

Single Pole (One Location) or Multi-Location  
Multi-Technology Wall Switch Occupancy Sensor  
California title 24 2005 Compliant  
Cat. No. OSSMT-MDx

Incandescent: 800W @ 120V    Fluorescent: 1200VA @ 120V    Supplemental: 1/4hp-5.8A @ 120V

No Minimum Load Required  
Compatible with incandescent lamps, electronic and magnetic low-voltage ballasts, electronic and magnetic ballasts, and fans

### INSTALLATION INSTRUCTIONS

#### WARNINGS AND CAUTIONS:

- To be installed and/or used in accordance with appropriate electrical codes and regulations.
- If you are unsure about any part of these instructions, consult a qualified electrician.
- Controlling a load in excess of the specified ratings will damage the unit and pose risk of fire, electric shock, personal injury or death. Check your load ratings to determine suitability for your application.
- Do not install this unit to control a receptacle.

#### Tools needed to install your Sensor:

Slotted/Phillips Screwdriver  
Pencil  
Electrical Tape  
Cutters  
Pliers  
Ruler

#### DESCRIPTION

Leviton's Designer Multi-Technology Wall Switch Occupancy Sensor, Cat. No. OSSMT-MDx, is designed to detect motion using the passive infrared (PIR) sensor from sources (such as a person entering a room) within its field-of-view (monitored space) and automatically switch lights ON. The ultrasonic (US) sensors work with the PIR to keep the lights ON when occupied. The controlled lights will remain ON until no motion is detected and the scheduled time-delay has expired. The sensor adapts its time delay settings to the occupancy patterns of a room.

Cat. No. OSSMT-MDx is UL listed, CUL listed and conforms to California Title 24 requirements.

The Occupancy Sensor senses motion within its maximum coverage area of 2400 sq. ft (223 m<sup>2</sup>) and controls the connected lighting. This is a self-contained device that provides sensing and light control. The Occupancy Sensor will turn the lights ON when motion is detected and keep the lights ON for as long as motion is detected.

The PIR Occupancy Sensor uses a small semiconductor heat detector that resides behind a multi-zone optical lens. This Fresnel lens establishes dozens of zones of detection. The Sensor is sensitive to the heat emitted by the human body. In order to initially trigger the Sensor, the source of heat must move from one zone of detection to another. The device is most effective in sensing motion across its field-of-view and it is less effective sensing motion towards or away from its field-of-view). Keep this in mind when selecting the installation location (refer to Field-of-View diagrams).

The US Occupancy Sensor uses a non-audible, high frequency (40kHz) to sense Doppler shifts caused by motion in the space. The US is more sensitive to small motion and does not rely on line of sight for detection. If both sensors have not detected any motion for the set timeout period, the lights will be turned OFF.

Note that occupancy sensors respond to rapid changes in temperature, so care should be taken not to mount the device near a climate control source (i.e. radiators, air exchanges, and air conditioners). Hot or cold drafts will look like body motion to the device and will trigger it if the unit is mounted too close. It is recommended to mount the Occupancy Sensor at least 6 ft. away from the climate control source. The device can be mounted in a single gang wall box.

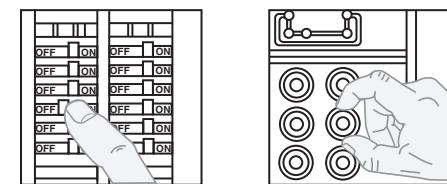
In addition, it is also recommended NOT to mount the Occupancy Sensor directly under a large light source. Large wattage bulbs (greater than 100W incandescent) give off a lot of heat and switching the bulb causes a temperature change that can be detected by the device.

Mount the Occupancy Sensor at least 6 ft. away from large bulbs. If it is necessary to mount the device closer, lower the wattage of the bulb directly overhead.

#### INSTALLING YOUR SENSOR

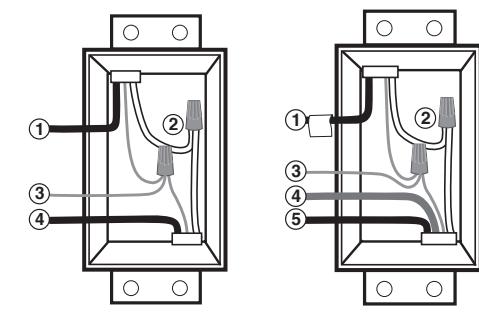
NOTE: Use check boxes  when Steps are completed.

