Multi-Technology Wall Mounted Occupancy Sensor
Cat. No. OSW12-M
To be used with 24VDC OSPxx Series and CN100 Power Pack Class II Low-Voltage Wiring

**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.
- Sensors must be mounted on a vibration free surface.
- All sensors must be mounted at least 6 feet away from air vents.
- Do not mount sensors closer than 10 feet from each other.
- Do not touch the surface of the lens. Clean outer surface with a damp cloth only.

**Tools needed to install your Sensor**
- Slot/Phillips Screwdriver
- Pliers
- Pencil
- Cutters

**Parts Included List:**
- Sensor (1)
- #8-32 x 1/2" Screw (2)
- #8-32 x 1 1/2" Screw (2)
- #32 Washer and Nut (2)

**DESCRIPTION**
The Occupancy Sensor is a low-voltage infrared and ultrasonic sensor that works with the OSPxx Series and CN100 power pack to automatically control lighting. The sensor turns the lights on and keeps them on whenever occupancy is detected and will turn them off after the 'delayed-off time' has expired.

The sensor continually analyzes and adjusts to changing conditions. The sensor uses the latest microprocessor-based technology which permits it to continually adjust and optimize its performance.

The combination of ultrasonic (doppler shift) motion detection which gives maximum sensitivity and infrared motion detection which gives higher false triggering immunity.

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**INSTALLING YOUR OCCUPANCY SENSOR**

**NOTE:** Use check boxes when Steps are completed.

**Step 1** Preparing and connecting wires:

1. Install the mounting bracket of the wall sensor to the wallboard or ceiling using the included screws, nuts and washers.
2. Drill holes for mounting screws using mounting bracket as template.
3. Make a hole in the wallboard or ceiling large enough to pass the wire connectors. Secure each connector with electrical tape.
4. Secure each connector with electrical tape.
5. Push wire connections through the center hole of the back cover and into the wall or ceiling.
6. Snap neck and base cover onto mounting bracket in the desired orientation.
7. Check that power is off before wiring!

**Step 2** Using Screws, Nuts and Washers:

**Step 3** Mounting Option Diagram A

**Step 3 cont'd**

**Step 3 cont'd**

**Step 3 cont'd**

**Step 3 cont'd**

**OPERATION**
- **Multi-Tech Mode** – This is the default mode of operation for the sensor. PIR technology turns lights on in this mode; however, motion detection by either technology will keep the lights on. If neither technology detects motion, the lights turn off after the delayed-off time.
- **Single-Tech Mode** – Only one technology is active in this mode. The technology is selected by the dip switches. Motion detection by the selected technology - PIR or ultrasonic - will turn on the lights as well as keep them on. When motion is not detected, the lights will turn off after the delayed-off time.
- **Delayed-Off Time** – The sensor is designed to turn the lights off if no motion is detected after a specified time. This length of time is called the delayed-off time and is set using the time knob on the sensor. The adjusting patterns will modify the delayed-off time to fit the parameters of each installation based on environmental conditions and occupancy patterns.
- **Walk-through Mode** – 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.
- **LED Operation** – There are two LED indicators that will flash when motion is detected. The LED flash can be disabled using the LED disable switch setting (refer to Table 2). Green flash indicates motion detection by ultrasonic technology. Red flash indicates motion detection by infrared technology.

**FCC COMPLIANCE STATEMENT:** This device complies with part 15 and part 18 of the FCC rules. Operation is subject to the following two conditions: (1) This device must not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
ADAPTIVE FUNCTIONS

The Sensor continuously analyzes the parameters of the motion detection signal and adjusts its internal operation to maximize detection of motion while minimizing the effects of noise (electrical noise, air currents, temperature changes, etc.).

