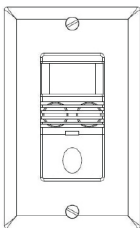


INSTALLATION INSTRUCTIONS



MTOS180

MTOS180

Multi-Technology PIR/Ultrasonic
Sensor Switch
Occupancy / Vacancy
(2-IN-1)

SPECIFICATIONS

Voltage 120/277VAC,50/60Hz
Load Requirments:
Incandescent.....800W-120VAC,50/60Hz
Fluorescent.....800VA-120VAC,1600VA-277VAC,50/60Hz
Motor 1/4HP-120VAC,50/60Hz
Adjustment Time Delay..... 15Sec to 30Mins
Walk-Through Mode.....3 minutes if no activity after 30 sec.
Test Mode 15 sec. at initial power up or DIP switch reset
PIR Adjustment.....High or Low (DIP switch)
Ultrasonic Adjustment Minimum to Maximum (trimpot)
Light Level Adjustment.....100 Lux --daylight(trimpot)
Operation Temperature..... 32° F--131° F

DESCRIPTION

This Multi-Technology Occupancy Sensor combines advanced passive infrared (PIR) and ultrasonic technologies into one unit. The combined technologies help to avoid false triggering. Selectable operating modes allow the sensor to turn a load on, and hold it on as long as either or both technologies detect occupancy . After no movement is detected for the selected time delay, the lights switch off. A "walk-through" mode can turn lights off after only 3 minutes, if no activity is detected after 30 seconds following an occupancy detection. This sensor also contains a light level sensor. If adequate daylight is present, the sensor holds the load OFF until light levels drop, even if the area is occupied.

COVERAGE PATTERN

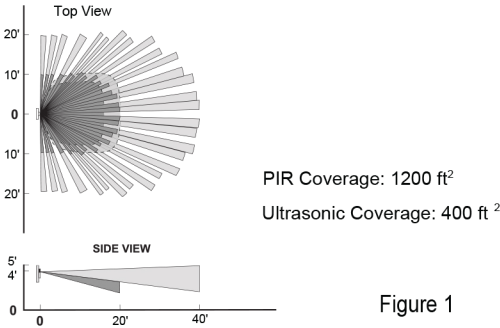


Figure 1

WARNING: Turn off the circuit breaker before installation.

Indoor use only.
Do not exceed electrical ratings.

INSTALLATION

1. Make sure that the power has been turned OFF at the circuit breaker.
2. Connect lead wires as WIRING DIAGRAM (see Figure 2): Black lead to Line(Hot), Red lead to Load wire, White lead to Neutral wire, Green lead to Ground.

Wiring Diagram:

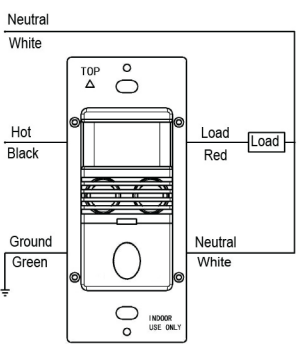


Figure 2

3. Mount device "TOP" up.
4. Gently position wires in wall box, attach sensor switch to the box.
5. Restore power at circuit breaker or fuse, wait **one** minute.
6. Remove the small cover plate (illustrated in Figure 3).
7. Locate the adjustment trimpots on the control panel to perform test and adjustment (illustrated in Figures 3 and 4).
8. Replace the small cover plate after testing and adjustment.

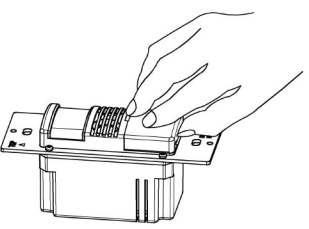


Figure 3

ADJUSTMENT

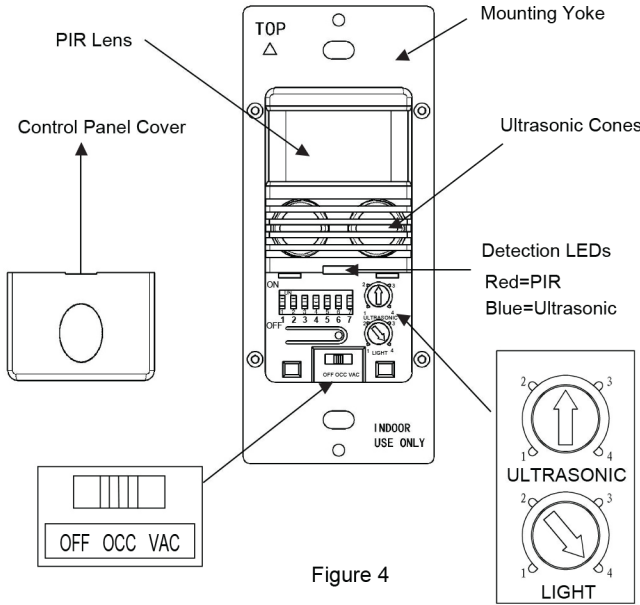


Figure 4

Band switch prescription.

Mode	Position	Description	React to the push-button
OFF	Left	Circuit is permanently opened. (switched off)	None
OCC	Center	Occupancy Mode: Automatic On, automatic Off after set time delay.	Manually toggles the load On/Off
VAC	Right	Vacancy Mode: Manual On only, automatic Off after set time delay.	Manually toggles the load On/Off

Ultrasonic Sensitivity Adjustment Trimpot

Default position: Center at 65%
Adjustable: 30% (Position 1) to 100% (Position 4)
Note: Turn toward right for greater room space. Turn toward left to avoid false alert in smaller room and near the door way or heat source.