**Step 1** **WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER** at circuit breaker or fuse and test that power is off before wiring!



**Step 2** **Identifying your wiring application (most common):**

NOTE: If the wiring in the wall box does not resemble this configuration, consult a qualified electrician.



**IMPORTANT:** For 3-Way applications, note that one of the screw terminals from the old switch being removed will usually be a different color (Black) or labeled Common. Tag that wire with electrical tape and identify as the common (Line or Load) in both switch wall boxes.

**Step 3** **Preparing and connecting wires:**

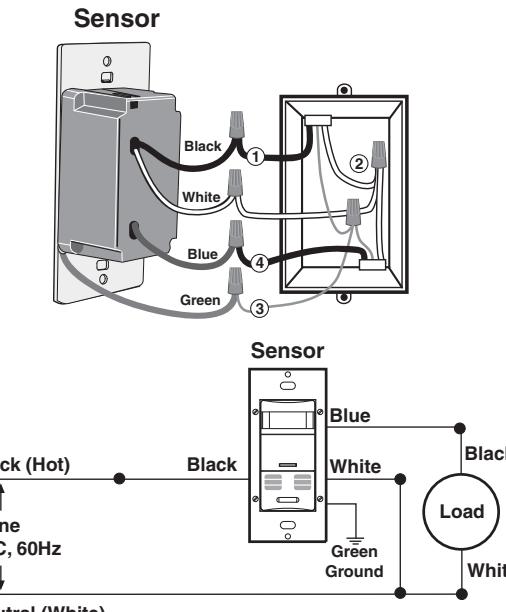


- Pull off pre-cut insulation from sensor leads.
- Make sure that the ends of the wires from the wall box are straight (cut if necessary).
- Remove insulation from each wire in the wall box as shown.

For non-standard wiring applications, refer to Wire Nut and Conductor Size Chart

WIRE NUT / # OF COND. COMBINATION CHART
1- #12 w/ 1 to 3 #14, #16 or #18
2- #12 w/ 1 or 2 #16 or #18
1- #14 w/ 1 to 4 #16 or #18
2- #14 w/ 1 to 3 #16 or #18

**Step 4** **Installing your Sensor - Single-Pole Application:**



**WIRING SENSOR:**

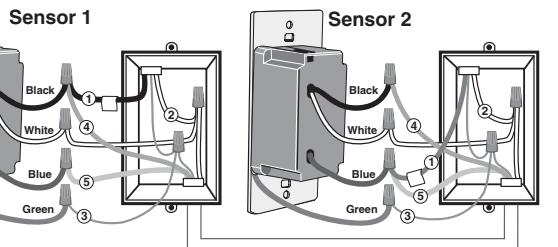
Connect wires per WIRING DIAGRAM as follows:

- Green or bare copper wire in wall box to Sensor 1 Green lead.
- Line Hot (common) wall box wire identified (tagged) when removing old switch and First Traveler from Sensor 2 to Sensor 1 Black lead.
- Second Traveler wall box wire from Sensor 2 to Sensor 1 Blue lead.
- Line Neutral wall box wire to Sensor 1 White lead.

**WIRING SENSOR 2:**

- Connect wires per WIRING DIAGRAM as follows:
- Green or bare copper wire in wall box to Sensor 2 Green lead.
  - Load wall box wire identified (tagged) when removing old switch and Second Traveler from Sensor 1 to Sensor 2 Blue lead.
  - First Traveler Line Hot from Sensor 1 to Sensor 2 Black lead.
  - Second Traveler wall box wire from Sensor 2 to Sensor 1 Blue lead.
  - Line Neutral wall box wire to Sensor 1 White lead.
- NOTE: Allow 1 minute for warm-up after connected.

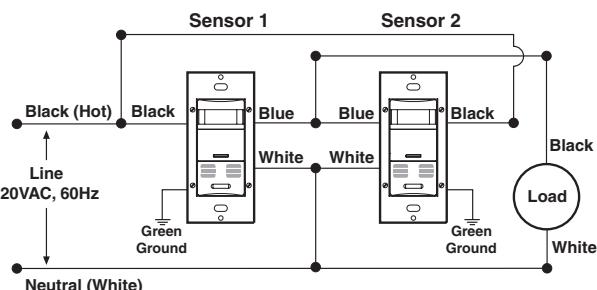
**Step 5** **Installing your Sensor - 3-Way Wiring Application:**



#### WARNINGS AND CAUTIONS:

- The OSSMT-MDx Multi-Technology Wall Switch Occupancy Sensor is intended to replace a standard light switch.
- Do not touch the surface of the lens. Clean outer surface with a damp cloth only.
- Disconnect power at circuit breaker or fuse when servicing, installing or removing fixture.
- Use this device only with copper or copper clad wire. With aluminum wire use only devices marked CO/ALR or CU/AL.