Operation:

When the lights turn on, the sensor initially enters the "walk-through" mode. Once the room is occupied for longer than 2.5 minutes, the sensor enters the "Occupied" mode and is set to use the "Manual Mode". When the sensor is first installed, the delayed-off time is set to the "Factory Default Setting". The sensor analyzes the motion signal properties and will determine the delayed-off time duration based on how the sensor adapts to the room conditions. Whenever the sensor automatically turns on, the value of the delayed-off time will be updated to fit the particular situation. If the adaptive setting is not acceptable, the value of the adaptive delay can be reset to the Factory Default Setting.

For Delayed-Off Time:

The adapted settings can be reset using the DIP switch.

Occupancy Pattern Learning For Delayed-Off Time:

The sensor will automatically change the delayed-off time in response to the occupancy and environmental conditions of the space it is installed in. The sensor analyzes the motion signal properties and will determine the delayed-off time duration based on how the sensor adapts to the room conditions. Whenever the sensor automatically turns on, the value of the delayed-off time will be updated to fit the particular situation. If the adaptive setting is not acceptable, the value of the adaptive delay can be reset to the Factory Default Setting.

Default Settings:

Adjustment knob settings are as per "Factory Default Setting", (refer to Table 1 and Figure 3).

All switches in the "off" position refer to Table 2.

TABLE 1: ADJUSTMENT KNOB SETTINGS

<table>
<thead>
<tr>
<th>Knob</th>
<th>Color</th>
<th>Setting</th>
<th>Factory Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Set the ultrasonic range.</td>
<td>Full clockwise (CW) = max.</td>
<td>75%</td>
</tr>
<tr>
<td>Red</td>
<td>Set the infrared range.</td>
<td>Full CCW = min. (30 s)</td>
<td>75%</td>
</tr>
<tr>
<td>Black</td>
<td>Delayed-Off Time in response to occupancy.</td>
<td>Full CCW = max. (30 min)</td>
<td>75%</td>
</tr>
<tr>
<td>Blue</td>
<td>Ambient Light Override (Gray wire only).</td>
<td>Full CCW = lights stay OFF</td>
<td>75%</td>
</tr>
</tbody>
</table>

TABLE 2: SWITCH SETTINGS

<table>
<thead>
<tr>
<th>SWITCH</th>
<th>FUNCTION</th>
<th>SW1</th>
<th>SW2</th>
<th>SW3</th>
<th>SW4</th>
<th>SW5</th>
<th>SW6</th>
<th>SW7</th>
<th>SW8</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Single Mode Only</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>B</td>
<td>Walk-through Mode</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>C</td>
<td>Override to OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>D</td>
<td>Override to ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>E</td>
<td>Manual Mode</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>F</td>
<td>Motor Up</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>G</td>
<td>Motor Down</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>H</td>
<td>Light Forced OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>I</td>
<td>Light Forced ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>J</td>
<td>Override to OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>K</td>
<td>Override to ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

NOTE: This setting is only used if the Single Technology Option (switch A1) is selected.

Test Mode: To set the delayed-off time to 3 seconds for performing a walk test. While the sensor is in test mode, the LED will flash amber once a second.

1. ENSURE POWER IS ON.
2. Remove front cover.
3. Locate DIP Switch 3 in Bank B (B3) as shown in Figure 1. B3 will be in the OFF position by default.
4. To enter Test Mode, move switch to ON and back to OFF. This test mode has been enabled with a 0.5 time-out interval. This test mode can be enabled again with the following operation:

   Notes:

   1. The timer will remain in the 0.5 second test mode for 15 minutes, then automatically exit test mode and reset to the delayed-off time setting as defined by the black timer knob.
   2. To manually exit the 0.5 second test mode, simply toggle the switch B3 from OFF to ON and back to OFF.

