PS-HDTC24-R:
1000 sq ft 360° Presence Sensor
HDIR and Ultrasonic Technology
Ceiling Mount | Low Voltage

Overview:
The PS-HDTC24-R is a low voltage High Definition Passive Infrared (HDIR) and Ultrasonic (US) Presence Sensor designed to work with any PerfectSense power pack, to automatically control lighting in applications where minor motion is dominant and a dual technology sensor is necessary. Utilizes patented industry best HDIR infrared sensing technology (864 field of view points) that provides superior micro-movement detection. Dual Form C Relays are present on the sensor to allow for integration to NexLight’s 2-wire system and HVAC/BMS Systems. The sensor turns the lights on and keeps them on while occupancy is detected and will turn the lights off after the delayed-off time has expired.

Operation:
Single-tech Mode: Only one technology (dip switch selectable) is active in this mode. Motion detection by the selected technology 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.

Multi-tech Mode:
Mode 1: Switch A1 is OFF and Switch A2 is OFF: PIR detection will turn lights ON in this mode, motion detection by either technology will keep the lights ON. If neither technology detects motion, the lights turn off after the delayed-OFF time.

Mode 2: Switch A1 is OFF and Switch A2 is ON (this is the default mode): Detection by either technology will turn the lights ON as well as keep them ON. If neither technology detects motion, the lights will turn OFF after the delayed-OFF time.

Walk-Through Mode: useful when a room is momentarily occupied, like a storage area, When a person enters the room, the lights turn on. If the person leaves the room before the 2.5 minute walk-through timer expires, the sensor will turn the lights OFF. If the person stays in the room longer than 2.5 minutes the sensor will proceed to standard operation.

Daylight Sensor: The integrated daylight sensor allows for ambient light override functionality. If this setting is enabled, the controlled lighting load will only turn on if the ambient light present is less than the preset level.

LED Indication: The integrated LED indication lights will flash when motion is detected. This can be disabled using the LED Disable switch setting in the control console of the sensor. A Red flash indicates motion sensing by HDIR, while a Green flash indicates motion sensing by Ultrasonic.

Features:
• 1000 sq ft range
• Patented HDIR 8-element Sensor
• 864 Optical Field-of View Pattern
• Dual Technology
• Single Technology selectable
• 360° Coverage Pattern
• Superior RF immunity
• Adjustable Time Delay (30 sec – 30 min)
• Walk-Through Mode
• Daylight Override Mode
• Mounts in drop ceilings and solid ceilings
• LED indication of occupancy sensing

Specifications

Electrical:
Power Requirements: 24VDC, from powerpack
Current Consumption: 30mA
Output: 24VDC active high logic control signal with short circuit protection
Isolated Relays: 2 SPDT 1 Amp, 30 VDC Form C
Wiring Diagram: See Fig. 2

Controls:
HDIR Sensitivity: 0-100% (Factory Set 50%)
Ultrasonic Sensitivity: 0-100% (Factory Set 50%)
Light Sensor: 20-320 Foot Candles (Factory Disabled)
Detection Range: See Fig. 1
Load Rating: Controls Class 2 Power Pack
Housing Material: High-Impact ABS
Color: White
Environment Temperature: 14°F to 122°F
Humidity: 0-95% Non Condensing
Installation: See Install Instructions
Dimensions: Diameter 4.33 in
Height 2.2 in
Supported with limited 5-year warranty
Title 24 Compliant
Meets ASHRAE 90.1 requirements

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Sensor Adjustments Console:

All aspects of sensor operation can be adjusted here. View of adjustments when cover is removed. Dip Switch setting table below illustrates how to enable and disable sensor functions.

### Ultrasonic Adjustment

Ultrasonic sensitivity can be dialed up or down to meet the exact needs of any space. This adjustment is helpful to ensure detection in all areas during a walk test.

### Passive Infrared Adjustment

PIR sensitivity can be dialed up or down to meet the exact needs of any space. This adjustment is helpful to ensure detection in all areas during a walk test.

### Daylight Sensor Adjustment

Factory default setting is disabled. If installed location calls for the use of daylight sensor this is the adjustment for control of required ambient light levels necessary to disable the automatic ON control of the sensor when detecting occupancy. NOTE: The daylight sensor function is not applicable in rooms using manual ON control.