**Step 5 cont'd** **Installing your Sensor - 3-Way Wiring Application:**



**NOTE:** Sensor 1 must be installed in a wall box that has both a LINE Hot and a Neutral connection. Sensor 2 must be installed in a wall box that has both a Load and a Neutral connection.

If you are unsure about any part of these instructions, consult a qualified electrician.

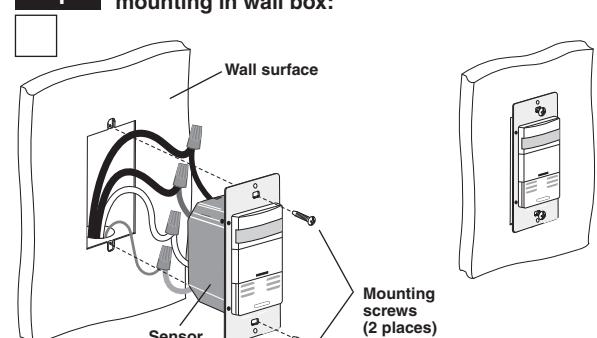
**WIRING SENSOR 1:**

- Connect wires per WIRING DIAGRAM as follows:
- Green or bare copper wire in wall box to Sensor 1 Green lead.
  - Line Hot (common) wall box wire identified (tagged) when removing old switch and First Traveler from Sensor 2 to Sensor 1 Black lead.
  - Second Traveler wall box wire from Sensor 2 to Sensor 1 Blue lead.
  - Line Neutral wall box wire to Sensor 1 White lead.

**WIRING SENSOR 2:**

- Connect wires per WIRING DIAGRAM as follows:
- Green or bare copper wire in wall box to Sensor 2 Green lead.
  - Load wall box wire identified (tagged) when removing old switch and Second Traveler from Sensor 1 to Sensor 2 Blue lead.
  - First Traveler Line Hot from Sensor 1 to Sensor 2 Black lead.
  - Second Traveler wall box wire from Sensor 2 to Sensor 1 Blue lead.
  - Line Neutral wall box wire to Sensor 1 White lead.
- NOTE: Allow 1 minute for warm-up after connected.

**Step 6** **Testing your Sensor prior to completely mounting in wall box:**



**NOTE:** Dress wires with a bend as shown in diagram to relieve stress when mounting device.

- Position all wires to provide room in outlet wall box for device.
- Partially secure device using long mounting screws provided.
- Restore power at circuit breaker or fuse.

**NOTE:** Cat. No. OSSMT-MDx is factory preset to work without any adjustments. If necessary, adjust the Blinders and PIR Range Control to stop any unwanted activation of the lights (refer to FEATURES section).

- For additional Time Control Settings (refer to the SETTINGS section).

**Step 6 cont'd** **Testing your Sensor prior to completely mounting in wall box:**

**NOTE:** To avoid PERMANENT DAMAGE to the unit, be careful NOT TO OVERTURN the control knobs or levers when setting the Sensor. The controls can be accessed by removing the wallplate (if applicable) and control panel cover (refer to Control Panel Diagram). Use a small straight blade screwdriver to adjust knobs and blinder levers.

**NOTE:** DO NOT press in on blinder levers or use excessive force (refer to Control Panel Diagram).

- Attach the Control Panel cover when the desired settings are complete.

If lights do not turn ON, refer to the TROUBLESHOOTING section.

**FEATURES:**

**NOTE:** To access control settings, remove the control panel cover. If necessary, remove the warning label that covers the adjustment dials (refer to Control Panel Diagram).

**Factory Settings:** The sensor is shipped from the factory to work in almost all situations, without any added adjustments. The factory settings are: Blinders open, Adapting Time-Out starting with 30 minute Base Time-Out, Lights always turn ON regardless of existing light levels, and Medium range.

**Blinders:** The blinders are two independent shutters that can narrow the field-of-view from a maximum of 180° down to 32°. The blinders are operated by moving the blinder levers towards or away from the center of the Sensor. The blinder levers can be found above the control dials in the control panel (refer to Control Panel Diagram).