Troubleshooting:

- Lights do not turn ON:
  - Circuit breaker or fuse has tripped.
  - Low-voltage measured. To Test: Change RED to BLUE wire at power pack to force lights ON.
  - Line voltage measured. To Test: Change BLUE to BLUE relay wire (of power pack) to force the lights ON.
- Lights stay ON:
  - Constant motion. To Test: Reduce RED and/or GREEN knobs by 10%. Remove sensor from location where it is sensing more motion. No sensor movement will occur with a single light source.
- Switches do not change state:
  - Pull sensor in timer test mode walk and wait hallway. If lights continue to come ON, move sensor.
- Light turns ON too long:
  - Timer setting too high. To Test: Check switch settings. Typical setting is 10 minutes.

PRODUCT INFORMATION

- For technical assistance, contact us at 1-800-824-3005
- Visit our website at www.leviton.com

Photocell: Ambient Light Override adjustment:

In order to use the Ambient Light Override functionality of the sensor, the sensor must be wired to the power pack (OSFx) using the Grey wire instead of the Blue wire. This feature allows the user to conserve energy by keeping the controlled lights off if ambient light is not sufficient. The sensor works by analyzing the ambient light and keeping the controlled lights off if there is enough ambient light available. To use this feature, the Photocell adjustment (Blue knob) must be adjusted from the default position. Once the adjustment is made, the controlled lights will only turn on if the ambient light present is less than the factory default setting.

To set the photocell level (used with the gray wire connection):

NOTE: This setting must be performed when the natural light is low enough to require artificial light.

1. Remove the cover from the sensor.
2. Make note of the position of the Red and Green knobs. Rotate the Red and Green knobs full CCW and enter the sensor's Test mode as described above.
3. Rotate the Blue knob full CW.
4. Wait for the lights to turn OFF.
5. Rotate the Red knob full CW.
6. Slowly rotate the blue knob clockwise until the lights turn ON. This is the correct setting.
7. Return the Red and Green knobs to their original positions.
8. Replace cover. Setting is complete.

Mounting Location Diagram

Wiring Diagram

Multiple Sensor, Single Power Pack

OFPx Series Power Pack

**TABLE 3: WIRE DESIGNATIONS**

<table>
<thead>
<tr>
<th>Name</th>
<th>Color</th>
<th>Gauge</th>
<th>Temp/package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line</td>
<td>24VDC</td>
<td>20</td>
<td>20 amp</td>
</tr>
<tr>
<td>Neutral</td>
<td>20</td>
<td>20 amp</td>
<td></td>
</tr>
<tr>
<td>Load</td>
<td>20</td>
<td>20 amp</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

- When using the Photocell function, connect the Gray wire of the sensor to the Blue wire of the power pack. DO NOT use the Blue wire of sensor.
- Ensure to cap wire that is not being used.

**LIMITED 3 YEAR WARRANTY AND EXCLUSIONS**

Leviton warrants to the original consumer purchaser and their successor in interest that its product shall be free from defects in materials and workmanship under normal and proper use for three years from the date of purchase. Leviton’s sole obligation is to correct such defects by repair or replacement, at its option, if within such five year period the product is returned prepaid, with proof of purchase date, and a description of the defect, to Leviton. This warranty is void if the product is installed incorrectly or in an inappropriate environment, abused, misused, damaged, or repaired by anyone other than an authorized Leviton warranty service center. Except as otherwise specifically stated, all other warranties, whether expressed or implied, including without limitation, those of merchantability and fitness for a particular purpose, are hereby disclaimed. Leviton is not liable for incidental or consequential damages in any event. LIMITATION OF DAMAGES LIMITATION OF REMEDIES: NOTwithstanding any other provisions of this warranty, the remedies of the consumer are limited to repair or replacement. Some jurisdictions do not allow limitations on incidental or consequential damages, so the above limitation may not apply to you. Some jurisdictions do not allow the exclusion or limitation of remedies, so the above exclusion may not apply to you. This warranty gives you specific legal rights; you may have other rights which vary from jurisdiction to jurisdiction.

**Figure 1** Minimum and Default Settings

**Figure 2** Field-of-View Ranges