### Off Time Adjustment

Each time motion is detected, the lights remain activated for a preset time, which is set by the Off-time adjustment. The fully counter-clockwise setting (30 seconds) can be used for testing. If motion is detected during the ON time, the timer resets and lights will remain on until the full off-time has expired.
Ordering Information - Ceiling Mount Models

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CATALOG #</th>
<th>OPERATING FREQUENCY</th>
<th>COVERAGE*</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIR Wide View Ceiling Mounted Low Voltage Occupancy Sensor w/Relay</td>
<td>PS-PCL24-R</td>
<td>-NA-</td>
<td>360' 2000sf</td>
<td>White</td>
</tr>
<tr>
<td>Dual Tech HDIR Ceiling Mounted Low Voltage Occupancy Sensor w/Relay</td>
<td>PS-HDTC24-R</td>
<td>40kHz</td>
<td>360' 1000sf</td>
<td>White</td>
</tr>
<tr>
<td>HDIR Ceiling Mounted Low Voltage Occupancy Sensor w/Relay</td>
<td>PS-HC24-R</td>
<td>-NA-</td>
<td>360' 1000sf</td>
<td>White</td>
</tr>
<tr>
<td>PIR High Bay Ceiling Mounted Low Voltage Occupancy Sensor w/Relay</td>
<td>PS-HBC24-R</td>
<td>-NA-</td>
<td>360' 2000sf</td>
<td>White</td>
</tr>
<tr>
<td>Dual Tech Ceiling Mounted Low Voltage Occupancy Sensor w/Relay</td>
<td>PS-DTC24-R</td>
<td>40kHz</td>
<td>360' 1000sf</td>
<td>White</td>
</tr>
<tr>
<td>20A Heavy Duty Occupancy Power Pack</td>
<td>PS-PP3000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20A Heavy Duty Occupancy/Vacancy Power Pack</td>
<td>PS-PP7000</td>
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</tbody>
</table>

*all coverage areas are based on a standard mounting height

Detection Range and Coverage Area (Fig. 1)

<table>
<thead>
<tr>
<th>Optical Fields-of-View</th>
<th>Long-range</th>
<th>Mid-range</th>
<th>Short-range</th>
<th>Look-down</th>
<th>Total Field-of-View</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>192</td>
<td>384</td>
<td>256</td>
<td>32</td>
<td>864</td>
</tr>
</tbody>
</table>

Note: Sensor tested using NEMA WD 7-2011 Occupancy Motion Sensors Standard

Wiring Diagram (Fig. 2)
Sensor Technology Comparison

HDIR technology significantly surpasses known boundaries of IR sensor technology. Extending the capability of IR to new levels of accuracy through a combination of patented sensor hardware and logic algorithms. The power behind this innovation originates from a proprietary 8-element pyros infrared element that eclipses current competitive sensor logic technologies. Eight-Hundred and Sixty-Four (864) optical view patterns are achieved, delivering unmatched sensitivity for minor motion events like hand and finger movements. Paired with ultrasonic technology for a complete solution designed to meet the demands of Title 24 and ASHRAE 90.1.

<table>
<thead>
<tr>
<th>#</th>
<th>Element Orientation</th>
<th>Detection Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8 Element IR of PerfectSense PS-HDTC24-R</td>
<td><img src="image" alt="Detection Area Image" /></td>
<td>864 optical view patterns, each cluster of 8-element pattern makes detecting very fine body movement possible. 360-degree coverage with circular area, good repeatability. Detect movements 20 degree across the optical zone.</td>
</tr>
<tr>
<td>4</td>
<td>4 Element IR of Ordinary Product</td>
<td><img src="image" alt="Detection Area Image" /></td>
<td>224 optical view patterns. Detection coverage is not full circle. Many blind spots.</td>
</tr>
<tr>
<td>2</td>
<td>2 Element IR of Ordinary Product (Industry Standard)</td>
<td><img src="image" alt="Detection Area Image" /></td>
<td>62 optical view patterns. An ellipse shape detection coverage, not full circle. Detect movement 40 degree across optical zone.</td>
</tr>
</tbody>
</table>