**Time-Outs:** The Sensor has three types of Time-Outs: Walk-through, Fixed, and Adapting.

- Walk-through Time-Out: The value of this Time-Out is preset to 2.5 minutes.
- Fixed Time-Out: The value of this Time-Out is user selected through the use of the Time Control Setting.
- Adapting Time-Out: When activated, the value of this Time-Out (30 minutes) is changed by the Sensor based on room occupancy and lighting conditions.

**Walk-Through:** The walk-through feature is useful when a room is momentarily occupied. With this feature, the Sensor will turn the lights OFF shortly after the person leaves the room.

The walk-through feature works in the following manner: When a person enters the room, the lights will turn ON. If the person leaves the room before the walk-through time-out of 2.5 minutes, the Sensor will turn the lights OFF. If the person stays in the room for longer than 2.5 minutes, the Sensor will instead use the time-out per the Time Control setting (refer to Time Control setting in the following sections).

**Adapting Time Delay:** The Sensor has built in adapting intelligence that changes the Adapting Time-Out duration in response to the occupancy conditions of the room it is installed in.

If the Sensor detects "large" motions (as in a person walking by), it will NOT change the Time-Out duration. If the Sensor detects "small", infrequent motion (as in a person sitting down and writing) it will INCREASE the Adapting Time-Out duration. If the Sensor detects "small", frequent motion (as in several persons in a room during a meeting), it will DECREASE the time-out duration only if it was NEVER increased (this is because the built-in intelligence will always proceed in the direction of "increasing" adapting Time-Out once it has increased it for any of the occupancy conditions sensed).

If the room is occupied for longer than 2.5 minutes, the Sensor will enter the Occupied Mode with the time-out duration specified by the Time Control setting. This time-out is used as the starting point for adapting. After seven days, the Time-Out value will adapt to the "best" value based on the occupancy conditions detected in the room.

### Step 6 cont'd Testing your Sensor prior to completely mounting in wall box:

If the Sensor detects motion within 45 seconds after the lights turn OFF, it will turn the lights ON and increase the time-out value by 1.5 times the existing value.

The adapted Time-Out may be reset to the base value by rotating the Time Control to a new time selection value (refer to Control Panel Diagram).

**Time Control Setting:** The fixed Time-Out value is selected by rotating the Time Control dial. There are four (4) values from which to choose. Each mark around the dial corresponds to a different value as indicated below (refer to Control Panel Diagram).

**NOTE:** All time durations are approximate within ±10 seconds.

**Ambient Light Override:** The Ambient Light Override is used to keep the lights OFF if there is already enough natural light in the room. For proper operation, the Ambient Light Override adjustment must be performed when there is enough natural light (refer to the SETTINGS section). If the adjustment is made when there is less natural light, the lights may not turn ON even though they are enabled and will require manual activation of the push-buttons to turn the lights ON.

**NOTE:** The ambient light level in the center of a room will be different than the level at the wall where the switch is located.

**Ambient Light Dial:** The ambient light setting is adjusted with the Ambient Light Dial (refer to Control Panel Diagram). Turning the Light Dial fully counter-clockwise (CCW), sets the Sensor to manual ON mode (lights always turn ON) (see following section). All other settings will cause the lights to turn ON only when the light level is less than the setting.

To prevent false low light levels from the user standing in front of the device during adjustment, the Sensor remembers the ambient light level from 1 minute ago.

**NOTE:** When the setting is at the minimum CCW level, the lights will stay OFF when the room is dim. When the setting is at the maximum level clockwise (CW), the lights will turn ON when the room is bright.

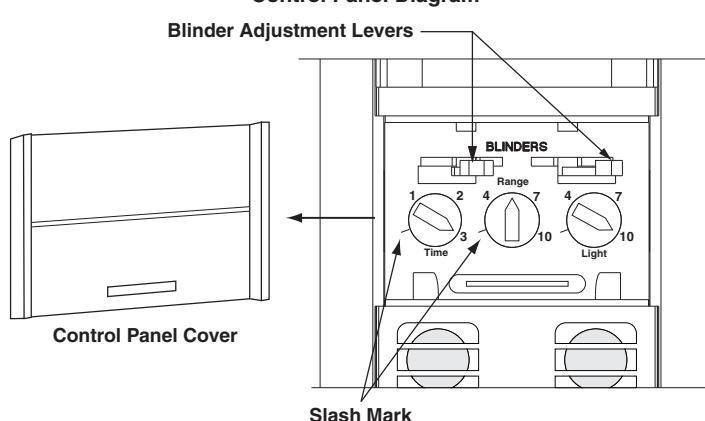
**Manual ON Mode:** When the light control is in the fully CCW position the lights will never automatically turn ON. In this mode the lights need to be manually turned ON by the push-button, and will turn OFF with the absence of motion. If the light control is in the fully CW position, the lights will turn ON whenever motion is detected, even in full daylight. Intermediate settings will cause the lights to turn ON only when the ambient light is below the level selected by the light control.