Ambient Light Level

Default position: Daylight (100% at position 4)
Adjustable: Daylight to 100Lux (Counter clockwise)
Note: Use ambient light feature when daylight source is available.

INSTALLATION INSTRUCTIONS

◆ DIP SWITCH SETTING

The MTOS180 has 7 DIP switches under the cover. They are used to set sensitivity, time delay, trigger mode, walk through mode feature settings.

Trigger Mode	Initial Trigger	Maintain Load Output	Re-trigger	2	3
Option 1	Both	Either	Either	↓	↓
Option 2	PIR	PIR	PIR	↓	↑
Option 3	US	US	US	↑	↓
Option 4	Both	Both	Both	↑	↑

PIR Sensitivity	↑
50%	↓
100%	↑
Walk Through	7
Disabled	↓
Enabled	↑

Time Delay	4	5	6
15 Sec/Test	↓	↓	↓
1 Minute	↓	↓	↑
5 Minutes	↓	↑	↑
10 Minutes	↑	↑	↑
15 Minutes	↑	↑	↑
20 Minutes	↑	↑	↑
25 Minutes	↑	↑	↑
30 Minutes	↑	↑	↑

↓=OFF ↑=ON ◀=Factory Setting

PIR Sensitivity setting: Switch 1

50% - sensors coverage is smaller, just about half of the widest range.
100% - the maximum range of sensors PIR coverage is 1200 square feet, see "coverage pattern".

Trigger Mode: Switches 2, 3

The sensor has 4 trigger options, set with DIP switches 2 and 3.
In the trigger mode DIP switch setting table:

- **Both** - requires motion detection by the PIR and the Ultrasonic.
- **Either** - requires motion detection by only one technology.
- **PIR** - requires motion detection by the PIR.
- **US** - requires motion detection by the Ultrasonic.

Time Delay: Switches 4, 5, 6

The sensor will hold the lights on as long as occupancy is detected. The time delay countdown starts when no motion is detected. After no motion is detected for the length of the time delay, the sensor will turn the lights off.

Walk-through mode: Switch 7

Turns the lights off three minutes after the area is initially occupied, if no motion is detected after the first 30 seconds. If motion continues beyond the first 30 seconds, the selected time delay applies.

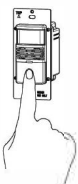


Figure 5

◆ OPERATION

The Sensor Switch can be used to select either Occupancy Mode or Vacancy Mode as set by the Band Switch position under the control panel cover. Some might call the Vacancy mode, "Manual On Occupancy Mode".

Manual On/Off Button

By Pushing the Control Panel Cover, the Load can be turned On/Off under either OCC or VAC mode (illustrated in Figure 5).

Occupancy Mode - Auto on, Auto Off

Load will be Automatically On once occupancy is detected.

Vacancy Mode - Manual On, Auto Off

On/Off Button must be pushed to turn On the Load.

Automatic Off

Under either mode, the Sensor keeps the Load On until no motion is detected plus the set time delay, load turns Off automatically.
Under VAC Mode, the Load turns On automatically if motion detected within the first 3 minutes.

Manual Off

By Manual On/Off Button, the Load can be turned Off under either OCC or VAC mode.

Under OCC Mode, if you press manual On/Off button first, when set-time is more than 3 minutes, the sensor switch returns to normal after 3 minutes. However, when set-time is less than 3 minutes, the sensor switch returns to normal until set-time finishes.

Note: Only when no motion is detected during the set-time period will the sensor switch returns to normal.

◆ TROUBLESHOOTING

For proper operation, the Sensor Switch has to consume power from hot and **Neutral**. Therefore, a **Secured Neutral Wiring is required**.

Initialization

The Sensor Switch needs to initialize for one minute. During initialization the load might be turned On and Off several times.

The Time Delay Switch is set on 15 seconds by default, do not adjust it until initialization is complete and proper operation confirmed.

The Load is out of control (frequently flashing)

1. It can take up to one minute for initialization.
2. Check the wiring connections, especially the **Neutral wiring**.

The Load does not turn On without LED flashing or LED flashes regardless of motion

1. Push Manual On/Off Button. If the load turns On, verify that Sensitivity Range is on high. If the Load does not turn On go to Step 2.
2. Check the wiring connections, especially Hot line and Neutral wiring.

The Load does not turn On while LED flashes with motion detected

1. Check to see if Ambient Light Level is enable by covering the lens by hand.
2. Push Manual On/Off Button. If the load turns On, verify that Sensitivity Range is on high. If the Load does not turn On go to Step 3
3. Check the wiring connections, especially Hot Line and Neutral wiring.

The Load does not turn Off

1. There can be up to a 30 minutes time delay after the last motion is detected. To verify proper operation turn the Time Delay Switch to 15s (Test Mode), and make sure there is no motion (no LED flashing). The Load should turn Off in 15 seconds.
2. Check the wiring connections, especially the Neutral wiring to the sensor switch.

The Load turns On when not desired

1. Switch from OCC to VAC mode.
2. Reduce the Sensitivity Level to avoid false alerts in smaller rooms and when near a doorway.

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