the front cover.

B. Verify that the MW sensitivity adjust is set to minimum (turn the adjust anti-clockwise) and DIP switch SW-3 is set to ON (the green walk-test LED is enabled).

C. Start by moving into the coverage area at the far edge. The green LED should light steadily for up to 5 seconds each time your motion is detected.

D. If your motion was not detected at the far edge of the coverage area, advance the MW adjust slightly toward maximum(clockwise) and try again until your motion is detected reliably at the far edge.

Caution! *The MW detection range must not exceed the far edge of the desired coverage area, otherwise* it will detect movement from outside the walls of the protected area and causes false alarm.

E. Walk across the coverage area at various ranges and verify that your motion is consistently detected.

Note: *If PIR trips interfere with your test, disable the PIR by inserting a small piece of cardboard in front of the sensor.*

4. Alarm Walk Test

A. Set DIP switches SW-2 and SW-3 to ON (both LEDs are enabled).

B. Install the front cover in place.

C. Walk across the detector's field of view in different directions, at various distances from the detector, and verify proper detection throughout the detector's coverage area (the red LED will illuminate for 3 seconds).

D. When done, remove the cover and set DIP switches SW-2 and SW-3 to OFF to prevent unauthorized people from tracing the coverage pattern.

E. Remount the cover and fasten it to the base using a small screw at the bottom.

WARRANTY

The Seller warrants its products to be free from defects in materials and workmanship under normal use for a period of one year. Except as specifically stated herein, all express or implied warranties whatsoever, statutory or otherwise, including without limitation, any implied warranty of merchantability and fitness for a particular purpose, are expressly excluded. Since the Seller does not install or connect the products and because the products may be used in conjunction with products not manufactured by Seller. Seller cannot guarantee the performance of the security system. Seller obligation and liability under this warranty is expressly limited to repairing or replacing, at Seller's option, any product not meeting the specifications. In no event shall the Seller be liable to the buyer or any other person for any loss or damages whether direct or indirect or consequential or incidental, including without limitation, any damages for lost profits stolen goods, or claims by any other party, caused by defective goods or otherwise arising from the improper, incorrect or otherwise faulty installation or use of the merchandise sold.

SPECIFICATIONS

PIR Sensor	Low noise dual-element pyroelectric sensor
PIR Trigger Indication	Green LED flashes for up to 5 seconds
Pulse Count	Selectable, 1 or 2 pulse count
Lens	34 beams, 90° field of view
Coverage	12m x 90°
Microwave Oscillator	DRO-stabilized type
Microwave Frequency	2.45 GHz
Microwave Range	Adjustable from 25% to 100% (3 m to 12 m)
MW Trigger Indication	Green LED illuminates for up to 5 seconds
Alarm Indication	Red LED illuminates for 2-3 seconds if both PIR and MW detection are triggered
Alarm Output	Normally closed, 0.1 A resistive / 30 VDC; 18 ohms resistor in series with contacts (Optional N.O. output)
Alarm Duration	3 seconds (red LED lights and output relay contacts open)
Tamper Switch	N.C., 50 mA resistive /30 VDC
Trouble Output	Open collector, 100 mA max.
Trouble Indication	LEDs flash alternately and TRB output pulls LOW
RFI Protection	>30 V/m (20 MHz to 1000 MHz)
Power Source	9 to 16 VDC
Operating Current	About 26 mA @ 12 VDC
Mounting	Surface or corner (without brackets), up to 2.4 m high
Operating Temperature	–10°C to 50°C
Dimensions (H x W x D)	104 x 60 x 35 mm
Net Weight/Shipping Weight	110Grams/145Grams