**NOTE:** The ambient light in a room will change with the time of day and the season of the year.

**PIR RANGE:** To decrease PIR detection range and sensitivity, rotate the knob CCW (refer to Control Panel Diagram). The detection range can be adjusted from 100% down to 30%.

**ULTRASOUND (US) SENSITIVITY:** US sensitivity can be adjusted to LOW-MEDIUM-HIGH by holding the ON button for 15 seconds. The Amber LED will flash 3 times (per second) for HIGH, 2 times for MEDIUM, and 1 time for LOW. Tapping the ON button during the desired LED flash indication will set the sensitivity. The program times out in 30 seconds from the last button press. The factory setting for the US sensitivity is HIGH.

### Control Panel Diagram



### Step 6 cont'd Adjusting your Sensor Settings:

#### SETTINGS

**NOTE:** To avoid PERMANENT DAMAGE to the unit, be careful NOT TO OVERTURN or use excessive force when setting the control knobs or levers of Cat No. OSSMT-MDx. Use a small straight blade screwdriver to adjust the knobs and your finger to adjust the blinder levers.

1. Remove Decora® wallplate and Control Panel Cover from Sensor.
2. Rotate the Time dial to select the desired fixed Time-Out value.
3. If the Sensor is installed within 6 feet of an air duct, rotate the Range Control 1/4 turn counter-clock-wise (CCW).

**4. Set the Ambient Light Level - AMBIENT LIGHT:** Cat. No. OSSMT-MDx has an adjustment to determine at what minimum ambient light level the unit will operate. The adjustment should be made when the ambient light is at the level where no artificial light is needed. Follow these steps to make a more accurate adjustment of the light control.

- If Manual-On mode is desired, turn the Lights knob to fully counter-clockwise (CCW) position.

**A.** With the lights ON, rotate the Time Control fully CCW to the set the Time-Out to the thirty (30) second test mode (refer to Control Panel Diagram).

**B.** Rotate the Light Control fully CCW.

**C.** Cover the Sensor Unit with an opaque material, or leave the room and let the Sensor Unit Time-Out and turn the lights OFF.

**D.** Rotate the Light Control clockwise (CW) **SLOWLY**, until the lights turn ON. This is the setting for the current level of light in the room.

**NOTE:** When the light control is in the fully CCW position the lights will never automatically turn ON. This is the Manual-On mode, where the lights need to be manually turned ON by the push-button, and will turn OFF with the absence of motion.

If the light control is in the fully CW position, the lights will turn ON whenever motion is detected, even in full daylight.

Intermediate settings will cause the lights to turn ON only when the ambient light is below the level selected by the light control.

**NOTE:** The ambient light in a room will change with the time of day and the season of the year.

#### 6. Time-Out Settings:

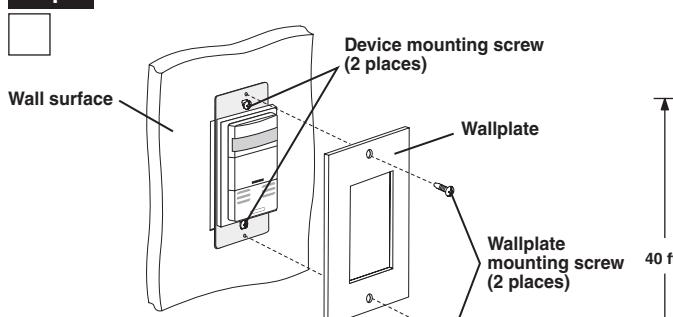
- A.** Adjust the Time dial. The Sensor Amber LED will flash twice each time the Time dial is pointed at a new Time-Out value. The Time-Out values for non-adapting mode are:

Face Marking	Value of Time
(/) Slash Mark	30 second fixed time-out for performing a walk test
1	10 minutes fixed time-out
2	20 minutes fixed time-out
3	30 minutes fixed time-out

**NOTE:** To return to adapting mode, rotate the Time dial to full CW position. Be sure the Time dial is rotated until an Amber LED flash is issued to be sure a new time value was selected. Then return the Time dial to the desired Time-Out setting.

- 7.** If desired, adjust the blinders to block any unwanted motion.
- 8.** Replace the Control Panel Cover and Decora® wallplate.

### Step 7 Sensor and Wallplate Mounting:



- Secure device by firmly tightening mounting screws.
- Install Decora® style wallplate (sold separately).

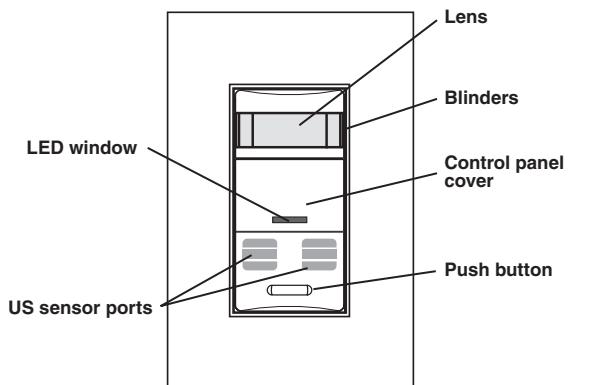
### OPERATION

**PUSH-BUTTON:** Cat. No. OSSMT-MDx has a push-button switch that will toggle the lights (refer to Figure). If the lights are OFF, the lights will turn ON when the button is pressed, and remain ON in the presence of motion. In the absence of motion, the Sensor Unit will Time-Out and turn the lights OFF.

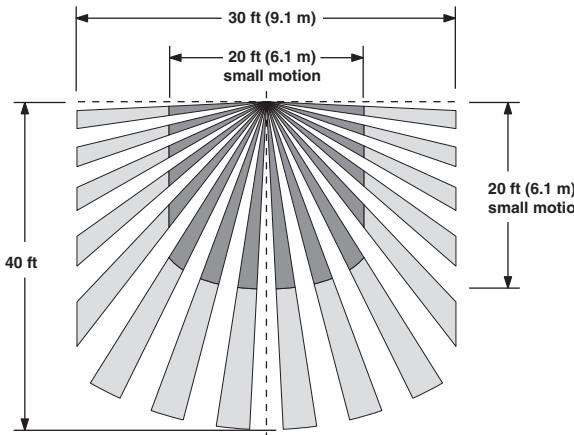
If the lights are ON, the lights will turn OFF when the button is pressed. The lights will stay OFF regardless of motion detected, until the Time-Out expires. After the Time-Out expires, the lights will turn ON with the next detected motion. This is useful for slide or film presentations.

#### NOTES:

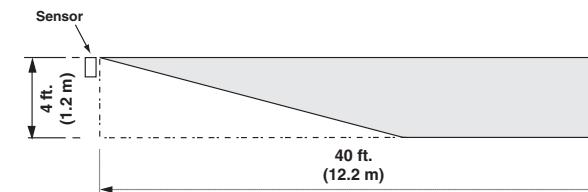
- The Motion Indicator LED will blink every 2 seconds while motion is detected.
- In Manual-On mode, the button must be pressed to turn the lights ON. In the absence of motion, the unit will Time-Out and turn the lights OFF.
- If Manual-On mode is desired, keep the Light knob in the fully counter-clockwise (CCW) position.



### Field-of-View (Horizontal)



### Side (Vertical) Field-of-View



### FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/tv technician for help.

### TROUBLESHOOTING

- 1.** If there is no response from the unit and the LED never blinks or the push button does not activate the lights 1 1/2 minutes after power is applied, then uninstall device and verify wiring (Step 4).
- 2.** If the lights constantly stay ON, even when the room is unoccupied:
  - A.** Check the Time setting. See how this time compares to how long the lights stay ON.
  - B.** Try lowering the Range Control. Rotate the knob counter-clockwise about 30°.
  - C.** If the problem persists, try reducing again. Note: Do Not reduce so much that Cat. No. OSSMT-MDx cannot see normal occupancy.
  - D.** Be sure to use the Blinders to block any unwanted hallway traffic.
  - E.** Check for reflected heat/motion as Sensor Unit may be seeing motion through a window.
  - F.** Check for adjacent HVAC and/or heater ducts.

### PRODUCT INFORMATION

- For technical assistance contact us at **1-800-824-3005**
- Visit our website at [www.leviton.com](http://www.leviton.com)